Renewable Natural Gas Facility at the El Sobrante Landfill

Addendum to the Environmental Impact Report for the El Sobrante Landfill Expansion (SCH# 1990020076) & the El Sobrante Landfill Solid Waste Facility Permit Revision Supplemental Environmental Impact Report (SCH# 2007081054)

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Moreno Valley, CA 92553

September 2024

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Table of Contents

Section		**Page**
1.0	Introduction	1
1.1	Purpose of the Addendum	1
1.2	Legal Authority	1
1.3	Incorporation by Reference	3
2.0	Project Description	5
2.1	South RNG Site	12
2.2	North RNG Site	13
2.3	Gas POR Site	14
2.4	Underground Piping	14
2.5	SoCal Gas Pipeline Interconnection	15
2.6	Construction and Operation Details	23
3.0	Initial Study/Modified Environmental Checklist	24
4.0	Findings and Conclusions	135
5.0	Continued Implementation of Mitigation Measures and Regulatory Requirements	135
6.0	References	136

Table	**Page**
Table 1-1: Pertinent and Related Documents	3
Table 3-1: Proposed Project Estimated Construction Emissions	39
Table 3-2: Proposed Project Estimated Operational Emissions	41
Table 3-3: Proposed Project Estimated On-Site Construction Emissions	44
Table 3-4: Proposed Project Construction Petroleum Demand	65
Table 3-5: Proposed Project Operations Annual Energy Demand	66
Table 3-6: Consistency with Energy Management Plans	68
Table 3-7: Proposed Project Estimated Greenhouse Gas Emissions	79

Figure	**Page**
Figure 1: Regional Map	6
Figure 2: Vicinity Map	8
Figure 3: Proposed Project	10
Figure 4: South RNG Site Preliminary Layout	17
Figure 5: North RNG Site Preliminary Layout	18
Figure 6: Gas POR Site	20

APPENDICES

Appendix A	Visual Simulations
Appendix B	Air Quality and Greenhouse Gas Emissions Impacts Study
Appendix C	Biological Resources Technical Report
Appendix D	Cultural Resources Report
Appendix E	Energy Impact Study
Appendix F1	Geotechnical Investigation Report
Appendix F2	Geotechnical Exploration and Recommendations Report
Appendix G	Paleontological Memorandum
Appendix H	Flood Risk Summary Memeo
Appendix I	Noise and Vibration Study

1.0 Introduction

1.1 Purpose of the Addendum

An Environmental Impact Report (EIR) for the El Sobrante Landfill was certified by the Riverside County Board of Supervisors on September 1, 1998 (State Clearinghouse [SCH] No. 1990020076). That EIR, comprised of the April 1994 Draft EIR, the April 1996 Final EIR, and the July 1998 Update to the Final EIR, was prepared to address the El Sobrante Landfill Expansion Project (herein, 1998 EIR) and found all impacts would be reduced to below a level of significance with implementation of mitigation measures identified in the 1998 EIR.

In 2009, a Supplemental EIR (SEIR) (herein, 2009 SEIR) was certified by the Riverside County Board of Supervisors on March 31, 2009 (SCH No. 2007081054). The 2009 SEIR analyzed a proposed revision to the El Sobrante Landfill Solid Waste Facility Permit (SWFP) for allowing acceptance of waste material over a continuous 24-hour period and changing the maximum tonnage limit to a weekly tonnage limit of 70,000 tons per week (tpw) not to exceed 16,054 tons per day (tpd). The 2009 SEIR analyzed potential environmental impacts associated with aesthetics, air quality, noise, public health and safety, and transportation and circulation, and determined that the proposed revision to the SWFP would not result in any new environmental impacts that were not previously accounted for, and mitigated by, the 1998 EIR. The numbering of some mitigation measures identified in the 1998 EIR Mitigation and Monitoring Plan (MMP) were changed in the 2009 SEIR to reflect the completion of mitigation requirements and/or to omit mitigation measures that no longer applied since certification of the 1998 EIR. Additionally, various Addenda have been prepared to the 1998 EIR/2009 SEIR, one of which resulted in the modification of the MMP (mitigation measure N-1 was modified). The latest Addendum prepared to the 1998 EIR/2009 SEIR is dated January 2018 and it analyzed the reduction and reconfiguration of the overall limit of grading; incorporation of and revision to a previously considered conceptual drainage plan for the El Sobrante Landfill (landfill); and construction of a new equipment maintenance shop on the northern portion of the landfill site (2018 Addendum).

1.2 Legal Authority

According to the California Environmental Quality Act (CEQA) Guidelines Section 15164(a), the lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred. (CEQA Guidelines, § 15164, subd. (a); see also Pub. Resources Code, § 21166.) Section 15162 of the CEQA Guidelines lists the conditions that would require the preparation of a subsequent EIR rather than an addendum. These include the following:

(a) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(b) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(c) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time of the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

(i) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(ii) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(iii) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(iv) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Where a lead agency determines that neither substantial changes in the project, changed circumstances, nor new information triggers the need for an EIR, "the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation." (CEQA Guidelines, § 15162, subd. (b); see also CEQA Guidelines § 15164, subd. (b).)

In *Friends of College of San Mateo Gardens v. San Mateo County Community College Dist.* (2016) 1 Cal.5th 937, 949 ("*Friends*"), the California Supreme Court explained that "[o]nce a project has been subject to environmental review and received approval, [Public Resources Code] section 21166 and CEQA Guidelines section 15162 limit the circumstances under which a subsequent or supplemental EIR must be prepared. These limitations are designed to balance CEQA's central purpose of promoting consideration of the environmental consequences of public decisions with interests in finality and efficiency." The subsequent review provisions, accordingly, are "designed to ensure that an agency that proposes changes to a previously approved project "explore[s] environmental impacts *not* considered in the original environmental document" (*id*. at p. 951 [italics added]). "This assumes that at least some of the environmental impacts of the modified project were considered in the original environmental document, such that the original document retains some relevance to the ongoing decision-making process. A decision to proceed under CEQA's subsequent review provisions must thus necessarily rest on a determination—whether implicit or explicit—that the original environmental document retains some informational value" (*ibid*). Consistent with these legal principles and CEQA Guidelines provisions governing subsequent review, the Riverside County Department of Waste Resources (RCDWR) prepared the analysis below in order to determine whether any of the conditions described in section 15162 of the CEQA Guidelines calling for preparation of a subsequent EIR have occurred.

Based on these considerations, preparation of an Addendum to the certified 1998 EIR/2009 SEIR was deemed appropriate to comply with CEQA for the proposed Renewable Natural Gas (RNG) Facility at El Sobrante Landfill Project (proposed project); refer to Section 2.0, Project Description, for specific details). This Addendum appropriately focuses only on those aspects of the proposed project or its impacts that require additional discussion in light of the environmental analysis already found in the 1998 EIR/2009 SEIR and related CEQA documents (see *Friends*, *supra*, 1 Cal.5th at p. 951).

The RCDWR evaluated the environmental conditions associated with the proposed project, which are described in Section 2.0 of this Addendum, in light of the requirements defined under CEQA. In addition, RCDWR evaluated the potential impacts of the proposed project using an Initial Study/Modified Environmental Checklist (see Section 3.0 of this Addendum), which is the means for providing the required documentation.

1.3 Incorporation by Reference

State CEQA Guidelines §15150 allows for an EIR to "…incorporate by reference all or portions of another document…Incorporation by reference is most appropriate for including long, descriptive, or technical materials that provide general background but do not contribute directly to the analysis of the problem at hand." Several documents have been completed for the project site, including the 1998 EIR and 2009 SEIR. The 1998 EIR and 2009 SEIR are herein incorporated by reference and are available at the RCDWR, 14310 Frederick Street, Moreno Valley, CA 92553. In addition, the Second El Sobrante Landfill Agreement (1998), the First, Second, Third, and Fourth Amendments to the Second El Sobrante Landfill Agreement (2003, 2007, 2012, and 2015, respectively), First Amended and Restated Second El Sobrante Landfill Agreement (2018), and the SWFP for the El Sobrante Landfill are herein incorporated by reference and are available with the RCDWR, at the above-listed address.

Another document, entitled, "Joint Technical Document, El Sobrante Landfill, Riverside, CA" (revised November 2023), was prepared to satisfy the Report of Waste Discharge Requirements (ROWD) found in California Code of Regulations (CCR), Title 27, §21585 and the Report of Disposal Site Information requirements found in CCR Title 27, §21600. This document is herein incorporated by reference, and is available at the Riverside County Department of Environmental Health, Local Enforcement Agency, located at 4080 Lemon Street, Riverside, CA 92501.

Table 1-1, Pertinent and Related Documents, provides a summary of the existing and related documents pertaining to the proposed project.

Table 1-1: Pertinent and Related Documents

Document Type	Date	Description
Draft EIR for the El Sobrante Landfill Expansion Project	June 1994	CEQA compliance documentation to add 1,144 acres to the landfill site, for a total of 1,322 acres; to expand the overall waste disposal capacity of the landfill from approximately eight (8) million tons to approximately 108 million tons, or 196.11 million cubic yards; to increase acceptable daily tonnage from 4,000 to 10,000 tpd, and to permit waste disposal operations from 4:00 AM to 12:00 Midnight, seven (7) days per week, with the exception of holidays designated by the County.
Final EIR for the El Sobrante Landfill Expansion Project	April 1996	
Update to Final EIR for the El Sobrante Landfill Expansion Project	July 1998	
Second El Sobrante Landfill Agreement	September 1, 1998	Public-private agreement between County of Riverside and USA Waste of California, Inc., for the expansion (as described above) and operation of the El Sobrante Landfill. The Second Agreement superseded the original agreement and the six (6) subsequent amendments thereto.

Document Type	Date	Description
First Amendment to Second El Sobrante Landfill Agreement	June 20, 2003	Permits the construction and operation of a landfill gas to energy facility and a yard trimmings chipping, grinding and processing facility at the landfill.
Second Amendment to Second El Sobrante Landfill Agreement	March 12, 2007	Allows for USA Waste of California, Inc. to seek regulatory approvals for proposed operational changes, sets disposal rates, requires the diversion of some County Waste from the landfill into a County owned or operated landfill, and increases the aggregate capacity reserved for County waste at the landfill.
Draft SEIR	December 22, 2008	CEQA compliance document for continuous 24-hour acceptance of waste material for disposal, up to 7 days a week, and a change from a maximum daily capacity (10,000 tons per day) to a weekly disposal capacity limit (70,000 tons per week not exceeding 16,054 tons per day).
Final SEIR	March 31, 2009	
Current Solid Waste Facility Permit #33-AA-0217	September 9, 2009	Permit allows 70,000 tons per week (16,054 tons per day maximum daily peak) of waste to be disposed within 468 acres and a maximum of 1,305 daily vehicle trips
Third Amendment to Second El Sobrante Landfill Agreement	December 18, 2012	Changed hours for existing and future excavation and liner construction activities in new landfill cells, which resulted in a revised MMP being adopted for the landfill.
Fourth Amendment to Second El Sobrante Landfill Agreement	March 24, 2015	Revised a definition for "Non-hazardous Solid Waste" to remove conflicting language from the Second Agreement, which allowed for the continued acceptance of a non-hazardous material (incinerator ash) at the landfill. This amendment also substituted a State-approved financial assurance mechanism for Closure/Post-Closure Maintenance.
Addendum to the EIR for the El Sobrante Landfill Expansion & the El Sobrante Landfill SWFP Revision Supplemental EIR	January 2018	CEQA compliance document for reduction and reconfiguration of the overall limit of grading; incorporation of and revision to a previously considered conceptual drainage plan for the El Sobrante Landfill; and construction of a new equipment maintenance shop on the northern portion of the landfill site.
First Amended and Restated Second El Sobrante Landfill Agreement	July 2018	A public-private agreement between County of Riverside and USA Waste of California, Inc. that was approved by the County Board of Supervisors on July 17, 2018. The primary intent of the new agreement was to consolidate and combine the Second Agreement and its four amendments into a single document. This agreement also incorporated Ponds 3 and 4, as well as the new maintenance facility, into the landfill's permitted disturbance limits.
Joint Technical Document, El Sobrante Landfill, Riverside, CA	November 2023	Provides operational characteristics at the landfill in conformance with the ROWD found in CCR, Title 27, §21585, and the Report of Disposal Site Information requirements found in CCR Title 27, §21600.

2.0 Project Description

The proposed project is the installation of a RNG Facility at the Waste Management (WM)'s El Sobrante Landfill (see Figures 1 and 2 for regional and vicinity maps) to utilize landfill gas (LFG) that would be diverted from existing landfill flares and processed to meet Southern California Gas Company (SoCal Gas) specifications for local distribution via an existing SoCal Gas pipeline. The proposed project is addressed as an acceptable onsite use, consistent with future development plans for beneficial use of LFG as a fuel source, in the current (2023) El Sobrante Landfill Joint Technical Document (JTD). Specifically, Section 3.1.6, Landfill Gas Control/Recovery Systems, of the 2023 JTD identifies:

"The LFG may be used to produce electricity, produce liquid natural gas, renewable natural gas (RNG), or other beneficial use. The LFG cogeneration plant was decommissioned in 2016 and USA Waste currently has plans to develop an RNG plant onsite. Any LFG not used at the RNG facility will be directed to the flare station which is sized to handle all LFG currently generated at the facility. ***The RNG Facility will process existing LFG that will be diverted from the existing flares, processed to meet SoCal Gas specifications, and sold to SoCal Gas through a Point of Receipt (POR) for local distribution.*** *The proposed RNG improvements will be located within three previously disturbed areas within WM owned property at ESL (see Figure 11-1). The RNG Location Map indicate the three locations designated as South RNG Site, North RNG Site, and Gas POR."*

Figure 11-1, Renewable Natural Gas Location Map, of the 2023 JTD identifies where the future development plans for an RNG plant are intended to be located, which is consistent with the proposed project (as detailed below). Toro Energy of California – El Sobrante, LLC (Toro) has entered into a property lease agreement with WM to install and operate the proposed RNG Facility within three previously disturbed areas, which would involve the following elements (see Figure 3): a South RNG Site; a North RNG Site; a Gas Point of Receipt (POR) Site; underground piping within pipe trenches connecting the three sites for the purpose of conveying LFG, processed gas, and other necessary lines for the RNG process; and an underground pipeline interconnection between the Gas POR Site and SoCal Gas' existing main pipeline located in Temescal Canyon Road.

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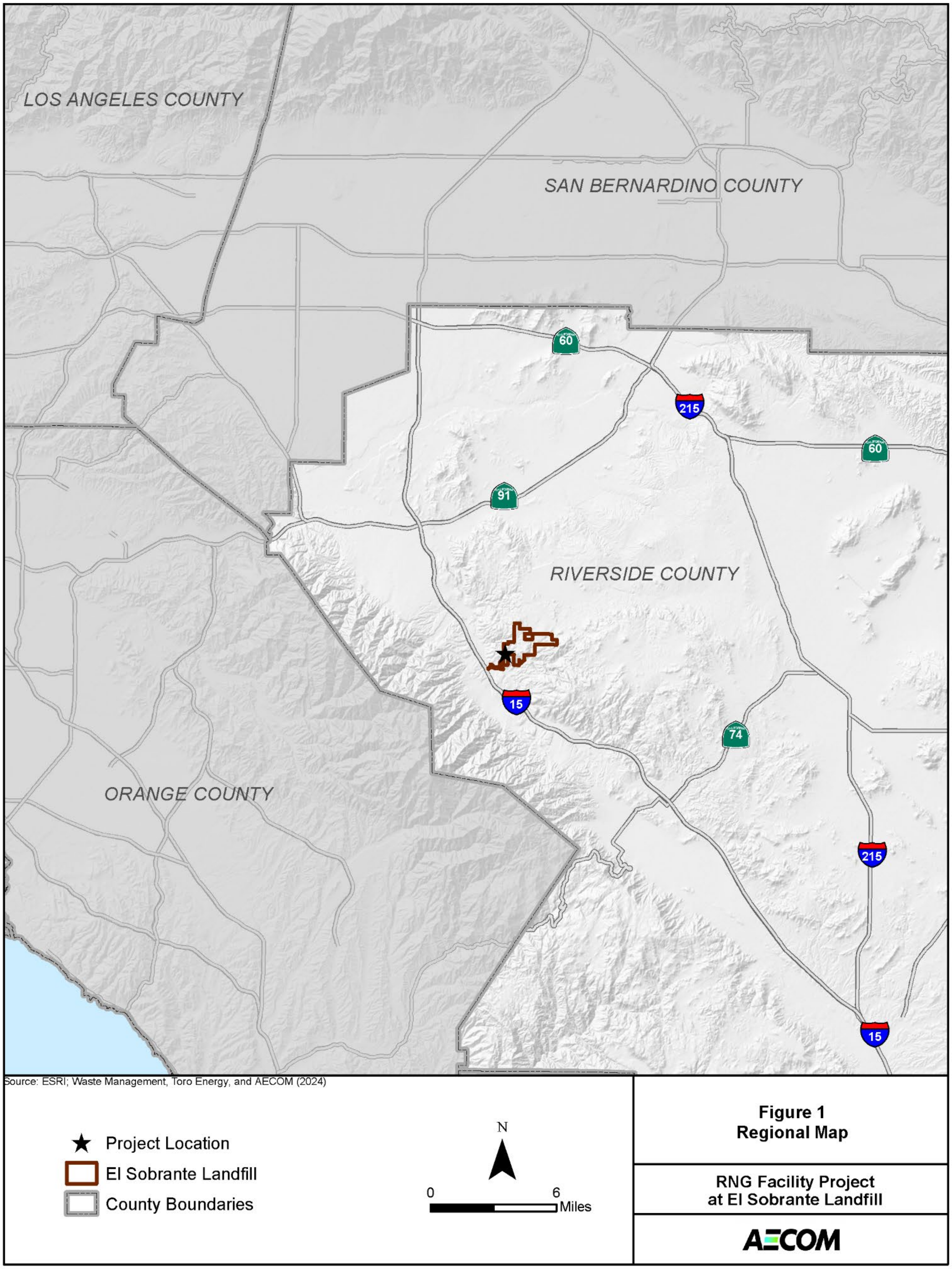

Figure 1
Regional Map

RNG Facility Project at El Sobrante Landfill

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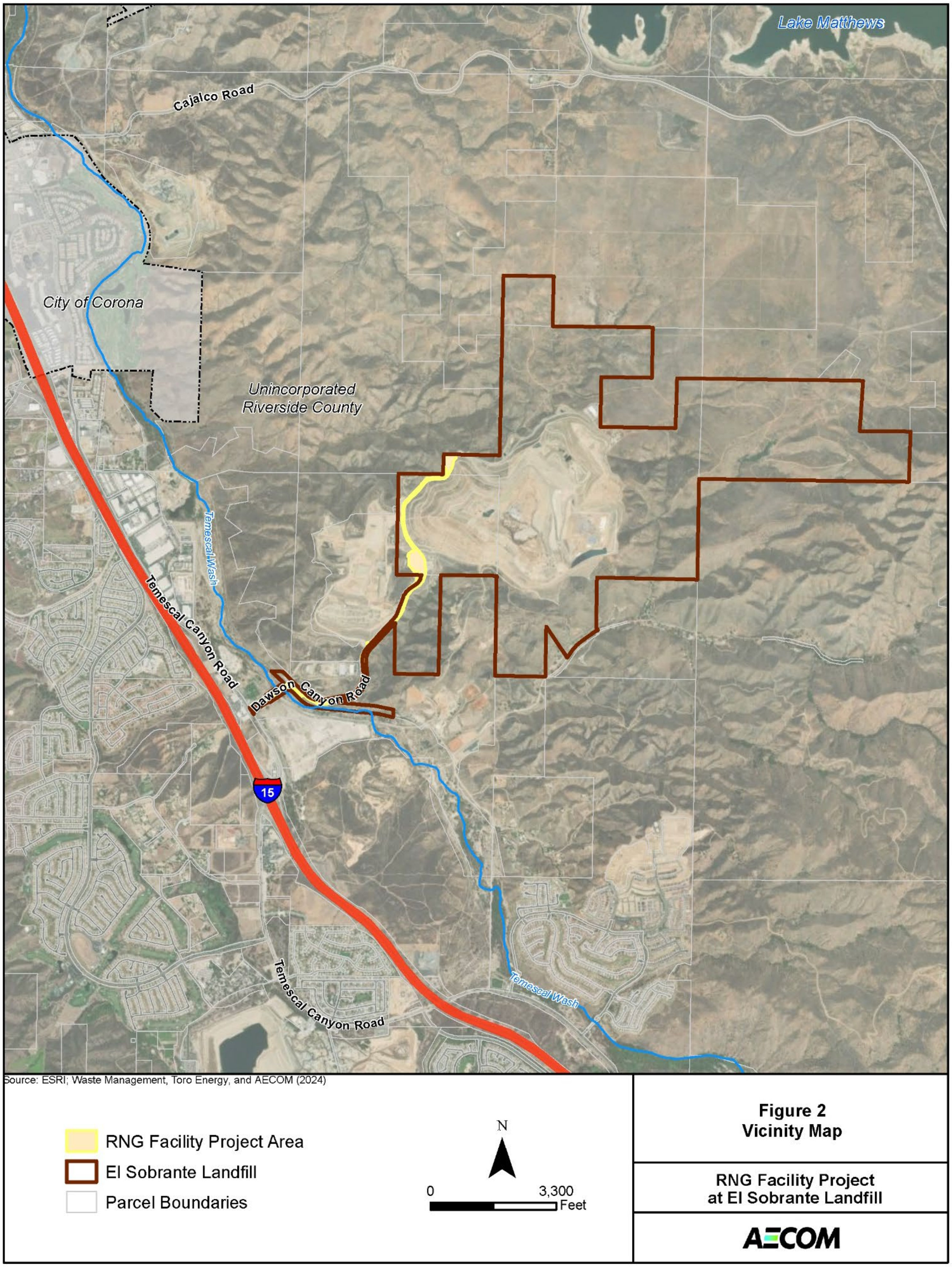

Figure 2
Vicinity Map

RNG Facility Project at El Sobrante Landfill

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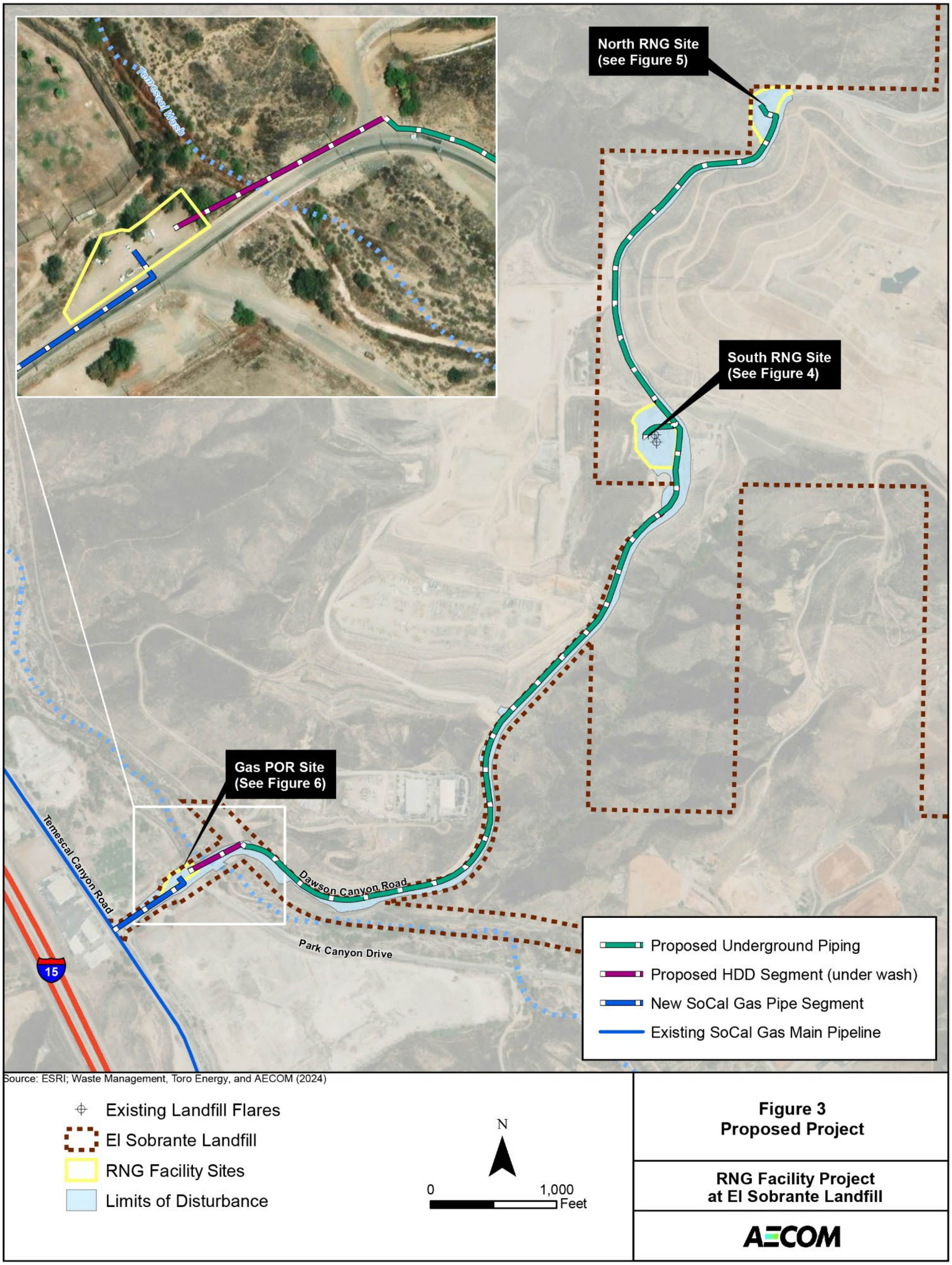

Figure 3
Proposed Project

RNG Facility Project at El Sobrante Landfill

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2.1 South RNG Site

The South RNG Site would be an approximately 0.3-acre area located adjacent to El Sobrante Landfill's two existing LFG flares (flare station) (see Figure 4). The 0.3-acre area currently contains three concrete pads that were previously used for co-gen power generation; these existing concrete pads would be removed and replaced with concrete specifically designed for the equipment to be utilized at the site. The South RNG Site location is part of a larger graded area associated with the existing landfill entry and scales.

The RNG process would begin at the South RNG Site through the interception of LFG by tapping into the discharge manifold header piping prior to the gas being burned at the existing flare station. The diverted, raw LFG would be conveyed to the North RNG Site utilizing a 30-inch diameter pipe to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road (see Section 2.4 for pipe trench and piping details). The North RNG Site would treat LFG (see Section 2.2 for details) that meets minimum specifications for processing; LFG that does not meet minimum specifications would be returned within a separate pipe (LFG reject line) in the same pipe trench back to the South RNG Site to be reprocessed through the RNG plant.

After the initial treatment process at the North RNG Site, the partially treated gas would be sent via another pipe in the pipe trench to be refined at the South RNG Site (i.e., final nitrogen removal) sufficient to meet SoCal Gas specifications. It would then be diverted via a sales gas compressor to a dedicated underground sales gas main to be placed within an underground pipe trench within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road (see Section 2.4) and sent southward to the Gas POR Site (see Section 2.3). Waste gas from the refining process would be sent (via separate pipe in the pipe trench) to the recuperative oxidizer at the North RNG site for further treatment and release. Condensate generated from the RNG facility would be treated on-site at the South RNG Site with Double-Stage Forward Osmosis and Reverse Osmosis (DFRO) process equipment. Any permeate generated from this process that meets industrial waste requirements would be sent to the Temescal Valley Water District sanitary system. Solids would be trucked off to a facility that is permitted to accept the solids. Ancillary equipment to be located at the South RNG Site would include sales gas compressors, nitrogen rejection units, condensate treatment equipment, gas coolers, various tanks, transformers/switch gear, and a utilities building. The South RNG Site would also include an approximately 3,200-square foot (SF) maintenance and office building, which would be used as an equipment control center as well as for routine equipment maintenance required for the RNG Facility (e.g., instrument repair/swap out, inspections, oil and filter parts for compressor changes, etc.). For vehicle access to, and parking at, the South RNG Site a 25-foot-wide access easement would be dedicated between the proposed equipment and structures at the South RNG Site and the existing flare station. Building and equipment heights at the South RNG Site would typically range between 5 and 12 feet above ground surface, but with the housing for the nitrogen rejection units being 80 feet above ground surface.

2.2 North RNG Site

The North RNG Site would be an approximately 1.2-acre area on an existing graded landfill pad, approximately 0.5-mile north of the South RNG Site. This pad currently contains the landfill's former maintenance shop, a trailer, a concrete pad, a 40,000-gallon reclaimed water storage tank, and potable water booster tanks. The North RNG Site is where initial treatment/refining of the LFG would occur and is referred herein as the 'RNG Facility' (see Figure 5). The RNG Facility would require removal of the existing concrete pads, the existing canopy structure of the former maintenance facility, and the existing trailer. The existing water storage tank and potable water booster tanks would be protected in place (i.e., these tanks would not be part of the 1.2-acre RNG Facility). The RNG Facility would consist of various equipment, which would be located on separate concrete pads with above and below ground pipe connections. Equipment would include scrubbers, blowers, coolers, LFG compressors, absorbers, strippers, oxidizers, exchangers, filters, tanks, amine treatment, utilities building, motor control center building, etc., with heights ranging from 5 to 80 feet above ground surface. The RNG Facility would be bordered by 12-foot-high fencing with colored slats (to match the adjacent natural terrain) with sound-attenuating drapes on the inside of the fence.

Once the gas has met certain carbon dioxide (CO_2), hydrogen sulfide (H_2S), volatile organic compounds (VOCs), and moisture concentrations it would be diverted via the amine treatment and hydration unit back to the South RNG Site for final nitrogen removal and compression into a 6-inch sales gas main to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road between the South RNG and Gas POR Sites (see Section 2.4). All condensate collected at the North RNG Site will be diverted to the South RNG Site for treatment (see Section 2.1).

2.3 Gas POR Site

The RNG process concludes at the 0.2-acre SoCal Gas POR Site that will be located at the southwest portion of the El Sobrante Landfill within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection (see Figure 6). A temporarily closed Temescal Driving Range is located to the north, and a potential future Temescal Valley Commercial Center (TVCC) development area is located to the south (across Dawson Canyon Road), of the Gas POR Site. The 6-inch sales gas RNG main will be brought to the POR underground via horizontal directional drilling (HDD) beneath Temescal Canyon Wash (see Section 2.4) and brought to grade/connected within the fence-enclosed POR. SoCalGas will have various pieces of equipment to receive the RNG, including gas analyzer, gas odorant equipment, electrical equipment, etc., that would be housed within shelters or canopies. Equipment at the POR would be supported on concrete slabs to be placed above 3- to 5-feet of over excavation of the existing onsite soils. The overall POR facility would be on a raised fill pad so that it is one foot above the base flood elevation. An approximately 3-foot-high masonry retaining wall would support the fill on its southern side between Dawson Canyon Road and an internal POR access road/driveway. The entire POR facility would be surrounded by 6-foot-high decorative fencing. It will be installed, owned, and maintained by SoCal Gas.

2.4 Underground Piping

Between the South RNG Site and North RNG Site an approximate 5-foot-8-inch wide by 8.5-foot-deep pipe trench, approximately 3,700 linear feet in length, would be installed via open cut trenching within the existing pavement or shoulder of the landfill access road. This pipe trench would house six separate lines: a 30-inch, high-density polyethylene (HDPE) LFG supply line to send raw LFG to the RNG plant; a 6-inch FlexSteel line to send partially treated gas from North RNG Site to the exchanger at the South RNG Site for semi-treatment; a 12-inch HDPE line to send partially treated waste gas from the South RNG Site to the recuperative oxidizer at the North Site for further treatment and release; a 4-inch HDPE fuel gas line to service the recuperative oxidizer and amine heater at the North RNG Site; a 20-inch HDPE LFG reject line from the North to South site to the existing flare station; and a 2-inch HDPE condensate line.

Between the South RNG Site and the north side of Temescal Canyon Wash (opposite the Gas POR Site) an approximate 4-foot-wide by 5-foot-deep pipe trench, approximately 6,700 linear feet in length, would be installed via open cut trenching (within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road). This pipe trench would house four separate lines: a 6-inch FlexSteel sales gas main delivering RNG to the POR; a 6-inch FlexSteel reject gas line for rejected gas from the POR back to South RNG Site; a 4-inch HDPE fuel gas line (from a service meter tap near the POR) to the North RNG Site; and a 4-inch treated condensate force main from the South RNG Site to a manhole at the Dawson Canyon Road Bridge.

Underground piping would then be accomplished via HDD boring to cross beneath, and avoid disturbance of, Temescal Canyon Wash. One bore of approximately 500 linear feet for the two 6-inch lines (sales gas and rejected gas lines) and the 4-inch fuel gas line would be drilled beneath the wash with minimum depth of 20 feet below the surface at the center of the wash.

2.5 SoCal Gas Pipeline Interconnection

The RNG will ultimately be delivered to SoCal Gas' main pipeline located underground in the public right-of-way within Temescal Canyon Road, approximately 600 linear feet southwest from the POR. This would require approximately 600 feet of trenching performed by SoCal Gas within Dawson Canyon Road (between the Gas POR Site and existing SoCal Gas main pipeline) to install an underground pipeline interconnection between the POR and existing main pipeline.

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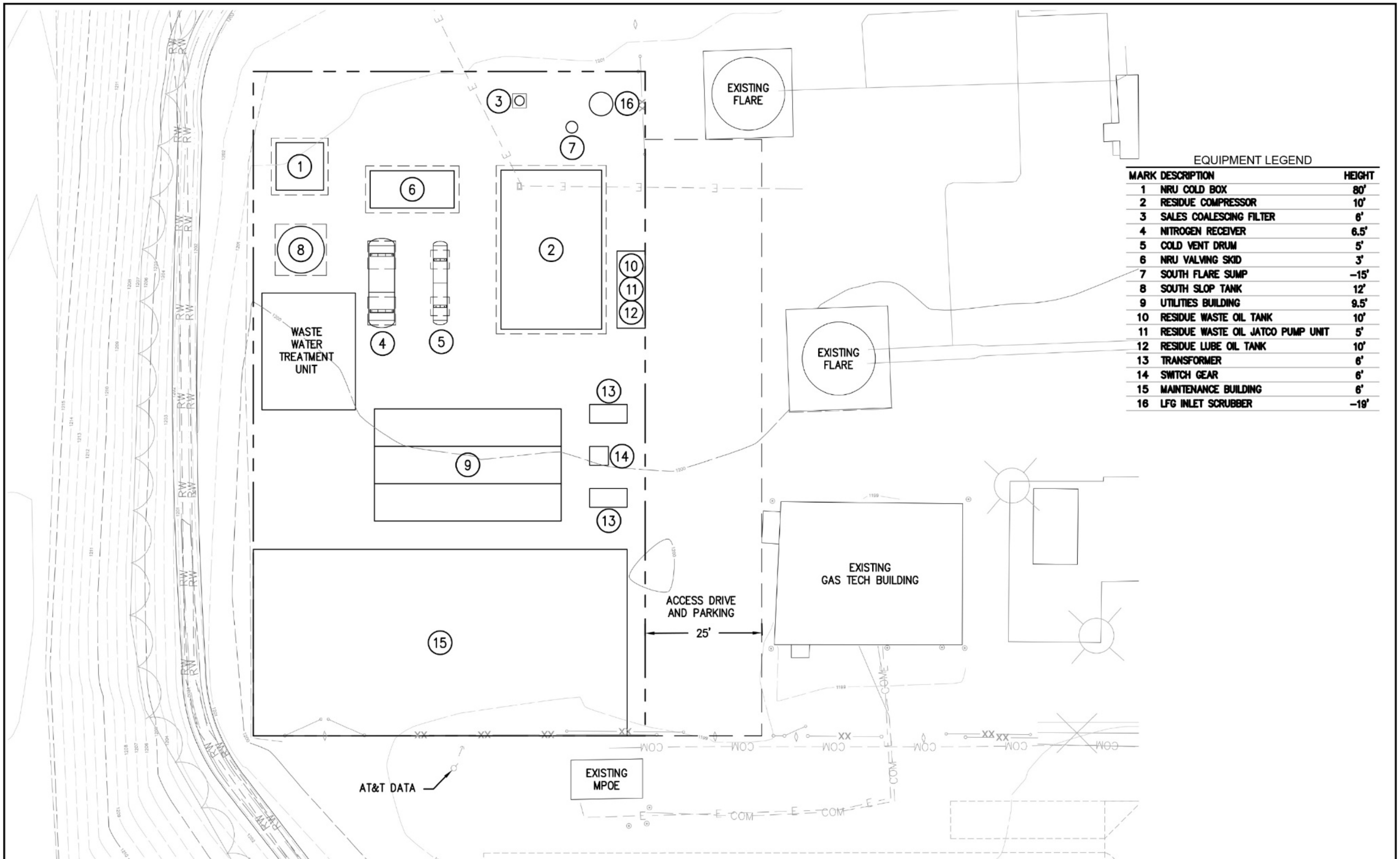

MARK	DESCRIPTION	HEIGHT
1	NRU COLD BOX	80'
2	RESIDUE COMPRESSOR	10'
3	SALES COALESCING FILTER	6'
4	NITROGEN RECEIVER	6.5'
5	COLD VENT DRUM	5'
6	NRU VALVING SKID	3'
7	SOUTH FLARE SUMP	–15'
8	SOUTH SLOP TANK	12'
9	UTILITIES BUILDING	9.5'
10	RESIDUE WASTE OIL TANK	10'
11	RESIDUE WASTE OIL JATCO PUMP UNIT	5'
12	RESIDUE LUBE OIL TANK	10'
13	TRANSFORMER	6'
14	SWITCH GEAR	6'
15	MAINTENANCE BUILDING	6'
16	LFG INLET SCRUBBER	–19'

Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

N

Not to Scale

Figure 4
South RNG Site

RNG Facility Project at El Sobrante Landfill

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EQUIPMENT LEGEND

MARK	DESCRIPTION	HEIGHT
1	INLET BLOWER SUCTION SCRUBBER	15'
2	INLET BLOWERS	6'
3	INLET BLOWER GAS COOLER	12'
4	INLET BLOWER DISCHARGE SCRUBBER	15'
5	LFG COMPRESSOR A	25'
6	LFG COMPRESSOR B	25'
7	LFG COMPRESSOR COOLER A	12'
8	LFG COMPRESSOR COOLER B	12'
9	INLET FILTER COALESCER	20'
10	PRE TREAT ABSORBER	45'
11	GAS/GAS EXCHANGER	40'
12	MAIN INLET ABSORBER/INLET ABSORBER	80'
13	HP FLASH TANK	25'
14	ATMOSPHERIC FLASH/AIR STRIPPER	75'
15	PRETREAT STRIPPER/INCINERATOR	45'
16A	TOX RECOOP OXIDIZER	15'
16B	TOX BLOWER	45'
17	PLANT TOX SCRUBBER	15'
18	PRETREAT EXCHANGER	20'
19	CHILLED WATER SKID	17'
20	PRE TREAT COOLER	17'
21	SELEXOL SKID	17'
22	AMINE SKID	17'
23	AMINE HEATER	17'
24	O2 REMOVAL SKID	17'
25	O2 GAS COOLER	12'
26	AMINE COOLER	12'
27	DEHY SKID	17'
28	FLARE SUMP	-15'
29	UTILITIES BUILDING	9.5'
30	SLOP TANK (x2)	15'
31	480 VOLT MCC	9.5'
32	4160 MCC BUILDING	9.5'
33	PIPE RACK	20'
34	CHILLED WATER UNIT	17'
35	5TH STAGE COALESCING FILTER	15'
36	LFG LUBE OIL TANK	10'
37	LFG WASTE OIL JATCO PUMP UNIT	5'
38	LFG WASTE OIL TANK	10'

Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

Figure 5
North RNG Site

RNG Facility Project at El Sobrante Landfill

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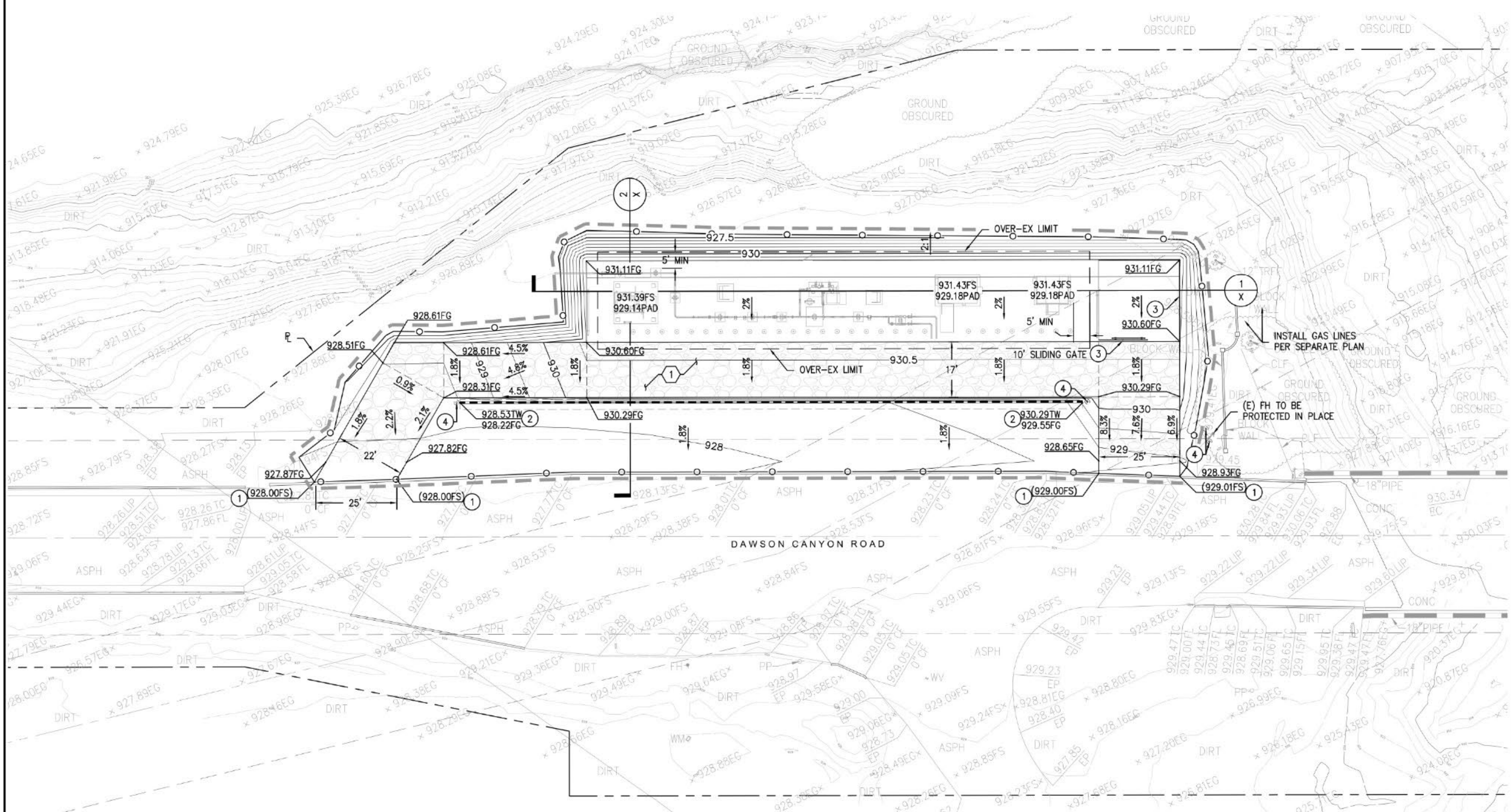

Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

LEGEND

- - - - - -	RIDGE LINE / GRADE BREAK
— — — —	OVER-EX LIMIT
——o——	GRADING DAYLIGHT LIMIT
▬ ▬ ▬ ▬	LIMIT OF WORK

CONSTRUCTION NOTES

1. JOIN EXISTING CURB AND MATCH GRADE.
2. CONSTRUCT MASONRY RETAINING WALL PER SPPWC STANDARD PLAN 618–3 TYPE A.
3. CONSTRUCT 6' CHAIN LINK FENCE AND GATES PER SPPWC STANDARD PLAN 600–4. DRIVE GATE OPENING WIDTHS PER PLAN. (POR CHAIN LINK PER SEPARATE SGC PLANS)
4. INSTALL CONCRETE BOLLARD PER SEPARATE STRUCTURAL PLANS

PAVING LEGEND

1 UNPAVED ROAD
PLACE 18" MINIMUM ¾ INCH MINUS, CLASS 2 AGGREGATE BASE PER CALTRANS STANDARD SPECIFICATIONS, COMPACTED TO AT LEAST 95% RELATIVE COMPACTION UNDERLAIN BY A GEOTEXTILE LAYER AS DESCRIBED IN THE GEOTECHNICAL REPORT.

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Not to Scale

Figure 6
Gas POR Site

RNG Facility Project at El Sobrante Landfill

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2.6 Construction and Operation Details

Construction

Construction of the proposed project is anticipated to begin in November 2024 and take approximately 18 months to complete (with completion anticipated in March 2026). A crew of approximately 6 to 12 construction workers (daily) would be in the project area during construction. Temporary construction staging areas adjacent to Dawson Canyon Road (approximately 0.6 acre) about 500 feet northeast of the Dawson Canyon Road Bridge over Temescal Canyon Wash, at the South RNG Site (approximately 0.08 acre), and at the North RNG Site (approximately 0.07 acre) would be used for equipment staging and laydown; all three sites would have materials (e.g., demolition and soil) stockpiled on short-term bases. Any excess material requiring disposal would utilize El Sobrante Landfill. Temporary lane closures along the landfill access road/Dawson Canyon Road would occur; however, access to El Sobrante Landfill for normal landfill operations would be maintained throughout the construction period with the use of construction flaggers (e.g., during trenching within roadways, etc.).

Construction activities will include: grading, trenching, directional drilling, import of construction materials (asphalt concrete, aggregate base, decomposed granite, and fill material), soil compaction, equipment installations, building construction, etc.

Major equipment to be used during construction includes, but is not limited to: backhoe, boom truck, concrete pump rig, crane, dozer, excavator, skid loader, vibratory compacter/roller, generator, loader, motor grader, paving machine, roller, sheeps foot, dump truck, flatbed truck, oil/lube truck, pickup truck, water truck, 18-wheel low boy, fuel truck, horizontal directional drill, Redi-Mix truck, etc.

The total construction-related disturbance footprint for the proposed project, both permanent and temporary, would be approximately 5.5 acres.

Operation

The proposed project has been sized to process up to 15,000 standard cubic feet per minute (SCFM) of LFG, which would translate to a maximum RNG output of 8,600 million British thermal units (MMBTU) per day. Operation of the RNG Facility would require the use of fuel gas for heating certain refining/treatment equipment at the North RNG Site. Waste gas from the treatment/refining process would be directed to the recuperative oxidizer for further treatment and release (with less overall methane [emissions] in it than flared LFG). The proposed project does not increase the production or volume of LFG at El Sobrante Landfill but would reduce the overall amount of LFG that is flared.

Toro expects to hire seven full-time employees and up to three part-time employees for operation of the RNG Facility. Regular deliveries of materials (oil, chemicals, spare parts [e.g., filters]) are expected to require one truck trip per week. Infrequent maintenance truck trips (limited to emergency instrument repairs/swap outs, inspections, and other maintenance needs [e.g., oil changes]) would require up to seven vehicle trips spanning up to 10 calendar days out of a year.

Toro and WM are separate corporate entities; therefore, RNG Facility and ESL are owned and operated independently. Each source will maintain separate permits and reporting. As a safety precaution, the RNG plant will be equipped with both a manual shut-off system as well as an automatic shut-off system that functions based on detected pressure drops. Additionally, all accessible pipe flanges would be inspected on a monthly basis for any possible leaks.

3.0 Initial Study/Modified Environmental Checklist

This Initial Study/Modified Environmental Checklist has been prepared pursuant to CEQA (Pub. Resources Code, § 21000 et seq.) for the proposed project. (See Pub. Resources Code, § 21166; State CEQA Guidelines, §§ 15162, 15164.) The El Sobrante Landfill is owned and operated by USA Waste of California, Inc., a subsidiary of WM. Toro, as a separate entity, would own and operate the RNG Facility independently from WM and the El Sobrante Landfill. The RCDWR, acting on behalf of the County of Riverside (County), is the lead agency for the proposed project pursuant to CEQA.

Pursuant to PRC Section 21166, and State CEQA Guidelines Sections 15162 and 15164, subdivision (b), the attached Initial Study/Modified Environmental Checklist and supporting documents have been prepared to support the determination by RCDWR that the 1998 EIR, the 2009 SEIR, and this Addendum for the proposed project is sufficient for purposes of approval of the proposed project, and that no additional subsequent environmental review is required under CEQA. As previously stated, the 1998 EIR analyzed the impacts related to landfill site expansion; overall waste disposal capacity expansion; acceptable daily tonnage increase; and update to the permit waste disposal operations hours. The 1998 EIR found all impacts would be reduced to below a level of significance with implementation of mitigation measures identified in the 1998 EIR. The 2009 SEIR analyzed a revision to the El Sobrante SWFP to accept waste material over a continuous 24-hour period and the change from a maximum daily tonnage limit of 10,000 tpd to a maximum weekly tonnage limit of 70,000 tpw not to exceed 16,054 tpd. The 2009 SEIR analyzed potential environmental impacts associated with aesthetics, air quality, noise, public health and safety, and transportation and circulation, and determined that the revision to the SWFP would not result in any new environmental impacts that were not previously accounted for, and mitigated by, the 1998 EIR.

The attached Initial Study/Modified Environmental Checklist uses the standard environmental checklist provided in Appendix G of the CEQA Guidelines but provides answer columns for evaluation consistent with the considerations listed under CEQA Guidelines sections 15162, subdivision (a), and 15164. The purpose of the Initial Study/Modified Environmental Checklist is to evaluate the environmental factors in terms of any “changed condition” (e.g., changed circumstances, proposed project changes, or new information of substantial importance) which will require major revisions to the adopted 1998 EIR and 2009 SEIR due to the involvement of new significant effects or a substantial increase in the severity of a previously identified significant effect. (CEQA Guidelines, § 15162). A “no” answer does not necessarily mean that there are no potential impacts relative to the environmental factor, but rather that there is no change in the condition or status of the impact since it was analyzed and addressed with mitigation measures or project revisions in the 1998 EIR or 2009 SEIR.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
1. Aesthetics. Except as provided in Public Resources Code Section 21099, would the project:					
a. Have a substantial adverse effect on a scenic vista?	1998 EIR, § 4.8; 2009 SEIR, § 4.1	No	No	No	No
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	1998 EIR, § 4.8; 2009 SEIR, § 4.1	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
c. In nonurbanized areas, substantially degrade the existing visual character or quality of the public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	1998 EIR, § 4.8; 2009 SEIR, § 4.1	No	No	No	No
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	1998 EIR, § 4.8; 2009 SEIR, § 4.1	No	No	No	No

Environmental Setting/Discussion

The proposed project consists of installing and operating an RNG Facility at the existing El Sobrante Landfill (landfill) within three previously disturbed areas, which would involve the following elements: a South RNG Site; a North RNG Site; a Gas POR Site; underground piping within pipe trenches connecting the three sites for the purpose of conveying the LFG, processed gas, and other necessary lines for the RNG

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
process; and an underground pipeline interconnection between the Gas POR Site and SoCal Gas' existing main pipeline located in Temescal Canyon Road. The South RNG Site will be located adjacent to the landfill's existing flare station. This location is part of a larger graded area associated with the existing landfill entry and scale. The North RNG Site will be located on an existing graded landfill pad which contains the landfill's former maintenance shop, a trailer, a concrete pad, a 40,000-gallon reclaimed water storage tank, and potable water booster tanks. The Gas POR Site will be located within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection. The proposed underground pipe trenches will be constructed along the existing paved, two-lane access road (Dawson Canyon Road) between the South RNG Site and North RNG Site, and between the South RNG Site and the north side of Temescal Canyon Wash. The proposed underground piping will be connected to a proposed HDD segment under Temescal Canyon Wash which will connect to the Gas POR Site. The Gas POR Site will then be connected to a new SoCal Gas pipeline segment. The landfill encompasses approximately 1,322 acres in unincorporated western Riverside County and is located east of Interstate (I)-15, in the upper elevations of the foothills east of Temescal Valley between Olsen Canyon and Dawson Canyon. The site is characterized by gently to steeply sloping hills, as well as knolls, ridges, and flat mesas. The landfill is currently permitted for disposal of municipal solid waste on approximately 468 acres of the 1,322-acre site. The overall landfill area includes an administration building, maintenance facility, a flare station, entrance area, and scales. The facilities that are generally clustered at the entrance to the El Sobrante Landfill include: a security gate, a vehicle queuing area, four (4) scales, three single-story pre-fabricated buildings, a rest area, and a paved parking area. A landfill gas-to-energy facility/flare station (consisting of three generators and supporting equipment) is located adjacent to the landfill entrance. A series of dirt roads traverse the landfill site providing access to the various activity areas. The remaining northern, eastern, and southern portions of the landfill are managed as natural open space conservation lands (i.e., Declaration of Conservation and Conservation Easement lands within the El Sobrante Landfill Multiple Species Habitat Conservation Plan [ESL MSHCP]) and are mostly characterized by gently to steeply sloping hillsides and native vegetation. Dawson Canyon Road, an approximate 20-foot-wide, paved road with shoulders, provides access to the landfill entrance area. It includes an approximate 180-foot-long bridge spanning Temescal Canyon Wash approximately 950 feet northeast of its intersection with Temescal Canyon Road. Dawson Canyon Road is approximately 1.25 miles long between Temescal Canyon Road and the landfill entrance.					

a. <u>Have a substantial adverse effect on a scenic vista?</u>
b. <u>Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?</u>
c. <u>In nonurbanized areas, substantially degrade the existing visual character or quality of the public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?</u>

The 1998 EIR prepared for the El Sobrante Landfill included an in-depth analysis of potential adverse impacts to the overall visual quality and character of the El Sobrante area as well as potential impacts to scenic vistas and County- and State-Eligible Scenic Highways. As a result of the previous analysis, several significant adverse impacts to visual quality were identified (e.g., topographic alterations/creation of a new ridgeline, nighttime lighting/illumination, cumulative modification of the rural character of the area, etc.). Mitigation measures were included in the 1998 EIR to reduce potential visual quality impacts to below a level of significance (e.g., visual screening via phased development and vegetative restoration, color selection for facilities that blends with the surrounding area, shielding and downward directing of lighting, etc.), and the required mitigation measures have been incorporated into the operational characteristics of the El Sobrante Landfill. The 2009 SEIR analyzed minor modifications to the operational characteristics of the landfill associated with hours or operation and waste acceptance rates and found no new significant impacts to scenic vistas, scenic highways, or visual character or quality of the site beyond those identified in the 1998 EIR.

As discussed above, implementation of the proposed project includes installing and operating an RNG Facility within three previously disturbed areas at the existing landfill. The nearest State Eligible Scenic Highway is I-15 from the City of Corona south to the San Diego County line, which is located approximately 0.2 mile west of the Gas POR Site at its closest point to the proposed project. The Gas POR Site is a disturbed dirt pad adjacent to Danson Canyon Road, with limited vegetation and some non-native eucalyptus trees. There are no identified scenic resources on the Gas POR Site, including rock outcroppings or historic buildings. Three non-native eucalyptus trees would be removed for installation of the POR facility, but they are not considered scenic resources. The South and North RNG Sites are both existing graded pads within the landfill, located approximately 1 and 1.5 miles northeast of the Gas POR Site, respectively. There are no identified scenic resources on the South or North RNG Sites.

The project components that could be visible to the public from certain vantage points would be the above-ground structures associated with the North RNG Site, South RNG Site, and Gas POR Site. To assess visibility of the proposed project six public viewpoints that have the potential to offer views of the proposed above-ground structures were analyzed. These viewpoints have varying degrees of visibility of the three sites considering distance, elevation, and topography (refer to Appendix A of this Addendum for the viewpoints and visual simulations). The six viewpoints (see Figures 1, 8, and 11 in Appendix A for the index maps) are from [1] Leroy Road, [2] Pulsar Court, and [3] Stellar Court (all three located approximately 1.4 miles west of the North RNG Site; see Figures 2 through 5 in Appendix A for street views and renderings); [4] Dawon Canyon Road (located nearby the Gas POR Site; see Figures 6 and 7 in Appendix A for street view and renderings); [5] Bedford Motor Way (located approximately 2.6 miles west of the North RNG Site; see Figures 9 and 10 in Appendix A for street view

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
and rendering); and [6] Terramor, a master-planned community (located approximately 2 miles south of the South RNG Site and North RNG Site; see Figures 12 through 14 in Appendix A for renderings). Due to existing topography of the foothills surrounding the landfill, as well as the elevations of the landfill itself, views of the North RNG Site are limited to those from the west (where Olsen Canyon offers line of site). As shown in the street views from Leroy Road and Pulsar and Stellar Courts (the closest locations from the west; Figures 2 through 4), the North RNG Site would be shielded by existing landscaping and buildings and not visible. To depict a representation of views that could be possible from other, private views in this area, renderings with the absence of the obstructing landscaping and buildings are provided in Figure 5. These renderings show that the tallest equipment at the North RNG Site could be visible but, due to distance (approximately 1.4 miles) and the color of the equipment that would blend with its surroundings, the proposed changes would be difficult to discern. Further west (approximately 2.6 miles from the North RNG Site) and from an elevated position at Bedford Motor Way (Figures 9 and 10), a similar but more distant view would occur. Due to distance and color of equipment the proposed changes from this viewpoint would similarly be difficult to discern. Existing vegetation, utilities, fencing, and buildings along Temescal Canyon Road obstruct views of the Gas POR Site, which would only be visible from Dawson Canyon Road itself, and briefly to motorists on Temescal Canyon Road at its intersection with Dawson Canyon Road. Figure 6 shows the street view of the Gas POR Site from the adjacent Dawson Canyon Road, which has been disturbed and used as a graded turnout area and temporary food truck parking. The renderings shown in Figures 6 and 7 depict a representation of the POR facility that includes painted, decorative fencing (6 feet in height), which would screen the POR components within. As shown, the overall POR facility would be on a raised fill pad so that it is one foot above the base flood elevation. An approximately 3-foot-high masonry retaining wall supports the fill and is visible between Dawson Canyon Road and the internal POR access road/driveway with gates. Installation of the POR facility would require removal of three non-native eucalyptus trees, but vegetation behind the facility (associated with Coldwater Canyon Creek [also referred to as Coldwater Canyon Wash]) and the nearby Temescal Canyon Wash would remain. Dawson Canyon Road in this area is a paved roadway lined with trees, vegetation, utility poles, exposed pipelines with associated metering appurtenances, existing masonry brick walls with gates/fencing (at intersection with Temescal Canyon Road), roadway and landfill signage, etc. The proposed POR facility structure materials and colors would be consistent with the existing visual context of Dawson Canyon Road and vicinity in this location.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
The graded pad of the South RNG Site is situated within a depression relative to the immediately surrounding natural and landfill-related topographic features (i.e., natural ridgelines and constructed fill slopes) that serve to obstruct most views of the South RNG Site. Due to existing topography of the foothills surrounding the landfill, as well as the elevations of the landfill itself, views of the South RNG Site would be limited to those from the south but at distant, elevated positions. The Terramor development, approximately 2 miles south of the landfill, is at a sufficiently elevated position relative to the landfill for potential views of the South RNG Site. As shown in Figure 11, of the three views (View 1, View 2 and View 3) from the Terramor development only one (View 1) is able to offer a view of proposed equipment at the South RNG Site. The rendering for Site 1 (Figure 12) shows the top of the tallest piece of equipment at the South RNG Site is visible but, due to the 2-mile distance and the color of the equipment that blends with its surroundings, the proposed changes would be difficult to discern from this location. Existing hillsides, ridgelines, and landfill elevations shield the remainder of the South RNG Site, as well as the entirety of the North RNG Site from this view. As shown in the renderings for Views 2 and 3 from Terramor (Figures 13 and 14) no parts of the South or North RNG Sites are visible due to topographic obstructions. The most distant considered vantage point was Trilogy Parkway, located approximately 3.1 miles southwest of the North RNG Site. However, it was determined that none of the proposed, above-ground structures would be visible from this location. The existing elevations of the landfill face would fully obstruct views of the proposed project and, therefore, this vantage point was not included in Appendix A. Overall, the proposed project-related changes would be visible from a limited number of locations due to natural and landfill-related topographic features that obstruct most views. For the North and South RNG Facility Sites the distance to, and color of, proposed equipment would be sufficient such that they are not substantially noticeable from the limited locations. For the Gas POR Site, which would only be visible from a portion of Dawson Canyon Road, and briefly to motorists on Temescal Canyon Road at its intersection with Dawson Canyon Road, the proposed changes would be consistent with the existing visual context of Dawson Canyon Road and vicinity in this location. Further, these changes within the context of previous analyses would not significantly alter the prior aesthetics-related impact conclusions for the lateral and vertical landfill expansion. The mitigation measures identified in the 1998 EIR to reduce potential aesthetics impacts (see Mitigation Measure A-3, below, for example) would continue to be enforced upon implementation of the proposed project. Accordingly, no new significant adverse impacts on a scenic vista or within a scenic highway, or degradation of the existing visual character or quality of the site would occur.					

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Onsite landfill operations with respect to light and glare were analyzed as part of the 1998 EIR and mitigation measures were identified to reduce potential impacts associated with onsite artificial lighting. The 2009 SEIR performed detailed light and glare analyses for eight (8) residential areas in the landfill vicinity due to the proposal to extend the hours for waste delivery, which had the potential to introduce increased (offsite) artificial lighting into the surrounding areas during non-daylight hours. The analysis within the 2009 SEIR found that potential lighting impacts would not be significant.

The proposed project does not include any changes to landfill operations. Any lighting associated with the proposed project, such as site lighting for nighttime operation and maintenance, would be subject to the mitigation measures identified in the 1998 EIR to reduce potential impacts associated with onsite artificial lighting (see Mitigation Measures A-5 and A-6, below), which would continue to be enforced upon implementation of the proposed project. Accordingly, no new significant adverse impact related to light and glare would occur.

Therefore, no new significant adverse impacts to aesthetics associated with the proposed project are anticipated.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

A-1 To assure visual screening of landfill operations and facilities, a phased closure and restoration plan shall be implemented. The closure and restoration plan shall utilize Riversidian sage scrub consistent with native vegetation in nearby undisturbed areas of the Gavilan Hills to minimize visual impacts to surrounding views.

A-2 Development shall be phased such that only approximately 20 acres are disturbed at any one time. Riversidian sage scrub restoration activities shall be similarly phased.

A-3 Landfill-associated facilities and structure exteriors (including rooftops) and signage shall be of a color consistent with the surrounding area.

A-4 A plan that assures the removal or approved use of landfill-associated facilities, structures, and signage shall be approved by the CALRECYCLE, as part of the Post-closure Plan.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
A-5 Outdoor lighting associated with the access road, administration building, and scales shall be directed toward the ground and shall be shielded. Portable lighting used for landfill operations (i.e., working face of the landfill) shall be shielded and directed toward the working area.					
A-6 Wherever feasible, temporary earthen or landscape berms, or other structures or measures, shall be utilized to provide visual screening of operations at the working face and to reduce potential glare impacts on surrounding residences from nighttime activities at the working face of El Sobrante. Any measures implemented for this purpose shall be subject to annual review by the Citizen Oversight Committee.					
A-7 A plan that assures the removal of litter associated with the proposed project shall be approved by the CALRECYCLE prior to the issuance of a SWFP. USA Waste or its successor-in-interest shall be responsible for the control and cleanup of litter and debris from the landfill and/or waste-hauling vehicles along the landfill access road to its intersection with Temescal Canyon Road, and along Temescal Canyon Road from the intersection of Interstate 15 (I-15) to the intersection with Weirick Road. At a minimum, USA Waste or its successor-in-interest shall inspect and remove litter and debris from these roadways on a weekly basis and within 48 hours upon receipt of notice of complaint.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
2. Agriculture and Forestry Resources. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:					
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	1998 EIR, Appendix A, § 47. Agriculture, p. A.1-38	No	No	No	No
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	1998 EIR, Appendix A, § 47. Agriculture, p. A.1-38	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	Not Previously Assessed	No	No	No	No
d. Result in the loss of forest land or conversion of forest land to non-forest use?	Not Previously Assessed	No	No	No	No
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	1998 EIR, Appendix A, § 47. Agriculture, p. A.1-38	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Environmental Setting/ Discussion

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

The 1998 EIR found no significant adverse impacts to agricultural resources. It concluded that there was no agricultural crops or prime farmland located within the landfill, that no agricultural preserves were located within or adjacent to it, and that although the lateral expansion would result in the development of land zoned for agriculture, no significant impacts would occur because the expansion area was vacant and not used for agricultural activities.

Since the proposed project will not physically expand the landfill footprint and the prior environmental documentation that analyzed the proposed project footprint determined that there was no impact to agricultural resources/operations, the prior environmental documentation adequately addresses the proposed project's impacts to agricultural resources/operations and no additional analysis of this issue is warranted.

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?
d. Result in the loss of forest land or conversion of forest land to non-forest use?

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

The 1998 EIR and 2009 SEIR did not contain an analysis of forestland resources. The proposed project is not located on forest land (as defined by Public Resources Code Section 12220[g]) or timberland (as defined in Public Resources Code Section 4526), nor would it be on land zoned as timberland (as defined by Government Code Section 51104[g]). The proposed project would therefore not conflict with existing zoning for, or cause rezoning of, forest land, or timberland zoned Timberland Production or result in the conversion of forest land to non-forest use. No impacts would occur and no mitigation measures would be required.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Refer to responses (a) through (d), above. No significant adverse impacts to agriculture or forestry resources associated with the proposed project are anticipated.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

There are no mitigation measures, conditions of approval, or regulatory requirements related to this environmental factor.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
3. Air Quality. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a. Conflict with or obstruct implementation of the applicable air quality plan?	1998 EIR § 4.6; 2009 SEIR, § 4.2, Appendix B	No	No	No	No
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	1998 EIR § 4.6; 2009 SEIR, § 4.2, Appendix B	No	No	No	No
c. Expose sensitive receptors to substantial pollutant concentrations?	1998 EIR § 4.6; 2009 SEIR, § 4.2, Appendix B	No	No	No	No
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	1998 EIR § 4.6; 2009 SEIR, § 4.2, Appendix B	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Environmental Setting/ Discussion

The discussion below is based on Air Quality and Greenhouse Gas Emissions Report (TAHA 2024a) (Appendix B of this Addendum) prepared for the proposed project.

The project site is located in the portion of Riverside County within the South Coast Air Basin (SCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD jurisdiction is divided geographically into 38 source receptors areas (SARs), 28 of which contain at least one air quality monitoring station. The proposed project site is located within SRA 22 – Corona/Norco Area (for North and South RNG Sites) and SRA 25 – Lake Elsinore (Gas POR Site). The monitoring site that provides data most representative of air quality in the vicinity of the proposed project is the Lake Elsinore site located at 506 West Flint Street which is located approximately 11.6 miles southeast of the proposed project.

a. Conflict with or obstruct implementation of the applicable air quality plan?

Construction

Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips by construction workers and haul and delivery trucks traveling to and from the project site. Fugitive dust emissions would primarily result from grading, trenching, and truck loading activities. Nitrogen oxides (NO_X) emissions would be generated in off-road equipment exhaust and on-road vehicle exhaust. The assessment of construction air quality impacts considered all of these emissions sources.

Construction of the RNG Facility, Gas POR Site connection work, and installation of the underground pipeline would collectively occur over an 18-month period between the fourth quarter of 2024 and the first quarter of 2026. Emissions generated during construction of the proposed project would be temporary in nature and would cease entirely once the RNG Facility and utility connections are complete. **Table 3-1** presents a summary of the maximum daily emissions that could occur during concurrent construction of the various proposed project components on the three designated sites.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Table 3-1: Proposed Project Estimated Construction Emissions

Construction Activity	Maximum Daily Emissions (lbs./day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Mobilization (Component Delivery)	0.7	18.5	6.5	0.4	3.9	1.3
POR Metering Site Preparation	9.3	6.8	21.0	<0.1	1.1	0.5
POR Metering Facility SoCalGas Work	0.4	3.6	5.5	<0.1	0.8	0.3
South Plant Site Grading & Construction	0.8	6.6	10.5	<0.1	0.9	0.4
North Plant Site Grading & Construction	1.3	9.7	15.1	<0.1	1.2	0.5
Primary Electrical Installation	1.2	9.2	12.8	<0.1	1.1	0.5
Office & Maintenance Building Construction	0.5	4.1	5.3	<0.1	0.4	0.2
Pipe Installation & Roadway Restoration	1.4	11.1	14.1	<0.1	1.1	0.6
Plant Equipment Assembly & Installation	0.7	5.4	7.5	<0.1	0.6	0.3
Total Daily Overlapping Construction	***16.3***	***75.1***	***98.2***	***0.7***	***11.0***	***4.5***
REGIONAL ANALYSIS						
Maximum Regional Daily Emissions	**16.3**	**75.1**	**98.2**	**0.7**	**11.0**	**4.5**
Regional Significance Threshold	75	100	550	150	150	55
Exceed Daily Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note**:** Emissions modeling files can be found in Appendix B of this Addendum.
Source**:** TAHA, 2024

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

As stated above and consistent with the regulatory compliance measures identified in previous environmental documentation, the unmitigated emissions account for the provisions of SCAQMD Rule 403, which requires best management practice in fugitive dust control. Maximum daily emissions of all air pollutants would remain below all applicable regional SCAQMD thresholds during construction of the proposed project. Based on SCAQMD guidance, construction of the proposed project would not have the potential to result in an increase in the frequency or severity of existing air quality violations, nor would it create new air quality violations. Construction of the proposed project would not interfere with implementation of the Air Quality Management Plan (AQMP) or the Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Furthermore, construction crews would be sourced from the existing regional workforce and would not induce growth in population within the SCAB. The temporary emissions associated with delivery of proposed project components would not contribute to a potentially significant air quality impact. However, the 1998 EIR/2009 SEIR determined that landfill expansion-related emissions were potentially significant and mitigation measures AQ-1 through AQ-14 were identified to reduce these impacts to a level below significant. As such, with the addition of the proposed project to the existing landfill operation, the 1998 EIR/2009 SEIR mitigation measures would remain in effect. Therefore, this impact would be less than significant for construction of the proposed project, and no additional mitigation would be required.

<u>Operations</u>
From an air quality perspective, the emissions sources involved in proposed project operations would be similar to existing conditions with the exception of the RNG Facility reducing LFG flared to the atmosphere. Implementation of the proposed project would not introduce any new growth in population, housing, or employment at the regional scale. Project operations would not introduce any new substantial permanent source of air pollutant emissions to the project area; seven full-time employee and up to three part-time employee commuting trips would result in negligible changes to regional air quality. The proposed project does not have the potential to conflict with or obstruct implementation of the AQMP as it pertains to attaining the ambient air quality standards.

The operational emissions analysis for implementation of the proposed project focused on the daily change in emissions resulting from the diversion of LFG from being flared to the RNG Facility, as well as the employee vehicle trips and several additional daily private waste delivery trips. **Table 3-2** provides a summary of the daily ozone-precursor and criteria pollutant emissions that would be generated by future operation of the proposed project, including the RNG Facility. As demonstrated by the results of the analysis, RNG Facility operation would result in a net decrease in volatile organic compounds (VOCs) emissions due to the reduction in LFG flaring, and relatively minor increases

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

in NO_X, carbon monoxide (CO), and particulate matter (PM) emissions associated with vehicle trips. Therefore, this impact would be less than significant regarding the potential exacerbation of air quality violations and delaying attainment of the air quality standards.

Table 3-2: Proposed Project Estimated Operational Emissions

Sources and Analytical Parameters	Daily Emissions (lbs./day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
VEHICLE TRIP EMISSIONS						
RNG Facility Employee Trips	0.3	0.5	4.3	<0.1	1.0	0.3
Maintenance Vehicle Trips	0.1	0.2	0.7	<0.1	<0.1	<0.1
Private Delivery Trips	0.1	0.2	1.4	<0.1	0.4	0.1
Vehicle Trips Subtotal	***0.5***	***0.9***	***6.4***	***<0.1***	***1.5***	***0.4***
RNG FACILITY EMISSIONS						
Existing Flared Emissions	558.1	-	-	-	-	-
RNG Facility Emissions	396.2	-	-	-	-	-
Net Change from Existing Conditions	***(161.8)***	-	-	-	-	-
REGIONAL ANALYSIS						
Project Operational Emissions	**(161.3)**	**0.9**	**6.4**	**<0.1**	**1.5**	**0.4**
SCAQMD Significance Threshold	55	55	550	150	150	55
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Emissions modeling files can be found in Appendix B of this Addendum; parenthetical notation (#) indicates negative value.
Source: TAHA, 2024

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

The second element of consistency with the air quality plan is determined by evaluating whether implementation of the proposed project would exceed the assumptions in the AQMP related to regional growth, thereby rendering the regional emissions inventory inaccurate. Implementation of the proposed project would not introduce new growth in regional population or housing, and would require seven full-time employees and up to three part-time employees to manage the RNG Facility. Therefore, proposed project operations would have a negligible effect related to growth projections built into the AQMP emissions inventory, as it is assumed that the additional employees would be sourced from the existing regional workforce (i.e., would not relocate for employment at the landfill). The proposed project would not have any potential to result in growth that would exceed the projections incorporated into the AQMP or the applicable RTP/SCS that could render the emissions inventory or air quality conformity analysis invalid. Future operation of the proposed project would not interfere with air pollution control measures listed in the AQMP. The proposed project would accommodate more efficient operations at the landfill and would not have the potential to exacerbate existing air quality violation conditions. Therefore, this impact would be less than significant.

b. <u>Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?</u>

The SCAQMD is currently designated nonattainment for O_3 and PM_{10} under state standards and nonattainment for O_3 under the federal standards. Therefore, a project may result in a cumulatively considerable air quality impact under this criterion if daily emissions of ozone precursors (VOC and NO_X) or particulate matter (PM_{10}) exceed applicable air quality thresholds of significance established by the SCAQMD. The SCAQMD designed the significance thresholds to prevent projects from exceeding the ambient air quality standards and potentially resulting in air quality violations. The SCAQMD suggests that if any quantitative air quality significance threshold is exceeded by an individual project during construction activities or operation, that project is considered significant and would be required to implement effective and feasible mitigation measures to reduce air quality impacts. Conversely, the SCAQMD propagates the guidance that if an individual project would not exceed the significance thresholds, then it is generally not considered to be significant. As discussed above and demonstrated in the analysis presented in **Table 3-1** and **Table 3-2**, implementation of the proposed project would not generate magnitudes of emissions in excess of any applicable SCAQMD regional mass daily threshold during construction or operations. Therefore, this impact would be less than significant.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
c. Expose sensitive receptors to substantial pollutant concentrations? Construction The nearest sensitive receptors to the project site are residences located approximately 1,740 feet to the west of the Gas POR Site. The SCAQMD has established 1,640 feet (500 meters) as the protective buffer distance for assessing localized air quality impacts for CEQA projects. There are no sensitive receptors within close enough proximity to the project site that substantial pollutant concentrations would be capable of reaching through atmospheric dispersion by wind patterns. Pollutant concentrations resulting from heavy-duty equipment use and vehicle trips would dissipate prior to encountering any sensitive receptors. However, a localized analysis of proposed project construction emissions was included for informational purposes and to replicate the scope of prior air quality analyses within environmental documentation prepared for the landfill. **Table 3-3** presents a summary of maximum daily emissions from sources located on the project site, which include all off-road equipment emissions as well as vehicle trips that would occur within the property boundary. As shown below, maximum daily emissions from sources located within the property boundary and the Gas POR Site would remain well below the applicable SCAQMD Localized Significance Threshold (LST) screening values for both SRA 22 and SRA 25. Therefore, this impact would be less than significant.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Table 3-3: Proposed Project Estimated On-Site Construction Emissions

Construction Activity	Maximum Daily Emissions (lbs./day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
POR Metering Site Preparation	6.8	21.0	1.1	0.5
POR Metering Facility SoCalGas Work	3.6	5.5	0.8	0.3
South Plant Site Grading & Construction	6.6	10.5	0.9	0.4
North Plant Site Grading & Construction	9.7	15.1	1.2	0.5
Primary Electrical Installation	9.2	12.8	1.1	0.5
Office & Maintenance Building Construction	4.1	5.3	0.4	0.2
Pipe Installation & Roadway Restoration	11.1	14.1	1.1	0.6
Plant Equipment Assembly & Installation	5.4	7.5	0.6	0.3
Total Daily On-Site Emissions	***56.6***	***91.7***	***7.1***	***3.2***
LOCALIZED ANALYSIS				
Maximum Regional Daily Emissions	***56.6***	***91.7***	***7.1***	***3.2***
SRA 22 Localized Significance Threshold	652	17,637	198	92
SRA 25 Localized Significance Threshold	896	23,866	178	86
Exceed Daily Localized Thresholds?	**No**	**No**	**No**	**No**

Note: Emissions modeling files can be found in Appendix B of this Addendum.
Source**:** TAHA, 2024

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Operations

As mentioned in the discussion regarding construction, there are no sensitive receptors located within 1,600 feet of the project site. Implementation of the proposed project would not introduce any new stationary sources of emissions to the project site, and the operation of the RNG Facility would result in a net decrease in O_3-precursor (VOC) emissions, as shown in **Table 3-2**. Proposed project operations would not materially alter the nature of activities conducted on the landfill, and maintenance trips would occur only several times per year. As a safety precaution, the RNG plant will be equipped with both a manual shut-off system as well as an automatic shut-off system that functions based on detected pressure drops. Additionally, all accessible pipe flanges would be inspected on a monthly basis for any possible leaks. Therefore, there is no potential for future operation of the proposed project to expose sensitive receptors to substantial pollutant concentrations, and this impact would be less than significant.

d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Construction

Potential sources that may produce objectionable odors during construction activities include equipment exhaust and off-gassing of disturbed waste. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site. Construction of the proposed project would employ best management practices to prevent the occurrence of a nuisance odor in accordance with SCAQMD Rule 402 Nuisance, and the odors would be typical of most construction sites and temporary in nature. There are no sensitive land uses in close proximity to the project site that would be especially sensitive to odors emanating from these sources. Therefore, this impact would be less than significant.

Operations

Solid waste and landfill gas are potential sources of odor. Odor associated with landfill operations is controlled by application of daily cover material. This limits most odors to the proximity of the working face during operations. Cover methods and the remoteness of the site keep odor from becoming a nuisance. Historically, landfill operations have not created significant odor impacts. The landfill is in full compliance with SCAQMD Rule 1150.1 governing control of gaseous emissions from landfills, and with Rule 402 prohibiting creation of a nuisance from odor or dust. The proposed RNG facility would involve a closed system that would not vent any landfill gas directly to the atmosphere, and the magnitude of flared landfill gas volume would be reduced relative to existing operational conditions. Operation of the proposed project would not introduce any new permanent source of air pollutant emissions to the project area beyond intermittent employee, private

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

delivery, and maintenance vehicle trips, which would not alter the magnitude of odorous emissions emanating from the landfill. Therefore, operation of the proposed project does not have the potential to expose sensitive receptors to odors or other emissions that could cause public nuisances, and therefore, this impact would be less than significant.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

AQ-1 The following activities shall occur based on SCAQMD Rule 1150.1 - Control of Gaseous Emissions from Active Landfills:

- Landfill gas collection and thermal destruction systems shall be provided and operated.
- Landfill gas destruction system shall be constructed using best available control technology (BACT). Improved combustion technology (e.g., boiler) shall be installed at the time that the continued use of current technology flares would exceed SCAQMD standards for stationary sources.
- A network of landfill gas monitoring probes shall be installed to identify potential areas of subsurface landfill gas migrations.
- The project includes a landfill gas barrier layer (i.e., 10- to 20-mil high-density polyethylene [HDPE] or polyvinyl chloride [PVC] sheeting) as part of the intermediate cover and final cover system. This gas barrier layer is not required by Subtitle D and would minimize excess air infiltration and fugitive landfill gas emissions, and would increase landfill gas collection efficiency.
- Monitoring of landfill gas concentrations at perimeter probes, gas collection system headers, landfill surface, and in ambient air downwind of the landfill shall be conducted in accordance with applicable regulations.
- Annual emissions testing of inlet and exhaust gases from the landfill gas destruction system shall be conducted to evaluate gas destruction efficiency.
- The gas collection system shall be adjusted and improved based on quarterly monitoring and annual stack testing results.

AQ-2 The following activities shall occur based on SCAQMD Rule 403 - Fugitive Dust:

- Emission controls necessary to assure that dust emissions are not visible beyond the landfill property boundary shall be implemented.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

- New cell construction and cell closure activities shall not occur simultaneously.
- The Rule 403 Fugitive Dust Emissions Control Plan for the landfill, approved by SCAQMD in May 1993, shall be adhered to. The plan itemized various control strategies for dust emissions from earthmoving, unpaved road travel, storage piles, vehicle track-out, and disturbed surface areas, including watering, chemical stabilizers, revegetation, and operational controls or shutdown for implementation during both normal and high wind conditions.
- Rule 403 Fugitive Dust Emissions Control Plan shall be revised on an annual basis.

[Note: Dust control measures are currently implemented at El Sobrante Landfill in accordance with this mitigation measure and the landfill's SCAQMD-approved Rule 403 Large Operation Notification. However, it should be noted that subsequent to approval of the 1998 EIR, Rule 403 requirements changed, and the landfill operator is no longer required to revise the Fugitive Dust Control Plan on an annual basis (www.aqmd.gov). The current Fugitive Dust Control Plan is available for review at the landfill, and is filed in the site records for mitigation compliance purposes.]

AQ-3 The following mitigation measures exceed current regulatory requirements and shall be incorporated by design, construction, and operation:

- PM_{10} monitoring stations and an onsite meteorological station shall be installed and operated, as agreed in consultation with the SCAQMD.
- Where feasible, landfill roads shall be paved.
- Portions of paved roads abutting unpaved haul truck traffic areas shall be routinely swept and/or washed.
- Onsite vehicles shall be routinely maintained.

AQ-4 In the event monitoring indicates that permissible levels of PM_{10} are being exceeded, some combination of the following dust control measures shall be implemented:

- Washing of truck wheels.
- Routing paved access roads away from directions that result in property boundary impacts.
- Curtailing specific activities (e.g., new phase construction) when conditions are unfavorable for fugitive PM_{10} control.

AQ-5 The following activities would occur based on SCAQMD Regulation XIII - New Source Review:

- Control devices for stationary emission sources shall be provided which satisfy BACT requirements.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

- NOx, ROG, SOx, and PM_{10} emissions from stationary sources shall be offset according to SCAQMD requirements for essential public services.

AQ-6 The following activity shall occur based on SCAQMD Regulation XIV - Toxics and Other Noncriteria Pollutants:

- Control devices for stationary emission sources shall be provided which assure that emissions of potentially carcinogenic and/or toxic compounds do not result in unacceptable health risks downwind of the landfill.

AQ-7 Onsite vehicles shall be routinely maintained.

AQ-8 Heavy construction equipment shall use low sulfur fuel (<0.05 percent by weight) and shall be properly tuned and maintained to reduce emissions.

AQ-9 Construction equipment shall be fitted with the most modern emission control devices.

AQ-10 The project shall comply with SCAQMD Rule 461 which establishes requirements for vapor control from the transfer of fuel from the fuel truck to vehicles.

AQ-11 Prior to construction and construction/operation activities, the following premonitoring measures shall be implemented to avoid or lessen boundary concentrations of NO_2:

- Normal landfill operations and cell construction/closure activities shall be preplanned to avoid potentially adverse alignments (both horizontally and vertically) during anticipated periods of meteorological conditions which could result in the greatest property boundary concentration.
- During periods when both disposal and construction activities are occurring, downwind property line monitoring of NO_2 shall be implemented for wind and stability conditions which could result in the highest boundary concentrations.

During construction and construction/operation activities, the following postmonitoring measures shall be implemented to avoid or lessen boundary concentrations of NO_2:

- If monitoring determines that the 1-hour NO_2 standard (i.e., 470 µg/m3) is being approached (i.e., within 95percent of the standard or approximately 450 µg /m3), construction or cell closure activities shall be curtailed until the appropriate tiered mitigation measures can be implemented, or until adverse meteorological conditions no longer exist.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

- The waste placement and/or clay preparation areas shall be moved to a preplanned alternative working location to separate emissions from clay placement construction emissions.
- Construction procedures shall be configured such that operations requiring heavy equipment do not occur simultaneously (e.g., clay placement and protective soil placement by scrapers will not be done during periods with adverse meteorological conditions).
- Construction scheduling will be slowed to reduce daily equipment usage.
- Hours of construction with designated pieces of equipment (e.g., scrapers) shall be constrained to occur outside of peak adverse meteorological conditions.

AQ-12 Within three years of start date [July 1, 2001], USA Waste or its successor-in-interest shall submit to the County of Riverside an evaluation of the technological and economical feasibility of using natural gas fuel or other alternative fuel in transfer trucks. The technological feasibility of the evaluation shall include review comments by the South Coast Air Quality Management District. The evaluation shall be subject to County approval. If the County finds that natural gas fuel or other alternative fuel in transfer trucks is technologically and economically feasible, USA Waste or its successor-in-interest shall develop and implement a program to phase-in transfer trucks capable of using these fuels. The program shall be subject to County approval. If the County concludes that transfer trucks capable of using alternative fuels are not technologically and economically feasible, USA Waste or its successor-in-interest shall periodically reevaluate the feasibility of using alternative fuels in transfer trucks. Such reevaluations shall be at least every three (3) years. USA Waste or its successor-in-interest shall, however, conduct such a reevaluation anytime deemed appropriate by County.

AQ-13 The project shall provide the required emission reductions of NOx and ROG sufficient to cause no net increase of project emissions.

AQ-14 USA Waste shall amend its Policies and Procedures Manual at the landfill to require that heavy construction and operating equipment at the landfill shall not idle for longer than 15 minutes.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
4. Biological Resources. Would the project:					
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	1998 EIR, § 4.3	No	No	No	No
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	1998 EIR, § 4.3	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	1998 EIR, § 4.3	No	No	No	No
d. Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	1998 EIR, § 4.3	No	No	No	No
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	1998 EIR, § 4.3	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	1998 EIR, § 4.3	No	No	No	No

Environmental Setting /Discussion

The discussion below is based on the Biological Resources Technical Report (BRTR) (Artemis 2024) (Appendix C of this Addendum) that was prepared for the proposed project.

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Most of the proposed project components are located in areas that are already developed or disturbed (i.e., North RNG Site, South RNG Site, along Dawson Canyon Road, and Gas POR Site), so significant habitat loss or modifications are not expected in these areas. However, construction activities for implementation of the proposed project would occur immediately adjacent to (and beneath) Temescal Wash, where natural habitats for multiple special status species occur. Potential impacts could include direct destruction of special status plants, special status fossorial mammal burrows, nests of special status birds, and roosts of special status bats; direct destruction of habitat for riparian special status species in Temescal Wash; and indirect effects from water quality impacts, vehicular traffic, noise and human presence, lighting, toxins, entrapment, and the spread of invasive species. Because the proposed pipeline at Temescal Wash would be bored underneath the riparian area it would eliminate any impacts to the natural habitat within and around the riparian area. Also, potential impacts to special status species are expected to be temporary and not significant, lasting only during the construction phase, with the exception of the potential impact of the spread of invasive species into natural habitats, which could degrade the quality of habitat for special status species in the region. As such, the project design and construction would include avoidance and minimization measures (see Section 5.1.1 of Appendix C of this Addendum) that would be consistent with the *Multiple Species Habitat Conservation Plan for the El Sobrante Landfill* (2001) (ESL MSHCP), which was prepared in 2001 for the 50-year landfill expansion to address mitigation for biology impacts. Further, the proposed project would be in compliance with the ESL MSHCP and would not change or affect the ESL MSHCP. During the construction phase, the proposed project would follow the impact avoidance and reduction measures as described in Section 5 Part D of Part 1 of the ESL MSHCP (see Section 5.1.5 of Appendix C of this Addendum).

It is anticipated that there will be some indirect impacts resulting from the proposed project based on its proximity to sensitive habitat and sensitive species (see Section 5.3 of Appendix C of this Addendum). For example, indirect and temporary impacts to wildlife movement due to construction noise, including presence of humans, will be expected during construction of the proposed project. If nighttime work is required for the proposed project, construction lighting may penetrate wildlife habitat within or adjacent to the Study Area[1] that could temporarily impact sensitive wildlife species including the movement of nocturnal species. However, the potential indirect impacts would be maintained at less than significant levels with implementation of best management practices, applicable ESL MSHCP measures, and the avoidance and minimization measures outlined in Section 5.0 of Appendix C of this Addendum.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
Additionally, the mitigation measures identified in the 1998 EIR to reduce potential biological resources impacts would continue to be enforced upon implementation of the proposed project. Therefore, potential impacts related to species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or the U.S. Fish and Wildlife Service (USFWS) would be less than significant with the implementation of existing mitigation measures and measures consistent with those adopted for the ESL MSHCP. b. <u>Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?</u> As stated previously, most of the project components are located in areas that are already developed or disturbed, so significant habitat loss or modifications are not expected in these areas. The areas that are most sensitive to proposed project-related construction activities are Temescal Wash and Coldwater Canyon Creek, where riparian habitats and Riversidean Sage Scrub occur. As such, the proposed project has been designed to avoid impacts to the riparian habitats around Temescal Wash and Coldwater Canyon Creek by boring via HDD underneath the streambed. The permits and agreements from the USACE, RWQCB, and CDFW for activities related to HDD underneath Temescal Wash would be obtained and an HDD Frac-out Contingency Plan would be submitted with permit applications and approved by regulatory agencies. This HDD Frac-out Contingency Plan includes drilling procedures and methods prior to, during, and after construction. Therefore, no new significant adverse impacts to riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USWS would occur.					

[1] Study Area includes the North RNG Site, South RNG Site, Gas POR Site, the proposed pipe trench route continuing down Dawson Canyon Road that will be located within the road shoulder, the boring alignment that crosses beneath Temescal Wash, and a buffer that extends either to the top or toe of adjacent slopes (nearest slope edge) depending on the locations.

c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

As stated above, the proposed project has been designed to avoid impacts to federally protected wetlands within the Temescal Wash downstream of the Dawson Canyon Bridge by utilizing HDD to bore underneath the streambed, so no impacts would occur temporarily or permanently. The applicable permits and agreements mentioned above would be obtained and an HDD Frac-out Contingency Plan would be prepared to avoid and minimize impacts to jurisdictional waters. Therefore, no new significant adverse impacts to state or federally protected wetlands through direct removal, filling, hydrological interruption, or other means would occur.

d. Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The El Sobrante Landfill lies between Lake Matthews and Estelle Mountain and connects the conserved lands of the Stephen's kangaroo rat (SKR) Lake Matthews-Estelle Mountain Reserve. Because El Sobrante Landfill is made up of open space, it likely provides space for wildlife movement in areas that are not active or blocked with barriers. Movement opportunities for wildlife species within the Study Area are provided by Dawson Canyon Road, which may be used by large and small mammals, and Temescal Wash and Coldwater Canyon Creek, which may be utilized by primarily fish, amphibian, reptile, bird, and large and small mammals. Buildings in the North RNG Site and South RNG Site, and structures such as Dawson Canyon Road Bridge may provide nursery sites for bats. Appropriate soils at the edge of the developed areas or roadsides where construction or trenching would take place may provide habitat for burrowing animals, including SKR and Northwestern San Diego pocket mouse. The proposed project has potential to raise the likelihood of traffic collisions with wildlife, damage or destroy bat nurseries, and damage or destroy mammal burrows during construction. As such, the proposed project would include avoidance and minimization measures (see Section 5.1.4 of Appendix C of this Addendum) that would be consistent with the ESL MSHCP to avoid or minimize impacts to wildlife movement and nurseries. Further, the proposed project would be in compliance with the ESL MSHCP and would not change or affect the ESL MSHCP. During the construction phase, the proposed project would follow the impact avoidance and reduction measures as described in Section 5 Part D of Part 1 of the ESL MSHCP (see Section 5.1.5 of Appendix C of this Addendum). Additionally, the mitigation measures identified in the 1998 EIR to reduce potential biological resources impacts would continue to be enforced upon implementation of the proposed project. Therefore, potential impacts related to wildlife movement corridors associated with the proposed project would be less than significant with the implementation of existing mitigation measures and measures consistent with those adopted for the ESL MSHCP.

e. <u>Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?</u>
f. <u>Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?</u>

Although the proposed project would involve trimming or removing three non-native eucalyptus trees, these trees are not protected by Riverside County Ordinance No. 559 regulating the removal of trees because the ordinance only protects native trees in areas above 5,000-foot elevations. As such, removal of these trees would continue to comply with local ordinances.

As stated previously, the ESL MSHCP was prepared in 2001 for the 50-year landfill expansion to address mitigation for biology impacts. USFWS issued a Section 10 (a) permit and CDFW issued a Section 2081 (b) permit for impacts to two threatened and endangered species, and 29 other sensitive species that were not yet listed as threatened or endangered. Most of the proposed project is located within the limits of the ESL MSHCP. The area of the proposed project that is not within the ESL MSHCP limits, and is being submitted for approval for inclusion into the ESL MSHCP area, includes the approximate 12.64 acres along Dawson Canyon Bridge and Dawson Canyon Road in the southern portion of the project site. The proposed project would comply with the provisions of the ESL MSHCP, and most of the proposed project is located on already developed or disturbed lands. Additionally, the proposed project has been designed to avoid impacts to the riparian habitats of Temescal Wash by boring via HDD underneath the streambed., Further, the proposed project would be in compliance with the ESL MSHCP and would not change or affect the ESL MSHCP. During the construction phase, the proposed project would follow the impact avoidance and reduction measures as described in Section 5 Part D of Part 1 of the ESL MSHCP (see Section 5.1.5 of Appendix C of this Addendum). Therefore, no new significant adverse impacts to policies protecting biological resources or habitat conservation pans associated with the proposed project would occur.

<u>Mitigation Measures, Conditions of Approval or Regulatory Requirements</u>

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

B-1 Development shall be phased so that the area to be disturbed shall be minimized. Restoration of previously disturbed areas shall be performed in accordance with the *Multiple Species Habitat Conservation Plan for the El Sobrante Landfill* and its Implementing Agreement, both dated July 2001, and any approved modifications or amendments thereto.

B-2 Areas within the landfill limits of disturbance shall be restored with Riversidian sage scrub in accordance with the *Multiple Species Habitat Conservation Plan for the El Sobrante Landfill* and its Implementing Agreement, both dated July 2001, and any approved modifications or amendments thereto.

B-3 Dudleya salvaging and restoration shall be performed in accordance with the Multiple Species Habitat Conservation Plan for the El Sobrante Landfill and its Implementing Agreement, both dated July 2001, and any approved modifications or amendments thereto.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
B-4 Prior to disturbance to wetland/riparian areas, a wetland compensation and mitigation plan shall be developed in consultation with the ACOE, if a 404 Permit is required, the CDFW, pursuant to Section 1603 of the California Fish and Game Code, the RWQCB, pursuant to 401 Water Quality requirements and/or policies to protect wetlands, and the USFWS, if consultation is triggered pursuant to Section 7 of the Endangered Species Act. Mitigation of riparian habitats shall be targeted at a 3:1 ratio with compensation of 6.36 acres. Target mitigation of an additional 1.28 acres of riparian herb vegetation shall be at a 1:1 ratio. Final determination of mitigation ratios shall be made subsequent to onsite evaluation by the ACOE, CDFW, RWQCB, and/or USFWS and shall not be unreasonable or arbitrary. B-5 Activities to mitigate the disturbance to wetlands may include, but are not limited to: • Identification and assessment of sites and specific riparian mitigation measures along Temescal Wash. • Enhancement of degraded areas within existing channels. • Weed removal to improve existing riparian habitat. • Potential purchase of offsite riparian habitat. B-6 The purchase of offsite riparian/wetland habitat shall be incorporated into the mitigation plan in the event that the ACOE Section 404 permit and CDFW Section 1603 agreement process conclude that onsite enhancement and offsite mitigation along Temescal Wash could not provide sufficient compensation for disturbance to onsite riparian habitat. If this mitigation were implemented, surveys shall be conducted in coordination with USFWS and CDFW to identify offsite riparian habitat that would be suitable for purchase as mitigation for onsite habitat disturbance. Considerations shall include, but not be limited to: • Proximity to landfill site. • Similarity of adjacent habitat. • Management plans. • Comparability. • Sustainability. • Cost. B-7 Wetland/riparian habitat mitigation shall be implemented in accordance with all permits, approvals, and/or agreements as may be required by ACOE, CDFW, RWQCB, and/or USFWS.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
B-8 Landfill personnel shall be instructed as to the requirement for and importance of restoration of completed areas of the site.					
B-9 Approximately 406 acres of undisturbed open space, upon which a Declaration of Conservation Covenants and Restrictions has been recorded in favor of CDFW and USFWS, shall be maintained and managed for the benefit of Covered Species, pursuant to federal and state incidental take permits and the Multiple Species Habitat Conservation Plan for the El Sobrante Landfill and its Implementing Agreement, both dated July 2001, and any approved modifications or amendments thereto.					
B-10 Pursuant to Section 5 of the Agreement, USA Waste or its successor-in-interest shall pay the County a per ton charge for the deposit of Non-County waste at El Sobrante Landfill, $1.50 of which shall be utilized for multi-species habitat acquisition and management, including planning and research activities, as provided in Section 10.7 of the Agreement and as approved by the Board of Supervisors on September 1, 1998. Monies to be utilized for multispecies purposes shall be deposited in a trust fund administered by the Executive Officer of the County.					
B-11 In the unlikely event that out-of-County waste ceases to be disposed of at El Sobrante, use of the 60 million tons of air space currently allocated for out-of-County waste shall include the requirement for payment of $1.00 per ton for multispecies habitat acquisition and management.					
B-12 Lighting at the working face shall be downcast and shielded to minimize reflection, and shall be directed inward toward the landfill.					
B-13 A predator monitoring and control plan shall be implemented in accordance with the *Multiple Species Habitat Conservation Plan for the El Sobrante Landfill* and its Implementing Agreement, both dated July 2001, and any approved modifications or amendments thereto.					
B-14 Brush clearing and habitat removal in each phase of landfill expansion will not be allowed to occur between February 1 and August 15, pursuant to the *Multiple Species Habitat Conservation Plan for the El Sobrante Landfill* and its Implementing Agreement, both dated July 2001, and any approved modifications or amendments thereto.					
B-15 When the landfill expansion is complete (i.e., after closure of all phases and at the end of the postclosure monitoring maintenance period [currently a minimum of 30 years]), including all restoration activities in accordance with the *Multiple Species Habitat Conservation Plan for the El Sobrante Landfill* and its Implementing Agreement, both dated July 2001, and any approved					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
modifications or amendments thereto, the area of onsite disturbance (approximately 645 acres) shall be kept in permanent conservation through a conservation easement in favor of the CDFW. In the event that CDFW revokes its acceptance of the conservations easement, the land shall be placed into conservation with the County, or other County-designated entity, such as Western Riverside County Regional Conservation Authority as approved by the US Fish and Wildlife Service and the El Sobrante habitat management committee. B-16 USA Waste or its successor-in-interest shall continue to include the County in all aspects of future permitting processes involving USFWS, pursuant to Section 7 of the Endangered Species Act, CDFW, pursuant to Section 1603 of the California Fish and Game Code, ACOE 404 permitting, and RWQCB, pursuant to 401 Water Quality requirements and/or policies to protect wetlands.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
5. Cultural Resources. Would the project:					
a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	1998 EIR, § 4.9 and 4.10; 2009 SEIR, Appendix A § 14	No	No	No	No
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	1998 EIR, § 4.9 and 4.10; 2009 SEIR, Appendix A § 14	No	No	No	No
c. Disturb any human remains, including those interred outside of dedicated cemeteries?	1998 EIR, § 4.9 and 4.10; 2009 SEIR, Appendix A § 14	No	No	No	No

Environmental Setting/Discussion

The discussion below is based on Cultural Resources Report (AECOM 2024a) (Appendix D of this Addendum) prepared for the proposed project.

A records search for the project site and a 0.5-mile search radius was completed in the California Historical Resources Information System at the Eastern Information Center (EIC), located at the University of California, Riverside. Supplemental research included review of the National Register of Historic Places, California Register of Historical Resources; and other national, state, and local registers. Additional archival research included research of online repositories such as review of historic maps (historic aerials, historic topographical maps), the Built Environment Resources Directory, geology maps, and ethnographic maps prepared by local historians, early anthropologists, and modern Native American tribal leaders. A Sacred Lands File (SLF) request was solicited from the Native American Heritage Commission (NAHC) to identify tribal cultural resources and traditional sites that might be impacted by the proposed project. An intensive-level pedestrian archaeological survey of the project area was performed.

a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?
c. Disturb any human remains, including those interred outside of dedicated cemeteries?

The 1998 EIR found no sites of historical significance on or near the landfill area and concluded that no significant impacts to historical resources would occur. However, the landfill area was determined to have a high potential for archeological and paleontological resources, which necessitated archeological and paleontological assessments as part of the 1998 EIR. The mitigation measures stemming from these assessments were incorporated into the 1998 EIR and have resulted in ongoing cultural resources surveying/monitoring. There are seven archaeological sites (CA-RIV-1143, CA-RIV-1144, CA-RIV-1146, CA-RIV-1148, CA-RIV-1651, CA-RIV-4307, and CA-RIV-4981) within the landfill site boundary, and one site (CA-RIV-1147) that is outside of, but immediately adjacent to, the site boundary that are surveyed on a biannual basis.

Based on the results of archival research, the Native American outreach program, and the field survey, no new or previously recorded cultural resources were identified in the project area. Sites P-33-003832 and P-33-000078, identified during the EIC records search, were confirmed to be present in the project vicinity, outside the project footprint. However, an assessment of archaeological sensitivity indicates that the southern end of the project area, extending from the intersection of Temescal Canyon Road and Dawson Canyon Road, along Dawson Canyon Road until the road turns north and starts going uphill, exhibits moderate potential to encounter archaeological resources, based on proximity to previously recorded resources, natural setting, and presence of soils with potential for buried deposits. The proposed project would include excavation activities, which could have the potential to inadvertently uncover archaeological resources, tribal cultural resources, and unknown human remains. As such, the mitigation measures identified in the 1998 EIR to address cultural resources would continue to be enforced upon implementation of the proposed project, which would include the continuation of monitoring, testing, and/or preservation or data recovery excavation by certified archaeologists (if necessary) for future grading and other disturbance-related activities within and in close proximity to identified archaeological sites. No monitoring is recommended currently for construction activities where Dawson Canyon Road turns north and ascends northward upslope, because soils in this area exhibit more clear evidence of disturbance, they likely are older and less likely to contain archaeological resources, and the project area is not as close to previously recorded sites and sensitive landscape features, such as low slopes and freshwater resources. If archaeological resources are encountered during ground-disturbing activities in areas determined not to require monitoring or following completion of monitoring in the archaeologically sensitive area, work should be halted temporarily in the vicinity of the find and a qualified archaeologist should be contacted to evaluate and determine appropriate treatment of the resource, in accordance with Section 21083.2(i) of the Public Resources Code. Accordingly, with the continued enforcement of existing mitigation measures associated with cultural resources, no substantial changes to the circumstances under which the proposed project would be undertaken regarding the proposed project's potential impacts to cultural resources would occur. Therefore, potential impacts related to cultural resources would be less than significant with the implementation of existing mitigation measures, supplemented with recommendations that are based on the present context of the project site and are consistent with and meet the intent of the existing, previously adopted mitigation measures.

<u>**Mitigation Measures, Conditions of Approval or Regulatory Requirements**</u>

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project (and as modified herein; see Section 19, Tribal Cultural Resources) will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

C-1 Prior to grading, a Registered Professional Archaeologist (RPA)-certified archaeologist(s) shall be retained, at the expense of the project, to provide surface collection, mapping, and test excavations for identified archaeological sites. If the sites are determined to be important, the resources within these sites shall be either preserved or a data recovery excavation shall be conducted. <u>If necessary, a RPA-certified archeologist(s) shall oversee development and implementation of worker environmental awareness program (WEAP) training before the start of construction and to conduct and coordinate archaeological and tribal monitoring in sensitive portions of the project area.</u>

C-2 Routine road or stormwater facilities, maintenance or other land-altering activities in the vicinity of sites shall be monitored by a Registered Professional Archaeologist (RPA)-certified archaeologist to prevent inadvertent disturbance or loss of important resources.

C-3 The status of the sites shall be monitored on a semi-yearly basis to assure that incidental disturbance or recreational collection of resources has not occurred.

C-4 In the event of an accidental discovery or recognition of any human remains, <u>Section 7050.5 of the Health and Safety Code and the protocol in </u>Public Resources Code (PRC) Section<u>s</u> 5097~~.98~~ <u>and 5098 </u>must be followed. In this instance, once project-related earthmoving begins and if there is accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps shall be taken:

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

- There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the County Coroner is contacted to determine if the remains are Native American and if an investigation of the cause of death is required. If the coroner determines the remains to be Native American, then the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours, and the NAHC shall identify the person or persons it believes to be the "most likely descendant" of the deceased Native American. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98, or
- Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendations of the most likely descendant or on the property in a location not subject to further subsurface disturbance:
  - The NAHC is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 48 hours after being granted access to the site;
  - The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the NAHC fails to provide measures acceptable to the landowner.

C-5 The approved archaeological mitigation measures shall be affixed to all copies of the project grading plans.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
6. Energy. Would the project:					
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	N/A	N/A	N/A	N/A	N/A
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	N/A	N/A	N/A	N/A	N/A

Environmental Setting/Discussion

The discussion below is based on Energy Impacts Study (TAHA 2024b) (Appendix E of this Addendum) prepared for the proposed project.

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The following analysis discusses short-term (construction) and long-term (operational) use of petroleum fuels, electricity, and natural gas that would result from implementation of the proposed project.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Petroleum

Construction

Petroleum fuels would be consumed during construction of the proposed project by heavy-duty equipment, on-site trucks, on-road truck trips delivering facility components and cement for foundations, and on-road vehicle trips by construction crews. **Table 3-4** presents a summary of the one-time expenditure of petroleum fuels that would be required during the 18-month RNG Facility construction period. Construction activities would consume approximately 73,161 gallons of diesel fuel in total. The annual diesel fuel consumption would represent less than 0.05 percent of 2022 countywide retail sales. RNG Facility construction crew vehicle trips would also consume approximately 14,258 gallons of gasoline over the 18-month construction period. This incremental increase in petroleum fuels demand to construct the proposed project would not place a disproportionate burden on available petroleum fuel supply.

Table 3-4: Proposed Project Construction Petroleum Demand

Fuel Type and End Use	Fuel Consumption (Gallons)
DIESEL	
RNG Facility Component Deliveries	24,810
RNG Facility Construction Off-Road Equipment	32,381
RNG Facility Construction Truck Trips	15,970
Total Diesel Consumption	**73,161**
GASOLINE	
Construction Crew – RNG Facility Construction (Total)	**14,258**
Source: TAHA, 2024	

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

The proposed project would adhere to best management practices to avoid the potential for the wasteful consumption of petroleum fuels, such as ensuring that equipment operates within optimum manufacturer specifications and enforcing the restriction on heavy-duty diesel vehicle idling time to five minutes in compliance with CARB's Airborne Toxics Control Measure 2485. Therefore, because petroleum use would be minimized to the extent feasible and represents a relatively small amount of regional fuel consumption, construction of the proposed project would result in a less than significant impact related to wasteful, inefficient, or unnecessary consumption of petroleum.

Operations

Operation of the proposed project would involve the consumption of petroleum fuels in the employee vehicles traveling to and from the project site and occasional maintenance vehicle trips. As shown in **Table 3-5**, proposed project operations would require approximately 2,973 gallons of gasoline and 1,065 gallons of diesel fuel annually. Proposed project operations would not result in wasteful consumption of petroleum fuels; this impact would be less than significant.

Table 3-5: Proposed Project Operations Annual Energy Demand

Energy Resource and End Use	Energy Consumption
GASOLINE	
Toro RNG Facility Employee Trips (Gallons)	2,973
DIESEL FUEL	
Onsite Maintenance Truck Trips (Gallons)	1,065
ELECTRICITY	
RNG Facility Power (MWh)	61,320
RNG Facility Utility Building Power (MWh)	31
Total Annual Electricity (MWh)	**61,351**
NATURAL GAS	
RNG Facility Natural Gas Production (MMBTU)	3,139,000
Source: TAHA, 2024	

Electricity

Construction

Construction of the proposed project may require electricity for operation of electrically powered hand tools. However, electricity to the site would be provided by diesel generators or connection to the existing SCE grid. Therefore, construction of the proposed project would result in a less than significant impact related to wasteful or inefficient consumption of electricity.

Operations

Implementation of the proposed project would require additional permanent electricity consumption associated with operation of the RNG Facility and the utility and maintenance building, as summarized in **Table 3-5**. The increase in annual electricity demand would not place an undue burden on SCE power supply or grid reliability. Therefore, implementation of the proposed project would have a less than significant impact related to operational electricity consumption.

Natural Gas

Construction

Construction of the proposed project would not involve end uses of natural gas. Therefore, construction of the proposed project would result in a less than significant impact related to wasteful or inefficient consumption of natural gas.

Operations

Implementation of the proposed project would divert LFG through the RNG Facility and produce up to 8,600 MMBTU of RNG daily. The proposed project would provide a new source of renewable energy and would contribute to regional efforts to reduce reliance on nonrenewable resources. Therefore, implementation of the proposed project would have a less than significant impact related to operational natural gas consumption.

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Implementation of the proposed project would not conflict with or obstruct any State, regional, or local plan involving the expansion of renewable energy resources or improving energy efficiency. The proposed project would provide a net energy benefit by producing approximately 8,600 MMBTU of RNG on a daily basis. **Table 3-6** below summarizes the most directly applicable plans and policies enacted for the purpose of managing energy resource consumption and conservation and provides a brief description of the proposed project's

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

influence on implementation of the provisions therein. Implementation of the proposed project would not impede efforts to improve energy efficiency or expand renewable resources. Therefore, this impact would be less than significant.

Table 3-6: Consistency with Energy Management Plans

Plan Goal, Objective, or Target	Project Evaluation
CARB Truck and Bus Regulation (2008, Amended 2014): By January 1, 2023, all drayage trucks must have 2010 model year or newer engines.	**Consistent.** Implementation of the proposed project would not generate new truck trips within the greater Riverside County area. All commercial heavy-duty trucks serving the RNG Facility will be required to comply with the requirements set forth in the CARB Truck and Bus Regulation. Proposed project construction and operations would not impede the phasing out of trucks with older engines failing to comply with the regulation.
CARB Sustainable Freight Action Plan (2015): Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.	**Consistent.** The proposed project would not hinder the State's efforts to implement near-zero- and zero-emission technologies. The fleet of trucks and equipment used at the RNG Facility would be turned over at similar rates consistent with the rest of the operations and the greater SCAG region.
Source: TAHA, 2024	

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
7. Geology and Soils. Would the project:					
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. ii. Strong seismic ground shaking? iii. Seismic-related ground failure, including liquefaction? iv. Landslides?	1998 EIR, § 4.1	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
b. Result in substantial soil erosion or the loss of topsoil?	1998 EIR, § 4.1.2	No	No	No	No
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	1998 EIR, § 4.1; 1998 EIR, Appendix A, Attachment D	No	No	No	No
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	1998 EIR, § 4.1.1.6	No	No	No	No
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the	Not Previously Assessed	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
disposal of waste water?					
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic features?					

Environmental Setting/Discussion

The discussion below is based on Geotechnical Investigation Report (HAI 2023) (Appendix F1 of this Addendum), Geotechnical Exploration and Recommendations Report (WSP 2022) (Appendix F2 of this Addendum), Paleontological Memorandum (AECOM 2024b) (Appendix G of this Addendum), and Flood Risk Summary Memo (Blue Ocean Civil Consulting 2023) (Appendix H of this Addendum) prepared for the proposed project.

a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
   i. Rupture of a known earthquake fault?
   ii. Strong seismic ground shaking?
   iii. Seismic-related ground failure, including liquefaction?
   iv. Landslides?

The proposed project consists of installing and operating the RNG Facility at the existing El Sobrante Landfill within three previously disturbed areas. Active faults have not been mapped within the landfill boundary and the project site is not located within an Alquist-Priolo Earthquake Fault Zone. The proposed project would not be built on an area of known geologic hazards and would not expose people or structures to substantial adverse effect from a rupture of a known earthquake fault. It would be designed in accordance with existing geology and soils-related mitigation measures for the landfill, and any additional recommendations identified in the geotechnical exploration and recommendations report and geotechnical investigation report prepared for the proposed project, such that the proposed project would not expose people or structure to substantial adverse effects associated with strong seismic ground shaking, seismic stability of the landfill, and/or

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

landslides. The proposed RNG Facility would be designed in accordance with the California Building Code and local practices and ordinances (County of Riverside Building Code). Therefore, no new significant adverse impacts related to exposure of people or structures to seismic hazards would occur.

b. Result in substantial soil erosion or the loss of topsoil?

As indicated in the 1998 EIR, erosion, sedimentation and flooding caused by an earthquake are precluded by the design of the landfill. The JTD for the landfill provides operational characteristics consistent with the Report of Waste Discharge (ROWD) requirements found in CCR Title 27. The proposed construction of a RNG Facility would be completed consistent with requirements and Best Management Practices as found in the JTD for the landfill with respect to design for soil erosion/loss of topsoil, etc.

The Gas POR Site is located south of Coldwater Canyon Wash (CCW) and west of Temescal Canyon Wash, and is in a Federal Emergency Management Agency (FEMA) special flood hazard areas (SFHA) Zone AE, with an effective Base Flood Elevation (BFE) of between 927 and 932 feet. Separately, a Riverside County Flood Control (RCFC) flood hazard zone (FHZ) associated with CCW has been established based on a Special Study. As such, the proposed project, specifically the Gas POR Site, has been designed to not encroach into CCW defined slopes that designate the existing floodway. The proposed project design would maintain a finished floor and equipment elevation of 933 feet minimum, which is one foot above the effective BFE of 932 feet. Although this elevation is appropriate to minimize flood hazard risk based on the effective Flood Insurance Rate Map, it is also conservative considering the existing conditions and likely future development. Updated flood models based on existing topography and Dawson Canyon Road Bridge geometry show that the one percent annual chance flood is contained within the Temescal Wash main channel in the vicinity of the project site. Localized flooding on the project site due to CCW would be insignificant, as flood water would seek Temescal Wash through lower lying areas relative to the proposed project. In addition, potential lateral erosion along the north edge of the Gas POR Site in CCW would be monitored as part of an erosion control plan that would be implemented as needed.

Therefore, no new significant adverse impacts related to substantial soil erosion or loss of topsoil would occur.

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

The Initial Study prepared for the 2009 SEIR concluded that the landfill was not located within an Alquist-Priolo Earthquake Fault Zone or an existing County Fault Hazard Zone or a Recommended Fault Hazard Zone. There are no site conditions that indicate the potential of ground rupture due to faulting, subsidence or liquefaction during earthquake ground shaking, landslides or lurching of exposed slope faces (1998 EIR). Also, the recommendations presented in the above-mentioned geotechnical reports would be incorporated into design and construction of the RNG Facility. Therefore, no new significant adverse impacts related to unstable soils would occur.

d. Be located on expansive soil, as defined in Table 18- 1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

As identified in the 1998 EIR, limited areas of expansive soils with a low expansion index have been identified at the landfill. Existing mitigation measures require that expansive index testing be performed to verify the suitability of native soils for fill materials, which would be included as part of the geotechnical and soils investigation described in section (a) above to support the construction and operation of the RNG Facility, as well as with all other landfill slopes and the perimeter drainage and access road per County of Riverside Building Code and CCR Title 27. If testing indicates a potential for high expansiveness in the soil, such soils shall be either treated (e.g. mixed with non-expansive soils) or removed. Therefore, no new significant adverse impacts related to expansive soils would occur.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

While this CEQA element was not analyzed in the 1998 EIR or 2009 SEIR, it was addressed within the 2018 Addendum that included a septic system as part of the maintenance shop. For the proposed project, a holding tank that will collect both sanitary sewage from the proposed maintenance building as well as treated condensate/leachate derived from the landfill gas as part of the RNG process is proposed, which would be designed to be in compliance with the appropriate County Department of Environmental Health standards, and all appropriate permits would be obtained. The collected sanitary sewage would meet the Temescal Valley Water District (TVWA) discharge parameters and would be pumped through a force main that will deliver the sanitary sewage down the haul road to a manhole just prior to the bridge. The proposed project would not include additional onsite wastewater treatment systems such as seepage pits or leach field. Therefore, implementation of the proposed project is not anticipated to result in any significant adverse impacts associated with the use of septic tank/leach field system.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

According to the Paleontological Memorandum (AECOM 2024b) (Appendix G of this Addendum), the proposed project has the potential to impact several geologic units rated as having high paleontological potential. Excavation for the pipe trench between the South RNG Site and North RNG Site would impact the Lake Matthews Formation (Tlm). The HDD boring process would impact young axial channel deposits (Qya) and possibly an underlying deposit beneath the Temescal Canyon Wash. Although Qya deposits are rated as having low paleontological potential at the surface, paleontological potential increases with depth and Pleistocene fossils have been found at a depth of 20 feet, which is the minimum depth of HDD boring at the center of the wash. As such, prior to ground disturbance, development of a paleontological monitoring and mitigation program with provisions for testing sediment samples for microvertebrate fossils by a qualified professional paleontologist is recommended for project activities within these formations. This recommendation matches the existing Mitigation Measures P-1 and P-2 as shown below. Project activities are not anticipated to impact the Silverado Formation (Tsi). As such, project activities within the formations with low potential or those with high potential that will not be impacted by the project activities (e.g., Silverado Formation) would not require monitoring. Therefore, potential impacts related to directly or indirectly destroying unique paleontological resources would be less than significant with the implementation of existing mitigation measures.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

G-1 The landfill and associated structures shall be designed and constructed to withstand the expected ground motions and potential effects of seismic ground shaking.

G-2 Final exterior waste fill slopes shall not be steeper than 1.75:1 with a minimum of one 15-foot wide bench for every 50-feet of vertical height.

G-3 A slope or foundation stability report shall be prepared by a registered civil engineer or certified engineering geologist. The report must indicate at least a 1.5 factor of safety for the critical slope under dynamic conditions, or appropriate factor of safety in

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
accordance with applicable regulations. G-4 In lieu of achieving a 1.5 factor of safety under dynamic conditions, a more rigorous analytical method that provides a quantified estimate of the magnitude of movement may be employed. G-5 Significant slopes (including cut, fill, and waste prism slopes greater than 20 feet high and steeper than 3:1) shall be designed to comply with RWQCB and CALRECYCLE requirements for the identified maximum probable earthquake peak acceleration. G-6 RWQCB and CALRECYCLE requirements shall be complied with, and the final cover surface slopes shall be limited to 3:1, based on seismic considerations, with intermediate fill stage heights limited to 70 feet, with 15-foot wide benches to improve stability, unless subsequent analyses verify the acceptability of steeper slopes or greater fill heights. Under no circumstance, however, shall the final exterior waste fill slope be steeper than 1.75:1 (see G-2 above). G-7 Slope buttresses shall be provided, if necessary, to increase slope stability and reduce deformations. G-8 Parameters developed by geosynthetic and geotechnical testing shall be included in the analysis of liner systems on side slopes. Residual strength values (i.e., after shearing) shall be used, unless control of peak strengths can be demonstrated. G-9 A post-earthquake inspection plan shall be submitted to the RWQCB and CALRECYCLE, for approval which provides for detailed site inspection after an earthquake of magnitude (M) 5.0 or greater within 25 miles of the site to determine the integrity of landfill structures and systems. The plan shall identify appropriate measures which may be initiated to correct earthquake-related damage. Also, a routine inspection plan shall be developed and implemented by a registered certified engineer to examine slope conditions. G-10 If geotechnical investigations reveal the need for blasting for a specific landfill phase, a blasting study shall be conducted in compliance with County requirements. If such a study is necessary, it shall be conducted by a licensed engineer and submitted to the County Engineering Geologist for approval. G-11 If isolated saturated bedrock conditions are encountered in cut slopes, appropriate drainage systems shall be installed. These systems could consist of weep systems, subdrain systems, or the flattening of excavated cut slopes to improve slope stability.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
G-12 Landfill liners shall be placed over the side slopes, and surface water runoff control systems (e.g., V-ditches at the top of slopes) shall be constructed to prevent uncontrolled flow down the face of the slopes. G-13 Structural fills shall be built above ground water and compacted in place to a specific high relative density. G-14 Expansive index testing shall be performed to verify the suitability of native soils for fill materials. If testing indicates a potential for high expansiveness in the soil, such soils shall be either treated (e.g., mixed with non-expansive soils) or removed. G-15 Blasting shall be conducted in compliance with local building code requirements to prevent damage to structures and new construction from shear waves generated during blasting. G-16 Only state-licensed blasters shall be used to design, supervise, and detonate explosives on the site. G-17 Seismic monitoring of each blast shall be conducted by an independent, qualified consultant. G-18 There shall be no onsite storage of explosives. Explosives shall be transported to the site by the licensed blaster on an as-needed basis. G-19 USA Waste shall inform the Riverside County Sheriff's Department (Sheriff's Dept.) and the Riverside County Fire Department (Fire Dept.) prior to blasting. G-20 USA Waste shall notify neighbors within 1,000 feet of potential blasting areas prior to a blasting episode. G-21 A record of each blast shall be retained for at least three years and shall be submitted to the County Building and Safety Department as requested by the Building and Safety Director. G-22 Preblast inspections shall be made by a civil engineer licensed by the State of California of residences and facilities existing at the					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

time of landfill permit approval and located within 1,000 feet of potential blasting areas.

G-23 A letter containing a general description of the blasting operations and precautions, including the blast-warning whistle signals that are required by the State of California Construction Safety orders, shall be sent to residents within a one-half mile radius of the landfill operations by USA Waste in accordance with applicable regulations.

G-24 Blasting complaints, if any, shall be recorded by USA Waste as to complainant, address, data, time, nature of the complaint, name of the person receiving the complaint, and the complaint investigation conducted. Complaint records shall be made available to the County Engineering Geologist, Planning Department, and Building and Safety Department.

P-1 A qualified paleontologist shall be retained, at the expense of the project, to monitor ongoing grading or other extensive activities in the Silverado Canyon and Lake Mathews formations. The monitoring program shall reflect the County's intent to research, recover, and preserve significant paleontological resources.

P-2 In the event that significant paleontological resources are uncovered during excavation, earthmoving and/or grading, work shall be redirected from the area until an appropriate data recovery program can be developed and implemented.

P-3 Recovered fossils shall be cleaned, cataloged, and identified to the lowest taxon possible. A report containing monitoring results, including an itemized list of fossils, shall be submitted to the County. A copy shall accompany the fossils to an appropriate repository.

P-4 Collected fossils shall be curated at a public institution with an educational/research interest in the material. The expenses shall be borne by the project.

P-5 The approved paleontologic mitigation measures shall be affixed to all copies of the project grading plans.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
8. Greenhouse Gas Emissions. Would the project:					
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	2009 SEIR, § 4.2	No	No	No	No
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases?	2009 SEIR, § 4.2	No	No	No	No

<u>Environmental Setting/Discussion</u>

The discussion below is based on Air Quality and Greenhouse Gas Emissions Report (TAHA 2024a) (Appendix B of this Addendum) prepared for the proposed project.

a. <u>Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?</u>

The proposed project would generate greenhouse gas (GHG) emissions directly during temporary construction activities through off-road equipment exhaust and vehicle trips. In accordance with SCAQMD recommendations, the total amount of GHG emissions that would be generated during construction activities is amortized over a 30-year operational lifetime of the proposed project and combined with long-term operational emissions. Future operation of the proposed project would increase regional GHG emissions through the additional vehicle trips to and from the project site (direct emissions) and indirect emissions associated with energy consumption and RNG Facility operations, as well as minor emissions from water consumption and on-site solid waste generation at the RNG utility building. **Table 3-7** presents the estimated annual operating GHG emissions that would be generated by the proposed project.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Table 3-7: Proposed Project Estimated Greenhouse Gas Emissions

Emissions Source	CO_2e (Metric Tons)*
CONSTRUCTION ANALYSIS	
South RNG Site Construction Emissions	46
North RNG Site Construction Emissions	394
Gas POR Site Construction Emissions	225
Underground Pipe Installation Emissions	226
Project Construction Emissions – Total (Direct)	**892**
LONG-TERM OPERATIONAL ANALYSIS	
Amortized Construction Emissions (Direct)	30
RNG Facility Employee Commute & Maintenance Trips (Direct)	265
RNG Utility Building Energy Consumption (Indirect)	12
RNG Utility Building Water Consumption (Indirect)	2
RNG Utility Building Waste Generation (Indirect)	1
RNG Facility Net Emissions [Existing – Captured] (Direct)	(52,801)
RNG Facility Electricity Consumption (Indirect)	9,685
TOTAL	**(42,806)**

* Parenthetical notation (#) indicates a negative value.
Source: TAHA, 2024

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Construction activities would generate a total of approximately 892 $MTCO_2e$ over the 18-month duration. Accounting for the indirect emissions from electricity requirements—approximately 9,697 $MTCO_2e$ per year—the RNG Facility would offset approximately 42,806 $MTCO_2e$ of GHG emissions annually that would have otherwise occurred. As demonstrated by the emissions analysis, the proposed project would contribute to regional efforts to reduce GHG emissions and would provide a new supply of renewable energy resources in the form of RNG. Implementation of the proposed project would provide a net environmental benefit and would aid County initiatives towards achieving the GHG emissions reduction targets established by the 2019 Climate Action Plan (CAP) Update. Therefore, the impact regarding the magnitude of GHG emissions associated with the proposed project would be less than significant.

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases?

There is no potential for the proposed project to conflict with GHG reduction plans such as the California Air Resources Board (CARB) *2022 Scoping Plan Update for Achieving Carbon Neutrality*, the SCAG Connect SoCal RTP/SCS, or the County's 2019 CAP Update. Implementation of the proposed project would provide a net environmental benefit through the reduction of GHG emissions as well as the expansion of local renewable energy resource production. Operation of the proposed project would offset GHG emissions by diverting LFG that would have otherwise been flared through the closed RNG system, which would then be used to reduce reliance on natural gas supplied by nonrenewable resources. The proposed project would be consistent with the objectives of the CARB statewide GHG emissions reduction policy, as well as contribute to the 2019 CAP Update goals of reducing community-wide GHG emissions and expanding the availability of renewable energy resources.

GHG emissions are regionally cumulative in nature, and it is highly unlikely that construction of any individual project would generate GHG emissions of sufficient quantity to conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. The emissions analysis for construction of the proposed project incorporates reasonably conservative assumptions such that the emissions reflect maximum possible emissions, beyond what is expected to occur. Standard construction and operating procedures would be undertaken in accordance with the SCAQMD and CARB regulations applicable to heavy-duty construction equipment and diesel haul trucks to limit unnecessary emissions to the extent practicable. Adhering to requirements pertinent to equipment maintenance and inspections and emissions standards, as well as diesel fleet requirements—including idling time restrictions and maintenance—would ensure that construction and operational activities associated with the proposed project would not conflict with GHG emissions reductions efforts. Therefore, this impact would be less than significant.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
<u>Mitigation Measures, Conditions of Approval or Regulatory Requirements</u> There are no mitigation measures, conditions of approval, or regulatory requirements related to this environmental factor.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
9. Hazards and Hazardous Materials. Would the project:					
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Not Previously Assessed	No	No	No	No
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	2009 SEIR, § 4.4	No	No	No	No
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Not Previously Assessed	No	No	No	No
d. Be located on a site which is included on a list of hazardous	Not Previously Assessed	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?					
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	Not Previously Assessed	No	No	No	No
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	1998 EIR, Appendix A, § 39. 2009 SEIR, § 4.4	No	No	No	No
g. Expose people or structures, either	2009 SEIR, § 4.4	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?					

Environmental Setting/Discussion

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Construction of the proposed project would involve transport, use, and disposal of limited quantities of hazardous materials such as paints, solvents, cleaning agents, oils, grease, and fuel for construction equipment. However, the proposed project would comply with all federal, state, and local requirements related to the transport, use, and disposal of such materials.

Implementation of the proposed project would continue existing operations at the El Sobrante Landfill. As discussed in the 2009 SEIR, concerns associated with leachate, hazardous substances, and the generation of methane gas at the landfill, are associated with long-term maintenance of the landfill areas, and the proposed project would not result in an increase in any of these adverse conditions. The proposed project would extract landfill gas; undergo a purification process; and transform the purified methane into a clean and pipeline-quality renewable gas. Moreover, landfill gas collection systems designed for the collection of gas already are in place and a methane gas monitoring program has been implemented. As such, the risk of an accidental explosion of such gases is currently addressed and remediated as part of ongoing monitoring efforts that would extend to operation of the RNG Facility. As a safety precaution, the RNG plant will be equipped with both a manual shut-off system as well as an automatic shut-off system that functions based on detected pressure drops. Additionally, all accessible pipe flanges would be inspected on a monthly basis for any possible leaks. Although the proposed RNG Sites would not receive or process any leachate from the landfill, measures are in place to respond to the potential release of leachate and exposure to hazardous waste. Condensate that is generated through gas compression will be treated according to applicable regulations for wastewater generation. As such, impacts related to accidental explosion or release of hazardous substances would not increase with implementation of the proposed project. Potential impacts would continue to be less than significant. No additional analysis is required.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No schools are located within one-quarter mile of the El Sobrante Landfill. The nearest school (Temescal Valley Elementary School) is located approximately 0.45 miles west of the project site across I-15. Furthermore, the proposed project would not result in an increase in permitted daily tonnage or in the types of waste currently allowed for disposal at the El Sobrante Landfill. The proposed project would extract landfill gas; undergo a purification process; and transform the purified methane into a clean and pipeline-quality renewable gas. Therefore, the proposed project would not result in the transport, use or disposal of hazardous materials within one-quarter mile of an existing school. No impacts would result and no further analysis of this issue is required.

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Based on a search of the Government Code Section 65962.5 "Cortese" list, the El Sobrante Landfill is not listed as a hazardous materials site and is not near any superfund or cleanup sites. According to the State Water Resources Control Board, there are no Underground Storage Tanks in the vicinity of the landfill. In addition, the landfill accepts only Class III municipal solid waste, which excludes hazardous materials. Implementation of the proposed project would continue existing operations at the El Sobrante Landfill. No impacts would result and no further analysis of this issue is required.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

There are no airports existing or planned within the vicinity of the project site. The nearest airport to the project site is the Corona Municipal Airport, which is located approximately 10 miles to the northwest. Thus, the proposed project would not result in a safety hazard for people residing or working in the project area. No impacts would result and no further analysis of this issue is required.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

f. <u>Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?</u>

As discussed in the 1998 EIR, the El Sobrante Landfill does not interfere with an emergency response plan or an emergency evacuation plan because the project site is located in a remote area. As discussed in the 2009 SEIR, the El Sobrante Landfill Health and Safety Plan would continue to address emergency issues and protocol in the event that an emergency situation occurs. No impacts would result and no further analysis of this issue is required.

g. <u>Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?</u>

As discussed in the 2009 SEIR, the El Sobrante Landfill has implemented a Fire Management Plan to address fire hazards at the site. The proposed project would be in compliance with the Fire Management Plan; therefore, any perceived increase in fire hazards for adjacent open space areas is considered less than significant. No additional analysis is required.

<u>Mitigation Measures, Conditions of Approval or Regulatory Requirements</u>

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

U-1 Access roads/streets shall be wide enough to accommodate movement and parking without hindering the flow of traffic. Roadway modifications shall be designed to provide smooth and orderly traffic flow and shall be well lighted.

U-2 Warning or caution signs shall be placed on Temescal Canyon Road and the El Sobrante access road to indicate the presence of slow-moving traffic/trucks.

U-3 Upon assignment of a numbered street address by the County, the project entrance shall be clearly marked with address numbers.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
U-4 Buildings shall be constructed with fire retardant roofing material as approved by the County Fire Department. U-5 Water mains and fire hydrants providing required fire flows shall be constructed subject to approval by the County Fire Department. U-6 Prior to approval of any development plan for lands adjacent to open space areas, a fire protection/revegetation management plan shall be submitted to the Riverside County Fire Department for review and comment. U-7 Landfill equipment operators, waste transfer vehicle drivers, and landfill personnel assigned to nighttime operations shall have appropriate training for night operation of heavy equipment. U-8 Portable lights shall be used at the working face to provide a safe working environment during nighttime operations. U-9 The landfill access road and onsite roads to the working face shall be equipped with reflectors, reflective cones, reflective barriers and signs. U-10 Public access to the landfill shall be restricted to the hours of 6:00 a.m. to 6:00 p.m.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
10. Hydrology and Water Quality. Would the project:					
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	1998 EIR § 4.2	No	No	No	No
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	1998 EIR § 4.2.2.2	No	No	No	No
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	1998 EIR § 4.2.1.1.2	No	No	No	No
i. result in a substantial erosion	1998 EIR § 4.2.3.2.4	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
or siltation on- or off-site;					
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	1998 EIR § 4.2.3.2.4	No	No	No	No
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	1998 EIR § 4.2.3.2.4	No	No	No	No
iv. impede or redirect flood flows?	1998 EIR § 4.2 (the 1998 EIR did not identify the landfill as part of a mapped 100-year flood plain)	No	No	No	No
d. In flood hazard, tsunami, or seiche zones, risk release of	1998 EIR § 4.2 (the 1998 EIR did not identify the landfill	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
pollutants due to project inundation?	as part of a mapped 100-year flood plain)				
e. Conflict with or obstruct implementation or a water quality control plan or sustainable groundwater management plan?	1998 EIR § 4.2	No	No	No	No

Environmental Setting/Discussion

The discussion below is based on Geotechnical Investigation Report (HAI 2023) (Appendix F1 of this Addendum), Geotechnical Exploration and Recommendations Report (WSP 2022) (Appendix F2 of this Addendum), and Flood Risk Summary Memo (Blue Ocean Civil Consulting 2023) (Appendix H of this Addendum) prepared for the proposed project.

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

The landfill currently operates under state and federal regulations, including, but not limited to, California Code of Regulations (CCR) Title 27, Division2, and 40 CFR 258 (in accordance with State Water Resources Control Board Resolution 93-62). The primary operating permits/approvals for the landfill are SWFP No. 33-AA-0217 issued by the County of Riverside Department of Environmental Health as the designated LEA, Waste Discharge Requirements (WDR) Order Number R8-202016-034 from the California Regional Water Quality Control Board – Santa Ana Region (RWQCB) and numerous permits to construct/operate issued by the South Coast Air Quality Management District. The proposed RNG Sites would be constructed on the existing graded landfill pads; proposed Gas POR Site within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection; and underground piping installed within pipe trenches in the existing pavement or shoulder of the landfill access road, or bored beneath Temescal Canyon Wash (to avoid disturbance), and in the public right-of-way within Temescal Canyon Road. As such, the proposed project would maintain a similar drainage pattern compared to existing conditions and continue with the current surface water control systems, and construction and operation of the proposed project would be required to comply with these regulations. Potential lateral erosion along the north edge of the Gas POR

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Site in CCW would be monitored as part of an erosion control plan that would be implemented as needed. Also, the proposed project would be in compliance with applicable regulations for stormwater runoff and continue to implement existing Best Management Practices (BMPs) for erosion/sediment control. The proposed RNG Sites would not receive or process any leachate from the landfill. Condensate that is generated through gas compression will be treated according to applicable regulations for wastewater generation. Therefore, no new significant adverse impacts related to water quality standards or waste discharge requirements would occur.

b. <u>Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?</u>

Section 4.2.2.2 of the 1998 EIR concluded that the landfill is located on a non-water bearing zone. Depth to groundwater at the landfill is variable across the site. The 1998 EIR concluded that groundwater is no deeper than 20 feet below grade in the canyons and depth to confined ground water can be as much as 200 feet below grade. In addition, two geotechnical studies were conducted for the proposed RNG Sites and Gas POR Site: *Geotechnical Exploration and Recommendations Report for Proposed RNG Facility* (WSP 2022) and *Geotechnical Investigation Report* (HAI 2023), respectively. Groundwater was not encountered in any of the borings drilled at the proposed RNG Sites, which reached depths of 51 feet below ground surface (bgs). During the subsurface exploration at the proposed Gas POR Site, groundwater was encountered at roughly 29 feet bgs. The proposed project would not require use of groundwater or interfere with groundwater recharge. Therefore, no new significant adverse impacts related to groundwater or groundwater recharge would occur.

c. <u>Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:</u>

i. <u>result in a substantial erosion or siltation on- or off-site;</u>
ii. <u>substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;</u>
iii. <u>create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or</u>
iv. <u>impede or redirect flood flows?</u>

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

The 1998 EIR identified that the landfill has been constructed over an area with four natural hydrologic drainage basins. The current surface water control systems include run-on diversion berms/ditches that divert off-site waters around the landfill footprint. Run-off from the landfill is handled by a series of V-ditches along the inside of access benches, V-ditches and down drains at drainage concentration points to divert flow down the surface of the landfill, and collection ditches/culverts at the landfill base to convey run-off to the existing ponds and canyons. As stated previously, the proposed RNG Sites would be constructed on the existing graded landfill pads; proposed Gas POR Site within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection; and underground piping installed within pipe trenches in the existing pavement or shoulder of the landfill access road, or bored beneath Temescal Canyon Wash (to avoid disturbance), and in the public right-of-way within Temescal Canyon Road. The pipes underneath the Temescal Canyon Wash would be contained within a continuous 18-inch sleeve under the wash for protection and containment . As such, the proposed project would maintain a similar drainage pattern compared to existing conditions and continue with the current surface water control systems. Potential lateral erosion along the north edge of the Gas POR Site in CCW would be monitored as part of an erosion control plan that would be implemented as needed. Also, the proposed project would be in compliance with applicable regulations for stormwater runoff and continue to implement existing BMPs for erosion/sediment control. Therefore, no new significant adverse impacts related to substantially altering the existing drainage pattern of the site or area would occur.

d. <u>In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?</u>

The North RNG Site and South RNG Site have not been identified as being mapped within a 100-year flood zone as defined by the FEMA. Regardless, the current surface water control systems were designed to handle the 100-year, 24-hour storm event. As previously stated, the Gas POR Site has Temescal Canyon Wash to the east and CCW to the north and is in a FEMA SFHA Zone AE, with an effective BFE of between 927 and 932 feet. Separately, a RCFC FHZ associated with CCW has been established based on a Special Study; no flood elevations are determined for this area. As such, a Flood Risk Summary Memo (Blue Ocean, 2023) was prepared to summarize the information gathered from FEMA and the County related to flood hazard and risk mitigation. As a result, the proposed shelters at the Gas POR Site would be designed with a finish floor elevation of 933 feet minimum, one foot above the effective BFE and all water sensitive equipment would be elevated to 933 feet or higher. The Gas POR Site may extend to the top of slope adjacent to CCW via a retaining wall. Retaining wall placement will be in accordance with applicable building code, structure and geotechnical recommendation. The proposed project would not encroach into CCW defined slopes that designate the existing floodway. Although this elevation is appropriate to minimize flood hazard risk based on the effective Flood Insurance Rate Map, it is also conservative considering the existing conditions and likely future development. Updated flood models based on existing topography and bridge geometry show that the one percent annual chance flood is contained within the Temescal Wash main

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channel in the vicinity of the Gas POR Site. Localized flooding on the Gas POR Site due to CCW would be insignificant as flood water would seek Temescal Wash through lower lying areas relative to the project site. Potential lateral erosion along the north edge of the Gas POR Site in CCW would be monitored as part of an erosion control plan that would be implemented as needed. Therefore, no new significant adverse impacts related to flooding would occur.

The landfill is not located near a levee or dam. No flooding hazards due to a failure of a levee or dam would occur with implementation of the proposed project. In addition, the landfill is not located near coastal or littoral systems. No hazards from inundation by seiche, tsunami or mudflow would occur with implementation of the proposed project.

e. <u>Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?</u>

As discussed above, the landfill operates under state and federal regulations, including, but not limited to, CCR Title 27, Division 2, and 40 CFR 258 (in accordance with State Water Resources Control Board Resolution 93-62). A Monitoring and Reporting Plan (M&RP) exists for the current and proposed water quality monitoring and response program for the landfill (as Appendix M of the JTD). The M&RP approved by RWQCB would describe required groundwater, leachate, surface water and vadose zone monitoring requirements for the project site. Groundwater monitoring has been ongoing at the landfill and has been performed in accordance with the landfill's WDRs issued by RWQCB. As such, the proposed project would continue with the existing programs and would comply with the state and federal regulations. In addition, implementation of the proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Given this, implementation of the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

<u>Mitigation Measures, Conditions of Approval or Regulatory Requirements</u>

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

W-1 Drainage structures, such as the perimeter drainage channels, sedimentation basins, leachate evaporation ponds, stormwater retention basins, and collection pipes and ditches, shall be inspected and maintained on a regular basis.

W-2 Regular monitoring (and possibly testing) of perimeter drainage channels and retention ponds shall be completed to assure that discharged stormwater does not contain contaminants from the landfill.

W-3 A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared. It shall include a Spill Prevention and Response Plan and a monitoring plan. The facility shall implement "best management practices" as required by NPDES.

W-4 Leachate shall be collected by the leachate collection and removal system (LCRS) installed at the base of each landfill cell. Such leachate shall be sampled regularly and, if necessary, treated prior to use for dust control on lined areas of the landfill.

W-5 Stormwater runoff that falls on the active working face of the landfill shall be diverted to a collection sump and reused for dust control on lined areas of the landfill. The sump for stormwater runoff from the active working face shall be designed to hold the runoff from the 100-year, 24-hour storm.

W-6 Drainage improvements shall be designed and constructed to provide all-weather access to the landfill.

W-7 To reduce the quantity of water used, the following measures shall be implemented:

- Low-flow plumbing fixtures shall be installed for onsite facilities.
- Washwater for cleaning equipment at the operations and maintenance center shall be collected and recycled, and reused for washing or dust control.
- Stormwater that falls on the active working face of the landfill shall be collected and used for dust control.

W-8 The liner system for the expansion of El Sobrante shall meet the following requirements:

- The liner system (inclusive of the bottom liner and the sideslope liner) of the landfill shall exceed the requirements of Subtitle D and California Code of Regulations (CCR) Title 27 and shall be composed of the alternative bottom liner (identified as Alternative Bottom Liner B2) and the alternative sideslope liner (identified as Sideslope Liner Alternative S2), which are both described and evaluated in Evaluation of Liner System Alternatives, El Sobrante Landfill Expansion, Riverside County, California, prepared by GeoSyntec Consultants and dated February 1998.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

- If it is determined that this liner system will not meet the requirements of the regulatory agencies, a substitute liner system must be approved by the regulatory agencies, and evidence of such a determination shall be forwarded to the El Sobrante Landfill Administrative Review Committee of Riverside County. In this event, the substitute liner system shall be composed of a bottom liner and a sideslope liner that are at least equal to Alternative Bottom Liner B2 and Sideslope Liner Alternative S2, respectively, and must be approved by the Administrative Review Committee.

W-9 Landfill gas collectors shall be placed as compacted lifts of waste are finished. Once sufficient waste has been placed above the collectors to prevent air intrusion, the collectors shall be used for active landfill gas extraction.

W-10 The final cover of the landfill shall conform to Subtitle D and CCR Title 27, and shall consist of a minimum of four (4) feet of vegetative layer in accordance with the augmented cover described in the EIR (State Clearinghouse No. 90020076). Any change from the augmented cover shall require clearance from the RCDWR, the California Integrated Waste Management Board (CALRECYCLE), Regional Water Quality Control Board (RWQCB), the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFW).

W-11 In accordance with applicable regulations, landfill gas shall be monitored at the landfill perimeter and in the vadose zone.

W-12 "Point of compliance" ground water monitoring wells, as required by CCR Title 27, shall be installed along the downgradient perimeter of the landfill footprint, pursuant to a monitoring plan approved by the RWQCB. These wells shall be sampled on a quarterly basis beginning one year prior to landfilling each respective cell, and will provide a secondary warning of a leak in the liner system.

W-13 If leachate or landfill gas generated by the landfill expansion were determined to be a potential risk to ground water, a corrective action plan shall be developed and implemented in conjunction with the RWQCB as required by CCR Title 27.

W-14 Whenever a specified material, design, system or action is required by the project or any exhibit thereto, USA Waste or its successor-in-interest may substitute such material, design, system or action, provided that:
Such material, design, system or action complies with applicable Federal, State, and local regulations; and,
Any Federal, State or local regulatory agency having jurisdiction has approved the use of the material, design, system or action for

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similar facilities (i.e., Class III landfills); and,
The General Manager - Chief Engineer of the RCDWR, with concurrence of the appropriate regulatory agency(ies), has determined that such material, design, system or action is technically equal, or superior to, those required in these conditions.

W-15 USA Waste or its successor-in-interest shall deposit 50 cents per ton into a Third Party, Environmental Impairment Trust, which fund shall be established and maintained throughout the life of the project. Any balance in the existing fund contributed by USA Waste or its successor-in-interest under the First El Sobrante Landfill Agreement, as amended, shall continue to accrue with deposits from all waste delivered to the site on or after the start date, including interest earnings on the funds, until the fund has reached a total of \$2,000,000, at which time deposits may be discontinued until withdrawals cause the fund to fall below the \$2,000,000 cap. The cap shall increase annually by 90 percent of the change in the Consumer Price Index (CPI) starting in the year 2002.

W-16 Monies may be withdrawn from the Environmental Impairment Trust only for environmental remediation purposes with approval by USA Waste or its successor-in-interest and the General Manager - Chief Engineer of the RCDWR. The Trustee shall be required to report quarterly to the Department on all fund activity and balances.

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11. Land Use and Planning. Would the project:					
a. Physically divide an established community?	1998 EIR, § 4.4; 2009 SEIR, Appendix A, § 1	No	No	No	No
b. Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	1998 EIR, § 4.4; 2009 SEIR, Appendix A, § 1	No	No	No	No

<u>Environmental Setting/Discussion</u>

a. <u>Physically divide an established community?</u>

The proposed project involves construction and operation of a RNG Facility within an existing landfill with no established community on the site. Therefore, the proposed project would not disrupt or divide the physical arrangement of an established community. No additional analysis is required.

b. <u>Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?</u>

The proposed project will be constructed within the existing landfill which is consistent with the Riverside County General Plan land use designation for the project site, which designates the landfill as a "Public Facility." The existing landfill's impact upon land use and zoning was evaluated in the 1998 EIR, and the project actions simply implement the existing general plan and zoning, and no changes to land-use or zoning are needed; therefore, no additional environmental analysis of this topic is required. All mitigation measures relating to Land Use and Zoning as proscribed in the previous EIR will remain in effect.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Mitigation Measures, Conditions of Approval or Regulatory Requirements

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

L-1 The development of El Sobrante Landfill Expansion shall be in accordance with the mandatory requirements of all applicable County ordinances and shall conform substantially with the project description in the EIR (State Clearinghouse No. 90020076), as filed in the office of the RCDWR.

L-2 Prior to any offsite grading, USA Waste or its successor-in-interest shall obtain and record appropriate offsite easements.

L-3 A Citizen Oversight Committee shall be formed by the Board of Supervisors upon approval of the project. The Citizen Oversight Committee shall be composed of a total of five (5) members, whose term of service will be established upon formation of the committee. Three (3) of the five (5) members will be appointed by the Supervisor of the district in which the landfill is located. Of these three (3), two (2) members must reside within a three (3) mile radius of the landfill property. One (1) member shall be a representative from a corporate operation within a three (3) mile radius of the landfill property. The remaining two (2) members will be appointed by the entire Board of Supervisors and shall be chosen at large to represent the affected communities of interest.

L-4 The Citizen Oversight Committee shall meet at least once annually to review the Annual Status Reports that will be submitted by an Administrative Review Committee which will include all reports and data that will be provided by USA Waste or its successor-in-interest and shall submit written comments on the project to the Board of Supervisors as they deem necessary.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
12. Mineral Resources. Would the project:					
a. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	1998 EIR, Appendix A, § 50, pp. A.1-39 and A.1-40; 2009 SEIR, Appendix A, § 8	No	No	No	No
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	1998 EIR, Appendix A, § 50, pp. A.1-39 and A.1-40; 2009 SEIR, Appendix A, § 8	No	No	No	No

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Environmental Setting/Discussion

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

According to the Riverside County General Plan, Figure OS-6 (Mineral Resources Zone), the project site is located in Mineral Resource Zone 3 (MRZ-3). This designation signifies that mineral deposits are likely to exist and the significance of the deposit is undetermined. However, no known mineral deposits are located on the landfill site, and it is not identified on local plans or state plans as a mineral recovery area. Therefore, as concluded in the previous EIRs, the proposed project would not result in the loss of availability of a known mineral resource in an area classified or designated by the State that would be of value to the region or the residents of the State. The proposed project will not result in any impacts related to mineral resources. No additional analysis is required.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

There are no mitigation measures, conditions of approval, or regulatory requirements related to this environmental factor.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
13. Noise. Would the project result in:					
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	1998 EIR § 4.7; 2009 SEIR, § 4.3	No	No	No	No
b. Generation of excessive groundborne vibration or groundborne noise levels?	1998 EIR § 4.7; 2009 SEIR, § 4.3	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
c. For a project within the vicinity of a private airstrip or on airport land use plan or, where such a plan has not been adopted, within two miles of public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	1998 EIR. Appendix A, § 31	No	No	No	No

Environmental Setting/Discussion

The discussion below is based on Noise and Vibration Study (TAHA 2024c) (Appendix I of this Addendum) prepared for the proposed project.

a. Generation of a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Noise impacts associated with the El Sobrante Landfill were analyzed as part of the 1998 EIR, the 2009 SEIR, and the 2018 Addendum. As discussed in the 2009 SEIR and 2018 Addendum, the project site emits noise levels of approximately 40.0 A-weighted decibel (dBA), Equivalent Noise Level (L_{eq}) at the nearest sensitive receptors[2], which when combined with existing ambient noise levels of 47.9 dBA, L_{eq} would result in exterior noise levels of approximately 48.6 dBA, L_{eq}. The landfill's contribution of 0.7 dBA is considered less than "barely perceptible" and the overall noise levels are well below the County of Riverside's 65 dBA, L_{eq} exterior standard. This analysis considers the

[2] The nearest noise sensitive uses to the project site are single-family homes located approximately 1,500 feet to the northwest of the proposed Gas POR Site and a Riverside County Habitat Conservation Area located to the west of the North RNG Site.

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potential for new construction and operational activities to result in increased noise levels relative to what was disclosed in the 1998 EIR, the 2009 SEIR, and the 2018 Addendum.

Construction

The temporary construction activities associated with the proposed project would be conducted within the existing landfill and is located over 1,500 feet from the nearest sensitive receptors. Construction activities will include grading, trenching, directional drilling, import of construction materials, soil compaction, equipment installations, and building construction. Typical noise levels from major construction equipment that would be used during construction are listed in Table 4 in Appendix I of this Addendum. The loudest piece of equipment would be a paving machine, which has a noise level of 82.5 dBA, L_{eq} at 50 feet. At 1,500 feet, the noise level would be approximately 53.0 dBA, L_{eq}. As the 24-hour CNEL noise level is calculated by averaging the 24 individual hourly noise levels (with sensitivity weighting applied for evening and nighttime hours) there is no potential for this non-continuous 53.0 dBA, L_{eq} noise level to increase the existing 24-hour noise level. Construction staging and stockpile areas would remain within the project site or would be disposed of at the El Sobrante Landfill. Construction activities would still maintain 1,500 feet or more of separation from the nearest sensitive receptors and would not result in an increase of existing ambient noise levels. Therefore, construction of the proposed project would not include activities that would expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.

Operations

Implementation of the proposed project would require up to seven additional full-time employees, up to three additional part-time employees, and one truck trip per week for regular deliveries of materials. Additionally, vehicle trips would be required for maintenance, but would be infrequent (seven vehicle trips spanning up to 10 calendar days out of a year). Caltrans has stated that a doubling of traffic volumes on a roadway segment is typically needed to audibly increase traffic noise.[3] The new vehicle trips would have no potential to double existing traffic volumes. Thus, the proposed project would not substantially increase vehicle trips and roadway noise would remain similar to existing conditions.

Operations of the RNG Facility would include the processing of up to 15,000 SCFM of LFG and include possible noise generating equipment such as gas compressors, condensers, and blowers. WM has conducted noise studies for an 8,000-SCFM facility that would be approximately

[3] Caltrans, *Technical Noise Supplement, page 6-5*, September 2013.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

the size of each RNG site. Thus, the approximate noise level used for this analysis is 89.0 dBA at 50 feet at each RNG site. The nearest sensitive receptor located to the southeast would be approximately 3,600 feet from the South RNG Site and 5,300 feet from the North RNG Site. The noise level at the nearest sensitive receptor noise generated by the combination of the two RNG facilities would be approximately 53.5 dBA, L_{eq} which when combined with the ambient noise level is 55.9 dBA, L_{eq}. Conservatively, this does not account for attenuation provided by topography and intervening structures, which would further reduce noise levels. Without accounting for topography the overall noise level would remain below the County of Riverside exterior noise standard of 65 dBA, L_{eq}. The sensitive receptors have their line of sight to the RNG Facility obstructed by rolling hills that reach up to 500 feet higher from the canyon floor. Due to topography, operational noise levels are reduced by topography acting as a natural noise barrier. Additionally, the North RNG Site would be bordered by 12-foot-high fencing with sound-attenuating drapes on the inside of the fence that would further reduce noise levels. Therefore, implementation of the proposed project would not include activities that would expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.

The North RNG Site is located at the boundary of the landfill where undeveloped land to the west and north is associated with the Riverside County Habitat Conservation Area. While noise from operation of the North RNG Site would likely be perceptible to wildlife that are in close proximity to this location, existing landfill-related operations presently include vehicular traffic (haul trucks) and associated human presence. Wildlife in close proximity would thus likely be accustomed to existing landfill-related noise and activity (or avoid the zones near the perimeter of the landfill due to the existing noise generated by the landfill).

b. Generation of excessive groundborne vibration or groundborne noise levels?

Ground-borne vibration and ground-borne noise impacts associated with the El Sobrante Landfill were analyzed as part of the 1998 EIR, the 2009 SEIR, and the 2018 Addendum. This analysis considers the potential for new construction and operational activities to result in increased in ground-borne vibration or ground-borne noise levels relative to what was disclosed in the 1998 EIR, the 2009 SEIR, and the 2018 Addendum.

Construction Vibration

Operation of heavy equipment can generate varying degrees of vibration, depending on the procedure and equipment. Typical vibration levels associated with construction equipment are provided in Table 5 in Appendix I of this Addendum. Heavy equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of a

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construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, and to slight damage at the highest levels. In most cases, the primary concern regarding construction vibration relates to damage.

Construction of the proposed project would require trenching to install underground piping. Trenching activity would be most typically represented by excavators. Excavators generate a vibration level of approximately 0.040 inches per second at 25 feet. Structures associated with sensitive receptors nearest to the trenching zones would be at least 1,500 feet away, and no sensitive buildings, such as recording studios and medical facilities, were identified in the area. At a distance of 1,500 feet, vibration generating equipment would generate vibration levels below the vibration damage threshold of 0.2 inches per second for non-engineered timber and masonry buildings. Therefore, the proposed project would result in a less-than-significant impact related to structure damage from construction vibration.

Operational Vibration

The RNG facilities would not include significant vibration-generating equipment and, therefore, would not result in exposure of sensitive receptors to increased vibration. Therefore, the proposed project would result in a less-than-significant impact related to off-site roadway vibration

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project would be located within the same landfill footprint as described in the 1998 EIR, 2009 SEIR, and 2018 Addendum. There are no existing or planned private airstrips or airports within the vicinity of the project site. The nearest airport to the project site is the Corona Municipal Airport, which is located approximately 10 miles to the northwest. Thus, the proposed project would not be affected by airport noise and no impact related to airport or airstrip noise would occur.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following: N-1 Excavation and liner construction of new landfill cells shall be limited to the hours of 7:00 a.m. to 10:00 p.m., Monday through Saturday, with the following restrictions: a) the conveyor belt system shall not be located less than 295 feet from occupied residences; and b) excavation and liner construction of new cells within 10 feet of the top of slope will be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday. N-2 Landfill equipment working on the outside slopes of the landfill shall be limited to the hours of 8:00 a.m. to 5:00 p.m. N-3 Construction equipment shall use industrial-grade mufflers to reduce noise emission. N-4 Blasting shall be postponed during temperature inversions and unfavorable wind conditions (wind blowing toward residences). N-5 Drilling and blasting shall be conducted between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, and will not occur on federal, state, and local holidays. N-6 Acoustic blankets shall be used around drilling operations to reduce potential drilling noise. N-7 Wherever feasible, temporary earthen or landscape berms, or other structures or measures, shall be utilized to reduce potential noise impacts on surrounding homeowners from nighttime activities at the working face of El Sobrante. Any measures implemented for this purpose shall be subject to annual review by the Citizen Oversight Committee.					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
14. Population and Housing. Would the project:					
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	1998 EIR, § 6.1; 2009 SEIR, Appendix A, § 2	No	No	No	No
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	1998 EIR, Appendix A, § 17; 2009 SEIR, Appendix A, § 2	No	No	No	No

Environmental Setting/Discussion

a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The proposed project consists of installation of a RNG Facility at the landfill which would not result in a change to existing landfill operations. Construction of the proposed project would require a crew of approximately 6 to 12 construction workers (daily) over an approximately 18-month period. It is anticipated that construction workers would come from local labor pools. The proposed project would require ongoing operation and maintenance employees and is expected to hire seven full-time employees and potentially three additional part-time employees. It is also anticipated that the jobs generated from the project operation would be filled by the local labor pool. It is unlikely that the employees would relocate from other regions for the proposed project. Therefore, implementation of the proposed project would not directly or indirectly induce substantial unplanned population growth in the area. No additional analysis is required.

b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The project site is an existing landfill with no established community of the site. The proposed project consists of installation of an RNG Facility at the landfill which would not displace existing people or housing, necessitating the construction of replacement housing elsewhere. No additional analysis is required.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

There are no mitigation measures, conditions of approval, or regulatory requirements related to this environmental factor.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
15. Public Services. Would the project:					
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
Fire protection?	1998 EIR, § 4.11; 2009 SEIR, Appendix A, § 11	No	No	No	No
Police protection?	1998 EIR, § 4.11; 2009 SEIR, Appendix A, § 11	No	No	No	No
Schools?	1998 EIR, Appendix A, § 8; 2009 SEIR, Appendix A, § 11	No	No	No	No

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Parks?	1998 EIR, Appendix A, § 12; 2009 SEIR, Appendix A, § 15	No	No	No	No
Other public facilities?	1998 EIR, Appendix A, § 10 and 11; 2009 SEIR, Appendix A, § 11	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Environmental Setting/Discussion

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
   - Fire protection?
   - Police protection?
   - Schools?
   - Parks?
   - Other public facilities?

The 1998 EIR addressed potential impacts associated with public services and found that the landfill expansion would not result in significant impacts with respect to the incremental increase in demand for fire and police protection, and would not result in any additional need for, schools, parks, or other public facilities. The proposed project consists of installation of a RNG Facility at the landfill which would not result in a change to existing landfill operations and would not generate population growth that would place new demands on local public service providers. As such, implementation of the proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered governmental facilities. Therefore, the proposed project would have no impact associated with any public services. No additional analysis is required.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

There are no mitigation measures, conditions of approval, or regulatory requirements related to this environmental factor.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
16. Recreation.					
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	1998 EIR, Appendix A, § 12; 2009 SEIR, Appendix A, § 15	No	No	No	No
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	1998 EIR, Appendix A, § 12; 2009 SEIR, Appendix A, § 15	No	No	No	No

Environmental Setting/Discussion

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The 1998 EIR addressed potential impacts associated with park and recreation resources and found that the landfill expansion would not affect or result in an indirect need for new or altered existing park or other recreational facilities and that no impact upon the quality or quantity of existing recreational opportunities would occur. The proposed project consists of installation of a RNG Facility at the landfill which would not result in a change to existing landfill operations and would not result in population growth that would increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. In addition, the proposed project does not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Therefore, the proposed project would have no impact associated with parks and recreation. No additional analysis is required.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

There are no mitigation measures, conditions of approval, or regulatory requirements related to this environmental factor.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
17. Transportation. Would the project:					
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	1998 EIR § 4.5; 2009 SEIR, § 4.5	No	No	No	No
b. Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	1998 EIR § 4.5; 2009 SEIR, § 4.5	No	No	No	No
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	1998 EIR § 4.5; 2009 SEIR, § 4.5	No	No	No	No
d. Result in inadequate emergency access?	1998 EIR § 4.5; 2009 SEIR, § 4.5	No	No	No	No

Environmental Setting/Discussion

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Traffic impacts associated with the El Sobrante Landfill were analyzed as part of the 1998 EIR and the 2009 SEIR. The proposed project consists of installing and operating the RNG Facility at the existing El Sobrante Landfill within three previously disturbed areas. The proposed project does not propose any changes to landfill operations and the maximum number of vehicle trips currently permitted on a daily basis (i.e., 1,305 one-way vehicle trips) would not be changed. The construction activities associated with the proposed project would be temporary (approximately 18 months) and would not require temporary access roads. The operation of the proposed project would require seven full-time employees and three part-time employees. Two service vehicles for 10 days per year; one delivery vehicle per week; and five maintenance vehicles for seven days per year are estimated for the project operation. At a worst-case scenario, there would be a total of 18 daily one-way trips, which represents only 1 percent of the daily activity (1,305 one-way vehicle trips) at the landfill. The project-related vehicle trips would be staggered throughout the day (rather than have the potential to occur all at once, such as during peak hour traffic) and traffic associated with service and maintenance vehicles would occur on an intermittent basis to not exceed the currently permitted daily vehicle trips of 1,305 one-way vehicle trips. The designated construction route to and from the work areas would be the existing access road, Dawson Canyon Road east from Temescal Canyon Road. A temporary lane closure would occur but no road closure and/or detour would be required. As such, the proposed project would not significantly change or modify any of the existing public transit, roadway, bicycle and pedestrian facilities or make any modification that could conflict with adopted policies, plans or programs or modify the safety of such facilities. Therefore, implementation of the proposed project would not result in conflicts with applicable plans, ordinances, or policies related to the performance of the circulation system or with applicable congestion management programming. No additional analysis is required.

b. Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

The County's Transportation Analysis Guidelines include screening criteria for certain development projects that could lead to a less than significant impact and would not need additional vehicle miles traveled (VMT) analysis. The screening criteria includes:

- Small Projects: This applies to projects with low trip generation per existing CEQA exemptions or based on the County Greenhouse Gas Emissions Screening Tables, result in a 3,000 Metric Tons of Carbon Dioxide Equivalent (MTCO2e) per year screening level thresholds.
- Projects Near High Quality Transit: High quality transit provides a viable option for many to replace automobile trips with transit trips resulting in an overall reduction in VMT.
- Local-Serving Retail: The introduction of new Local-serving retail has been determined to reduce VMT by shortening trips that will occur.
- Affordable Housing: Lower-income residents make fewer trips on average, resulting in a lower VMT overall.
- Local Essential Service: As with Local-Serving Retail, the introduction of new Local Essential Servies shortens non-discretionary

trips by putting those goods and services closer to residents, resulting in an overall reduction in VMT.

- Map-Based Screening: This method eliminates the need for complex analyses, by allowing existing VMT data to serve as a basis for the screening smaller developments. Nota that screening is limited to residential and office projects.
- Redevelopment Projects: Projects with lower VMT that existing on-site uses, can under limited circumstances, be presumed to have a non-significant impact. In the event this screening does not apply, projects should be analyzed as though there is no existing uses on site (project analysis cannot take credit for existing VMT).

The proposed project would require a crew of approximately 6 to 12 construction workers (daily) during construction. As previously stated, the operation of the proposed project would require seven full-time employees and three part-time employees. Two service vehicles for 10 days per year; one delivery vehicle per week; and five maintenance vehicles for seven days per year are estimated for the project operation. At a worst-case scenario, there would be a total of 18 daily one-way trips. As such, the proposed project would qualify for the small project screening criteria. Therefore, implementation of the proposed project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b). Impacts would be less than significant and no mitigation is required.

c. <u>Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?</u>

As discussed in the 2009 SEIR, roadway modification and traffic signal installation requirements were implemented to improve several surrounding roadways and intersections to the County of Riverside Transportation and Land Management Department standards. The proposed project does not include modifications to existing roadways and the maximum number of vehicle trips currently permitted on a daily basis (i.e., 1,305 one-way vehicle trips) would not be changed. The proposed project would require two outside service vehicles for approximately 10 days per year and one delivery truck per week. Therefore, because no additional physical improvements to surrounding roadways are proposed or necessary, and because the proposed project would not substantially increase vehicular trips on surrounding roadways, the proposed project would not result in hazards to safety from design features or incompatible uses and significant impacts would not occur. No additional analysis is required.

d. <u>Result in inadequate emergency access</u>?

As discussed in the 2009 SEIR, the El Sobrante Health and Safety Plan includes several options to provide access to the site during emergency situations. Implementation of the proposed project would not alter the emergency access routes and would not result in any changes to existing access to surrounding nearby uses. Therefore, implementation of the proposed project would not result in inadequate access to nearby uses, and impacts are evaluated as less than significant. No additional analysis is required.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

T-1 Out-of-County waste from Los Angeles County, Orange County, San Bernardino County, and San Diego County shall be transported to El Sobrante by transfer trucks.

T-2 Transportation of out-of-County waste from areas other than Los Angeles County, Orange County, San Bernardino County, and San Diego County shall not be permitted without additional environmental review and approval.

T-3 Transfer trucks hauling waste from out-of-County to El Sobrante that use State Route (SR) 91 shall travel to and from the landfill during off-peak hours for SR 91.

T-4 Vehicles delivering waste from out-of-County to be disposed at El Sobrante shall utilize on all trips (both inbound and outbound) only that portion of Temescal Canyon Road between its intersection with I-15 and the landfill access road, except in the event of a closure of the on- and/or offramps at Temescal Canyon Road and I-15.

T-5 Except for vehicles collecting waste in the immediate vicinity of El Sobrante, USA Waste's or successor's-in-interest collection vehicles delivering waste from in- County to be disposed at El Sobrante shall utilize only that portion of Temescal Canyon Road between its intersection with I-15 and the landfill access road for all trips (both inbound and outbound), except in the event of a closure of the on-and/or off-ramps at Temescal Canyon Road and I-15.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
18. Tribal Cultural Resources.					
a. Would the project cause a substantial adverse change in the significant of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or **ii.** A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	2018 Addendum EIR, 19. Tribal Cultural Resources	No	No	No	No

Environmental Setting/Discussion

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
   i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
   ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Refer to Section 5. Cultural Resources and Section 7. Geology and Soils, of this Addendum, which discuss the archaeological and paleontological assessment completed as part of the 1998 EIR and the proposed project, respectively. They also discuss the mitigation measures stemming from these assessments that were incorporated into the 1998 EIR (and would continue to be enforced upon implementation of the proposed project) that have resulted in ongoing cultural resource surveying/monitoring. As mentioned previously, there are seven archaeological sites (CA-RIV-1143, CA-RIV-1144, CA-RIV-1146, CA-RIV-1148, CA-RIV-1651, CA-RIV-4307, and CA-RIV-4981) within the landfill site boundary, and one site (CA-RIV-1147) that is outside of, but immediately adjacent to, the landfill site boundary that are surveyed on a biannual basis. Based on the most recent results of archival research, the Native American outreach program, and the field survey, no new or previously recorded cultural resources were identified in the project area. However, an assessment of archaeological sensitivity indicates that the southern end of the project area, extending from the intersection of Temescal Canyon Road and Dawson Canyon Road, along Dawson Canyon Road until the road turns north and starts going uphill, exhibits moderate potential to encounter archaeological resources, based on proximity to previously recorded resources, natural setting, and presence of soils with potential for buried deposits. The proposed project would include excavation activities, which could have the potential to inadvertently uncover archaeological resources, tribal cultural resources, and unknown human remains. As such, the mitigation measures identified in the 1998 EIR to address cultural resources would continue to be enforced upon implementation of the proposed project, which would include the continuation of monitoring, testing, and/or preservation or data recovery excavation by certified archaeologists (if necessary) for future grading and other disturbance-related activities within and in close proximity to identified archaeological sites. No monitoring is recommended currently for construction activities where Dawson Canyon Road turns north and ascends northward upslope, because soils in this area exhibit more clear evidence of disturbance, they likely are older and less likely to contain archaeological resources, and the project area is not as close to previously recorded sites and sensitive landscape features, such as low slopes and freshwater resources.

The certified 1998 EIR/2009 SEIR for the El Sobrante Landfill, under which the proposed project is being conducted, were completed before establishment of AB 52 in 2015, and thus AB 52 would not apply to the proposed project. Though the proposed project would not be subject to AB 52, tribal input was sought as a best practice measure to address potential impacts on any potential cultural resources in the project area. Information concerning sacred lands in the project vicinity was solicited from the NAHC. An email was sent to the NAHC on

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
January 25, 2024, requesting a search of its SLF to identify tribal cultural resources (TCR) in the area. A response was received on February 22, 2024, indicating that the results of the SLF search were positive and the Pechanga Band of Indians (Tribe) should be contacted for more information. The NAHC also provided a list of tribal contacts that are affiliated culturally with the project area. The contact list is provided in Appendix D of this Addendum. On May 3, 2024, AECOM sent an e-mail request to the Tribe for any insights or knowledge that they may wish to share regarding tribal history of the area and potential impacts on cultural resources in the project area. The letter included a description of the project location and undertaking, a summary of the ongoing archival research, and a map of the project area. The letter indicated that any information provided by the tribe would be included in the cultural resources assessment being conducted for the project, and would be submitted to the lead agency. A follow-up phone call was placed on May 17, 2024, and a voicemail message was left, detailing the purposed of the call and contact information if anyone wished to discuss the project. No response has been received to date. Copies of the NAHC communications and contact letter are provided in Appendix D of this Addendum. As part of the 2018 Addendum, the RCDWR provided notification of the 2018 project and solicited information regarding TCRs to eight local Native American Tribes, with only the Tribe responding. RCDWR and WM staff met with the Tribe and there were no new TCRs identified within the 2018 project site. While the 2018 project would not impact known TCRs, at the request of the Tribe, existing cultural resources-related mitigation measures, identified in Sections 5 and 7 of this Addendum, were modified to more specifically reflect conditions involving the accidental discovery or recognition of human remains, and new mitigation measures (TR-1 through TR-3, below) were added to specifically identify the Tribe for Native American monitoring and ownership of previously considered discovery of any unanticipated cultural resources.					

Accordingly, with the continued enforcement of mitigation measures associated with cultural resources, no substantial changes to the circumstances under which the proposed project would be undertaken regarding the proposed project's potential impacts to TCRs would occur. Thus, the prior environmental documentation for the proposed project adequately addresses the proposed project's impact to archeological resources, historical resources, paleontological resources, and human remains. As such, no new impacts to TCRs would occur and no additional analysis of this issue is warranted.

Mitigation Measures, Conditions of Approval or Regulatory Requirements

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

TR-1 Prior to impacts within the Phase 17 area, USA Waste of California, Inc. shall enter into an agreement with the Pechanga Band of Mission Indians for Native American monitoring. The Native American Monitor shall be on-site during all initial ground disturbing activities within Phase 17 including clearing, grubbing, tree removal, grading and trenching. The Native American Monitor shall have the authority to temporarily divert, redirect or halt the ground disturbance activities to allow identification, evaluation, and potential recovery of cultural resources.

TR-2 If during ground disturbance activities, unanticipated cultural resources are discovered, the following procedures shall be followed:

All ground disturbance activities within 100 feet of the discovered cultural resource shall be halted and USA Waste of California, Inc. shall call the County Archaeologist, or qualified archaeologist (if the County Archaeologist position is vacant), immediately upon discovery of the cultural resource. A meeting shall be convened between USA Waste of California, Inc., Riverside County Department of Waste Resources, the County Archaeologist, and the Pechanga Band of Mission Indians, to discuss the significance of the find. At the meeting with the aforementioned parties, a decision is to be made, with the concurrence of the County Archaeologist, as to the appropriate treatment (documentation, recovery, avoidance, etc.) for the cultural resource. Further ground disturbance shall not resume within the area of the discovery until the appropriate treatment has been accomplished. USA Waste of California, Inc. is responsible for all costs associated with the disposition of cultural resources (curation, re-burial, etc.).

TR-3 USA Waste of California, Inc. shall relinquish ownership of all cultural resources, including sacred items, burial goods, and Human Remains after these items have been released by the County Coroner, and provide evidence to the satisfaction of the County Archaeologist that all archaeological materials recovered during the archaeological investigations (this includes collections made during an earlier project, such as testing of archaeological sites that took place years ago), have been handled through one of the following methods:

1. A fully executed reburial agreement with the appropriate culturally affiliated Native American tribe or band. This shall include

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
measures and provisions to protect the future reburial area from any future impacts. Reburial shall not occur until all cataloging, analysis and special studies have been completed on the cultural resource(s). 2. Curation at a Riverside County Curation facility that meets federal standards per 36 Code of Federal Regulations (CFR) Part 79 and therefore will be professionally curated and made available to other archaeologists/researchers and tribal members for further study. The collection and associated records shall be transferred, including title, and are to be accompanied by payment of the fees necessary for permanent curation. Evidence shall be in the form of a letter from the curation facility identifying that archaeological materials have been received and that all fees have been paid. 3. If more than one Native American Group is involved with the project and cannot come to an agreement between themselves as to the disposition of cultural resources, USA Waste of California, Inc. shall then proceed with curation at the Western Science Center. 4. USA Waste of California, Inc. is responsible for all costs associated with the disposition of cultural resources (curation, re-burial, etc.).					

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
19. Utilities and Service Systems. Would the project:					
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	1998 EIR § 4.11	No	No	No	No
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	1998 EIR § 4.11	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
c. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	1998 EIR § 4.11	No	No	No	No
d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	1998 EIR § 4.11	No	No	No	No
g. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	1998 EIR § 4.11	No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Environmental Setting/Discussion

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?
c. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The 1998 EIR addressed potential impacts associated with utilities and service systems and found that the landfill expansion would not result in significant impacts with respect to the incremental increase in demand for potable water supply, wastewater treatment, electrical service, or natural gas service. The proposed project would not result in a change to existing landfill operations. The operation of the proposed project would require seven full-time employees and three part-time employees, and therefore would not result in a substantial increase in demand for utilities and service systems over existing baseline levels. Therefore, the proposed project would have a less than significant impact associated with utilities and service systems. The proposed RNG Sites would not receive or process any leachate from the landfill. Condensate that is generated through gas compression during the RNG process will not be substantial (less than 20 gallons per minute). As previously stated, condensate generated from the RNG facility would be treated on-site at the South RNG Site with DFRO process equipment. Any permeate generated from this process that meets industrial waste requirements would be sent to the Temescal Valley Water District sanitary system. Solids would be trucked off to a facility that is permitted to accept the solids. Impacts would be less than significant, and no additional analysis is required.

d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The proposed project would generate solid waste during construction primarily in the forms of demolition debris and excavated soil. All demolition debris and excess soil from the construction would stay within the landfill. The landfill is intended to meet existing and future needs for municipal solid waste disposal, while complying with federal, State, and local statutes and regulations related to solid waste.

<table>
<tr><th>Environmental Factor</th><th>Where Impact Was Analyzed in Prior Environmental Documents.</th><th>Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?</th><th>Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?</th><th>Any New Information Requiring New Analysis or Verification?</th><th>Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?</th></tr>
<tr><td colspan="6">Impacts would be less than significant, and no additional analysis is required.

<u>Mitigation Measures, Conditions of Approval or Regulatory Requirements</u>

Mitigation measures listed in the MMP for the El Sobrante Landfill Expansion Project will continue to be enforced upon implementation of the proposed project, if they are still applicable. The mitigation measures in the MMP related to this environmental factor consist of the following:

U-11 Installation of low flow toilets, faucets, and showers.

U-12 Wastewater shall go to the Lee Lake Treatment Facility, which makes water available for reuse.</td></tr>
</table>

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
20. Wildfire. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:					
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	N/A	N/A	N/A	N/A	N/A
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	N/A	N/A	N/A	N/A	N/A

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	N/A	N/A	N/A	N/A	N/A
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	N/A	N/A	N/A	N/A	N/A

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Environmental Setting/Discussion

Wildfire, as a stand-alone environmental topic with specific environmental issue questions, was not part of the Appendix G Guidelines and therefore was not addressed in either the 1998 or 2009 EIRs. Although the stand-alone wildfire topic was not part of the Appendix G Guidelines for the previous EIRs, the updated checklist is used here to provide the most up-to-date information.

a. Substantially impair an adopted emergency response plan or emergency evacuation plan?
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The proposed project is located within a state responsibility area classified as Very High Fire Hazard Severity Zone (CALFIRE, 2024). As discussed in the 1998 EIR, the El Sobrante Landfill would not substantially impair an adopted emergency response plan or emergency evacuation plan as the project site is located in a remote area within the El Sobrante Landfill property boundary. The project site will be accessed from the existing paved roads (Dawson Canyon Road and Temescal Canyon Road) and would not require complete road closures (lane closure only) or detours during the construction of the proposed project. Following the construction, daily operations at the project site would remain the same. As discussed in the 2009 SEIR, the El Sobrante Landfill Health and Safety Plan and Emergency Response Plan would continue to address emergency issues and protocol in the event that an emergency situation occurs. Furthermore, the proposed project would be subject to adopted federal, State, and local development guidelines such as California Fire Code and the Riverside County Ordinance No. 787 and No. 659, that govern wildfire, emergency services, and emergency access.

As stated previously, the Gas POR Site is located south of CCW and west of Temescal Canyon Wash, and is in a FEMA SFHA Zone AE. As such, the proposed project, specifically the Gas POR Site, has been designed to not encroach into CCW defined slopes that designate the existing floodway. The proposed project design would maintain a finished floor and equipment elevation of 933 feet minimum, which is one foot above the effective BFE of 932 feet. Although this elevation is appropriate to minimize flood hazard risk based on the effective Flood Insurance Rate

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Map, it is also conservative considering the existing conditions and likely future development. Updated flood models based on existing topography and Dawson Canyon Road Bridge geometry show that the one percent annual chance flood is contained within the Temescal Wash main channel in the vicinity of the project site. Localized flooding on the project site due to CCW would be insignificant, as flood water would seek Temescal Wash through lower lying areas relative to the proposed project. In addition, potential lateral erosion along the north edge of the Gas POR Site in CCW would be monitored as part of an erosion control plan that would be implemented as needed.

<u>Mitigation Measures, Conditions of Approval or Regulatory Requirements</u>

There are no mitigation measures, conditions of approval, or regulatory requirements related to this environmental factor.

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
21. Mandatory Findings of Significance.					
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?		No	No	No	No
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		No	No	No	No

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?

Environmental Setting/Discussion

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

With implementation of the applicable mitigation measures from the 1998 and 2009 EIRs (listed in this document) and as supplemented herein with recommendations that are based on the present context and are consistent with and meet the intent of the existing, older mitigation measures, the proposed project would not exceed the scope of any impact contemplated in the prior environmental documents associated with habitat, species, historic/prehistoric resources, or adverse effects on human beings. Furthermore, cumulative impacts associated with the proposed project would not exceed those contemplated in the prior environmental documents, because no individual impact exceeds the scope of that same impact in those environmental documents.

4.0 Findings and Conclusions

The above evaluation and additional substantial evidence (e.g., appendices) support the conclusion that preparation of a supplemental or subsequent EIR is not required prior to approval of the proposed project, and that the Initial Study/Modified Environmental Checklist is adequate for the approval of the proposed project under CEQA.

There are no substantial changes proposed to the existing and historically realized levels of baseline operations at the El Sobrante Landfill, or in the operations of the proposed changes that require major revisions to the previously adopted 1998 EIR or 2009 SEIR, or preparation of a new subsequent EIR, due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. As illustrated herein, the proposed project is consistent with the 1998 EIR and 2009 SEIR, and would include only minor modifications to the landfill site. (State CEQA Guidelines, § 15162, subd. (a)(1).)

No new information of substantial importance or substantial changes in circumstances regarding the existing El Sobrante Landfill has occurred since the adoption of the 1998 EIR and 2009 SEIR. The previous analyses completed under CEQA remain adequate for purposes of the proposed project, as considered and supplemented herein by the Initial Study/Modified Environmental Checklist prepared pursuant to CEQA. (State CEQA Guidelines, §§ 15162, subd. (a)(2), (3).)

In addition, consideration of the proposed project would not result in a new significant adverse cumulative impact or a substantial increase in the severity of a previously identified cumulative impact. El Sobrante Landfill remains obligated to comply with all applicable mitigation measures in the MMP adopted as part of the 1998 EIR and 2009 SEIR by the County, and with all conditions of approval and applicable regulatory requirements.

5.0 Continued Implementation of Mitigation Measures and Regulatory Requirements

As required by Public Resources Code Section 21081.6 and State CEQA Guidelines Section 15097, mitigation measures have previously been adopted to avoid or substantially lessen the significant adverse impacts of the El Sobrante Landfill. Those mitigation measures and conditions of approval which were previously imposed and adopted, including those that are not relevant to the proposed project, would continue to be implemented. Long-term monitoring of mitigation measures would also continue to be implemented by the County of Riverside as the lead agency in accordance with the existing regulatory requirements.

6.0 References

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Renewable Natural Gas Facility at the El Sobrante Landfill

Addendum to the Environmental Impact Report for the El Sobrante Landfill Expansion (SCH# 1990020076) & the El Sobrante Landfill Solid Waste Facility Permit Revision Supplemental Environmental Impact Report (SCH# 2007081054)

Technical Appendices

Riverside County Department of Waste Resources
14310 Frederick Street
Moreno Valley, CA 92553

September 2024

APPENDICES

Appendix A	Visual Simulations
Appendix B	Air Quality and Greenhouse Gas Emissions Impacts Study
Appendix C	Biological Resources Technical Report
Appendix D	Cultural Resources Report
Appendix E	Energy Impact Study
Appendix F1	Geotechnical Investigation Report
Appendix F2	Geotechnical Exploration and Recommendations Report
Appendix G	Paleontological Memorandum
Appendix H	Flood Risk Summary Memeo
Appendix I	Noise and Vibration Study

Appendix A
Visual Simulations

Figure 1

VISUAL SIMULATION - INDEX MAP | 1

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/10/2023

Figure 2

GOOGLE EARTH STREET VIEW - LEROY ROAD | 1

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/10/2023

Figure 3

GOOGLE EARTH STREET VIEW - PULSAR COURT | 2

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/10/2023

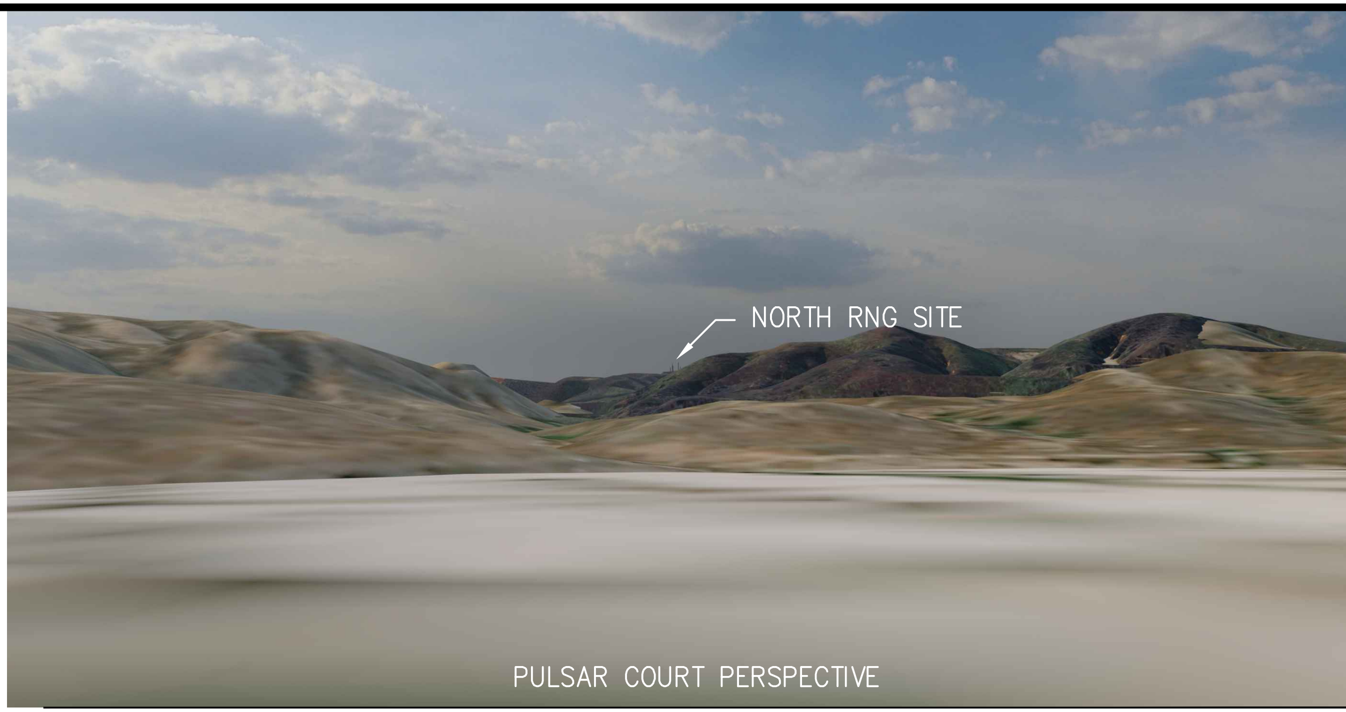
GOOGLE EARTH STREET VIEW - STELLAR COURT | 3

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/10/2023

Figure 5



VIEW OF NORTH RNG SITE FROM PULSAR COURT - RENDERING | 1

VIEW OF NORTH RNG SITE FROM LEROY ROAD - RENDERING | 2

RENEWABLE NATURAL GAS FACILITY
EL SOBRANTE LANDFILL
05/29/2024

Figure 6

GAS METERING POINT OF RECEIPT GOOGLE EARTH STREET VIEW - DAWSON CANYON ROAD | 1

GAS METERING POINT OF RECEIPT - RENDERING | 2

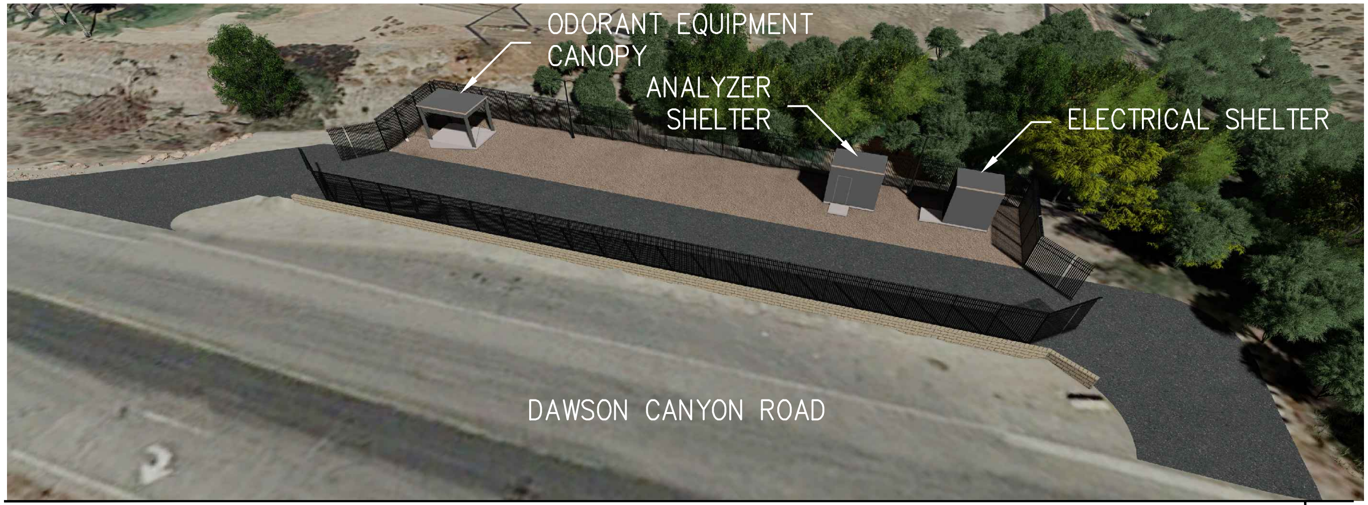
RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/10/2023

Figure 7

GAS METERING POINT OF RECEIPT - RENDERING | 3



GAS METERING POINT OF RECEIPT - RENDERING | 4

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/10/2023

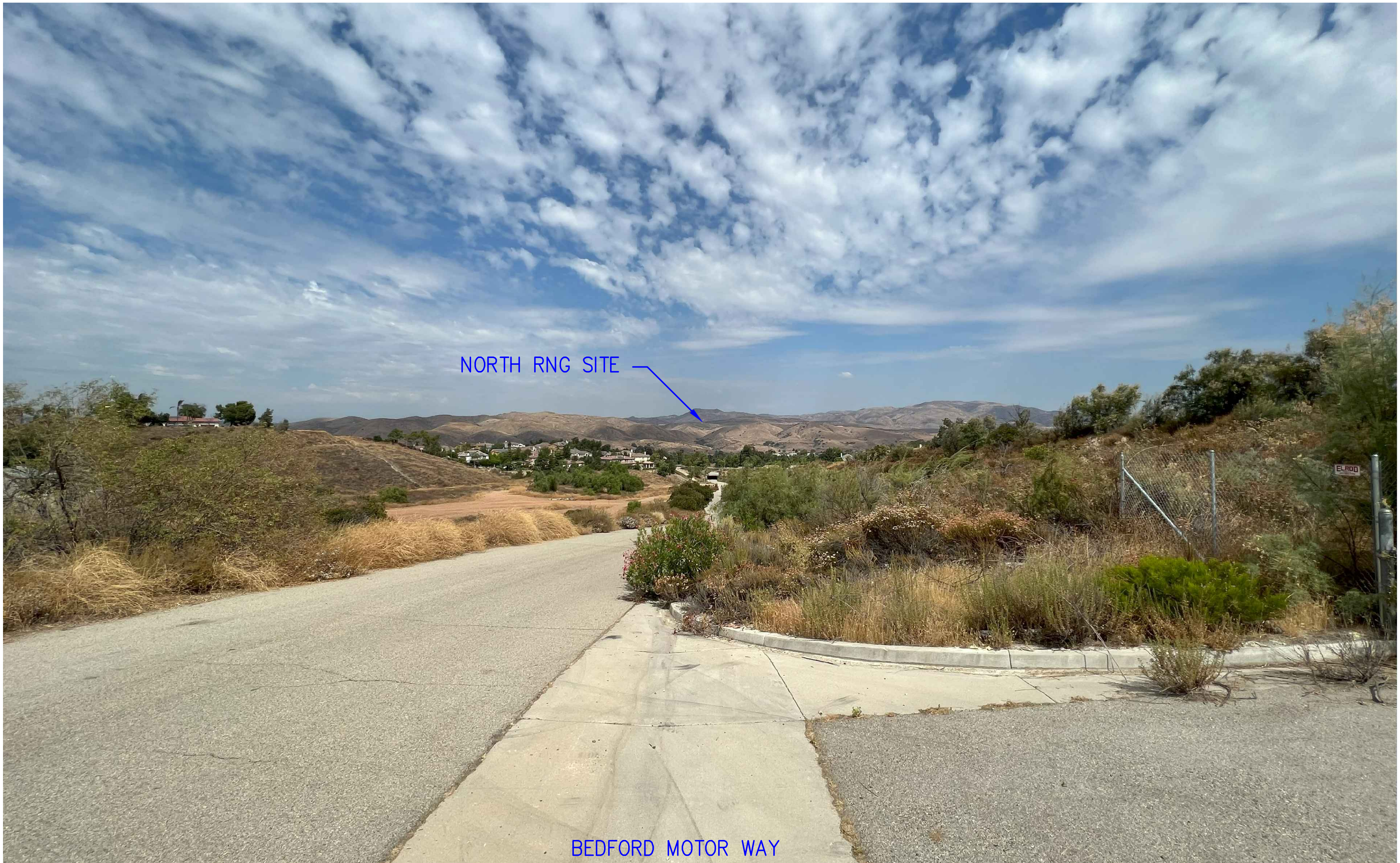
GOOGLE EARTH PLAN VIEW - INDEX MAP | -

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

08/14/2023

Figure 9



STREET VIEW - BEDFORD MOTOR WAY | 1

RENEWABLE NATURAL GAS FACILITY
EL SOBRANTE LANDFILL
08/14/2023

Figure 10

VIEW OF NORTH RNG SITE FROM BEDFORD MOTOR WAY - RENDERING | 1

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

08/14/2023

Figure 11

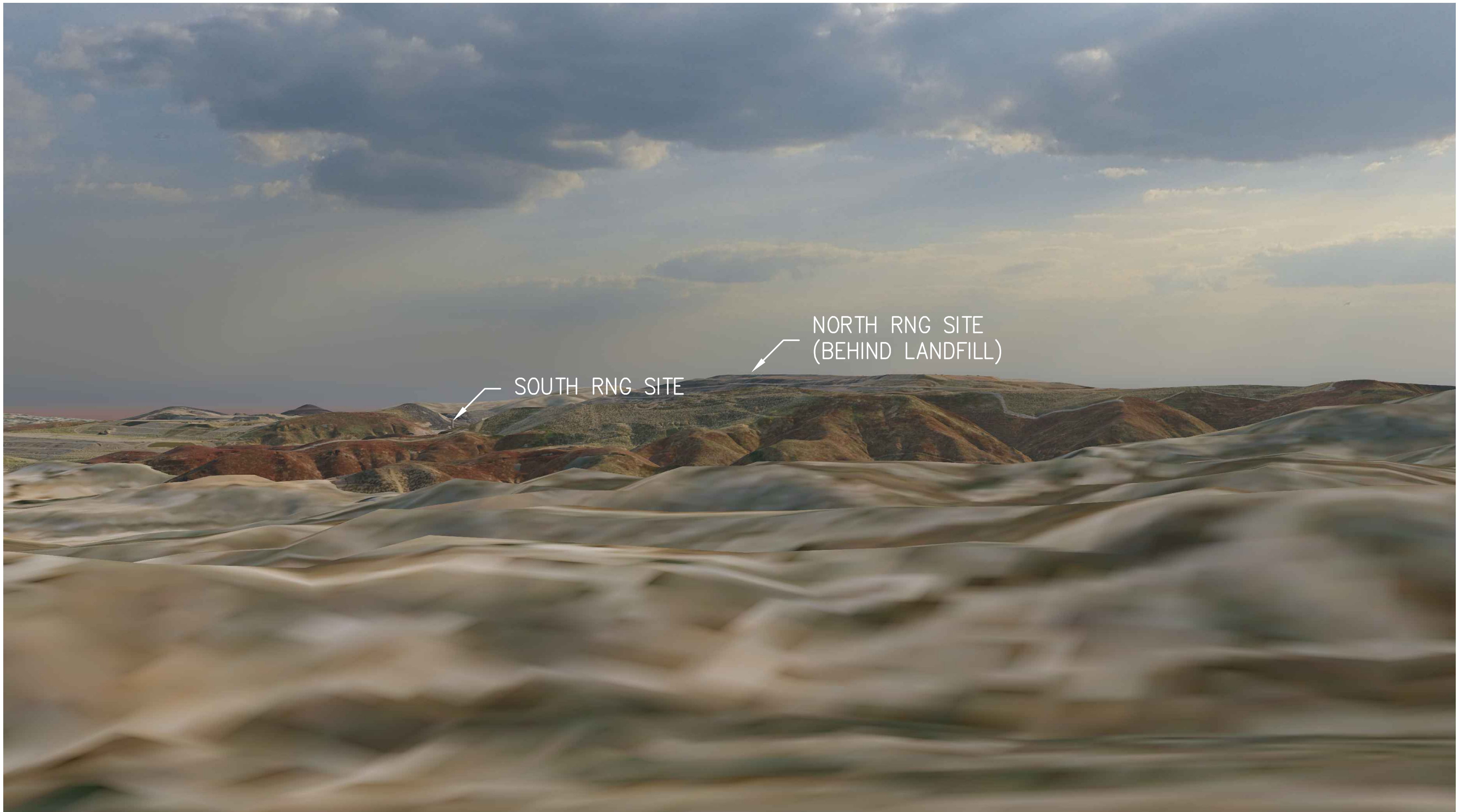
GOOGLE EARTH PLAN VIEW - INDEX MAP | -

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/28/2024

Figure 12



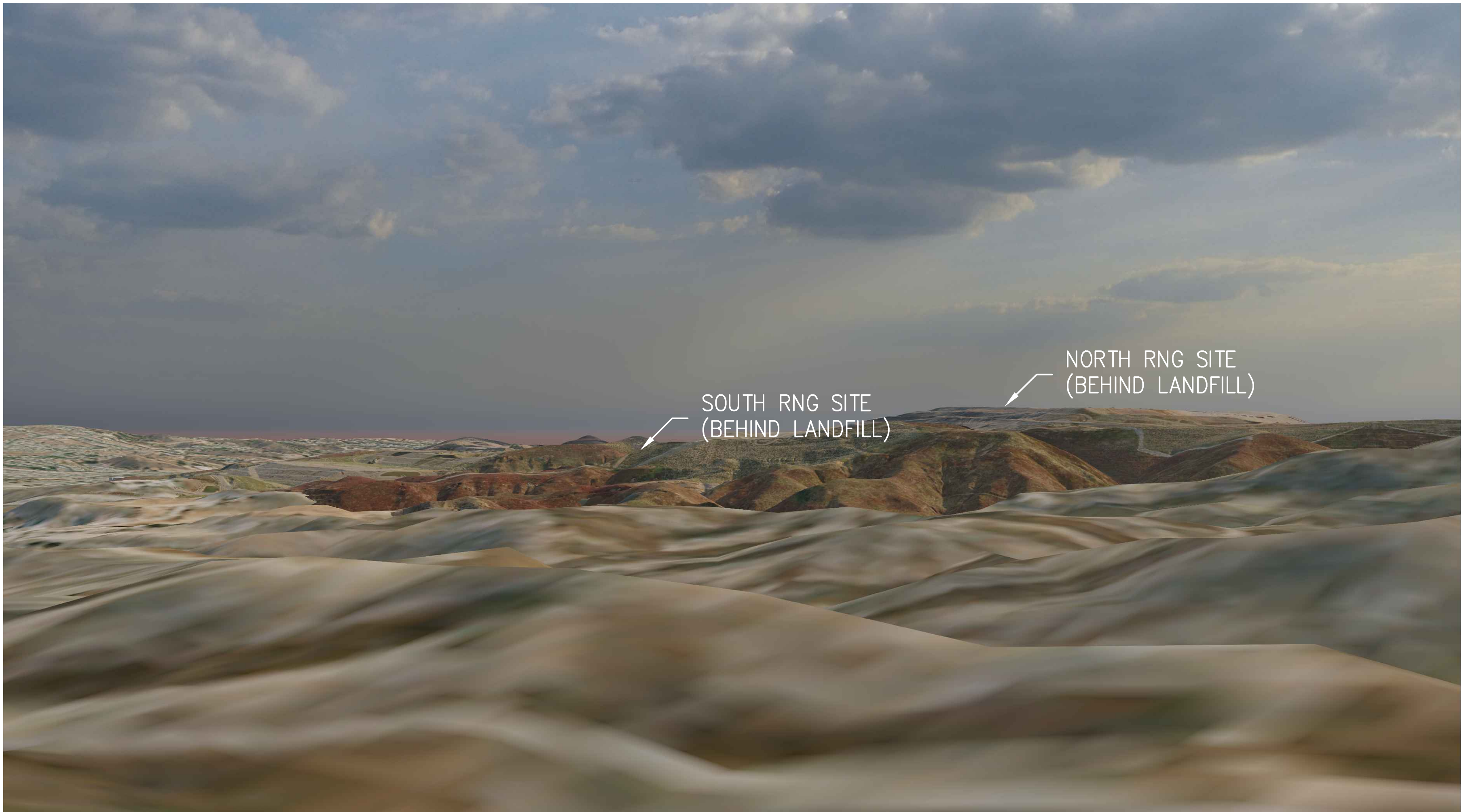
VIEW OF RNG SITES FROM TERRAMOR - RENDERING | 1

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/28/2024

Figure 13



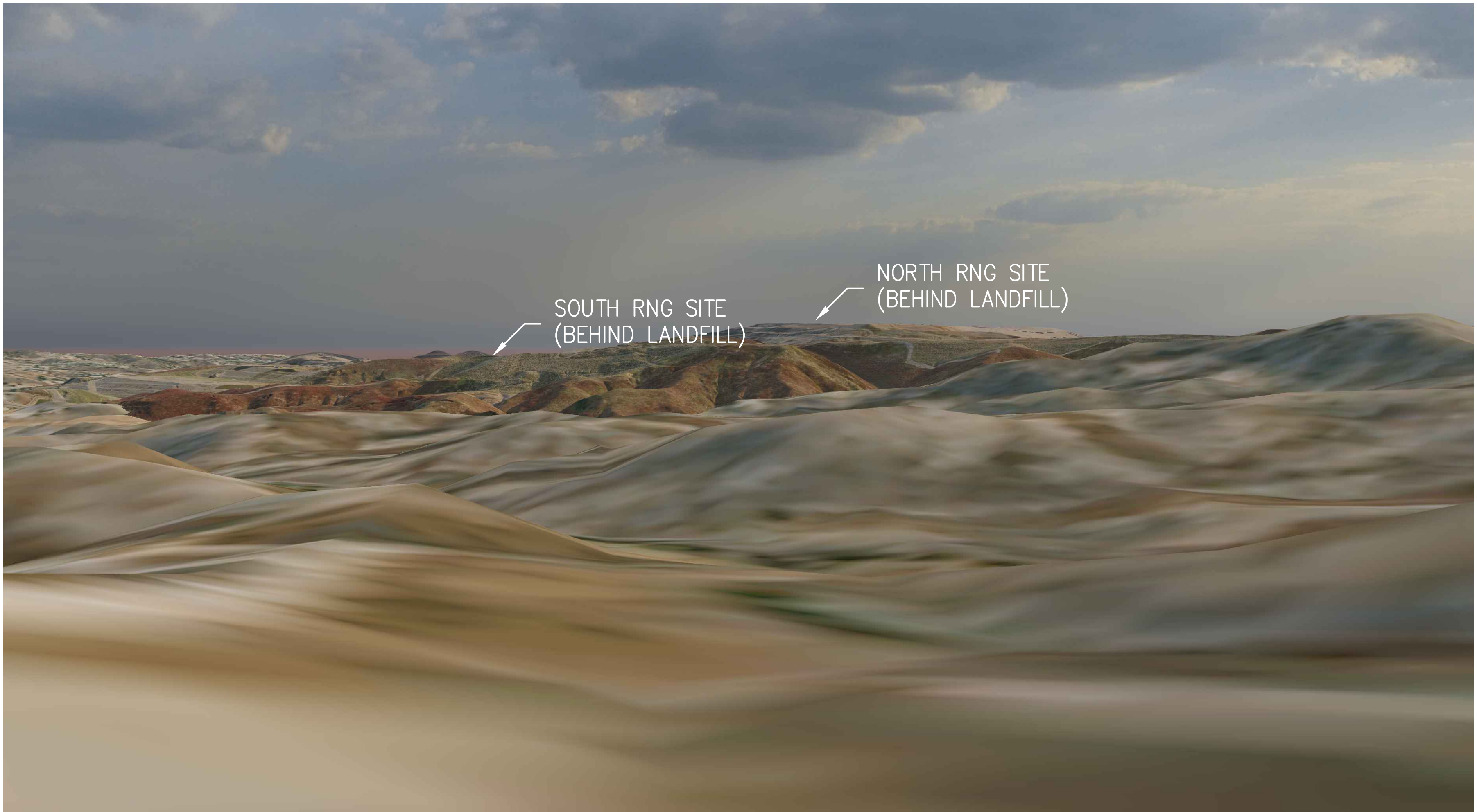
VIEW OF RNG SITES FROM TERRAMOR - RENDERING | 2

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/28/2024

Figure 14



VIEW OF RNG SITES FROM TERRAMOR - RENDERING | 3

RENEWABLE NATURAL GAS FACILITY

EL SOBRANTE LANDFILL

05/28/2024

Appendix B
Air Quality and Greenhouse Impacts Study

taha
environmental planners

Technical Memorandum

TO: Jane Chang
AECOM

FROM: Terry A. Hayes Associates Inc.

DATE: September 19, 2024

RE: El Sobrante Landfill Renewable Natural Gas Facility Project
Air Quality and Greenhouse Gas Emissions Impacts Study

Introduction

Terry A. Hayes Associates Inc. (TAHA) has completed an Air Quality and Greenhouse Gas Emissions (GHG) Assessment for the El Sobrante Landfill (ESL) Renewable Natural Gas (RNG) Facility Project (proposed project) in accordance with the provisions of the California Environmental Quality Act (CEQA) Statutes and Guidelines. This memorandum documents the methodology and results of the air quality and GHG emissions analyses and the potential environmental impacts associated with construction and future operation of the proposed project. This Assessment is organized as follows:

- Introduction
- Executive Summary
- Project Description
- Air Quality and GHG Emissions Topical Information
- Regulatory Framework
- Existing Setting
- Significance Thresholds
- Methodology
- Impacts Assessment
- References

Terry A. Hayes Associates Inc.
3535 Hayden Avenue, Suite 350
Culver City, California 90232
310.839.4200 fax 310.839.4201

Executive Summary

Several prior CEQA documents have been prepared and approved for the ESL since 1998. Environmental impacts related to Air Quality associated with the ESL were previously analyzed within the 1998 Environmental Impact Report (EIR) for the El Sobrante Landfill Expansion, the 2009 Supplemental EIR (SEIR) for the El Sobrante Landfill Solid Waste Facility Permit Revision, and the 2018 Addendum to the EIR and SEIR. In 2018, the CEQA Guidelines were updated, and the Environmental Checklist criteria were revised for several resource areas including Air Quality. Checklist criteria a) and b) were combined into criterion a), and the subsequent criteria were updated from c), d), and e) to b), c), and d). Additionally, the language in criterion d) was revised to include language specifically addressing emissions leading to odors.

Environmental Checklist criteria for GHG Emissions were added to the CEQA Guidelines in 2010; therefore, the 1998 EIR did not include an analysis of environmental impacts involving GHG emissions or climate change. Environmental impacts related to GHG Emissions were previously analyzed within the 2009 SEIR for the El Sobrante Landfill Solid Waste Facility Permit Revision and the 2018 Addendum to the EIR and SEIR. The 2018 updates to the CEQA Guidelines included an expansion of section 15064.4, which addresses the analysis of GHG emissions. The revised language clarified several points, including the following:[1]

- Lead agencies must analyze the GHG emissions of proposed projects. (CEQA Guidelines, § 15064.4, subd. (a).)
- The focus of the lead agency's analysis should be on the project's effect on climate change, rather than simply focusing on the quantity of emissions and how that quantity of emissions compares to statewide or global emissions. (CEQA Guidelines, § 15064.4, subd. (b).)
- The impacts analysis of GHG emissions is global in nature and thus should be considered in a broader context. A project's incremental contribution may be cumulatively considerable even it if appears relatively small compared to statewide, national, or global emissions. (CEQA Guidelines, § 15064.4, subd. (b).)
- Lead agencies should consider a timeframe for the analysis that is appropriate for the project. (CEQA Guidelines, § 15064.4, subd. (b).)
- A lead agency's analysis must reasonably reflect evolving scientific knowledge and state regulatory schemes. (CEQA Guidelines, § 15064.4, subd. (b).)
- Lead agencies may rely on plans prepared pursuant to section 15183.5 (Plans for the Reduction of Greenhouse Gases) in evaluating a project's GHG emissions. (CEQA Guidelines, § 15064.4, subd. (b)(3).)
- In determining the significance of a project's impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is consistent with those plans, goals, or strategies. (CEQA Guidelines, § 15064.4, subd. (b)(3).)
- The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. (See CEQA Guidelines, § 15064.4, subd. (c).)

Table 1 shows a summary of project changes to the previous environmental document conclusions. The construction and operation of the proposed project would not result in any new significant impacts and the conclusions of the previous environmental documents would not be altered.

[1] California Governor's Office of Planning and Research, *CEQA & Climate Change*, Available at https://opr.ca.gov/ceqa/ceqa-climate-change.html, Accessed July 2024.

TABLE 1: SUMMARY OF PREVIOUS ENVIRONMENTAL DOCUMENT CONCLUSIONS AND PROJECT CHANGES TO CONCLUSIONS

Impact Criteria	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a. Conflict with or obstruct implementation of the applicable air quality plan?	1998 EIR § 4.6; 2009 SEIR, § 4.2; 2018 Addendum § 3.2.3	No	No	No	No
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	1998 EIR § 4.6; 2009 SEIR, § 4.2; 2018 Addendum § 3.2.3	No	No	No	No
c. Expose sensitive receptors to substantial pollutant concentrations?	1998 EIR § 4.6; 2009 SEIR, § 4.2; 2018 Addendum § 3.2.3	No	No	No	No
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	1998 EIR § 4.6; 2009 SEIR, § 4.2; 2018 Addendum § 3.2.3	No	No	No	No
GREENHOUSE GAS EMISSIONS. Would the project:					
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	2009 SEIR, § 4.2; 2018 Addendum § 3.2.7	No	No	No	No
b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of greenhouse gases?	2009 SEIR, § 4.2; 2018 Addendum § 3.2.7	No	No	No	No

SOURCE: Riverside County Waste Management Department, *El Sobrante Landfill Expansion Draft Environmental Impact Report*, April 1994.; Riverside County Waste Management Department, *El Sobrante Landfill Solid Waste Facility Permit Revision Final Supplemental Environmental Impact Report*, March 31, 2009.; Riverside County Department of Waste Resources, *Addendum to the Environmental Impact Report for the El Sobrante Landfill Expansion & the El Sobrante Landfill Solid Waste Facility Permit Revision Supplemental Environmental Impact Report*, January 2018.

Project Description

The proposed project involves the installation of an RNG Facility at the Waste Management (WM)'s ESL site to utilize existing landfill gas (LFG) that would be diverted from existing landfill flares and processed to meet Southern California Gas Company (SoCal Gas) specifications for local distribution via an existing SoCal Gas pipeline. Specifically, the Project would include the following elements:

SOUTH RNG SITE

The South RNG Site would be an approximately 0.3-acre area located adjacent to ESL's two existing LFG flares (flare station). The 0.3-acre area currently contains three concrete pads that were previously used for co-gen power generation; these existing concrete pads would be removed and replaced with concrete specifically designed for the equipment to be utilized at the site. The South RNG Site location is part of a larger graded area associated with the existing landfill entry and scales.

The RNG process would begin at the South RNG Site through the interception of LFG by tapping into the discharge manifold header piping prior to the gas being burned at the existing flare station. The diverted, raw LFG would be conveyed to the North RNG Site utilizing a 30-inch diameter pipe to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road. The North RNG Site would treat LFG that meets minimum specifications for processing; LFG that does not meet minimum specifications would be returned within a separate pipe (LFG reject line) in the same pipe trench back to the South RNG Site.

After the initial treatment process at the North RNG Site, the partially treated gas would be sent via another pipe in the pipe trench to be refined at the South RNG Site (i.e., final nitrogen removal) sufficient to meet SoCal Gas specifications. It would then be diverted via a sales gas compressor to a dedicated underground sales gas main to be placed within an underground pipe trench within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road and sent southward to the Gas POR Site. Waste gas from the refining process would be sent (via separate pipe in the pipe trench) to the recuperative oxidizer at the North RNG site for further treatment and release. Ancillary equipment to be located at the South RNG Site would include sales gas compressors, nitrogen rejection units, condensate treatment equipment, gas coolers, various tanks, transformers/switch gear, and a utilities building.

The South RNG Site would also include an approximately 3,200-square foot maintenance and office building, which would be used as an equipment control center as well as for routine equipment maintenance required for the RNG Facility (e.g., instrument repair/swap out, inspections, oil and filter parts for compressor changes, etc.). For vehicle access to, and parking at, the South RNG Site a 25-foot-wide access easement would be dedicated between the proposed equipment and structures at the South RNG Site and the existing flare station. Building and equipment heights at the South RNG Site would typically range between 5 and 12 feet above ground surface, but with the housing for the nitrogen rejection units being 80 feet above ground surface.

NORTH RNG SITE

The North RNG Site would be an approximately 1.2-acre area on an existing graded landfill pad, approximately 0.5-mile north of the South RNG Site. This pad currently contains the landfill's former maintenance shop, a trailer, a concrete pad, a 40,000-gallon reclaimed water storage tank, and potable water booster tanks. The North RNG Site is where initial treatment/refining of the LFG would occur and is referred herein as the 'RNG Facility'. The RNG Facility would utilize the existing concrete pads when and where available but would require removal of the existing canopy structure of the former maintenance facility and the existing trailer. The existing water storage tank and potable water booster tanks would be protected in place (i.e., these tanks would not be part of the 1.2-acre RNG Facility).

The RNG Facility would consist of various equipment, which would be located on separate concrete pads with above and below ground pipe connections. Equipment would include scrubbers, blowers, coolers, LFG compressors, absorbers, strippers, oxidizers, exchangers, filters, tanks, amine treatment, utilities building, motor control center building, etc., with heights ranging from 5 to 80 feet above ground surface. The RNG Facility would be bordered by 12-foot-high fencing with colored slats (to match the adjacent natural terrain) with sound-attenuating drapes on the inside of the fence.

Once the gas has met certain carbon dioxide (CO_2), hydrogen sulfide (H_2S), volatile organic compounds (VOCs), and moisture concentrations it would be diverted via the amine treatment and hydration unit back to the South RNG Site for final nitrogen removal and compression into a 6-inch sales gas main to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road between the South RNG and Gas POR Sites.

GAS POINT OF RECEIPT (POR) SITE

The RNG process concludes at the 0.2-acre SoCal Gas POR Site that will be located at the southwest portion of the ESL within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection. A temporarily closed Temescal Driving Range is located to the north, and a potential future Temescal Valley Commercial Center (TVCC) development area is located to the south (across Dawson Canyon Road) of the Gas POR Site. The 6-inch sales gas RNG main will be brought to the POR underground via HDD drilling beneath Temescal Canyon Wash and brought to grade/connected within the fence-enclosed POR. The Southern California Gas Company (SoCalGas) will have various pieces of equipment to receive the RNG, including gas analyzer, gas odorant equipment, electrical equipment, etc., that would be housed within shelters or canopies. Equipment at the POR would be supported on concrete slabs to be placed above 3- to 5-feet of over excavation of the existing onsite soils. The overall POR facility would be on a raised fill pad so that it is one foot above the base flood elevation. An approximately 3-foot-high masonry retaining wall would support the fill on its southern side between Dawson Canyon Road and an internal POR access road/driveway. The entire POR facility would be surrounded by 6-foot-high decorative fencing. It will be installed, owned, and maintained by SoCalGas.

UNDERGROUND PIPING

Between the South RNG Site and North RNG Site an approximate 5-foot-8-inch wide by 8.5-foot-deep pipe trench, approximately 3,700 linear feet in length, would be installed via open cut trenching within the existing pavement or shoulder of the landfill access road. This pipe trench would house six separate lines: a 30-inch, high-density polyethylene (HDPE) LFG supply line to send raw LFG to the RNG plant; a 6-inch FlexSteel line to send partially treated gas from North RNG Site to the exchanger at the South RNG Site for semi-treatment; a 12-inch HDPE line to send partially treated waste gas from the South RNG Site to the recuperative oxidizer at the North Site for further treatment and release; a 4-inch HDPE fuel gas line to service the recuperative oxidizer and amine heater at the North RNG Site; a 20-inch HDPE LFG reject line from the North to South site to the existing flare station; and a 2-inch HDPE condensate line.

Between the South RNG Site and the north side of Temescal Canyon Wash (opposite the Gas POR Site) an approximate 4-foot-wide by 5-foot-deep pipe trench, approximately 6,700 linear feet in length, would be installed via open cut trenching (within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road). This pipe trench would house four separate lines: a 6-inch FlexSteel sales gas main delivering RNG to the POR; a 4-inch HDPE reject gas line for rejected gas from the POR back to South RNG Site; a 4-inch HDPE fuel gas line (from a service meter tap near the POR) to the North RNG Site; and a 2-inch treated condensate line from the South RNG Site to a manhole at the Dawson Canyon Road Bridge.

Underground piping would then be accomplished via HDD boring to cross beneath, and avoid disturbance of, Temescal Canyon Wash. Two bores of approximately 500 linear feet, one for the 6-inch sales gas main and one for the two 4-inch lines (fuel gas and rejected gas lines), would be drilled beneath the wash with minimum depths of 20-foot below the surface at the center of the wash.

SoCal Gas Pipeline Interconnection

The RNG will ultimately be delivered to SoCal Gas' main pipeline located underground in the public right-of-way within Temescal Canyon Road, approximately 600 linear feet southwest from the POR. This would require approximately 600 feet of trenching performed by SoCal Gas within Dawson Canyon Road (between the Gas POR Site and existing SoCal Gas main pipeline) to install an underground pipeline interconnection between the POR and existing main pipeline.

Figure 1 shows the regional location of the proposed project, **Figure 2** depicts an overview of the proposed project site, and **Figure 3** through **Figure 5** display the proposed project site plans: the South RNG site, the North RNG Site, and the Gas POR Site, respectively.

Construction Activities

Construction of the proposed project is anticipated to begin in October 2024 and take approximately 18 months to complete (with completion anticipated in February 2026). A crew of approximately 6 to 12 construction workers (daily) would be in the project area during construction. Temporary construction staging areas adjacent to Dawson Canyon Road (approximately 0.6 acre) about 500 feet northeast of the Dawson Canyon Road Bridge over Temescal Canyon Wash, at the South RNG Site (approximately 0.08 acre), and at the North RNG Site (approximately 0.07 acre) would be used for equipment staging and laydown; all three sites would have materials (e.g., demolition and soil) stockpiled on short-term bases. Any excess material requiring disposal would utilize ESL. Temporary lane closures along the landfill access road/Dawson Canyon Road would occur; however, access to ESL for normal landfill operations would be maintained throughout the construction period with the use of construction flaggers (e.g., during trenching within roadways, etc.).

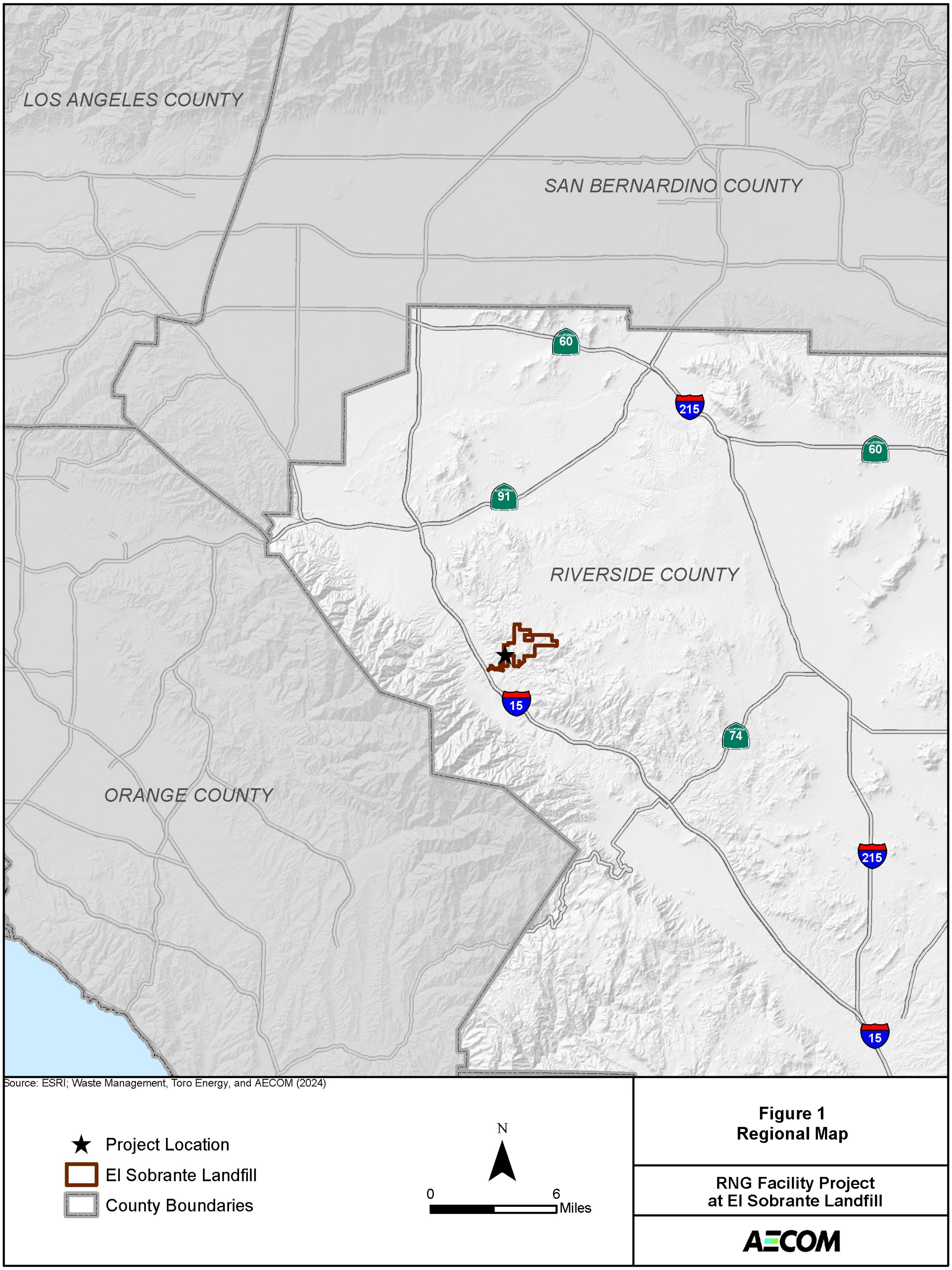
Construction activities will include grading, trenching, directional drilling, import of construction materials (asphalt concrete, aggregate base, decomposed granite, and fill material), soil compaction, equipment installations, building construction, etc.).

Major equipment to be used during construction of the proposed project would include, but are not limited to: backhoes, boom truck, concrete pump rig, crane, dozer, excavators, skid loaders, vibratory compacter/roller, generators, loader, motor grader, paving machine, roller, sheepsfoot, dump truck, flatbed truck, oil/lube truck, pickup truck, water truck, 18-wheel low boy, fuel truck, horizontal directional drill, Redi-Mix truck, etc.

The total construction-related disturbance footprint for the proposed project, both permanent and temporary, would be approximately 5.5 acres.

Project Operations

The proposed project has been sized to process up to 15,000 standard cubic feet per minute (SCFM) of LFG, which would translate to a maximum RNG output of 8,600 million British thermal units (MMBTU) per day. Operation of the RNG Facility would require the use of fuel gas for heating certain refining/treatment equipment at the North RNG Site. Waste gas from the treatment/refining process would be directed to the recuperative oxidizer for further treatment and release (with less overall methane [emissions] in it than flared LFG). The proposed project would not increase the production of LFG at ESL, but would reduce the overall amount of LFG that is flared.


LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
ORANGE COUNTY
60
215
60
91
15
74
215
15
Source: ESRI; Waste Management, Toro Energy, and AECOM (2024)
Project Location
El Sobrante Landfill
County Boundaries
N
0
6
Miles
Figure 1
Regional Map
RNG Facility Project
at El Sobrante Landfill
AECOM

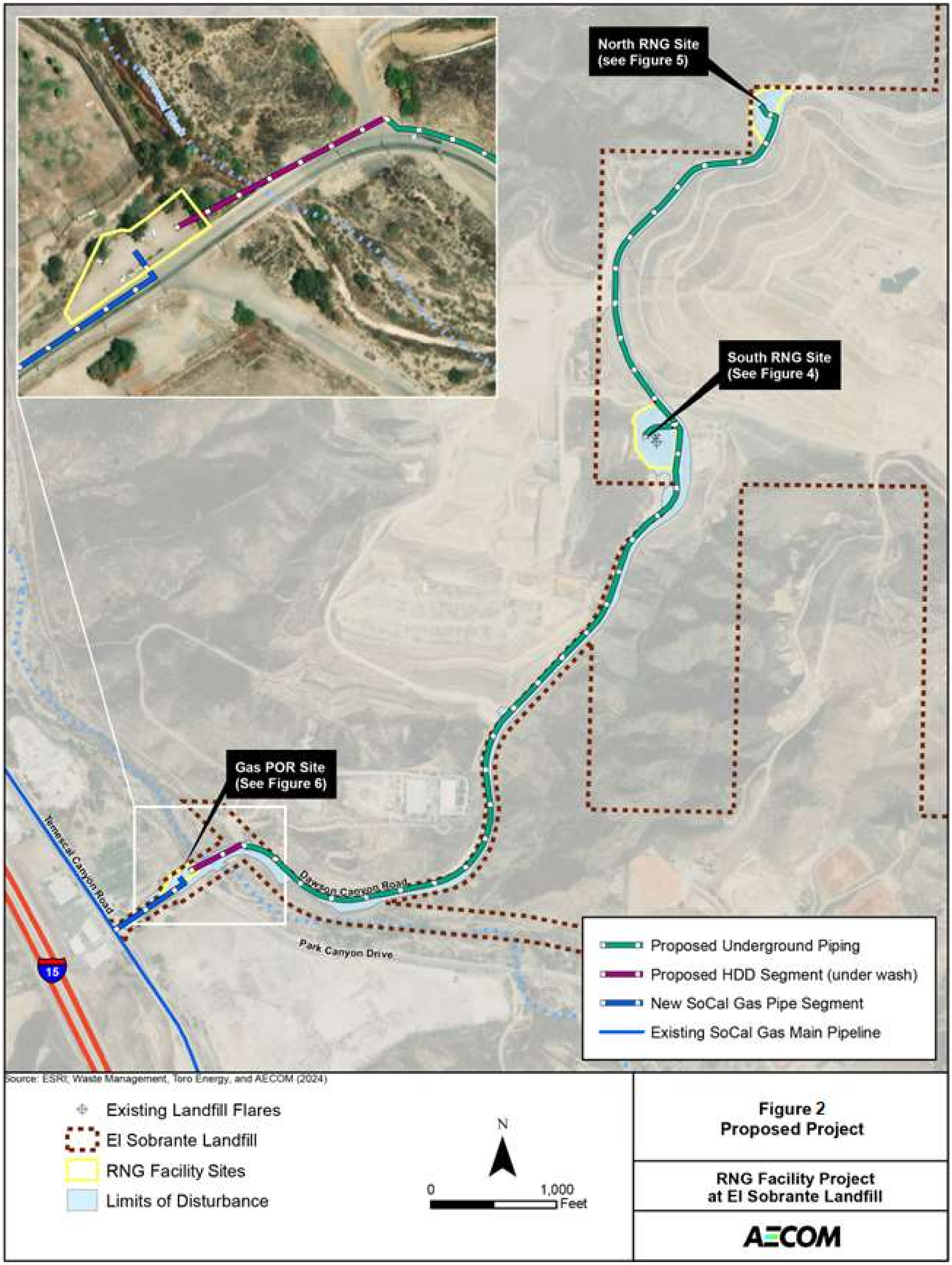
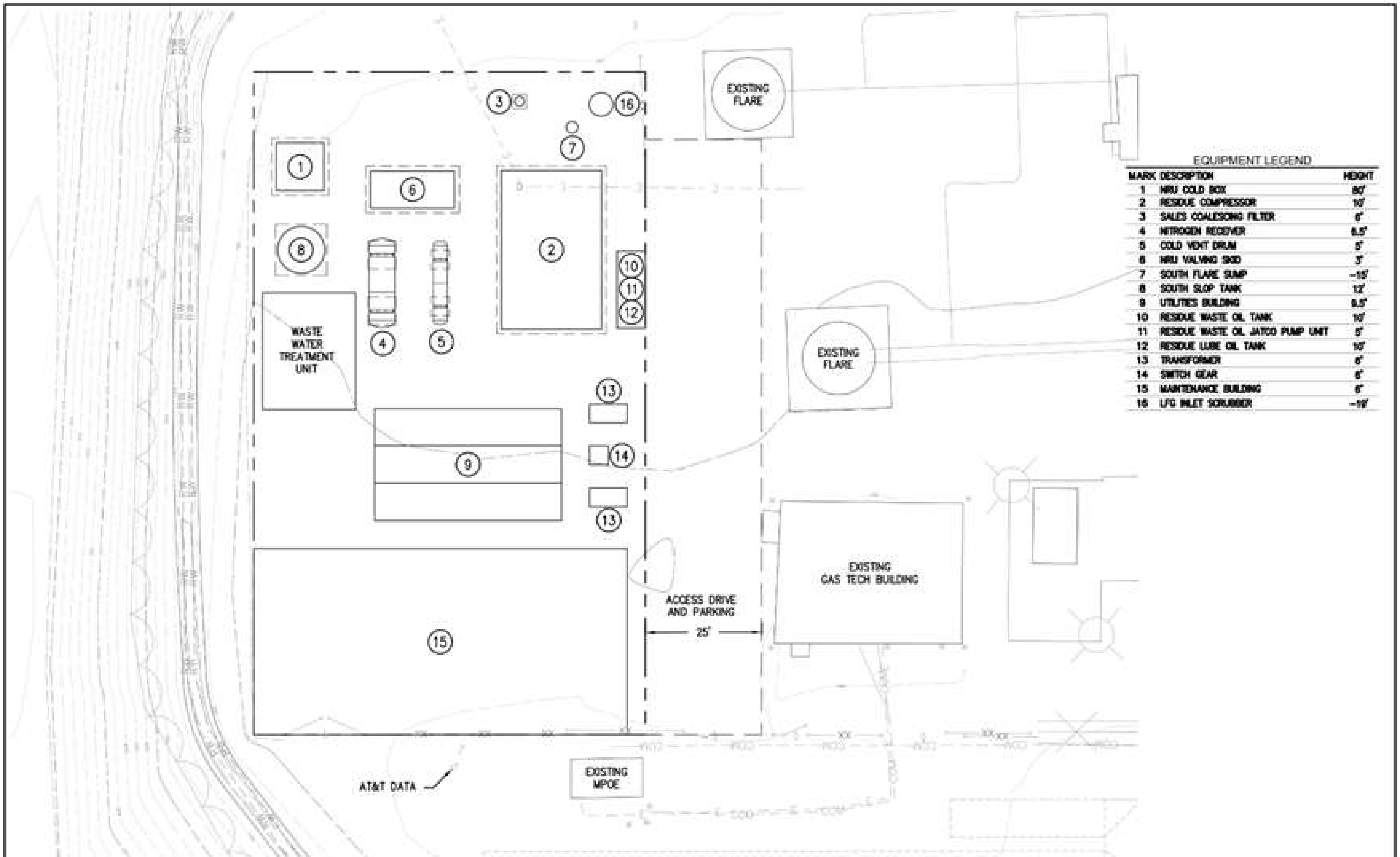


Figure 2
Proposed Project

RNG Facility Project
at El Sobrante Landfill

AECOM



EQUIPMENT LEGEND

MARK	DESCRIPTION	HEIGHT
1	NRU COLD BOX	80'
2	RESIDUE COMPRESSOR	10'
3	SALES COALESCING FILTER	6'
4	NITROGEN RECEIVER	6.5'
5	COLD VENT DRUM	5'
6	NRU VALVING SKID	3'
7	SOUTH FLARE SUMP	~15'
8	SOUTH SLOP TANK	12'
9	UTILITIES BUILDING	9.5'
10	RESIDUE WASTE OIL TANK	10'
11	RESIDUE WASTE OIL JATCO PUMP UNIT	5'
12	RESIDUE LUBE OIL TANK	10'
13	TRANSFORMER	6'
14	SWITCH GEAR	6'
15	MAINTENANCE BUILDING	6'
16	LFG INLET SCRUBBER	~18'

Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

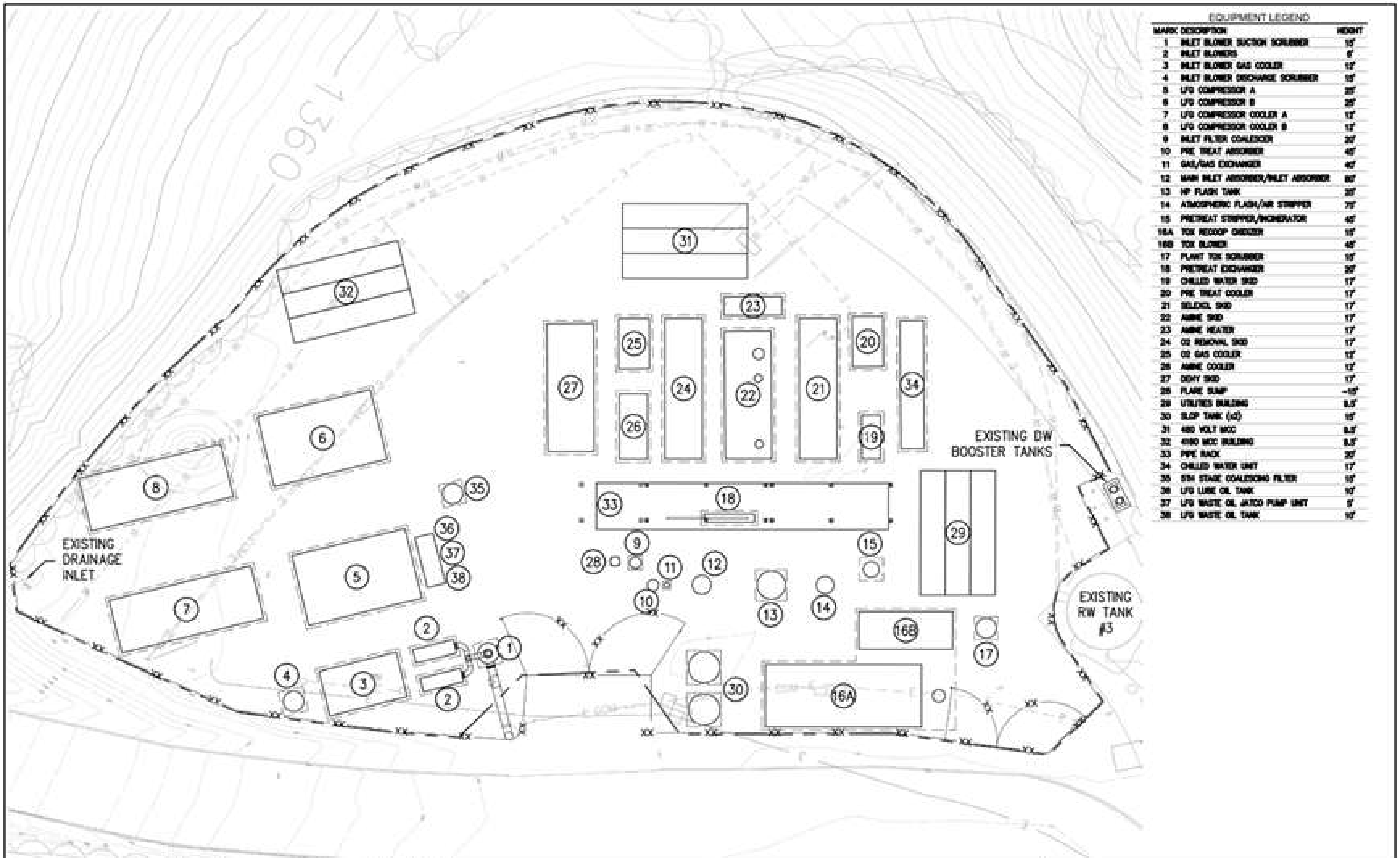
N

Not to Scale

Figure 3
South RNG Site

RNG Facility Project at El Sobrante Landfill

AECOM

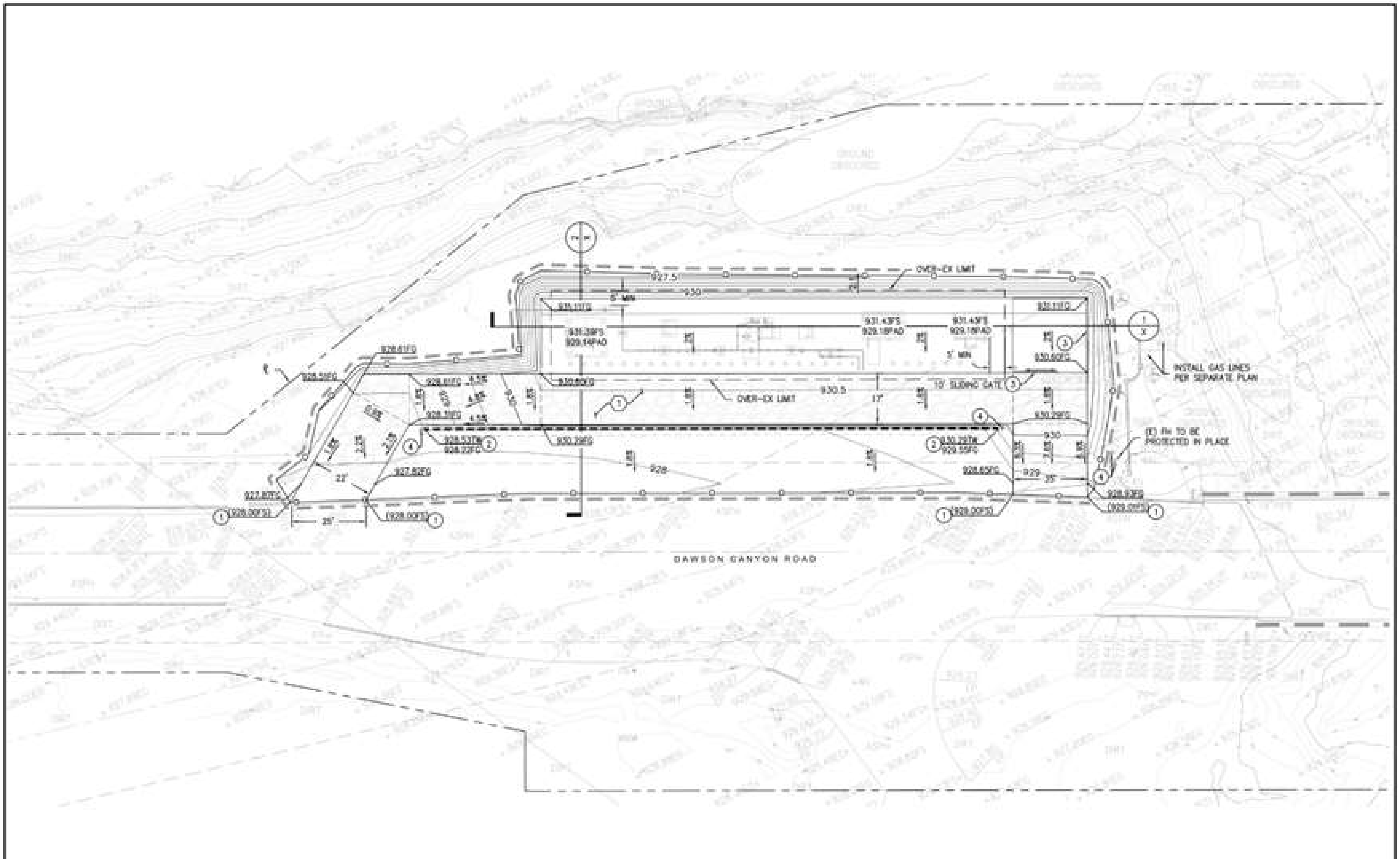


Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

Figure 4
North RNG Site

RNG Facility Project at El Sobrante Landfill

AECOM



Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

LEGEND
RIDGE LINE / GRADE BREAK
OVER-EX LIMIT
GRADING DAYLIGHT LIMIT
LIMIT OF WORK

CONSTRUCTION NOTES	
1	JOIN EXISTING CURB AND MATCH GRADE.
2	CONSTRUCT MASONRY RETAINING WALL PER SPPWC STANDARD PLAN 616-3 TYPE A.
3	CONSTRUCT 8' CHAIN LINK FENCE AND GATES PER SPPWC STANDARD PLAN 600-4. DRIVE GATE OPENING WIDTHS PER PLAN. (FOR CHAIN LINK PER SEPARATE SGC PLANS)
4	INSTALL CONCRETE BOLLARD PER SEPARATE STRUCTURAL PLANS.

PAVING LEGEND	
1	UNPAVED ROAD: PLACE 18" MINIMUM ¾ INCH MINUS, CLASS 2 AGGREGATE BASE PER CALTRANS STANDARD SPECIFICATIONS, COMPACTED TO AT LEAST 95% RELATIVE COMPACTION UNDERLAIN BY A GEOTEXTILE LAYER AS DESCRIBED IN THE GEOTECHNICAL REPORT.

N

Not to Scale

Figure 5
Gas POR Site

RNG Facility Project at El Sobrante Landfill

AECOM

Toro expects to hire seven additional full-time employees and up to three part-time employees to manage the operation of the RNG Facility. Regular deliveries of materials (oil, chemicals, spare parts [e.g., filters]) are expected to require one truck trip per week. Infrequent maintenance truck trips (limited to emergency instrument repairs/swap outs, inspections, and other maintenance needs [e.g., oil changes]) would require up to seven vehicle trips spanning up to 10 calendar days out of a year.

Toro and WM are separate corporate entities; therefore, the RNG Facility and ESL are owned and operated independently. Each source will maintain separate permits and reporting.

Air Quality and GHG Emissions Topical Information

AIR QUALITY

Air quality is typically characterized by ambient air concentrations of seven specific pollutants identified by the United States Environmental Protection Agency (USEPA) to be of concern with respect to health and welfare of the general public. These specific pollutants, known as "criteria air pollutants", are pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. These pollutants are common byproducts of human activities and have been documented through scientific research to cause adverse health effects. The federal ambient concentration criteria are known as the National Ambient Air Quality Standards (NAAQS), and the California ambient concentration criteria are referred to as the California Ambient Air Quality Standards (CAAQS). Federal criteria air pollutants include ground-level ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter ten microns or less in diameter (PM_{10}), fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), and lead (Pb). In addition to the federal criteria pollutants, the state regulates ambient concentrations of visibility-reducing particles, sulfates ($-SO_4^{2-}$), hydrogen sulfide (H_2S), and vinyl chloride.

Air toxics are generally defined as contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. Air toxics are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Air toxics include, but are not limited to, diesel PM, metals, gases absorbed by particles, and certain vapors from fuels and other sources.

GREENHOUSE GASES

The classification of GHG emissions refers to a group of emissions that are generally believed to affect global climate conditions. The greenhouse effect compares the Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), keep the average surface temperature of the Earth close to 60-degrees Fahrenheit (°F). Without the natural greenhouse effect, the Earth's surface would be about 61°F cooler.[2]

In addition to CO_2, CH_4, and N_2O, GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), black carbon (black carbon is the most strongly light-absorbing component of particulate matter emitted from burning fuels such as coal, diesel, and biomass), and water vapor. CO_2 is the most abundant pollutant that contributes to climate change through fossil fuel combustion. The other GHGs are less abundant but have higher global warming potential than CO_2. To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent of CO_2, denoted as CO_2e. CO_2e is a measurement used to

[2] California Environmental Protection Agency Climate Action Team, *Climate Action Report to Governor Schwarzenegger and the California Legislator*, March 2006.

account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. **Table 2** presents the spectrum of various GWP and atmospheric lifetimes of the most environmentally prevalent GHGs.

TABLE 2: ATMOSPHERIC PROPERTIES FOR REGULATED GREENHOUSE GASES			
Pollutant	**Lifetime (Years)**	**Global Warming Potential (20-Year)**	**Global Warming Potential (100-Year)**
Carbon Dioxide (CO_2)	--	1	1
Methane (CH_4)	12	21	25
Nitrous Oxide (N_2O)	114	310	298
Nitrogen Trifluoride	740	Unknown	17,200
Sulfur Hexafluoride (SF_6)	3,200	23,900	22,800
Perfluorocarbons (PFCs)	2,600-50,000	6,500-9,200	7,390-12,200
Hydrofluorocarbons (HFCs)	1-270	140-11,700	124-14,800
SOURCE: CARB, *GHG Global Warming Potentials*, Available at https://ww2.arb.ca.gov/ghg-gwps.			

Regulatory Framework

The following discussion includes relevant regulations, policies, and programs that have been adopted by federal, state, regional, and local agencies to protect public health and the environment.

AIR QUALITY

Federal

The Clean Air Act (CAA) governs air quality at the national level, and the USEPA is responsible for enforcing the regulations provided in the CAA. Under the CAA, the USEPA is authorized to establish NAAQS that set protective limits on concentrations of air pollutants in ambient air. Enforcement of the NAAQS is required under the 1977 CAA and subsequent amendments. As required by the CAA, NAAQS have been established for the seven criteria air pollutants: O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and Pb. These pollutants are common byproducts of human activities and have been documented through scientific research to cause adverse health effects. The CAA grants the USEPA authority to designate areas as attainment, nonattainment, or maintenance (i.e., previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS concentrations have been met on a regional scale, relying upon air monitoring data from the most recent three-year period. The NAAQS are summarized in **Table 3** along with the attainment status designations of the federal standards for the Riverside County portion of the South Coast Air Basin (SCAB).

State

Air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). The CCAA is administered by the California Air Resources Board (CARB) at the state level and by the air quality management districts at the regional and local levels. The CCAA requires all areas of the state to achieve and maintain the CAAQS by the earliest feasible date, which is determined in the most recent State Implementation Plan based on existing emissions and reasonably foreseeable control measures that will be implemented in the future. The CAAQS are also summarized in **Table 3**, below, along with the attainment status designations of the State standards for the Riverside County portion of the SCAB.

TABLE 3: AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS DESIGNATIONS					
		California		**Federal**	
Pollutant	**Averaging Period**	**Standards (CAAQS)**	**Attainment Status**	**Standards (NAAQS)**	**Attainment Status**
Ozone (O_3)	1-Hour Average	0.09 ppm (180 μg/m^3)	Nonattainment	*0.12 ppm (Revoked)*	*Nonattainment ("Extreme")*[/a/]
	8-Hour Average	0.070 ppm (137 μg/m^3)	Nonattainment	0.070 ppm (137 μg/m^3)	Nonattainment ("Extreme")
Carbon Monoxide (CO)	1-Hour Average	20 ppm (23 mg/m^3)	Attainment	35.0 ppm (40 mg/m^3)	Attainment (Maintenance)
	8-Hour Average	9.0 ppm (10 mg/m^3)	Attainment	9.0 ppm (10 mg/m^3)	Attainment (Maintenance)
Nitrogen Dioxide (NO_2)	1-Hour Average	0.18 ppm (338 μg/m^3)	Attainment	0.10 ppm (188 μg/m^3)	Unclassifiable/ Attainment
	Annual Arithmetic Mean	0.03 ppm (57 μg/m^3)	Attainment	0.053 ppm (100 μg/m^3)	Attainment (Maintenance)
Sulfur Dioxide (SO_2)	1-Hour Average	0.25 ppm (655 μg/m^3)	Attainment	0.075 ppm (196 μg/m^3)	Unclassifiable/ Attainment
	24-Hour Average	0.04 ppm (105 μg/m^3)	Attainment	0.14 ppm (365 μg/m^3)	Unclassifiable/ Attainment
	Annual Arithmetic Mean	--	--	0.030 ppm (80 μg/m^3)	Unclassifiable/ Attainment
Respirable Particulate Matter (PM_{10})	24-Hour Average	50 μg/m^3	Nonattainment	150 μg/m^3	Attainment (Maintenance)
	Annual Arithmetic Mean	20 μg/m^3	Nonattainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-Hour Average	--	--	35 μg/m^3	Nonattainment ("Serious")
	Annual Arithmetic Mean	12 μg/m^3	Nonattainment	9.0 μg/m^3	Nonattainment ("Serious")
Lead (Pb)	30-day Average	1.5 μg/m^3	Attainment	--	--
	Rolling 3-Month Average	--	--	0.15 μg/m^3	Unclassified/ Attainment
Sulfates (~SO_4^{2-})	24-Hour Average	25 μg/m^3	Attainment	**No Federal Standards**	
Hydrogen Sulfide (H_2S)	1-Hour Average	0.03 ppm (42 μg/m^3)	Unclassified		
Vinyl Chloride	24-Hour Average	0.01 ppm (26 μg/m^3)	Unclassified		

CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million; μg/m^3 = micrograms per cubic meter.
/a/ The 1979 1-hour O_3 NAAQS (0.12 ppm) was revoked, effective 6/15/2005; however, the SCAB has not attained this standard and therefore has some continuing obligations with respect to the revoked standard. The current attainment date is 2/6/2023.
SOURCE: SCAQMD, *Final 2022 Air Quality Management Plan – Appendix II: Current Air Quality*, 2022.

The CARB's statewide comprehensive air toxics program was established in the early 1980s. The Toxic Air Contaminant Identification and Control Act created California's program to reduce exposure to air toxics. Under the Toxic Air Contaminant Identification and Control Act, the CARB is required to prioritize the identification and control of air toxics emissions. In selecting substances for review, the CARB must consider criteria relating to the risk of harm to public health, such as amount or potential amount of emissions, manner of and exposure to usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community.

Regional

The 1977 Lewis Air Quality Management Act established the SCAQMD to coordinate air quality planning efforts throughout Southern California. The SCAQMD has jurisdiction over a total area of 10,743 square miles, consisting of the South Coast Air Basin (SCAB)—which comprises 6,745 square miles including Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties—and the Riverside County portion of the Salton Sea and Mojave Desert Air Basins. The proposed project would be located in the southernmost portion of the City of Corona and would be situated within the Riverside County Portion of the SCAB.

The SCAQMD is tasked with preparing regional programs and policies designed to improve air quality within the SCAB, which are assessed and published in the form of the Air Quality Management Plan (AQMP). The AQMP is updated every four years to evaluate the effectiveness of the adopted programs and policies and to forecast attainment dates for nonattainment pollutants to support the State Implementation Plan based on measured regional air quality and anticipated implementation of new technologies and emissions reductions. The most recent iteration of the regional plan is the 2022 AQMP that was formally adopted on December 2, 2022. The 2022 AQMP represents a thorough analysis of existing and potential regulatory control options, and includes available, proven, and cost-effective strategies to pursue multiple goals in promoting reductions in greenhouse gas emissions and toxic risk, as well as efficiencies in energy use, transportation, and goods movement.

The 2022 AQMP focuses on delineating NAAQS attainment dates for the 2015 eight-hour O_3 standard, which must be achieved by 2037 in following the USEPA's designation of the SCAB as an "Extreme" nonattainment area in 2018. Extreme nonattainment areas have a 20-year horizon to demonstrate how emissions reductions can be achieved to meet the air quality standard. The 2022 AQMP acknowledged that the most significant air quality challenge in the SCAB is the reduction of nitrogen oxides (NO_X) emissions, which must be reduced by 67 percent beyond what would be achieved with current regulatory programs. The 2022 AQMP builds on previous AQMPs and includes a variety of new strategies such as regulation, accelerated deployment of cleaner technologies as available (e.g., zero emissions technologies, when cost effective and feasible, and low-NO_X technologies in other applications), best management practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other measures to achieve the 2015 eight-hour O_3 standard.

The 2022 AQMP also includes an element that is related to transportation and sustainable communities planning. Pursuant to California Health and Safety Code Section 40450, the Southern California Association of Governments (SCAG) is designated as a Regional Transportation Planning Agency and a Council of Governments and has the responsibility of preparing and approving the portions of the AQMP that addresses transportation control measures, land use, and growth projections. The analysis incorporated into the 2022 AQMP is based on the forecasts contained within the SCAG Connect SoCal 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). SCAG formally adopted the Connect SoCal RTP/SCS on September 3, 2020, and the subsequent amendments have demonstrated conformity with the emissions budgets and attainment deadlines established by the AQMPs.

The SCAQMD has also established various rules to manage and improve air quality in the SCAB. The City shall comply with all applicable SCAQMD Rules and Regulations pertaining to construction activities, including, but not limited to:

- **Rule 402 (Nuisance)** states that a person should not emit air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
- **Rule 403 (Fugitive Dust)** controls fugitive dust through various requirements including, but not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining effective cover over exposed areas. Rule 403 also prohibits the release of fugitive dust emissions from any active operation, open storage piles, or disturbed surface area beyond the property line of the emission source and prohibits particulate matter deposits on public roadways.
- **Rule 1150.1 (Control of Gaseous Emissions from Active Landfills)** was established to reduce gaseous emissions from active landfills to prevent public nuisance and possible detriment to public health caused by exposure to such emissions. The rule requires in an active landfill, a landfill gas control system approved by the Executive Officer. This rule limits the average concentration of total organic compounds over a certain area on the surface of the landfill from exceeding 50 ppm and the maximum concentration of organic compounds as methane, measured at any point on the surface of the landfill, from exceeding 500 ppm.
- **Rule 1186 (PM_{10} Emissions from Paved and Unpaved Roads, and Livestock Operations)** specifically addresses dust deposited on paved roadway surfaces. It requires that any owner or operator of a paved public road on which there is visible roadway dust accumulations shall begin removal of such material through street cleaning within 72 hours of any notification of the accumulation and shall completely remove such material as soon as feasible.

<u>Local</u>

Local jurisdictions, such as the City of Corona, have the authority and responsibility to reduce air pollution through their land use decision-making authority. Specifically, the City is responsible for the assessment and mitigation of air emissions resulting from its land use decisions. The City is also responsible for the implementation of transportation control measures as outlined in the 2022 AQMP. In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces the implementation of such mitigation. The City relies on the expertise of the SCAQMD and utilizes the SCAQMD *CEQA Air Quality Handbook* as the guidance document for the environmental review of plans and development proposals within its jurisdiction.

GREENHOUSE GASES

Federal

In response to the Massachusetts v. USEPA ruling, President George W. Bush issued Executive Order (EO) 13432 in 2007, directing the USEPA, the United States Department of Transportation, and the United States Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. The National Highway Traffic Safety Administration (NHTSA) subsequently issued multiple final rules regulating fuel efficiency for and GHG emissions from cars and light-duty trucks for model year 2011 and later for model years 2012 through 2016. On May 19, 2009, the President of the United States announced a national policy for fuel efficiency and emissions standards in the auto industry. The adopted federal standard applies to passenger cars and light-duty trucks for model years 2012 through 2016.[3] These standards set a combined fleet wide average of 36.9 to 37 for the model years affected.[4]

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the USEPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014 through 2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the USEPA, this regulatory program would reduce GHG emissions and fuel consumption for the affected vehicles by six to 23 percent over the 2010 baselines.[5] Building on the first phase of standards, in August 2016, the USEPA and NHTSA finalized Phase 2 standards for medium and heavy-duty vehicles through model year 2027 that will improve fuel efficiency and cut carbon pollution. The Phase 2 standards are expected to lower CO_2 emissions by approximately 1.1 billion metric tons.[6]

The Energy Independence and Security Act facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- Requiring approximately 25 percent greater efficiency for light bulbs by phasing out incandescent light bulbs between 2012 and 2014; requiring approximately 200 percent greater efficiency for light bulbs, or similar energy savings, by 2020; and,
- While superseded by the USEPA and NHTSA actions described above, (i) establishing miles per gallon targets for cars and light trucks and (ii) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

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[3] USEPA, *Final Rule for Model Year 2012 – 2016 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards*, 2010, https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2012-2016-light-duty-vehicle, accessed August 2022.

[4] NHTSA, *Corporate Average Fuel Economy Standards*.

[5] The emission reductions attributable to the regulations for medium- and heavy-duty trucks were not included in the proposed project's emissions inventory due to the difficulty in quantifying the reductions. Excluding these reductions results in a more conservative (i.e., higher) estimate of emissions for the proposed project.

[6] USEPA, *EPA and NHTSA Adopt Standards to Reduce GHG and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles for Model Year 2018 and Beyond,* August 2016.

State

California Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24 of the California Code of Regulations) contain energy and water efficiency requirements (and indoor air quality requirements) for newly constructed buildings, additions to existing buildings, and alterations to existing buildings. The California Green Building Code, also referred to as CalGreen, lays out minimum requirements for newly constructed buildings in California, which will reduce GHG emissions through improved efficiency and process improvements.

Signed on September 12, 2002, Senate Bill (SB) 1078 required California to generate 20 percent of its electricity from renewable energy by 2017. SB 107, signed on September 26, 2006, changed the due date for this goal from 2017 to 2010, which was achieved by the state. On November 17, 2008, EO S-14-08, which established a Renewables Portfolio Standard (RPS) target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the State's RPS Program, requiring electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

Assembly Bill (AB) 1493 amended the Clean Car Standards (Chapter 200, Statutes of 2002), also known as the "Pavley" regulations which require reductions in GHG emissions in new passenger vehicles from 2009 through 2016. The amendments are part of California's commitment toward a nation-wide program to reduce new passenger vehicle GHGs from 2012 through 2016. The Clean Car Standards required CARB to develop and adopt standards for vehicle manufacturers to reduce GHG emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost-effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 to 2016; and Pavley II, which is now referred to as Low Emission Vehicle III GHG, will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction by 2012 and 30 percent by 2016.

EO S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

The California Global Warming Solutions Act of 2006, also known as AB 32, was signed into law. AB 32 focuses on reducing GHG emissions in California and requires the CARB to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. The 2020 target reductions were estimated to be 174 million metric tons of CO_2e. In November 2017, CARB adopted *California's 2017 Scoping Plan: The Strategy for Achieving California's 2030 GHG target* (2017 Scoping Plan), which established a goal of reducing statewide emissions to a level 40 percent below 2020 emissions by 2030. The 2017 Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts and identifies new policies and actions to accomplish the state's climate goals.

Most recently, CARB adopted the *2022 Scoping Plan for Achieving Carbon Neutrality* (2022 Scoping Plan). This plan was developed to outline a technologically feasible, cost-effective, and equity-focused path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan Update sets a target of reducing statewide GHG emissions by 85 percent by 2045 to achieve its ambitious goals. Additionally, CARB forecasts that effective implementation of the 2022 Scoping Plan will reduce statewide demand for petroleum by 94 percent and cut air pollution by 71 percent by the 2045 horizon year. The 2022 Scoping Plan includes a commitment to build no new fossil gas-fired power plants and increases support for mass transit.

In January 2012, CARB adopted the Advanced Clean Cars program to extend AB 1493 through model years 2017 to 2025. This program will promote all types of clean fuel technologies such as plug-in hybrids, battery electric vehicles, compressed natural gas vehicles, and hydrogen powered vehicles while reducing smog and saving consumers' money in fuel costs. Fuel savings may be up to 25 percent by 2025.

SB 375 requires RTPs to include SCSs. It provides a means for achieving AB 32 goals through the reduction in emissions by cars and light trucks.

EO B-30-15 set a goal to reduce GHG emissions 40 percent below their 1990 levels by 2030. The EO establishes GHG emissions reduction targets to reduce emissions to 80 percent below 1990 levels by 2050 and sets an interim target of emissions reductions for 2030 as being necessary to guide regulatory policy and investments in California and put California on the most cost-effective path for long-term emissions reductions.

Passed in 2016, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring a reduction goal of 40 percent below 1990 levels by 2030. CARB's 2017 Climate Change Scoping Plan (2017 Scoping Plan) (CARB 2017) describes California's strategy for achieving the 2030 GHG emissions reduction target established by SB 32. The 2017 Scoping Plan also recognized the critical and complementary role of local government in achieving the state's climate goals. CARB's Mobile Source Strategy (CARB 2016) describes California's strategy for containing air pollutant emissions from vehicles and quantifies growth in VMT that is compatible with achieving state climate targets.

EO B-55-18 directed the State to achieve carbon neutrality no later than 2045 and to achieve and maintain net negative emissions thereafter. The carbon neutrality target established by EO B-55-18 spurred the ambitious strategies and goals that were laid out in the *2022 Scoping Plan for Achieving Carbon Neutrality*.

EO N-79-20 established a target to make all new vehicles sold in the state emission free: applying to cars and passenger trucks by 2035, and medium- and heavy-duty trucks by 2045.

Regional

SCAG is the Metropolitan Planning Organization for the six-county region that includes Los Angeles, Orange, Riverside, Ventura, San Bernardino and Imperial counties. The RTP/SCS includes commitments to reduce emissions from transportation sources to comply with SB 375. Goals and policies included in the RTP/SCS to reduce air pollution consist of adding density in proximity to transit stations, mixed-use development and encouraging active transportation (i.e., non-motorized transportation such as bicycling). The most recent iteration of the SCAG RTP/SCS that has been approved by the Federal Highway Administration (FHWA) and the CARB is the *Connect SoCal* 2020–2045 RTP/SCS.

Local

The County of Riverside Climate Action Plan (CAP) Update was approved on December 17, 2019, and refines the County's efforts to meet GHG reduction strategies, specifically for the years 2030 and 2050. The 2019 CAP Update builds upon the foundation of GHG reduction strategies originally outlined in the 2015 CAP, and serves as a guide to help the County implement the objectives of conserving resources and reducing GHG emissions. The 2015 CAP included the establishment of a baseline emissions inventory using 2008 emissions levels. The 2019 CAP Update quantified a new interim baseline emissions inventory using 2017 data, and set targets to reduce community-wide GHG emissions to 15 percent below 2008 levels by 2020, to 49 percent below 2008 levels by 2030, and to 83 percent below 2008 levels by 2050. The County determined that these reduction targets would be consistent with the statewide reduction targets established by AB 32 (reduce GHG emissions to 1990 levels by 2020 and to 80 percent below 1990 levels by 2050) and SB 32 (reduce GHG emissions to 40 percent below 1990 levels by 2030).

The City of Corona General Plan 2020–2040 was adopted in June 2020. The GHG emissions-related goals and policies from the Environmental Resources Element that are applicable to the proposed project are presented below:

Goal ER-13: *Reduce GHG emissions from City operations and community-wide sources to 15 percent below 2008 levels by 2020, 49 percent below 2008 levels by 2030, and 66 percent below 2008 levels by 2040.*

> *Policy ER-13.1: Maintain and periodically update a comprehensive Climate Action Plan (CAP) that details the City's strategies to reduce GHG emissions and to ensure ongoing and sustained reduction of GHG emissions from all sectors to meet 2020, 2030, and 2040 reduction targets.*
>
> *Policy ER-13.2: Encourage the maximum feasible energy efficiency in site design, building orientation, landscaping, and utilities/infrastructure for all development and redevelopment projects (residential, commercial, industrial, and public agency) to support GHG emissions reductions.*
>
> *Policy ER-13.4: Support the increase of clean energy supply to existing and new development and municipal facilities through means to include, but not be limited to, onsite or other local renewable energy sources for new and existing buildings and infrastructure.*
>
> *Policy ER-13.6: Reduce solid waste sent to the landfills and associated community-wide GHG emission by ensuring all properties have access to curbside solid waste, recycled materials, and green/organize waste programs; target special programs for construction debris, household hazardous waste, etc.*

The City of Corona adopted the City's CAP Update in March 2019. Consistent with the Stat's adopted AB 32 GHG reduction target, the City's CAP Update has set a goal to reduce emissions to 1990 levels by the year 2020. This target was calculated as a 15-percent decrease from 2008 levels, as recommended in the AB 32 Scoping Plan. An interim goal for the City was created for 2030, which was to reduce emissions to 49 percent below 2008 levels. A longer-term goal was established for 2040, which was to reduce emissions to 66 percent below 2008 levels. The interim and longer-term goals would put the City on a path toward the State's long-term goal to reduce emissions 80 percent below 1990 levels by 2050. As stated in the City's CAP Update, additional local reduction measures that encourage energy efficiency, water conservation, alternative transportation, solid waste reduction, and clean energy are to be implemented in order to reach the City's reduction targets.

The CAP Update contains a community-wide GHG emissions inventory and a series of GHG reduction measures that are specific to various sectors of City operations. Of particular relevance to the proposed project are the GHG reduction measures that focus on solid waste (Goal 8: Decrease GHG Emissions through Reducing Solid Waste Generation) and energy (Goal 9: Decrease GHG Emissions through Increasing Clean Energy Use).

Existing Setting

AIR QUALITY

As acknowledged previously under the Regional Regulatory Framework, the ESL site is located in the portion of Riverside County within the SCAB, which is under the jurisdiction of the SCAQMD. The SCAB is subject to high levels of air pollution due to the immense magnitude of emissions sources and the combination of topography, low mean atmospheric mixing height, and abundant sunshine. Although the SCAB has a semiarid climate, air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants horizontally.

The mountains and hills surrounding the SCAB contribute to the variation of rainfall, temperature, and winds throughout the region. During the spring and early summer, pollution produced during any one day is typically blown out of the region through mountain passes or lifted by warm, vertical currents adjacent to mountain slopes. The vertical dispersion of air pollutants in the SCAB is limited by temperature inversions in the atmosphere close to the Earth's surface. The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants become more concentrated in urbanized areas with pollution sources of greater magnitude.

Air quality within the SCAB region is characterized by concentrations of air pollutants measured at monitoring stations located throughout the SCAQMD jurisdiction. The SCAQMD jurisdiction is divided geographically into 38 source receptors areas (SRAs), 28 of which contain at least one air quality monitoring station. The SRA boundaries were drawn based on proximity to the nearest air monitoring station, the local land use patterns and emissions sources, and surrounding topography. The proposed project site is located within SRA 22 – Corona/Norco Area (North and South RNG Sites) and SRA 25 – Lake Elsinore (Gas POR Site).

The monitoring site that provides data most representative of air quality in the vicinity of the proposed project is the Lake Elsinore site located at 506 West Flint Street approximately 11.6 miles southeast of the proposed project. **Table 4** displays recent monitored pollutant concentrations in the vicinity of the proposed project, the State and federal standards, and the frequency of concentrations recorded above the standards during the three-year period from 2021 to 2023. Recorded data in **Table 4** demonstrate that ambient concentrations of O_3 exceeded the CAAQS for both the one-hour and eight-hour averaging periods in all three years. Concentrations of PM_{10} exceeded the 24-hour average NAAQS once in 2023 and exceeded the annual average State standard in all three years. There were no instances of any CAAQS or NAAQS being exceeded for NO_2, CO, or $PM_{2.5}$ during the most recent three-year monitoring period at the Lake Elsinore monitoring location.

TABLE 4: MONITORED AMBIENT AIR QUALITY DATA IN THE PROJECT VICINITY

Pollutant	Data Statistics and Air Quality Standards	Yearly Maximum Concentrations and Frequencies of Exceeded Standards		
		2021	2022	2023
Ozone (O_3)	Maximum 1-hr. Concentration (ppm)	0.118	0.121	0.120
	Days > 0.09 ppm (State 1-hr. standard)	18	17	10
	Maximum 8-hr. Concentration (ppm)	0.097	0.091	0.103
	Days > 0.070 ppm (State 8-hr. standard)	44	37	31
	Days > 0.070 ppm (National 8-hr. standard)	44	37	31
Nitrogen Dioxide (NO_2)	Maximum 1-hr. Concentration (ppm)	0.044	0.037	0.042
	Days > 0.18 ppm (State 1-hr. standard)	0	0	0
	Days > 0.100 ppm (National 1-hr. standard)	0	0	0
Carbon Monoxide (CO)	Maximum 1-hr. Concentration (ppm)	0.9	0.9	1.3
	Days > 20.0 ppm (State 1-hr. standard)	0	0	0
	Days > 35 ppm (National 1-hr. standard)	0	0	0
	Maximum 8-hr. Concentration (ppm)	0.8	0.6	0.7
	Days > 9.0 ppm (State 1-hr. standard)	0	0	0
	Days > 9 ppm (National 1-hr. standard)	0	0	0

TABLE 4: MONITORED AMBIENT AIR QUALITY DATA IN THE PROJECT VICINITY				
Pollutant	Data Statistics and Air Quality Standards	Yearly Maximum Concentrations and Frequencies of Exceeded Standards		
		2021	2022	2023
Respirable Particulate Matter (PM_{10})	Maximum 24-hr. Concentration (μg/m³) Days > 50 μg/m³ (State 24-hr. standard) Days > 150 μg/m³ (Federal 24-hr. standard) Annual Average Concentration (μg/m³) Exceed State Annual Standard (20 μg/m³)?	90.0 4 0 22.4 Yes	91.8 1 0 20.3 Yes	187.0 5 1 21.8 Yes
Fine Particulate Matter ($PM_{2.5}$)	Maximum 24-hr. Concentration (μg/m³) Days > 35 μg/m³ (National 24-hr. standard) Annual Average Concentration (μg/m³) Exceed State Annual Standard (12 μg/m³)? Exceed Federal Annual Standard (9.0 μg/m³)?	28.8 0 6.9 No No	16.2 0 5.8 No No	19.9 0 5.9 No No

Note: ppm = parts per million; μg/m³ = micrograms per cubic meter.
SOURCE: CARB, *Air Quality Data Statistics*, *Top 4 Summary*, http://www.arb.ca.gov/adam/topfour/topfour1.php, Accessed July 2024; SCAQMD, *Historical Data by Year (2021, 2022, 2023)*, https://www.aqmd.gov/home/air-quality/historical-air-quality-data/historical-data-by-year, Accessed July 2024.

Regarding human exposures to air pollutant concentrations and the susceptibility to associated health effects, some land uses are considered more sensitive to changes in air quality than others depending on the population subgroups likely to be present and the nature of occupant behaviors. The CARB has identified the following subgroups of individuals who are most susceptible to experience adverse health effects due to exposure to air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, land uses that constitute sensitive receptors where these subgroups spend extended periods of time include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The proposed project is located in a rural environment in the southernmost portion of the City of Corona. There are no sensitive receptors within 1,600 feet of the proposed project site. The closest receptors are single-family residences located approximately 1,740 feet (530 meters) west of the Gas POR Site on the opposite side of Interstate 15. Therefore, SCAQMD guidance indicates that a localized emissions analysis is not warranted; however, it has been included for informational purposes.

GREENHOUSE GASES

GHGs are the result of both natural and human-influenced activities. Volcanic activity, forest fires, decomposition, industrial processes, landfills, consumption of fossil fuels for power generation, transportation, heating, and cooling are the primary sources of GHG emissions. Without human activity, the Earth would maintain an approximate, but varied, balance between the emission of GHGs into the atmosphere and the storage of GHG in oceans and terrestrial ecosystems. Increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) has contributed to a rapid increase in atmospheric levels of GHGs over the last 150 years. **Table 5** shows statewide GHG emissions from 2011 to 2021 that are tracked by the CARB. The transportation sector represents California's largest source of GHG emissions and contributed 37 percent of total annual emissions. Between 2013 and 2017, emissions from the transportation sector increased due to economic and population growth; however, the long-term trajectory of transportation-related GHG emissions is on the decline, with a 13 percent drop over the past decade. In 2021, emissions from routine emitting activities statewide were approximately 56.5 $MMTCO_2e$ (13 percent) lower than 2011 levels, and approximately 50 $MMTCO_2e$ below the 1990 level (431 $MMTCO_2e$), which was the State's 2020 GHG target.

TABLE 5: CALIFORNIA GREENHOUSE GAS EMISSIONS INVENTORY

Sector	Annual CO_2e Emissions (Million Metric Tons)										
	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Transportation	159.5	156.9	156.9	157.6	161.2	165.0	166.4	165.2	162.3	135.6	145.6
Industrial	85.8	99.4	94.0	90.3	86.3	70.8	64.4	65.0	60.2	59.5	62.4
Electric Power	89.2	80.7	82.7	85.0	82.7	81.2	81.4	82.0	80.8	73.3	73.9
Commercial and Residential	46.0	39.1	39.0	35.5	37.2	37.7	38.3	37.5	40.6	38.9	38.8
Agriculture	34.2	35.2	33.7	33.7	32.6	32.1	31.6	32.1	31.3	31.5	30.9
High GWP Emissions	14.8	15.8	17.0	17.9	18.8	19.4	20.1	20.5	20.7	21.3	21.3
Recycling and Waste	8.2	8.4	8.3	8.1	8.1	7.9	8.2	8.3	8.4	8.6	8.4
Total	**437.8**	**435.5**	**431.6**	**428.2**	**426.9**	**414.2**	**410.4**	**410.7**	**404.4**	**368.7**	**381.3**

SOURCE: CARB, *GHG Emissions Inventory (GHG EI) 2000–2021*, 2023; available at https://ww2.arb.ca.gov/ghg-inventory-data.

Of note, the COVID-19 pandemic globally affected economic activity in 2020 and 2021, including within California. Supply chain disruptions caused by the pandemic spurred an economic downturn that was pervasive throughout numerous sectors, as evidenced by the sharp decrease in statewide GHG emissions associated with transportation and electric power between 2019 and 2020 shown in **Table 5**. The CARB has not yet published finalized GHG emissions inventory data for 2022 or 2023, but the data for 2021 demonstrates a partial rebound effect in transportation-related emissions.

Significance Thresholds

This impacts assessment was undertaken to determine whether construction or operation of the proposed project would have the potential to result in significant environmental impacts in the context of the Appendix G Environmental Checklist criteria of the CEQA Statute and Guidelines.

AIR QUALITY

Implementation of the proposed project may result in a significant environmental impact related to Air Quality if the proposed project would:

a) Conflict with or obstruct implementation of the applicable air quality plan;
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;
c) Expose sensitive receptors to substantial pollutant concentrations; and/or,
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The Environmental Checklist acknowledges that, "[w]here available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make" the impact determinations. In its original 1993 *CEQA Air Quality Handbook*, the SCAQMD established screening thresholds for regional emissions based on maximum allowable mass daily emissions from construction and operation of proposed projects, which were derived from previously established quarterly and annual USEPA thresholds.[7] Regional emissions refer to all sources of emissions that would be associated with construction and operation of a project, both those located on the project site as well as remote or mobile sources of emissions.

Table 6 shows the regional and localized thresholds for daily emissions of CO, NO_X, VOC, sulfur oxides (SO_X), PM_{10}, and $PM_{2.5}$ generated by projects subject to CEQA within the SCAB and within SRA 22 and 25. The SCAQMD considers any project that would not produce daily emissions in excess of any regional threshold to have less-than-significant air quality impacts at both the project level and in the cumulative context. Conversely, if construction or operation of a project would generate daily mass emissions exceeding the regional threshold values presented in **Table 6**, those emissions would be considered significant, and opportunities for mitigation would need to be explored and implemented as feasible.

TABLE 6: SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS – MASS DAILY EMISSIONS

Screening Threshold	VOC (lbs./day)	NO_X (lbs./day)	CO (lbs./day)	SO_X (lbs./day)	PM_{10} (lbs./day)	$PM_{2.5}$ (lbs./day)
CONSTRUCTION						
Regional Threshold	75	100	550	150	150	55
Localized Threshold (SRA 22)	--	652	17,637	--	198	92
Localized Threshold (SRA 25)	--	896	23,866	--	178	86
OPERATIONS						
Regional Threshold	55	55	550	150	150	55
Localized Threshold (SRA 22)	--	652	17,637	--	48	23
Localized Threshold (SRA 25)	--	896	23,866	--	43	21

Lbs./day = pounds emitted per day.
Note: LST values selected for one-acre disturbance area based on equipment inventory and 500-meter receptor proximity in SRA 22/25.
SOURCE: SCAQMD, 2009 and 2023.

In addition to the regional thresholds, the SCAQMD originally published its guidance on using localized significance thresholds (LSTs) for CEQA impact assessments in 2003 and updated the guidance in 2008. The localized emissions analysis addresses only those sources that would be located on the project site, such as off-road equipment exhaust and fugitive area sources such as dust generation and asphalt off-gassing during construction activities. The SCAQMD LST guidance includes mass-rate lookup tables for daily emissions of NO_X, CO, PM_{10}, and $PM_{2.5}$ that correspond to the SRA in which a project is located, the area of daily disturbance during construction activities or site size during operations, and the proximity of the nearest sensitive receptor(s).[8] Using dispersion modeling and ambient air quality data during the 2000–2002 monitoring period, the SCAQMD developed SRA-specific maximum allowable emissions levels from on-site sources to prevent the occurrence of pollutant hot-spots surrounding the sites of projects subject to CEQA. The LST values presented in **Table 6** are specific to SRA 22 and 25 for a construction site with up to one acre of daily ground disturbance area with sensitive receptors at approximately 1,640 feet (500 meters) and were obtained from the SCAQMD LST guidance document.[9] These LST screening values are presented for informational purposes only, as the closest sensitive receptors are over 1,700 feet from the Gas POR Site.

[7] SCAQMD, *CEQA Air Quality Handbook (Version 3)*, November 2001.
[8] SCAQMD, *Final Localized Significance Threshold Methodology*, July 2008.
[9] SCAQMD, *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds*, February 2011.

GREENHOUSE GASES

Implementation of the proposed project may result in a significant environmental impact related to GHG emissions if the proposed project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Section 15064.4 of the CEQA Guidelines states that a lead agency should make a good-faith effort to describe, calculate, or estimate the amount of GHG emissions resulting from a project, and that the lead agency should consider the following factors when assessing the significance of impacts from GHG emissions on the environment:

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and,
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The CEQA Guidelines require lead agencies to adopt GHG thresholds of significance. When adopting these thresholds, the amended Guidelines allow lead agencies to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence, and/or to develop their own significance threshold. The SCAQMD does not have adopted GHG emissions thresholds for projects that the district does not administer as the Lead Agency. The County of Riverside has prepared a qualified CAP pursuant to CEQA Guidelines Section 15183.5(b), and the Climate Action Plan Update published in November 2019 is the most recent iteration.[10] In accordance with the CEQA Guidelines, the CAP serves as a "qualified plan for the reduction of greenhouse gases" and provide a mechanism for tiering and streamlining of GHG emissions analyses for projects that are consistent with such a plan.

Methodology

AIR QUALITY ANALYSES

This analysis focuses on the potential changes in the air quality environment due to implementation of the proposed project. The assessment of potential impacts to regional and local air quality as a result of proposed project implementation addresses both short-term impacts from construction of the RNG facility and utility connections and long-term impacts from future operation of the RNG facility on the ESL property. Emissions are generally quantified on a daily basis and expressed in terms of pounds per day (lbs./day). Detailed emissions modeling files can be found in the **Appendix**. Specific methodologies used to evaluate these emissions are discussed below.

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[10] Riverside County Planning Department, *County of Riverside Climate Action Plan Update*, November 2019.

Construction

Daily regional emissions during construction were estimated by assuming a conservative estimate of construction activities (i.e., assuming all construction occurs at the earliest feasible date) and applying mobile source and fugitive dust emissions factors. The emissions are estimated using the California Emissions Estimator Model (CalEEMod, Version 2022.1) software, an emissions inventory software program recommended by SCAQMD.[11] The CalEEMod model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with SCAQMD and received input from other California air districts and is currently used by numerous lead agencies in the Southern California area and within the state for quantifying the emissions associated with development projects undergoing environmental review, including by the County of Riverside and the City of Corona.

The CalEEMod database is populated by outputs from the CARB Off-Road Emissions Inventory Program model (OFFROAD–ORION) and the EMission FACtor model (EMFAC2021), which are emissions estimation models used to calculate emissions from construction activities utilizing off- and on-road vehicles, respectively. CalEEMod also relies upon survey-based emissions data associated with certain activities or equipment (often referred to as “default” data, values or factors) that can be used if site-specific information is not available.[12] Input parameters for the construction equipment and vehicle inventories were provided by Toro, and CalEEMod default values specific to the SCAQMD region were supplemented where applicable.

Project-related construction activities would generate emissions from the incremental increase in on-site heavy equipment used in earthmoving activities and compaction processes to create the new disposal cells. CalEEMod contains calculation processes for quantifying estimates of daily and annual emissions from these types of sources. **Table 7** provides an overview of the relevant sources of air pollutant emissions that were accounted for in CalEEMod during construction of the proposed project. CalEEMod default values were used for equipment emission factors, equipment load factors, and daily disturbance area. Maximum daily emissions calculated in CalEEMod represent conservative estimates of the worst-case daily emissions in each phase of construction based on continuous equipment activity. Detailed emissions modeling files for construction of the proposed project are provided in the **Appendix**.

TABLE 7: CALEEMOD CONSTRUCTION EMISSIONS SOURCES

Phase(s)	Activity	Source(s)	Pollutants
All Phases	Off-Road Equipment	Engine Exhaust	VOC, NO_X, CO, SO_X, PM_{10}, $PM_{2.5}$
All Phases	On-Road Vehicle Trips	Engine Exhaust	VOC, NO_X, CO, SO_X, PM_{10}, $PM_{2.5}$
All Phases	On-Road Vehicle Trips	Engine Evaporative Losses	VOC
All Phases	On-Road Vehicle Trips	Brake & Tire Wear	PM_{10}, $PM_{2.5}$
All Phases	On-Road Vehicle Trips	Re-Entrained Road Dust	PM_{10}, $PM_{2.5}$
Site Prep, Grading	Truck Loading	Fugitive Dust	PM_{10}, $PM_{2.5}$
Site Prep, Grading	Ground Disturbance	Fugitive Dust (Dozers/Graders)	PM_{10}, $PM_{2.5}$

Note: CO = carbon monoxide, *NO_X* = Oxides of Nitrogen, VOC = Volatile Organic Compounds, SO_X = Oxides of Sulfur, PM_{10} = Particulate Matter, $PM_{2.5}$ = Particulate Matter
SOURCE: CAPCOA, 2017.

[11] CAPCOA, *California Emissions Estimator Model (Version 2022.1) User’s Guide*, April 2022.
[12] CAPCOA, *California Emissions Estimator Model (Version 2022.1) User’s Guide*, April 2022.

Operations

The assessment of potential air quality impacts during future operations focuses on changes in daily facility-wide emissions associated with permanent, long-term sources that would result from implementation of the proposed project relative to existing conditions. Sources involved in the operation of the proposed project would include Toro employee vehicle trips to and from the facility, private delivery disposal trips to and from the ESL, and the change in volume of LFG flared to the atmosphere. Upon the completion of construction activities, future operation of the RNG facility would capture and process landfill gas that would otherwise have been routed through a flare and released into the atmosphere. Toro provided estimates of the offset emissions achieved through RNG processing based on stack testing of existing flared emissions and a reduction fraction of 29 percent. The air quality operational emissions analysis accounts for the net change in emissions resulting from the diversion of landfill gas through the RNG facility.

GREENHOUSE GAS EMISSIONS ANALYSES

In accordance with Section 15064.4(c) of the CEQA Guidelines and guidance from the SCAQMD, GHG emissions that would be generated during temporary construction activities and future long-term operation of the proposed project were estimated using CalEEMod, Version 2022.1, which is the industry standard regulatory tool recommended within the SCAQMD for estimating GHG emissions from proposed land use development projects. As described above, CalEEMod relies on an emissions factors database compiled from the CARB EMission FACtor (EMFAC) on-road mobile source emissions inventory model and the CARB OFFROAD off-road equipment model, as well as regional survey data for energy resource consumption, water use, and solid waste generation. Sources of GHG emissions during construction of the proposed project would include heavy-duty off-road equipment use at the ESL facility, as well as vehicle trips to, from, and within the property boundary. Construction would result in short-term GHG emissions produced by construction equipment exhaust that CalEEMod quantifies as emissions of CO_2, CH_4, and N_2O. As described previously, construction activities to implement the proposed project would not result in an increase in vehicle trips or associated GHG emissions.

Similar to the operational air quality emissions, sources of GHG emissions during future proposed project operations would include the additional Toro employee trips to manage the RNG facility, additional light-duty passenger vehicle and truck trips making disposal deliveries to the ESL, as well as indirect emissions from the provision of electricity to the RNG facility. Implementation of the proposed project would not increase the off-road equipment activities at the ESL or facility-wide water resources demand. Consistent with the air quality analyses, operational GHG emissions from mobile sources were estimated using EMFAC emission rates in CalEEMod, as were indirect emissions from electricity to power the office and maintenance building for the RNG facility. Toro estimated that the RNG facility would reduce GHG emissions flared to the atmosphere by approximately 29 percent, and provided existing LFG flow rates.

GHG emissions are calculated based on the amount of electricity consumed multiplied by the GHG intensity factors for the utility provider. In this case, GHG intensity factors for Southern California Edison (SCE) were selected from the CalEEMod appendix data. RNG facility operations were estimated to require approximately 61,320 megawatt-hours (MWh) of electricity annually, likely beginning in early 2026. GHG emissions are evaluated on an annual basis and, due to their cumulative nature, long-term operational emissions are combined with the amortized construction emissions extrapolated over a 30-year operational timeframe in accordance with regional guidance developed by the South Coast Air Quality Management District (SCAQMD). Detailed GHG emissions modeling files can be found in the **Appendix**.

Air Quality Impacts Assessment

(a) Would the proposed project conflict with or obstruct implementation of the applicable air quality plan? (Less-Than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

The following analysis addresses the proposed project's consistency with applicable SCAQMD and SCAG air quality planning guidance and policy, including the SCAQMD's 2022 AQMP and growth projections within the RTP/SCS. In accordance with the procedures established in the SCAQMD's *CEQA Air Quality Handbook*, the following criteria are required to be addressed in order to determine the proposed project's consistency with applicable SCAQMD and SCAG policies:

- Would the proposed project result in any of the following?
  - An increase in the frequency or severity of existing air quality violations;
  - New air quality violations; or,
  - Delay of timely attainment of air quality standards or the interim emission reductions specified in the AQMP.
- Would the proposed project exceed the assumptions utilized in preparing the AQMP?
  - Is the project consistent with the population and employment growth projections upon which AQMP forecasted emission levels are based;
  - Does the project include air quality mitigation measures; or,
  - To what extent is project development consistent with the AQMP land use policies?

Air quality violations occur when emissions from a particular project increase ambient pollutant concentration levels above the applicable State or federal air quality standards, which were derived to protect public health and the environment. Increases in the frequency or severity of air quality violations can affect the region's ability to attain the State and federal air quality standards. The SCAQMD established its regional and localized screening thresholds for mass daily emissions as a tool to evaluate the potential for emissions from development projects to result in air quality violations. If a project were to generate emissions in excess of the screening thresholds, those emissions could render assumptions built into the AQMP emissions inventory inaccurate, which may interfere with regional initiatives to reduce emissions. The AQMP emissions inventory accounts for growth projections related to population, housing, and employment, which are correlated with regional transportation emissions. The impacts assessment for the proposed project addresses AQMP consistency through comparing emissions to the SCAQMD screening thresholds and evaluating possible effects related to regional growth projections.

Construction

Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips by construction workers and haul and delivery trucks traveling to and from the project site. Fugitive dust emissions would primarily result from grading, trenching, and truck loading activities. NO_X emissions would be generated in off-road equipment exhaust and on-road vehicle exhaust. The assessment of construction air quality impacts considered all of these emissions sources.

Construction of the RNG facility, SoCalGas POR Site connection work, and installation of the underground pipeline would collectively occur over an 18-month period between the third quarter of 2024 and the first quarter of 2026. Emissions generated during construction of the proposed project would be temporary in nature and would cease entirely once the RNG facility and utility connections are complete. **Table 8** presents a summary of the maximum daily emissions that could occur during concurrent construction of the various proposed project components on the three designated sites.

TABLE 8: PROPOSED PROJECT ESTIMATED CONSTRUCTION EMISSIONS

Construction Activity	Maximum Daily Emissions (lbs./day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Mobilization (Component Delivery)	0.7	18.5	6.5	0.4	3.9	1.3
POR Metering Site Preparation	9.3	6.8	21.0	<0.1	1.1	0.5
POR Metering Facility SoCalGas Work	0.4	3.6	5.5	<0.1	0.8	0.3
South Plant Site Grading & Construction	0.8	6.6	10.5	<0.1	0.9	0.4
North Plant Site Grading & Construction	1.3	9.7	15.1	<0.1	1.2	0.5
Primary Electrical Installation	1.2	9.2	12.8	<0.1	1.1	0.5
Office & Maintenance Building Construction	0.5	4.1	5.3	<0.1	0.4	0.2
Pipe Installation & Roadway Restoration	1.4	11.1	14.1	<0.1	1.1	0.6
Plant Equipment Assembly & Installation	0.7	5.4	7.5	<0.1	0.6	0.3
Total Daily Overlapping Construction	***16.3***	***75.1***	***98.2***	***0.7***	***11.0***	***4.5***
REGIONAL ANALYSIS						
Maximum Regional Daily Emissions	**16.3**	**75.1**	**98.2**	**0.7**	**11.0**	**4.5**
Regional Significance Threshold	75	100	550	150	150	55
Exceed Daily Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Emissions modeling files can be found in the **Appendix**.
SOURCE: TAHA, 2024.

As stated above and consistent with the regulatory compliance measures identified in previous environmental documentation, the unmitigated emissions account for the provisions of SCAQMD Rule 403, which requires best management practice in fugitive dust control. Maximum daily emissions of all air pollutants would remain below all applicable regional SCAQMD thresholds during construction of the proposed project. Based on SCAQMD guidance, construction of the proposed project would not have the potential to result in an increase in the frequency or severity of existing air quality violations, nor would it create new air quality violations. Construction of the proposed project would not interfere with implementation of the AQMP or the SCAG RTP/SCS. Furthermore, construction crews would be sourced from the existing regional workforce and would not induce growth in population within the SCAB. The temporary emissions associated with delivery of proposed project components would not contribute to a potentially significant air quality impact. However, the 1998 EIR/2009 SEIR determined that landfill expansion-related emissions were potentially significant and mitigation measures AQ-1 through AQ-14 were identified to reduce these impacts to a level below significant.

As such, with the implementation of the proposed project to the existing landfill operation, the 1998 EIR/2009 SEIR mitigation measures would remain in effect. Therefore, this impact would be less than significant for construction of the proposed project, and no additional mitigation would be required.

Operations

From an air quality perspective, the emissions sources involved in proposed project operations would be similar to existing conditions with the exception of the RNG facility reducing LFG flared to the atmosphere. Implementation of the proposed project would not introduce any new growth in population, housing, or employment at the regional scale. Proposed project operations would not introduce any new substantial permanent source of air pollutant emissions to the project area; the seven Toro employee commuting trips and four additional private disposal trips would result in negligible changes to regional air quality. The proposed project does not have the potential to conflict with or obstruct implementation of the AQMP as it pertains to attaining the ambient air quality standards.

The operational emissions analysis for implementation of the proposed project focused on the daily change in emissions resulting from the diversion of LFG from being flared to the RNG facility, as well as Toro employee vehicle trips and several additional daily private waste delivery trips. **Table 9** provides a summary of the daily ozone-precursor and criteria pollutant emissions that would be generated by future operation of the proposed project, including the RNG facility. As demonstrated by the results of the analysis, RNG facility operation would result in a net decrease in VOC emissions due to the reduction in LFG flaring, and relatively minor increases in NO_X, CO, and PM emissions associated with vehicle trips. Therefore, this impact would be less than significant regarding the potential exacerbation of air quality violations and delaying attainment of the air quality standards.

TABLE 9: PROPOSED PROJECT ESTIMATED OPERATIONAL EMISSIONS

Sources and Analytical Parameters	Daily Emissions (lbs./day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
VEHICLE TRIP EMISSIONS						
RNG Facility Employee Trips	0.3	0.5	4.3	<0.1	1.0	0.3
Maintenance Vehicle Trips	0.1	0.2	0.7	<0.1	<0.1	<0.1
Private Delivery Trips	0.1	0.2	1.4	<0.1	0.4	0.1
Vehicle Trips Subtotal	***0.5***	***0.9***	***6.4***	***<0.1***	***1.5***	***0.4***
RNG FACILITY EMISSIONS						
Existing Flared Emissions	558.1	-	-	-	-	-
RNG Facility Emissions	396.2	-	-	-	-	-
Net Change from Existing Conditions	***(161.8)***	-	-	-	-	-
REGIONAL ANALYSIS						
Project Operational Emissions	**(161.3)**	**0.9**	**6.4**	**<0.1**	**1.5**	**0.4**
SCAQMD Significance Threshold	55	55	550	150	150	55
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Emissions modeling files can be found in the **Appendix**; parenthetical notation (#) indicates negative value.
SOURCE: TAHA, 2024.

The second element of consistency with the air quality plan is determined by evaluating whether implementation of the proposed project would exceed the assumptions in the AQMP related to regional growth, thereby rendering the regional emissions inventory inaccurate. Implementation of the proposed project would not introduce new growth in regional population or housing, and would require up to seven Toro personnel to manage the RNG facility. Therefore, proposed project operations would have a negligible effect related to growth projections built into the AQMP emissions inventory, as it is assumed that the additional employees would be sourced from the existing regional workforce (i.e., would not relocate for employment at ESL). The proposed project would not have any potential to result in growth that would exceed the projections incorporated into the AQMP or the applicable RTP/SCS that could render the emissions inventory or air quality conformity analysis invalid. Future operation of the proposed project would not interfere with air pollution control measures listed in the AQMP. The proposed project would accommodate more efficient operations at the ESL site and would not have the potential to exacerbate existing air quality violation conditions. Therefore, the impact would be less than significant.

Mitigation Measures

No mitigation measures are required for the proposed project; however, mitigation measures listed in the Mitigation and Monitoring Plan (MMP) for the El Sobrante Landfill Expansion Project will continue to be enforced upon proposed project implementation, if they are still applicable. The mitigation measures in the MMP related to air quality included in the 2018 Addendum consist of the following:

AQ-1 The following activities shall occur based on SCAQMD Rule 1150.1 – Control of Gaseous Emissions from Active Landfills:

- Landfill gas collection and thermal destruction systems shall be provided and operated.
- Landfill gas destruction system shall be constructed and maintained using best available control technology (BACT). Improved combustion technology (e.g., boiler) shall be installed at the time that the continued use of current technology flares would exceed SCAQMD standards for stationary sources.
- A network of landfill gas monitoring probes shall be installed to identify potential areas of subsurface landfill gas migrations.
- The project includes a landfill gas barrier layer (i.e., 10- to 20-mil high-density polyethylene (HDPE) or polyvinyl chloride (PVC) sheeting) as part of the intermediate cover and final cover system. This gas barrier layer is not required by Subtitle D and would minimize excess air infiltration and fugitive landfill gas emissions, and would increase landfill gas collection efficiency.
- Monitoring of landfill gas concentrations at perimeter probes, gas collection system headers, landfill surface, and in ambient air downwind of the landfill shall be conducted in accordance with applicable regulations.
- Annual emissions testing of inlet and exhaust gases from the landfill gas destruction system shall be conducted to evaluate gas destruction efficiency.
- The gas collection system shall be adjusted and improved based on quarterly monitoring and annual stack testing results.

AQ-2 The following activities shall occur based on SCAQMD Rule 403 – Fugitive Dust:

- Emission controls necessary to assure that dust emissions are not visible beyond the landfill property boundary shall be implemented.
- New cell construction and cell closure activities shall not occur simultaneously.
- The Rule 403 Fugitive Dust Emissions Control Plan for the landfill, approved by SCAQMD in May 1993, shall be adhered to. The plan itemized various control strategies for dust emissions

from earthmoving, unpaved road travel, storage piles, vehicle track-out, and disturbed surface areas, including watering, chemical stabilizers, revegetation, and operational controls or shutdowns for implementation during both normal and high wind conditions.

- Rule 403 Fugitive Dust Emissions Control Plan shall be revised on an annual basis.

  [**Note:** Dust control measures are currently implemented at El Sobrante Landfill in accordance with this mitigation measure and the landfill's SCAQMD-approved Rule 403 Large Operation Notification. However, it should be noted that subsequent to approval of the 1998 EIR, Rule 403 requirements changed, and the landfill operator is no longer required to revise the Fugitive Dust Control Plan on an annual basis. The current Fugitive Dust Control Plan is available for review at the landfill, and is filed in the site record for mitigation compliance purposes.]

AQ-3 The following mitigation measures exceed contemporary regulatory requirements and shall be incorporated by design, construction, and operation:

- PM_{10} monitoring stations and an onsite meteorological station shall be installed and operated, as agreed in consultation with the SCAQMD.
- Where feasible, landfill roads shall be paved.
- Portions of paved roads abutting unpaved haul truck traffic areas shall be routinely swept and/or washed.
- Onsite vehicles shall be routinely maintained.

AQ-4 In the event monitoring indicates that permissible levels of PM_{10} are being exceeded, some combination of the following dust control measures shall be implemented:

- Washing of truck wheels.
- Routing paved access roads away from directions that result in property boundary impacts.
- Curtailing specific activities (e.g., new phase construction) when conditions are unfavorable for fugitive PM_{10} control.

AQ-5 The following activities would occur based on SCAQMD Regulation XIII – New Source Review:

- Control devices for stationary emission sources shall be provided which satisfy BACT requirements.
- NO_X, reactive organic gases (ROG)/VOC, SO_X, and PM_{10} emissions from stationary sources shall be offset according to SCAQMD requirements for essential public services.

AQ-6 The following activity shall occur based on SCAQMD Rule XIV – Toxics and Other Noncriteria Pollutants:

- Control devices for stationary emission sources shall be provided which assure that emissions of potentially carcinogenic and/or toxic compounds do not result in unacceptable health risks downwind of the landfill.

AQ-7 Onsite vehicles shall be routinely maintained.

AQ-8 Heavy construction equipment shall use low sulfur fuel (<0.05 percent by weight) and shall be properly tuned and maintained to reduce emissions.

AQ-9 Construction equipment shall be fitted with the most modern emission control devices.

AQ-10 The project shall comply with SCAQMD Rule 461 which establishes requirements for vapor control from the transfer of fuel from the fuel truck to vehicles.

AQ-11 Prior to construction and construction/operation activities, the following pre-monitoring measures shall be implemented to avoid or lessen boundary concentrations of NO_2:

- Normal landfill operations and cell construction/closure activities shall be preplanned to avoid potentially adverse alignments (both horizontally and vertically) during anticipated periods of meteorological conditions which could result in the greatest property boundary concentration.
- During periods when both disposal and construction activities are occurring, downwind property line monitoring of NO_2 shall be implemented for wind and stability conditions which could result in the highest boundary concentrations.

During construction and construction/operation activities, the following pre-monitoring measures shall be implemented to avoid or lessen boundary concentrations of NO_2:

- If monitoring determines that the 1-hour NO_2 standard (i.e., 470 g/m3) is being approached (i.e., within 95 percent of the standard or approximately 450 g/m3), construction or cell closure activities shall be curtailed until the appropriate tiered mitigation measures can be implemented, or until adverse meteorological conditions no longer exist.
- The waste placement and/or clay preparation areas shall be moved to a preplanned alternative working location to separate emissions from clay placement construction emissions.
- Construction procedures shall be configured such that operations requiring heavy equipment do not occur simultaneously (e.g., clay placement and protective soil placement by scrapers will not be done during periods with adverse meteorological conditions).
- Construction scheduling will be slowed to reduce daily equipment usage.
- Hours of construction with designated pieces of equipment (e.g., scrapers) shall be constrained to occur outside of peak adverse meteorological conditions.

AQ-12 Within three years of start date [July 1, 2001], USA Waste or its successor-in-interest shall submit to the County of Riverside an evaluation of the technological and economical feasibility of using natural gas fuel or other alternative fuel in transfer trucks. The technological feasibility of the evaluation shall include review comments by the SCAQMD. The evaluation shall be subject to County approval. If the County finds that natural gas fuel or other alternative fuel in transfer trucks is technologically and economically feasible, USA Waste or its successor-in-interest shall develop and implement a program to phase-in transfer trucks capable of using these fuels. The program shall be subject to County approval. If the County concludes that transfer trucks capable of using alternative fuels are not technologically or economically feasible, USA Waste or its successor-in-interest shall periodically reevaluate the feasibility of using alternative fuels in transfer trucks. Such reevaluations shall be at least every three (3) years. USA Waste or its successor-in-interest shall, however, conduct such a reevaluation anytime deemed appropriate by County.

AQ-13 The project shall provide the required emission reductions of NO_X and ROG sufficient to cause no net increase of project emissions.

AQ-14 USA Waste shall amend its Policies and Procedures Manual at the landfill to require that heavy construction and operating equipment at the landfill shall not idle for longer than 15 minutes. [**Note:** this restriction has been reduced to 5 minutes through CARB's 2004 adoption of Airborne Toxic Control Measure 2485].

(b) Would the proposed project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard? (Less-than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Construction and Operations

The SCAQMD is currently designated nonattainment for O_3 and PM_{10} under state standards and nonattainment for O_3 under the federal standards. Therefore, a project may result in a cumulatively considerable air quality impact under this criterion if daily emissions of ozone precursors (VOC and NO_X) or particulate matter (PM_{10}) exceed applicable air quality thresholds of significance established by the SCAQMD. The SCAQMD designed the significance thresholds to prevent projects from exceeding the ambient air quality standards and potentially resulting in air quality violations. The SCAQMD suggests that if any quantitative air quality significance threshold is exceeded by an individual project during construction activities or operation, that project is considered significant and would be required to implement effective and feasible mitigation measures to reduce air quality impacts. Conversely, the SCAQMD propagates the guidance that if an individual project would not exceed the significance thresholds, then it is generally not considered to be significant. As discussed above and demonstrated in the analysis presented in **Table 8** and **Table 9**, implementation of the proposed project would not generate magnitudes of emissions in excess of any applicable SCAQMD regional mass daily threshold during construction or operations. Therefore, the impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

(c) Would the proposed project expose sensitive receptors to substantial pollutant concentrations? (Less-than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Construction

The nearest sensitive receptors to the project site are residences located approximately 1,740 feet to the west of the Gas POR Site. The SCAQMD has established 1,640 feet (500 meters) as the protective buffer distance for assessing localized air quality impacts for CEQA projects. There are no sensitive receptors within close enough proximity to the project site that substantial pollutant concentrations would be capable of reaching through atmospheric dispersion by wind patterns. Pollutant concentrations resulting from heavy-duty equipment use and vehicle trips would dissipate prior to encountering any sensitive receptors. However, a localized analysis of proposed project construction emissions was included for informational purposes and to replicate the scope of prior air quality analyses within environmental documentation prepared for the ESL facility. **Table 10** presents a summary of maximum daily emissions from sources located on the proposed project site, which include all off-road equipment emissions as well as vehicle trips that would occur within the property boundary. As shown below, maximum daily emissions from sources located within the ESL property boundary and the SoCalGas POR Site would remain well below the applicable SCAQMD LST screening values for both SRA 22 and SRA 25. Therefore, this impact would be less than significant.

TABLE 10: PROPOSED PROJECT ESTIMATED ON-SITE CONSTRUCTION EMISSIONS

Construction Activity	Maximum Daily Emissions (lbs./day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
POR Metering Site Preparation	6.8	21.0	1.1	0.5
POR Metering Facility SoCalGas Work	3.6	5.5	0.8	0.3
South Plant Site Grading & Construction	6.6	10.5	0.9	0.4
North Plant Site Grading & Construction	9.7	15.1	1.2	0.5
Primary Electrical Installation	9.2	12.8	1.1	0.5
Office & Maintenance Building Construction	4.1	5.3	0.4	0.2
Pipe Installation & Roadway Restoration	11.1	14.1	1.1	0.6
Plant Equipment Assembly & Installation	5.4	7.5	0.6	0.3
Total Daily On-Site Emissions	***56.6***	***91.7***	***7.1***	***3.2***
LOCALIZED ANALYSIS				
Maximum Regional Daily Emissions	***56.6***	***91.7***	***7.1***	***3.2***
SRA 22 Localized Significance Threshold	652	17,637	198	92
SRA 25 Localized Significance Threshold	896	23,866	178	86
Exceed Daily Localized Thresholds?	**No**	**No**	**No**	**No**

Note: Emissions modeling files can be found in the **Appendix**.
SOURCE: TAHA, 2024.

Operations

As mentioned in the discussion regarding construction, there are no sensitive receptors located within 1,600 feet of the ESL property boundary. Implementation of the proposed project would not introduce any new stationary sources of emissions to the ESL site, and Toro's operation of the RNG facility would result in a net decrease in O_3-precursor (VOC) emissions, as shown in **Table 9**. Proposed project operations would not materially alter the nature of activities conducted on the ESL property, and maintenance trips would occur only several times per year. As a safety precaution, the RNG plant will be equipped with both a manual shut-off system as well as an automatic shut-off system that functions based on detected pressure drops. Additionally, all accessible pipe flanges are inspected on a monthly basis for any possible leaks. Therefore, there is no potential for future operation of the proposed project to expose sensitive receptors to substantial pollutant concentrations, and this impact would be less than significant

Mitigation Measures

No mitigation measures are required.

(d) Would the proposed project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? (Less-than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Construction

Potential sources that may produce objectionable odors during construction activities include equipment exhaust and off-gassing of disturbed waste. Odors from these sources would be localized and generally confined to the immediate area surrounding the proposed project site. Construction of the proposed project would employ best management practices to prevent the occurrence of a nuisance odor in accordance with SCAQMD Rule 402 Nuisance, and the odors would be typical of most construction sites and temporary in nature. There are no sensitive land uses in close proximity to the project site that would be especially sensitive to odors emanating from these sources. Therefore, the impact would be less than significant.

Operations

Solid waste and landfill gas are potential sources of odor. Odor associated with landfill operations is controlled by application of daily cover material. This limits most odors to the proximity of the working face during operations. Cover methods and the remoteness of the site keep odor from becoming a nuisance. Historically, site operations have not created significant odor impacts. The landfill is in full compliance with SCAQMD Rule 1150.1 governing control of gaseous emissions from landfills, and with Rule 402 prohibiting creation of a nuisance from odor or dust. The proposed RNG facility would involve a closed system that would not vent any landfill gas directly to the atmosphere, and the magnitude of flared landfill gas volume would be reduced relative to existing operational conditions. Operation of the proposed project would not introduce any new permanent source of air pollutant emissions to the project area beyond intermittent employee, private delivery, and maintenance vehicle trips, which would not alter the magnitude of odorous emissions emanating from the ESL site. Therefore, operation of the proposed project does not have the potential to expose sensitive receptors to odors or other emissions that could cause public nuisances, and the impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Greenhouse Gas Emissions Impacts Assessment

(a) Would the proposed project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment? (Less-Than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Construction and Operations

The proposed project would generate GHG emissions directly during temporary construction activities through off-road equipment exhaust and vehicle trips. In accordance with SCAQMD recommendations, the total amount of GHG emissions that would be generated during construction activities is amortized over a 30-year operational lifetime of the proposed project and combined with long-term operational emissions. Future operation of the proposed project would increase regional GHG emissions through the additional vehicle trips to and from the ESL property (direct emissions) and indirect emissions associated with energy consumption and RNG facility operations, as well as minor emissions from water consumption and on-site solid waste generation at the RNG utility building. **Table 11** presents the estimated annual operating GHG emissions that would be generated by the proposed project.

TABLE 11: PROPOSED PROJECT ESTIMATED GREENHOUSE GAS EMISSIONS	
Emissions Source	**CO_2e (Metric Tons)***
CONSTRUCTION ANALYSIS	
South RNG Site Construction Emissions	46
North RNG Site Construction Emissions	394
Gas POR Site Construction Emissions	225
Underground Pipe Installation Emissions	226
Project Construction Emissions – Total (Direct)	**892**
LONG-TERM OPERATIONAL ANALYSIS	
Amortized Construction Emissions (Direct)	30
RNG Facility Employee Commute & Maintenance Trips (Direct)	265
RNG Utility Building Energy Consumption (Indirect)	12
RNG Utility Building Water Consumption (Indirect)	2
RNG Utility Building Waste Generation (Indirect)	1
RNG Facility Net Emissions [Existing – Captured] (Direct)	(52,801)
RNG Facility Electricity Consumption (Indirect)	9,685
TOTAL	**(42,806)**

* Parenthetical notation (#) indicates a negative value.
SOURCE: TAHA, 2024.

Construction activities would generate a total of approximately 892 $MTCO_2e$ over the 18-month duration. Accounting for the indirect emissions from electricity requirements—approximately 9,697 $MTCO_2e$ per year—the RNG processing facility would offset approximately 42,806 $MTCO_2e$ of GHG emissions annually that would have otherwise occurred. As demonstrated by the emissions analysis, the proposed project would contribute to regional efforts to reduce GHG emissions and would provide a new supply of renewable energy resources in the form of RNG. Implementation of the proposed project would provide a net environmental benefit and would aid County initiatives towards achieving the GHG emissions reduction targets established by the 2019 CAP Update. Therefore, the impact regarding the magnitude of GHG emissions associated with the proposed project would be less than significant.

Mitigation Measures

No mitigation measures are required.

(b) Would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions? (Less-Than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Construction and Operations

There is no potential for the proposed project to conflict with GHG reduction plans such as the 2022 Scoping Plan Update, the SCAG *Connect SoCal* RTP/SCS, or the County's 2019 CAP Update. Implementation of the proposed project would provide a net environmental benefit through the reduction of GHG emissions as well as the expansion of local renewable energy resource production. Operation of the proposed project would offset GHG emissions by diverting LFG that would have otherwise been flared through the closed RNG system, which would then be used to reduce reliance on natural gas supplied by nonrenewable resources. The proposed project would be consistent with the objectives of CARB statewide GHG emissions reduction policy, as well as contribute to the 2019 CAP Update goals of reducing community-wide GHG emissions and expanding the availability of renewable energy resources.

GHG emissions are regionally cumulative in nature, and it is highly unlikely that construction of any individual project would generate GHG emissions of sufficient quantity to conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. The emissions analysis for construction of the proposed project incorporates reasonably conservative assumptions such that the emissions reflect maximum possible emissions, beyond what is expected to occur. Standard construction and operating procedures would be undertaken in accordance with the SCAQMD and CARB regulations applicable to heavy-duty construction equipment and diesel haul trucks to limit unnecessary emissions to the extent practicable. Adhering to requirements pertinent to equipment maintenance and inspections and emissions standards, as well as diesel fleet requirements—including idling time restrictions and maintenance—would ensure that construction and operational activities associated with the proposed project would not conflict with GHG emissions reductions efforts. Therefore, this impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

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Appendix

- California Emissions Estimator Model (Version 2022.1) Output Files
    - RNG Facility Construction and Operations Detailed Report
    - Pipeline Installation and SoCalGas Construction Activities Detailed Report

El Sobrante Landfill RNG Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.3. Construction Emissions by Year, Mitigated

2.4. Operations Emissions Compared Against Thresholds

2.5. Operations Emissions by Sector, Unmitigated

2.6. Operations Emissions by Sector, Mitigated

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

3.2. Site Preparation (2024) - Mitigated

3.3. Grading-S (2024) - Unmitigated

3.4. Grading-S (2024) - Mitigated

3.5. Grading-N (2024) - Unmitigated

3.6. Grading-N (2024) - Mitigated

3.7. Grading-N (2025) - Unmitigated

3.8. Grading-N (2025) - Mitigated

3.9. Building Construction (2024) - Unmitigated

3.10. Building Construction (2024) - Mitigated

3.11. Building Construction (2025) - Unmitigated

3.12. Building Construction (2025) - Mitigated

3.13. EPC (2024) - Unmitigated

3.14. EPC (2024) - Mitigated

3.15. EPC (2025) - Unmitigated

3.16. EPC (2025) - Mitigated

3.17. Paving (2024) - Unmitigated

3.18. Paving (2024) - Mitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.1.2. Mitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.2. Electricity Emissions By Land Use - Mitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.2.4. Natural Gas Emissions By Land Use - Mitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.3.2. Mitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.4.2. Mitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.5.2. Mitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.6.2. Mitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.7.2. Mitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.8.2. Mitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.9.2. Mitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	El Sobrante Landfill RNG
Construction Start Date	8/5/2024
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	21.8
Location	33.79268209665507, -117.47540480799165
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5581
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Light Industry	3.20	1000sqft	2.80	3,200	0.00	0.00	—	Maintenance & Office Building

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads
Waste	S-4*	Recycle Demolished Construction Material
Refrigerants	R-7*	Reduce Disposal Emissions

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	9.34	25.4	38.4	0.06	1.08	2.07	3.14	0.99	0.39	1.38	—	7,614	7,614	0.31	0.17	6.39	7,678
Mit.	9.34	25.4	38.4	0.06	1.08	1.62	2.70	0.99	0.34	1.34	—	7,614	7,614	0.31	0.17	6.39	7,678
% Reduced	—	—	—	—	—	21%	14%	—	11%	3%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.41	35.0	49.3	0.08	1.38	2.83	4.21	1.27	0.54	1.81	—	10,032	10,032	0.41	0.24	0.24	10,114
Mit.	4.41	35.0	49.3	0.08	1.38	2.22	3.60	1.27	0.48	1.75	—	10,032	10,032	0.41	0.24	0.24	10,114
% Reduced	—	—	—	—	—	21%	14%	—	11%	3%	—	—	—	—	—	—	—

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.98	5.95	8.76	0.01	0.24	0.47	0.71	0.22	0.09	0.31	—	1,709	1,709	0.07	0.04	0.67	1,724
Mit.	0.98	5.95	8.76	0.01	0.24	0.37	0.61	0.22	0.08	0.30	—	1,709	1,709	0.07	0.04	0.67	1,724
% Reduced	—	—	—	—	—	20%	13%	—	11%	3%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.18	1.09	1.60	< 0.005	0.04	0.09	0.13	0.04	0.02	0.06	—	283	283	0.01	0.01	0.11	285
Mit.	0.18	1.09	1.60	< 0.005	0.04	0.07	0.11	0.04	0.01	0.06	—	283	283	0.01	0.01	0.11	285
% Reduced	—	—	—	—	—	20%	13%	—	11%	3%	—	—	—	—	—	—	—
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	9.34	25.4	38.4	0.06	1.08	2.07	3.14	0.99	0.39	1.38	—	7,614	7,614	0.31	0.17	6.39	7,678
2025	1.07	8.96	13.2	0.02	0.27	0.76	1.03	0.25	0.15	0.40	—	2,550	2,550	0.10	0.07	2.58	2,576
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	35.0	49.3	0.08	1.38	2.83	4.21	1.27	0.54	1.81	—	10,032	10,032	0.41	0.24	0.24	10,114
2025	2.20	17.7	26.6	0.04	0.64	1.51	2.16	0.59	0.30	0.89	—	5,553	5,553	0.23	0.13	0.12	5,597
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.98	5.95	8.76	0.01	0.24	0.47	0.71	0.22	0.09	0.31	—	1,709	1,709	0.07	0.04	0.67	1,724
2025	0.40	3.34	4.88	0.01	0.11	0.28	0.39	0.10	0.05	0.16	—	985	985	0.04	0.03	0.40	994
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.18	1.09	1.60	< 0.005	0.04	0.09	0.13	0.04	0.02	0.06	—	283	283	0.01	0.01	0.11	285
2025	0.07	0.61	0.89	< 0.005	0.02	0.05	0.07	0.02	0.01	0.03	—	163	163	0.01	< 0.005	0.07	165

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	9.34	25.4	38.4	0.06	1.08	1.62	2.70	0.99	0.34	1.34	—	7,614	7,614	0.31	0.17	6.39	7,678
2025	1.07	8.96	13.2	0.02	0.27	0.60	0.87	0.25	0.14	0.38	—	2,550	2,550	0.10	0.07	2.58	2,576
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	35.0	49.3	0.08	1.38	2.22	3.60	1.27	0.48	1.75	—	10,032	10,032	0.41	0.24	0.24	10,114
2025	2.20	17.7	26.6	0.04	0.64	1.24	1.88	0.59	0.27	0.86	—	5,553	5,553	0.23	0.13	0.12	5,597

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.98	5.95	8.76	0.01	0.24	0.37	0.61	0.22	0.08	0.30	—	1,709	1,709	0.07	0.04	0.67	1,724
2025	0.40	3.34	4.88	0.01	0.11	0.22	0.33	0.10	0.05	0.15	—	985	985	0.04	0.03	0.40	994
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.18	1.09	1.60	< 0.005	0.04	0.07	0.11	0.04	0.01	0.06	—	283	283	0.01	0.01	0.11	285
2025	0.07	0.61	0.89	< 0.005	0.02	0.04	0.06	0.02	0.01	0.03	—	163	163	0.01	< 0.005	0.07	165

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
Mit.	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
Mit.	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
Mit.	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280
Mit.	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Annual)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10,000
Unmit.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No
Mit.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Area	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Area	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.42	0.69	5.11	0.02	0.01	1.41	1.42	0.01	0.36	0.37	—	1,576	1,576	0.05	0.07	2.52	1,600
Area	0.09	< 0.005	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.39	0.39	< 0.005	< 0.005	—	0.39
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Area	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Energy	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.1	12.1	< 0.005	< 0.005	—	12.1
Water	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Waste	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Area	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Area	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.42	0.69	5.11	0.02	0.01	1.41	1.42	0.01	0.36	0.37	—	1,576	1,576	0.05	0.07	2.52	1,600
Area	0.09	< 0.005	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.39	0.39	< 0.005	< 0.005	—	0.39
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Area	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Energy	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.1	12.1	< 0.005	< 0.005	—	12.1
Water	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Waste	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	9.21	6.03	19.0	0.01	0.47	—	0.47	0.41	—	0.41	—	1,027	1,027	0.04	0.01	—	1,031
Dust From Material Movement	—	—	—	—	—	0.11	0.11	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25	0.17	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	28.1	28.1	< 0.005	< 0.005	—	28.2
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.28	0.28	< 0.005	< 0.005	< 0.005	0.29
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.03	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.66	4.66	< 0.005	< 0.005	—	4.67
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.05	0.05	< 0.005	< 0.005	< 0.005	0.05
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130

Hauling	0.02	0.53	0.28	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	220	220	0.01	0.04	0.39	231
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.34	7.34	< 0.005	< 0.005	0.01	7.44
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.56
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.03	6.03	< 0.005	< 0.005	< 0.005	6.33
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.22	1.22	< 0.005	< 0.005	< 0.005	1.23
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.59
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.00	1.00	< 0.005	< 0.005	< 0.005	1.05

3.2. Site Preparation (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	9.21	6.03	19.0	0.01	0.47	—	0.47	0.41	—	0.41	—	1,027	1,027	0.04	0.01	—	1,031
Dust From Material Movement	—	—	—	—	—	0.11	0.11	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25	0.17	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	28.1	28.1	< 0.005	< 0.005	—	28.2
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.28	0.28	< 0.005	< 0.005	< 0.005	0.29
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.03	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.66	4.66	< 0.005	< 0.005	—	4.67
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.05	0.05	< 0.005	< 0.005	< 0.005	0.05
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130
Hauling	0.02	0.53	0.28	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	220	220	0.01	0.04	0.39	231
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.34	7.34	< 0.005	< 0.005	0.01	7.44
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.56
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.03	6.03	< 0.005	< 0.005	< 0.005	6.33

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.22	1.22	< 0.005	< 0.005	< 0.005	1.23
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.59
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.00	1.00	< 0.005	< 0.005	< 0.005	1.05

3.3. Grading-S (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.85	1.15	< 0.005	0.04	—	0.04	0.04	—	0.04	—	209	209	0.01	< 0.005	—	210
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	1.38	1.38	< 0.005	< 0.005	< 0.005	1.45
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.6	34.6	< 0.005	< 0.005	—	34.8
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.23	0.23	< 0.005	< 0.005	< 0.005	0.24
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	2.00	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	345	345	0.01	0.01	1.37	351
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130
Hauling	< 0.005	0.08	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.14	1.51	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	317	317	0.02	0.01	0.04	321
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	< 0.005	0.09	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.0	44.0	< 0.005	< 0.005	0.08	44.7
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	17.0	17.0	< 0.005	< 0.005	0.02	17.8

Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.64	4.64	< 0.005	< 0.005	< 0.005	4.87
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.29	7.29	< 0.005	< 0.005	0.01	7.39
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.82	2.82	< 0.005	< 0.005	< 0.005	2.95
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.81

3.4. Grading-S (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.85	1.15	< 0.005	0.04	—	0.04	0.04	—	0.04	—	209	209	0.01	< 0.005	—	210
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	1.38	1.38	< 0.005	< 0.005	< 0.005	1.45
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.6	34.6	< 0.005	< 0.005	—	34.8
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.23	0.23	< 0.005	< 0.005	< 0.005	0.24
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	2.00	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	345	345	0.01	0.01	1.37	351
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130
Hauling	< 0.005	0.08	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.14	1.51	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	317	317	0.02	0.01	0.04	321
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	< 0.005	0.09	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.0	44.0	< 0.005	< 0.005	0.08	44.7
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	17.0	17.0	< 0.005	< 0.005	0.02	17.8

Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.64	4.64	< 0.005	< 0.005	< 0.005	4.87
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.29	7.29	< 0.005	< 0.005	0.01	7.39
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.82	2.82	< 0.005	< 0.005	< 0.005	2.95
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.81

3.5. Grading-N (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.21	1.81	2.34	< 0.005	0.08	—	0.08	0.08	—	0.08	—	481	481	0.02	< 0.005	—	482
Dust From Material Movement	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.33	0.43	< 0.005	0.02	—	0.02	0.01	—	0.01	—	79.6	79.6	< 0.005	< 0.005	—	79.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.34
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.17	3.01	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	518	518	0.02	0.02	2.06	526
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.9	60.9	< 0.005	0.01	0.17	63.8
Hauling	< 0.005	0.12	0.06	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.7	50.7	< 0.005	0.01	0.09	53.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.20	2.27	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	476	476	0.02	0.02	0.05	482
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.0	61.0	< 0.005	0.01	< 0.005	63.7
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.9	50.9	< 0.005	0.01	< 0.005	53.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.47	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	94.4	94.4	< 0.005	< 0.005	0.17	95.7
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.9	11.9	< 0.005	< 0.005	0.01	12.5

Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.94	9.94	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.6	15.6	< 0.005	< 0.005	0.03	15.8
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.65	1.65	< 0.005	< 0.005	< 0.005	1.73

3.6. Grading-N (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.21	1.81	2.34	< 0.005	0.08	—	0.08	0.08	—	0.08	—	481	481	0.02	< 0.005	—	482
Dust From Material Movement	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.33	0.43	< 0.005	0.02	—	0.02	0.01	—	0.01	—	79.6	79.6	< 0.005	< 0.005	—	79.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.34
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.17	3.01	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	518	518	0.02	0.02	2.06	526
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.9	60.9	< 0.005	0.01	0.17	63.8
Hauling	< 0.005	0.12	0.06	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.7	50.7	< 0.005	0.01	0.09	53.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.20	2.27	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	476	476	0.02	0.02	0.05	482
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.0	61.0	< 0.005	0.01	< 0.005	63.7
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.9	50.9	< 0.005	0.01	< 0.005	53.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.47	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	94.4	94.4	< 0.005	< 0.005	0.17	95.7
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.9	11.9	< 0.005	< 0.005	0.01	12.5

Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.94	9.94	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.6	15.6	< 0.005	< 0.005	0.03	15.8
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.65	1.65	< 0.005	< 0.005	< 0.005	1.73

3.7. Grading-N (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.35	11.9	0.02	0.37	—	0.37	0.34	—	0.34	—	2,457	2,457	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.73	1.05	< 0.005	0.03	—	0.03	0.03	—	0.03	—	216	216	0.01	< 0.005	—	217
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.92

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.13	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	35.8	35.8	< 0.005	< 0.005	—	35.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.17	2.10	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	466	466	0.02	0.02	0.05	472
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.1	60.1	< 0.005	0.01	< 0.005	62.8
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.1	50.1	< 0.005	0.01	< 0.005	52.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.20	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.6	41.6	< 0.005	< 0.005	0.07	42.2
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	0.01	5.54
Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.40	4.40	< 0.005	< 0.005	< 0.005	4.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.89	6.89	< 0.005	< 0.005	0.01	6.98
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.88	0.88	< 0.005	< 0.005	< 0.005	0.92
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.73	0.73	< 0.005	< 0.005	< 0.005	0.76

3.8. Grading-N (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.35	11.9	0.02	0.37	—	0.37	0.34	—	0.34	—	2,457	2,457	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.73	1.05	< 0.005	0.03	—	0.03	0.03	—	0.03	—	216	216	0.01	< 0.005	—	217
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.92
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.13	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	35.8	35.8	< 0.005	< 0.005	—	35.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.17	2.10	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	466	466	0.02	0.02	0.05	472
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.1	60.1	< 0.005	0.01	< 0.005	62.8
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.1	50.1	< 0.005	0.01	< 0.005	52.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.20	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.6	41.6	< 0.005	< 0.005	0.07	42.2
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	0.01	5.54
Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.40	4.40	< 0.005	< 0.005	< 0.005	4.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.89	6.89	< 0.005	< 0.005	0.01	6.98
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.88	0.88	< 0.005	< 0.005	< 0.005	0.92
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.73	0.73	< 0.005	< 0.005	< 0.005	0.76

3.9. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	3.79	4.19	0.01	0.12	—	0.12	0.11	—	0.11	—	764	764	0.03	0.01	—	766

Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	5.06	5.06	< 0.005	< 0.005	< 0.005	5.32
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.64	0.70	< 0.005	0.02	—	0.02	0.02	—	0.02	—	129	129	0.01	< 0.005	—	129
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.89
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.12	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.3	21.3	< 0.005	< 0.005	—	21.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.01	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	212	212	0.01	0.01	0.02	214
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	36.1	36.1	< 0.005	< 0.005	0.07	36.6
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.9	20.9	< 0.005	< 0.005	0.03	21.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.97	5.97	< 0.005	< 0.005	0.01	6.06
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.62
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	3.79	4.19	0.01	0.12	—	0.12	0.11	—	0.11	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.06	5.06	< 0.005	< 0.005	< 0.005	5.32
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.64	0.70	< 0.005	0.02	—	0.02	0.02	—	0.02	—	129	129	0.01	< 0.005	—	129
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.89
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.12	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.3	21.3	< 0.005	< 0.005	—	21.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.01	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	212	212	0.01	0.01	0.02	214

Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	36.1	36.1	< 0.005	< 0.005	0.07	36.6
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.9	20.9	< 0.005	< 0.005	0.03	21.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.97	5.97	< 0.005	< 0.005	0.01	6.06
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.62
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	4.95	4.95	< 0.005	< 0.005	0.01	5.20
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	4.98	4.98	< 0.005	< 0.005	< 0.005	5.23
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.09	0.87	0.99	< 0.005	0.03	—	0.03	0.02	—	0.02	—	182	182	0.01	< 0.005	—	183
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	1.18	1.18	< 0.005	< 0.005	< 0.005	1.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.18	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	30.2	30.2	< 0.005	< 0.005	—	30.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.20	0.20	< 0.005	< 0.005	< 0.005	0.21
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	1.24	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	226	226	0.01	0.01	0.83	229
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.08	0.93	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	207	207	0.01	0.01	0.02	210
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.24	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	50.1	50.1	< 0.005	< 0.005	0.09	50.8
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.2	29.2	< 0.005	< 0.005	0.04	30.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.30	8.30	< 0.005	< 0.005	0.01	8.42
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.84	4.84	< 0.005	< 0.005	0.01	5.07
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	4.95	4.95	< 0.005	< 0.005	0.01	5.20
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	4.98	4.98	< 0.005	< 0.005	< 0.005	5.23
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.87	0.99	< 0.005	0.03	—	0.03	0.02	—	0.02	—	182	182	0.01	< 0.005	—	183
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.18	1.18	< 0.005	< 0.005	< 0.005	1.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.18	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	30.2	30.2	< 0.005	< 0.005	—	30.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.20	0.20	< 0.005	< 0.005	< 0.005	0.21
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.07	1.24	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	226	226	0.01	0.01	0.83	229
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.08	0.93	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	207	207	0.01	0.01	0.02	210
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.24	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	50.1	50.1	< 0.005	< 0.005	0.09	50.8
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.2	29.2	< 0.005	< 0.005	0.04	30.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.30	8.30	< 0.005	< 0.005	0.01	8.42
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.84	4.84	< 0.005	< 0.005	0.01	5.07
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. EPC (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.09	6.15	0.01	0.18	—	0.18	0.17	—	0.17	—	1,019	1,019	0.04	0.01	—	1,023

Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.72	0.87	< 0.005	0.03	—	0.03	0.02	—	0.02	—	144	144	0.01	< 0.005	—	144
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	1.42	1.42	< 0.005	< 0.005	< 0.005	1.49
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.13	0.16	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.8	23.8	< 0.005	< 0.005	—	23.9
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.8	37.8	< 0.005	< 0.005	0.07	38.3
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	17.5	17.5	< 0.005	< 0.005	0.02	18.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.25	6.25	< 0.005	< 0.005	0.01	6.34
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.90	2.90	< 0.005	< 0.005	< 0.005	3.03
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. EPC (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.09	6.15	0.01	0.18	—	0.18	0.17	—	0.17	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.72	0.87	< 0.005	0.03	—	0.03	0.02	—	0.02	—	144	144	0.01	< 0.005	—	144
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.42	1.42	< 0.005	< 0.005	< 0.005	1.49
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.13	0.16	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.8	23.8	< 0.005	< 0.005	—	23.9
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268

Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.8	37.8	< 0.005	< 0.005	0.07	38.3
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	17.5	17.5	< 0.005	< 0.005	0.02	18.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.25	6.25	< 0.005	< 0.005	0.01	6.34
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.90	2.90	< 0.005	< 0.005	< 0.005	3.03
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. EPC (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	9.89	9.89	< 0.005	< 0.005	0.01	10.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.17	1.56	1.96	< 0.005	0.05	—	0.05	0.05	—	0.05	—	327	327	0.01	< 0.005	—	328
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.04	0.05	< 0.005	< 0.005	< 0.005	—	3.19	3.19	< 0.005	< 0.005	< 0.005	3.35
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.28	0.36	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.2	54.2	< 0.005	< 0.005	—	54.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.40	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	84.2	84.2	< 0.005	< 0.005	0.14	85.4
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.3	39.3	< 0.005	0.01	0.05	41.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	13.9	13.9	< 0.005	< 0.005	0.02	14.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.50	6.50	< 0.005	< 0.005	0.01	6.81
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.16. EPC (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.89	9.89	< 0.005	< 0.005	0.01	10.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.56	1.96	< 0.005	0.05	—	0.05	0.05	—	0.05	—	327	327	0.01	< 0.005	—	328
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	3.19	3.19	< 0.005	< 0.005	< 0.005	3.35
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.28	0.36	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.2	54.2	< 0.005	< 0.005	—	54.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.40	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	84.2	84.2	< 0.005	< 0.005	0.14	85.4
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.3	39.3	< 0.005	0.01	0.05	41.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	13.9	13.9	< 0.005	< 0.005	0.02	14.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.50	6.50	< 0.005	< 0.005	0.01	6.81
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Paving (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	20.1	20.1	< 0.005	< 0.005	0.03	21.2

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	20.3	20.3	< 0.005	< 0.005	< 0.005	21.3
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.44	1.68	< 0.005	0.06	—	0.06	0.05	—	0.05	—	302	302	0.01	< 0.005	—	303
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	—	3.32	3.32	< 0.005	< 0.005	< 0.005	3.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.26	0.31	< 0.005	0.01	—	0.01	0.01	—	0.01	—	50.0	50.0	< 0.005	< 0.005	—	50.2
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.58
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.14	2.50	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	432	432	0.02	0.01	1.71	438
Vendor	0.01	0.21	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.52	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.17	1.89	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	397	397	0.02	0.01	0.04	402
Vendor	0.01	0.22	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.01	195

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.33	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	66.1	66.1	< 0.005	< 0.005	0.12	67.0
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.6	30.6	< 0.005	< 0.005	0.04	32.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.07	5.07	< 0.005	< 0.005	0.01	5.31
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.18. Paving (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	20.1	20.1	< 0.005	< 0.005	0.03	21.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	20.3	20.3	< 0.005	< 0.005	< 0.005	21.3

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.44	1.68	< 0.005	0.06	—	0.06	0.05	—	0.05	—	302	302	0.01	< 0.005	—	303
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	3.32	3.32	< 0.005	< 0.005	< 0.005	3.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.26	0.31	< 0.005	0.01	—	0.01	0.01	—	0.01	—	50.0	50.0	< 0.005	< 0.005	—	50.2
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.58
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.14	2.50	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	432	432	0.02	0.01	1.71	438
Vendor	0.01	0.21	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.52	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.17	1.89	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	397	397	0.02	0.01	0.04	402
Vendor	0.01	0.22	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.01	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.33	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	66.1	66.1	< 0.005	< 0.005	0.12	67.0
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.6	30.6	< 0.005	< 0.005	0.04	32.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.07	5.07	< 0.005	< 0.005	0.01	5.31
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Total	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Total	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Total	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Total	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Total	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Total	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84
Total	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2

Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84
Total	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31
Total	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31
Total	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Total	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	< 0.005	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Total	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Total	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	< 0.005	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Total	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Total	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Total	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Total	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Total	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	8/19/2024	8/30/2024	5.00	10.0	POR Metering Site Clearing
Grading-S	Grading	9/2/2024	11/8/2024	5.00	50.0	South Plant Site
Grading-N	Grading	9/23/2024	2/14/2025	5.00	105	North Plant Site
Building Construction	Building Construction	10/7/2024	5/2/2025	5.00	150	Office/Maintenance Building
EPC	Building Construction	10/21/2024	6/13/2025	5.00	170	EPC - Plant Equipment & Install
Paving	Paving	9/2/2024	11/22/2024	5.00	60.0	Electrical Installation

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Site Preparation	Concrete/Industrial Saws	Diesel	Average	1.00	4.00	33.0	0.73
Site Preparation	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36
Site Preparation	Crawler Tractors	Diesel	Average	1.00	6.00	87.0	0.43
Site Preparation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Site Preparation	Crushing/Proc. Equipment	Gasoline	Average	1.00	2.00	12.0	0.85
Grading-S	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-S	Tractors/Loaders/Back hoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-S	Excavators	Diesel	Average	1.00	4.00	180	0.38

Grading-S	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-S	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-S	Plate Compactors	Diesel	Average	1.00	4.00	8.00	0.43
Grading-S	Rollers	Diesel	Average	1.00	2.00	36.0	0.38
Grading-N	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-N	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-N	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-N	Excavators	Diesel	Average	1.00	4.00	300	0.38
Grading-N	Excavators	Diesel	Average	1.00	2.00	180	0.38
Grading-N	Cranes	Diesel	Average	1.00	2.00	367	0.29
Grading-N	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-N	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Grading-N	Crawler Tractors	Diesel	Average	1.00	2.00	87.0	0.43
Grading-N	Plate Compactors	Diesel	Average	1.00	2.00	8.00	0.43
Grading-N	Rollers	Diesel	Average	1.00	3.00	36.0	0.38
Building Construction	Cranes	Diesel	Average	1.00	2.00	367	0.29
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	25.0	0.74
Building Construction	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Building Construction	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Building Construction	Aerial Lifts	Diesel	Average	1.00	4.00	46.0	0.31
Building Construction	Sweepers/Scrubbers	Diesel	Average	1.00	2.00	10.0	0.46
Building Construction	Air Compressors	Diesel	Average	1.00	4.00	37.0	0.48
EPC	Cranes	Diesel	Average	1.00	2.00	367	0.29
EPC	Generator Sets	Diesel	Average	1.00	4.00	25.0	0.74

EPC	Welders	Diesel	Average	2.00	4.00	46.0	0.45
EPC	Rough Terrain Forklifts	Diesel	Average	1.00	4.00	96.0	0.40
EPC	Forklifts	Diesel	Average	1.00	6.00	82.0	0.20
EPC	Aerial Lifts	Diesel	Average	1.00	2.00	46.0	0.31
EPC	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
EPC	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
EPC	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	2.00	300	0.56
Paving	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	4.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Paving	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74
Paving	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Paving	Rubber Tired Loaders	Diesel	Average	1.00	4.00	150	0.36
Paving	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Paving	Excavators	Diesel	Average	1.00	4.00	180	0.38
Paving	Plate Compactors	Diesel	Average	1.00	6.00	8.00	0.43

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Site Preparation	Concrete/Industrial Saws	Diesel	Average	1.00	4.00	33.0	0.73
Site Preparation	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36

Site Preparation	Crawler Tractors	Diesel	Average	1.00	6.00	87.0	0.43
Site Preparation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Site Preparation	Crushing/Proc. Equipment	Gasoline	Average	1.00	2.00	12.0	0.85
Grading-S	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-S	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-S	Excavators	Diesel	Average	1.00	4.00	180	0.38
Grading-S	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-S	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-S	Plate Compactors	Diesel	Average	1.00	4.00	8.00	0.43
Grading-S	Rollers	Diesel	Average	1.00	2.00	36.0	0.38
Grading-N	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-N	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-N	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-N	Excavators	Diesel	Average	1.00	4.00	300	0.38
Grading-N	Excavators	Diesel	Average	1.00	2.00	180	0.38
Grading-N	Cranes	Diesel	Average	1.00	2.00	367	0.29
Grading-N	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-N	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Grading-N	Crawler Tractors	Diesel	Average	1.00	2.00	87.0	0.43
Grading-N	Plate Compactors	Diesel	Average	1.00	2.00	8.00	0.43
Grading-N	Rollers	Diesel	Average	1.00	3.00	36.0	0.38
Building Construction	Cranes	Diesel	Average	1.00	2.00	367	0.29

Building Construction	Generator Sets	Diesel	Average	1.00	8.00	25.0	0.74
Building Construction	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Building Construction	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Building Construction	Aerial Lifts	Diesel	Average	1.00	4.00	46.0	0.31
Building Construction	Sweepers/Scrubbers	Diesel	Average	1.00	2.00	10.0	0.46
Building Construction	Air Compressors	Diesel	Average	1.00	4.00	37.0	0.48
EPC	Cranes	Diesel	Average	1.00	2.00	367	0.29
EPC	Generator Sets	Diesel	Average	1.00	4.00	25.0	0.74
EPC	Welders	Diesel	Average	2.00	4.00	46.0	0.45
EPC	Rough Terrain Forklifts	Diesel	Average	1.00	4.00	96.0	0.40
EPC	Forklifts	Diesel	Average	1.00	6.00	82.0	0.20
EPC	Aerial Lifts	Diesel	Average	1.00	2.00	46.0	0.31
EPC	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
EPC	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
EPC	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	2.00	300	0.56
Paving	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	4.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Paving	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74
Paving	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Paving	Rubber Tired Loaders	Diesel	Average	1.00	4.00	150	0.36
Paving	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Paving	Excavators	Diesel	Average	1.00	4.00	180	0.38

Paving	Plate Compactors	Diesel	Average	1.00	6.00	8.00	0.43

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	4.00	10.2	HHDT,MHDT
Site Preparation	Hauling	26.0	2.00	HHDT
Site Preparation	Onsite truck	2.00	1.00	HHDT
Grading-S	—	—	—	—
Grading-S	Worker	24.0	18.5	LDA,LDT1,LDT2
Grading-S	Vendor	4.00	10.2	HHDT,MHDT
Grading-S	Hauling	4.00	2.00	HHDT
Grading-S	Onsite truck	2.00	1.00	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	16.0	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	4.00	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	1.00	1.00	HHDT
Paving	—	—	—	—
Paving	Worker	30.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	0.00	HHDT
Paving	Onsite truck	4.00	1.00	HHDT
Grading-N	—	—	—	—
Grading-N	Worker	36.0	18.5	LDA,LDT1,LDT2

Grading-N	Vendor	2.00	10.0	HHDT,MHDT
Grading-N	Hauling	6.00	2.00	HHDT
Grading-N	Onsite truck	2.00	1.00	HHDT
EPC	—	—	—	—
EPC	Worker	20.0	18.5	LDA,LDT1,LDT2
EPC	Vendor	4.00	10.2	HHDT,MHDT
EPC	Hauling	0.00	20.0	HHDT
EPC	Onsite truck	2.00	1.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	4.00	10.2	HHDT,MHDT
Site Preparation	Hauling	26.0	2.00	HHDT
Site Preparation	Onsite truck	2.00	1.00	HHDT
Grading-S	—	—	—	—
Grading-S	Worker	24.0	18.5	LDA,LDT1,LDT2
Grading-S	Vendor	4.00	10.2	HHDT,MHDT
Grading-S	Hauling	4.00	2.00	HHDT
Grading-S	Onsite truck	2.00	1.00	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	16.0	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	4.00	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	1.00	1.00	HHDT
Paving	—	—	—	—
Paving	Worker	30.0	18.5	LDA,LDT1,LDT2

Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	0.00	HHDT
Paving	Onsite truck	4.00	1.00	HHDT
Grading-N	—	—	—	—
Grading-N	Worker	36.0	18.5	LDA,LDT1,LDT2
Grading-N	Vendor	2.00	10.0	HHDT,MHDT
Grading-N	Hauling	6.00	2.00	HHDT
Grading-N	Onsite truck	2.00	1.00	HHDT
EPC	—	—	—	—
EPC	Worker	20.0	18.5	LDA,LDT1,LDT2
EPC	Vendor	4.00	10.2	HHDT,MHDT
EPC	Hauling	0.00	20.0	HHDT
EPC	Onsite truck	2.00	1.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	2,080	3.75	0.00	—

Grading-S	0.00	960	12.5	0.00	—
Grading-N	0.00	4,000	39.4	0.00	—
Paving	0.00	0.00	0.00	0.00	0.00

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Light Industry	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	349	0.03	< 0.005
2025	0.00	349	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Light Industry	89.6	89.6	89.6	32,704	2,019	2,019	2,019	737,092

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year

General Light Industry	89.6	89.6	89.6	32,704	2,019	2,019	2,019	737,092

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	4,800	1,600	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	30,621	346	0.0330	0.0040	137,441

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	30,621	346	0.0330	0.0040	137,441

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	740,000	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	740,000	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Light Industry	3.97	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

General Light Industry	3.97	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	24.7	annual days of extreme heat
Extreme Precipitation	2.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	36.5	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	5	0	0	N/A

Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	1	1	4
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	5	1	1	4
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	1	1	4

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	84.6
AQ-PM	57.9
AQ-DPM	4.38
Drinking Water	79.0
Lead Risk Housing	3.18
Pesticides	65.5
Toxic Releases	49.4
Traffic	83.0
Effect Indicators	—
CleanUp Sites	74.9
Groundwater	32.4
Haz Waste Facilities/Generators	70.9
Impaired Water Bodies	0.00
Solid Waste	92.8
Sensitive Population	—
Asthma	44.2
Cardio-vascular	70.5
Low Birth Weights	54.1
Socioeconomic Factor Indicators	—
Education	42.3
Housing	16.3
Linguistic	26.4
Poverty	38.6
Unemployment	37.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	56.46092647
Employed	16.72013345
Median HI	50.14756833
Education	—
Bachelor's or higher	40.75452329
High school enrollment	100
Preschool enrollment	28.89772873
Transportation	—
Auto Access	98.98626973
Active commuting	13.82009496
Social	—
2-parent households	44.25766714
Voting	55.22905171
Neighborhood	—
Alcohol availability	92.31361478
Park access	12.72937251
Retail density	6.236365969
Supermarket access	11.88245862
Tree canopy	7.96868985
Housing	—
Homeownership	88.31002181
Housing habitability	84.12678044
Low-inc homeowner severe housing cost burden	30.54022841
Low-inc renter severe housing cost burden	77.98023868

Uncrowded housing	88.2586937
Health Outcomes	—
Insured adults	51.58475555
Arthritis	0.0
Asthma ER Admissions	58.5
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	53.7
Cognitively Disabled	56.3
Physically Disabled	65.4
Heart Attack ER Admissions	31.7
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	74.1
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	89.7
SLR Inundation Area	0.0

Children	89.4
Elderly	28.2
English Speaking	69.3
Foreign-born	8.9
Outdoor Workers	15.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	95.8
Traffic Density	73.0
Traffic Access	23.0
Other Indices	—
Hardship	47.0
Other Decision Support	—
2016 Voting	72.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	59.0
Healthy Places Index Score for Project Location (b)	42.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Total temporary disturbance area for all three sites and interconnecting piping installation is approximately 1 acre. Total permanent RNG site area for all three sites is approximately 1.7 acres. Support facility building structure is 3,200 square feet located on South RNG Site.
Construction: Construction Phases	Construction activity duration provided by Waste Management.
Construction: Off-Road Equipment	Equipment inventories provided by Waste Management. Adjusted for conservative emissions scenario.
Construction: Trips and VMT	Vehicle activity forecasts provided by Waste Management
Construction: On-Road Fugitive Dust	On-site roads are paved ~ minimal vehicle travel on unpaved areas.
Operations: Vehicle Data	Up to 10 additional employees and 4 additional private disposal trips per day.

El Sobrante Landfill RNG - Pipe Install & SoCalGas Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.3. Construction Emissions by Year, Mitigated

3. Construction Emissions Details

3.1. SCG Connection (2024) - Unmitigated

3.2. SCG Connection (2024) - Mitigated

3.3. SCG Connection (2025) - Unmitigated

3.4. SCG Connection (2025) - Mitigated

3.5. Pipe Installation (2024) - Unmitigated

3.6. Pipe Installation (2024) - Mitigated

3.7. Pipe Installation (2025) - Unmitigated

3.8. Pipe Installation (2025) - Mitigated

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	El Sobrante Landfill RNG - Pipe Install & SoCalGas
Construction Start Date	8/5/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	21.8
Location	33.7905451419209, -117.4765010743213
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5581
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Linear	2.00	Mile	1.50	0.00	0.00	—	—	POR Site + Pipeline

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
Mit.	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
Mit.	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
Mit.	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272
Mit.	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.44	3.55	5.45	0.01	0.11	0.66	0.77	0.10	0.15	0.25	—	1,872	1,872	0.06	0.16	3.54	1,924
2025	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
2025	1.54	12.7	18.6	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,191	5,191	0.19	0.25	0.14	5,270
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.34	2.77	3.67	0.01	0.12	0.27	0.38	0.11	0.06	0.17	—	1,062	1,062	0.04	0.06	0.59	1,082
2025	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.06	0.50	0.67	< 0.005	0.02	0.05	0.07	0.02	0.01	0.03	—	176	176	0.01	0.01	0.10	179
2025	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.44	3.55	5.45	0.01	0.11	0.66	0.77	0.10	0.15	0.25	—	1,872	1,872	0.06	0.16	3.54	1,924
2025	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
2025	1.54	12.7	18.6	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,191	5,191	0.19	0.25	0.14	5,270
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.34	2.77	3.67	0.01	0.12	0.27	0.38	0.11	0.06	0.17	—	1,062	1,062	0.04	0.06	0.59	1,082
2025	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.06	0.50	0.67	< 0.005	0.02	0.05	0.07	0.02	0.01	0.03	—	176	176	0.01	0.01	0.10	179
2025	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272

3. Construction Emissions Details

3.1. SCG Connection (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.68	1.00	< 0.005	0.03	—	0.03	0.03	—	0.03	—	189	189	0.01	< 0.005	—	190

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.87	9.87	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.12	0.18	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	31.3	31.3	< 0.005	< 0.005	—	31.4
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.72
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	0.02	0.70	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	1.75	651
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.59	294
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.02	0.74	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	0.05	650
Hauling	< 0.005	0.33	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.02	294
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.39	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	78.1	78.1	< 0.005	< 0.005	0.14	79.2
Vendor	0.01	0.21	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	181	181	< 0.005	0.03	0.22	190
Hauling	< 0.005	0.10	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	81.7	81.7	< 0.005	0.01	0.07	85.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.0	30.0	< 0.005	< 0.005	0.04	31.4
Hauling	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	13.5	13.5	< 0.005	< 0.005	0.01	14.2

3.2. SCG Connection (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.68	1.00	< 0.005	0.03	—	0.03	0.03	—	0.03	—	189	189	0.01	< 0.005	—	190

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.87	9.87	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.12	0.18	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	31.3	31.3	< 0.005	< 0.005	—	31.4
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.72
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	0.02	0.70	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	1.75	651
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.59	294
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.02	0.74	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	0.05	650
Hauling	< 0.005	0.33	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.02	294
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.39	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	78.1	78.1	< 0.005	< 0.005	0.14	79.2
Vendor	0.01	0.21	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	181	181	< 0.005	0.03	0.22	190
Hauling	< 0.005	0.10	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	81.7	81.7	< 0.005	0.01	0.07	85.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.0	30.0	< 0.005	< 0.005	0.04	31.4
Hauling	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	13.5	13.5	< 0.005	< 0.005	0.01	14.2

3.3. SCG Connection (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.93	1.43	< 0.005	0.03	—	0.03	0.03	—	0.03	—	270	270	0.01	< 0.005	—	271

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	13.9	13.9	< 0.005	< 0.005	0.01	14.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.17	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	44.8	44.8	< 0.005	< 0.005	—	44.9
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	2.30	2.30	< 0.005	< 0.005	< 0.005	2.41
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.67	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	1.74	642
Hauling	< 0.005	0.31	0.07	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.59	289
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	0.01	0.70	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	0.05	640
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.02	289
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.51	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	109	109	0.01	< 0.005	0.19	111
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	255	255	0.01	0.04	0.31	267
Hauling	< 0.005	0.13	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	115	115	< 0.005	0.02	0.11	120
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.1	18.1	< 0.005	< 0.005	0.03	18.4
Vendor	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.2	42.2	< 0.005	0.01	0.05	44.2
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.0	19.0	< 0.005	< 0.005	0.02	19.9

3.4. SCG Connection (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.93	1.43	< 0.005	0.03	—	0.03	0.03	—	0.03	—	270	270	0.01	< 0.005	—	271

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	13.9	13.9	< 0.005	< 0.005	0.01	14.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.17	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	44.8	44.8	< 0.005	< 0.005	—	44.9
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	2.30	2.30	< 0.005	< 0.005	< 0.005	2.41
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.67	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	1.74	642
Hauling	< 0.005	0.31	0.07	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.59	289
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	0.01	0.70	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	0.05	640
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.02	289
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.51	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	109	109	0.01	< 0.005	0.19	111
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	255	255	0.01	0.04	0.31	267
Hauling	< 0.005	0.13	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	115	115	< 0.005	0.02	0.11	120
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.1	18.1	< 0.005	< 0.005	0.03	18.4
Vendor	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.2	42.2	< 0.005	0.01	0.05	44.2
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.0	19.0	< 0.005	< 0.005	0.02	19.9

3.5. Pipe Installation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.24	10.4	12.6	0.03	0.55	—	0.55	0.51	—	0.51	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	1.60	1.94	< 0.005	0.09	—	0.09	0.08	—	0.08	—	418	418	0.02	< 0.005	—	419
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.23	5.23	< 0.005	< 0.005	< 0.005	5.50
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.29	0.35	< 0.005	0.02	—	0.02	0.01	—	0.01	—	69.2	69.2	< 0.005	< 0.005	—	69.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.91
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	249	249	0.01	0.04	0.02	260
Hauling	0.01	0.23	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	123	123	< 0.005	0.02	0.01	129
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.4	41.4	< 0.005	< 0.005	0.08	42.0
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.4	38.4	< 0.005	0.01	0.05	40.2
Hauling	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	18.9	18.9	< 0.005	< 0.005	0.02	19.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.86	6.86	< 0.005	< 0.005	0.01	6.95
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.36	6.36	< 0.005	< 0.005	0.01	6.65
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.13	3.13	< 0.005	< 0.005	< 0.005	3.29

3.6. Pipe Installation (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.24	10.4	12.6	0.03	0.55	—	0.55	0.51	—	0.51	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.19	1.60	1.94	< 0.005	0.09	—	0.09	0.08	—	0.08	—	418	418	0.02	< 0.005	—	419
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.23	5.23	< 0.005	< 0.005	< 0.005	5.50
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.29	0.35	< 0.005	0.02	—	0.02	0.01	—	0.01	—	69.2	69.2	< 0.005	< 0.005	—	69.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.91
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	249	249	0.01	0.04	0.02	260
Hauling	0.01	0.23	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	123	123	< 0.005	0.02	0.01	129
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.4	41.4	< 0.005	< 0.005	0.08	42.0
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.4	38.4	< 0.005	0.01	0.05	40.2
Hauling	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	18.9	18.9	< 0.005	< 0.005	0.02	19.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.86	6.86	< 0.005	< 0.005	0.01	6.95
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.36	6.36	< 0.005	< 0.005	0.01	6.65
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.13	3.13	< 0.005	< 0.005	< 0.005	3.29

3.7. Pipe Installation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	2.16	3.11	0.01	0.10	—	0.10	0.09	—	0.09	—	682	682	0.03	0.01	—	685
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	8.41	8.41	< 0.005	< 0.005	0.01	8.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.39	0.57	< 0.005	0.02	—	0.02	0.02	—	0.02	—	113	113	< 0.005	< 0.005	—	113
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.39	1.39	< 0.005	< 0.005	< 0.005	1.46
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.27	0.08	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.69	257
Hauling	0.01	0.21	0.09	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	120	120	< 0.005	0.02	0.24	126

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.28	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.02	256
Hauling	0.01	0.22	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	121	121	< 0.005	0.02	0.01	126
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.31	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	66.2	66.2	< 0.005	< 0.005	0.11	67.2
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.8	61.8	< 0.005	0.01	0.08	64.7
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.4	30.4	< 0.005	< 0.005	0.03	31.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.0	11.0	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.01	10.7
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.04	5.04	< 0.005	< 0.005	< 0.005	5.28

3.8. Pipe Installation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712

Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	2.16	3.11	0.01	0.10	—	0.10	0.09	—	0.09	—	682	682	0.03	0.01	—	685
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	8.41	8.41	< 0.005	< 0.005	0.01	8.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.39	0.57	< 0.005	0.02	—	0.02	0.02	—	0.02	—	113	113	< 0.005	< 0.005	—	113
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.39	1.39	< 0.005	< 0.005	< 0.005	1.46
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.27	0.08	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.69	257
Hauling	0.01	0.21	0.09	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	120	120	< 0.005	0.02	0.24	126
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.28	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.02	256
Hauling	0.01	0.22	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	121	121	< 0.005	0.02	0.01	126
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.31	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	66.2	66.2	< 0.005	< 0.005	0.11	67.2
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.8	61.8	< 0.005	0.01	0.08	64.7
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.4	30.4	< 0.005	< 0.005	0.03	31.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.0	11.0	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.01	10.7
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.04	5.04	< 0.005	< 0.005	< 0.005	5.28

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
SCG Connection	Linear, Drainage, Utilities, & Sub-Grade	8/5/2024	8/1/2025	5.00	260	SoCalGas POR Site
Pipe Installation	Linear, Paving	10/14/2024	5/9/2025	5.00	150	Pipe Installation

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37
SCG Connection	Aerial Lifts	Diesel	Average	1.00	2.00	320	0.31
SCG Connection	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
SCG Connection	Trenchers	Diesel	Average	1.00	2.00	40.0	0.50
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
SCG Connection	Welders	Diesel	Average	2.00	2.00	46.0	0.45
Pipe Installation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
Pipe Installation	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Pipe Installation	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Pipe Installation	Bore/Drill Rigs	Diesel	Average	1.00	2.00	83.0	0.50
Pipe Installation	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	72.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	180	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	6.00	320	0.38
Pipe Installation	Crawler Tractors	Diesel	Average	1.00	4.00	87.0	0.43
Pipe Installation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Pipe Installation	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Pipe Installation	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Pipe Installation	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Pipe Installation	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37

SCG Connection	Aerial Lifts	Diesel	Average	1.00	2.00	320	0.31
SCG Connection	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
SCG Connection	Trenchers	Diesel	Average	1.00	2.00	40.0	0.50
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
SCG Connection	Welders	Diesel	Average	2.00	2.00	46.0	0.45
Pipe Installation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
Pipe Installation	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Pipe Installation	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Pipe Installation	Bore/Drill Rigs	Diesel	Average	1.00	2.00	83.0	0.50
Pipe Installation	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	72.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	180	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	6.00	320	0.38
Pipe Installation	Crawler Tractors	Diesel	Average	1.00	4.00	87.0	0.43
Pipe Installation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Pipe Installation	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Pipe Installation	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Pipe Installation	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Pipe Installation	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Pipe Installation	—	—	—	—
Pipe Installation	Worker	20.0	18.5	LDA,LDT1,LDT2

Pipe Installation	Vendor	8.00	10.2	HHDT,MHDT
Pipe Installation	Hauling	8.00	4.00	HHDT
Pipe Installation	Onsite truck	4.00	2.00	HHDT
SCG Connection	—	—	—	—
SCG Connection	Worker	20.0	18.5	LDA,LDT1,LDT2
SCG Connection	Vendor	20.0	10.2	HHDT,MHDT
SCG Connection	Hauling	4.00	20.0	HHDT
SCG Connection	Onsite truck	4.00	2.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Pipe Installation	—	—	—	—
Pipe Installation	Worker	20.0	18.5	LDA,LDT1,LDT2
Pipe Installation	Vendor	8.00	10.2	HHDT,MHDT
Pipe Installation	Hauling	8.00	4.00	HHDT
Pipe Installation	Onsite truck	4.00	2.00	HHDT
SCG Connection	—	—	—	—
SCG Connection	Worker	20.0	18.5	LDA,LDT1,LDT2
SCG Connection	Vendor	20.0	10.2	HHDT,MHDT
SCG Connection	Hauling	4.00	20.0	HHDT
SCG Connection	Onsite truck	4.00	2.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
SCG Connection	0.00	0.00	1.50	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
User Defined Linear	1.25	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	532	0.03	< 0.005
2025	0.00	532	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	24.7	annual days of extreme heat
Extreme Precipitation	2.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	36.5	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	84.6

AQ-PM	57.9
AQ-DPM	4.38
Drinking Water	79.0
Lead Risk Housing	3.18
Pesticides	65.5
Toxic Releases	49.4
Traffic	83.0
Effect Indicators	—
CleanUp Sites	74.9
Groundwater	32.4
Haz Waste Facilities/Generators	70.9
Impaired Water Bodies	0.00
Solid Waste	92.8
Sensitive Population	—
Asthma	44.2
Cardio-vascular	70.5
Low Birth Weights	54.1
Socioeconomic Factor Indicators	—
Education	42.3
Housing	16.3
Linguistic	26.4
Poverty	38.6
Unemployment	37.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—

Above Poverty	56.46092647
Employed	16.72013345
Median HI	50.14756833
Education	—
Bachelor's or higher	40.75452329
High school enrollment	100
Preschool enrollment	28.89772873
Transportation	—
Auto Access	98.98626973
Active commuting	13.82009496
Social	—
2-parent households	44.25766714
Voting	55.22905171
Neighborhood	—
Alcohol availability	92.31361478
Park access	12.72937251
Retail density	6.236365969
Supermarket access	11.88245862
Tree canopy	7.96868985
Housing	—
Homeownership	88.31002181
Housing habitability	84.12678044
Low-inc homeowner severe housing cost burden	30.54022841
Low-inc renter severe housing cost burden	77.98023868
Uncrowded housing	88.2586937
Health Outcomes	—
Insured adults	51.58475555
Arthritis	0.0

Asthma ER Admissions	58.5
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	53.7
Cognitively Disabled	56.3
Physically Disabled	65.4
Heart Attack ER Admissions	31.7
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	74.1
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	89.7
SLR Inundation Area	0.0
Children	89.4
Elderly	28.2
English Speaking	69.3
Foreign-born	8.9

Outdoor Workers	15.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	95.8
Traffic Density	73.0
Traffic Access	23.0
Other Indices	—
Hardship	47.0
Other Decision Support	—
2016 Voting	72.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	59.0
Healthy Places Index Score for Project Location (b)	42.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Preliminary schedule provided by Waste Management.
Construction: Off-Road Equipment	Equipment inventories provided by Waste Management.
Construction: Trips and VMT	Vehicle inventory provided by WM.
Construction: On-Road Fugitive Dust	Nearly all vehicle travel on-site will occur on existing paved roads.
Construction: Paving	Approximately 2 miles of 5 ft width.

Appendix C
Biological Resources Technical Report

Biological Resources Technical Report for the Renewable Natural Gas Facility Project at the El Sobrante Landfill

Riverside County, California

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TABLE OF CONTENTS

SECTION			PAGE
1.0	INTRODUCTION		1
	1.1	Project Location	1
	1.2	Project Purpose and Need	1
	1.3	Project Description	1
	1.4	Study Area	2
2.0	SURVEY METHODS		4
	2.1	Literature Review and Desktop Analysis	4
	2.2	Biological Field Surveys	4
		2.2.1 Vegetation Mapping	4
		2.2.2 Habitat Assessment	4
	2.3	Aquatic Resources Delineation	5
		2.3.1 Delineation of Federal Waters	5
		2.3.2 Delineation of State Waters	5
3.0	ENVIRONMENTAL SETTING		6
	3.1	Regional Context	6
	3.2	General Land Uses	6
	3.3	Topography and Soils	6
	3.4	Hydrology	7
	3.5	Designated Critical Habitat	7
	3.6	Vegetation Communities and Cover Types	7
	3.7	Special-Status Biological Resources	10
		3.7.1 Special Status Plants	10
		3.7.2 Special Status Wildlife	12
	3.8	Jurisdictional Aquatic Resources	15
		3.8.1 Federal Aquatic Resources	16
		3.8.2 State Aquatic Resources	16
		3.8.3 Potential Non-jurisdictional Features	17
	3.9	Wildlife Movement	17
4.0	APPLICABLE REGULATIONS		18
5.0	PROJECT IMPACTS		19
	5.1	Thresholds for Determining Potential Significance	19
		5.1.1 Special Status Species	20
		5.1.2 Riparian Habitat and Sensitive Natural Communities	21
		5.1.3 Jurisdictional Wetlands	22
		5.1.4 Wildlife Movement or Nursery Sites	22
		5.1.5 Local Policies, Ordinances, and Habitat Conservation Plan	23
	5.2	Direct Impacts	25
	5.3	Indirect Impacts	25
		5.3.1 Runoff, Erosion, and Siltation	25
		5.3.2 Vehicular Traffic	26
		5.3.3 Noise and Human Presence	26
		5.3.4 Lighting	26
		5.3.5 Toxins	27
		5.3.6 Fugitive Dust	27
		5.3.7 Wildlife Entrapment	27

5.3.8 Invasive Species 27
5.4 Cumulative Impacts 28
6.0 MITIGATION 29
7.0 ACKNOWLEDGEMENTS AND CERTIFICATION 30
8.0 REFERENCES 31

APPENDICES

APPENDIX A Figures
APPENDIX B Photographs
APPENDIX C Aquatic Resources Delineation Report
APPENDIX D Special Status Plants Potential to Occur
APPENCIX E Special Status Wildlife Potential to Occur

LIST OF FIGURES

Figure 1 Project Vicinity Appendix A
Figure 2 Study Area Appendix A
Figure 3 Vegetation Communities and Land Cover Types Appendix A
Figure 4 Soils Appendix A
Figure 5 Critical Habitat Appendix A

LIST OF TABLES

Tables Page

Table 1. Vegetation Communities/Land Cover Types 8
Table 2. Summary of USACE/RWQCB[1] Potential Aquatic Resources within the Study Area 16

1.0 Introduction

Artemis Environmental Services, Inc. (Artemis Environmental) was retained by Toro Energy, LLC to prepare this Biological Resources Technical Report (BRTR) for the Renewable Natural Gas (RNG) Facility Project (RNG Facility or Project) at the El Sobrante Landfill. This BRTR analyzes the biological impacts on vegetation, wildlife, sensitive species, and sensitive habitat from the proposed changes associated with the Project.

1.1 Project Location

The Project overlaps the southwestern portion of the El Sobrante Landfill, located south of the City of Corona, east of Interstate (I)-15 and Temescal Canyon Road, in the Temescal Valley of western Riverside County (County), California (Appendix A, Figures 1 and 2). The Project is in Sections 23, 26, 34, and 35, Township 4 South, and Range 6 West of the United States Geological Survey (USGS) *Lake Mathews, California* 7.5-minute quadrangle map.

1.2 Project Purpose and Need

An Environmental Impact Report (EIR) was prepared and approved in 1998 for anticipated expansion of the El Sobrante Landfill from 146 acres to 645 acres (County 1998). To address mitigation for biology impacts, a Multiple Species Habitat Conservation Plan (MSHCP) was prepared in 2001 (USA Waste of California, Inc. [USA Waste] 2001; ESL MSHCP) for the 50-year landfill expansion. The U.S. Fish and Wildlife Service (USFWS) issued a Section 10 (a) permit and the California Department of Wildlife (CDFW, formerly California Department of Fish and Game) issued a Section 2081 (b) permit for impacts to two threatened and endangered species (see also Section 3.1, below), and 29 other sensitive species that were not yet listed as threatened or endangered.

Waste Management of California, Inc. (WM) and Toro Energy have entered into an agreement for Toro Energy to install and operate an RNG Facility onsite. The RNG Facility will process existing landfill gas (LFG) that will be diverted from the existing flares, processed to meet the Southern California Gas Company (SoCalGas) specifications, and sold to SoCalGas through a Point of Receipt (POR) for local distribution.

Most of the Project site is located within the limits of the 1998 EIR and 2001 MSHCP. The areas of the Project that are not within the 2001 MSHCP limits are being submitted for approval for inclusion into the MSHCP area, including 12.64 acres along Dawson Canyon Bridge and Dawson Canyon Road in the southern portion of the Project site within the updated *First Amended and Restated Second El Sobrante Landfill Agreement* (USA Waste 2018) (Appendix A, Figures 1 and 2). Although these areas were not identified in the existing Site Plan for the landfill and were not specifically analyzed as part of previous CEQA documents, they are part of existing conditions that have been in operation for a number of years. The Site Plan will be revised to reflect the additional segments along the southern and norther portions of the Project site.

1.3 Project Description

The proposed RNG Facility improvements will be located within three previously disturbed areas (the existing North Old Maintenance Shop, South Existing Flares, and parking area west of the Dawson Canyon

Bridge) within WM-owned property at El Sobrante Landfill (see Appendix A, Figure 2) and a pipeline connecting them. The RNG process begins at the south site within the South Existing Flares area (South Site). The RNG process will intercept the LFG prior to the existing flares and divert the gas flow to the proposed approximately 2,500 square foot Compressor Building located west of the existing flares. Once compressed, the gas will be conveyed to the proposed North Site by an underground pipeline located within the existing pavement or shoulder of the landfill access road. A proposed approximately 3,200 square foot Maintenance Building will be located within the South Site for routine equipment maintenance required for the RNG Facility as well as other equipment. The South Site operation will occupy approximately 0.3 acre.

The RNG gas refining process continues at the North Site located within the existing North Old Maintenance Shop area (see Appendix A, Figure 2). The RNG Facility will utilize the existing concrete pad and aims to preserve the existing canopy structure if possible. One proposed approximately 440 square foot Pump House Building will be located adjacent to the existing canopy. The remaining proposed equipment will be located on separate concrete pads with both above ground and below ground pipe connections. Once the gas meets SoCalGas specifications, the gas will be diverted to a dedicated underground sales gas main that will be located within the existing pavement or shoulder of the landfill access road to the SoCalGas POR. The North Site operation will occupy approximately 1.2 acre.

The onsite RNG process concludes at the POR that will be located on WM private property within the existing shoulder turn out approximately 600 feet northeast of Temescal Canyon Road and Dawson Canyon Road intersection. The sales RNG main will be brought to the POR underground and eventually brought above grade within a fence-enclosed POR. SoCalGas will have various pieces of equipment to receive the RNG. The RNG will then be delivered to SoCalGas' main pipeline located underground in the public right-the-way within Temescal Canyon Road, approximately 600 feet southwest from the POR. The construction area includes approximately 6,000 square feet of permanent space for the POR facility, and a temporary staging area and a temporary workspace which will be determined based on project needs.

1.4 Study Area

The Study Area, comprising the proposed construction of permanent and temporary disturbance and staging areas as the Project impact area plus a varying buffer to allow for minor project adjustments, totals 23.42 acres on multiple parcels owned by WM. The Study Area includes the three building sites (the North Site at the North Old Maintenance Shop, the South Site at the South Existing Flares, and the POR near the Dawson Canyon Bridge), the proposed pipe trench continuing down Dawson Canyon Road that will be located within the road shoulder, the boring alignment that crosses beneath Temescal Wash, and a buffer that extends either to the top or toe of adjacent slopes (nearest slope edge) depending on the locations. The northeastern edge of the Study Area is located at N33.801704 and W-117.471520 coordinates, and the southwestern edge of the Study Area is located at N33.783283 and W-115.488759 coordinates. The Study Area is in Sections 23, 26, 34, and 35, Township 4 South, and Range 6 West of the United States Geological Survey (USGS) *Lake Mathews, California* 7.5-minute quadrangle map.

The majority of the Study Area is developed and composed of paved roadways, compacted and graded or otherwise disturbed roadsides, and existing buildings and other structures associated with the landfill (site photos are provided in Appendix B). A portion of the Study Area occurs within Temescal Wash and Coldwater Canyon Creek, aquatic features with associated riparian and wetland habitats. Riversidean Sage Scrub occurs in the vicinity of the Study Area and within a small portion of the Study Area.

2.0 Survey Methods

Data regarding biological and aquatic resources present within the Study Area were obtained through a review of pertinent literature and field reconnaissance, both of which are described below.

2.1 Literature Review and Desktop Analysis

The purpose of the literature review and desktop analysis is to obtain contextual information relevant to the site which may not be evident from the ground during field surveys. The following sources were consulted to gain a better understanding of the physical and hydrologic setting of the Study Area:

- 7.5-minute USGS topographic quadrangle maps,
- Aerial imagery of the Study Area,
- The California Natural Diversity Database (CNDDB; CDFW 2023, CDFW 2024a, CDFW 2024b),
- USFWS Species Occurrence Data (USFWS 2023),
- USFWS critical habitat maps (USFWS 2024),
- The Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2023),
- The ESL MSHCP (2001),
- Annual reports documenting the monitoring and implementation of both the El Sobrante Landfill Mitigation Monitoring Plan (MMP) by the Riverside County Department of Waste Resources (RCDWR; 2018a, 2018b, 2019, and 2022) and USA Waste (2020, 2021, and 2023), and
- The Biological Resources Report for the Proposed Modifications to the El Sobrante Landfill Site Plan and Limits of Grading (Mariposa Biology 2017).

2.2 Biological Field Surveys

2.2.1 Vegetation Mapping

Vegetation communities were mapped during pedestrian surveys within the Study Area according to *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) by an Artemis Environmental biologist, Jasmine Bakker, on May 23, 2023 and December 21, 2023 (Appendix A, Figure 3). Plant nomenclature follows Baldwin et al. (2012) as updated by the Jepson Flora Project (2021).

2.2.2 Habitat Assessment

Information from the literature review, including species occurrences documented within 5 miles of the Project, was used to compile a list of species and habitats identified as special-status by State, federal, and local resources agencies that have the potential to occur in the Study Area or immediate vicinity. The vegetation mapping, hydrology information, soils data, and previous occurrence records were then utilized to assess the habitat quality within the Study Area to determine the potential of these species to occur.

2.3 Aquatic Resources Delineation

An initial field survey was conducted by Artemis Environmental wetland specialists, Jasmine Bakker and Kyle Gunther, on March 29, 2022 within the vicinity of the Dawson Canyon Bridge and included digging soil pits to document presence/absence of potential wetlands within the Temescal Wash. Ms. Bakker conducted a formal aquatic resources delineation for the entire Study Area, which included updating the delineation within the vicinity of the Dawson Canyon Bridge, on May 23, 2023. The aquatic resources delineation was revised by Ms. Bakker and Artemis regulatory specialist, Julie Stout, on December 21, 2023 to reflect changes both to aquatic resources regulations and to existing conditions within the Temescal Wash as a result of increased water flows between 2022 and 2023. Results of the aquatic resources delineation are provided in the Aquatic Resources Delineation Report (ARDR) for the Project (Artemis 2024; Appendix C).

2.3.1 Delineation of Federal Waters

Waters of the U.S. regulated by the U.S. Army Corps of Engineers (USACE) include those waters listed in 33 Code of Federal Regulations (CFR) 328.3 (Definitions of Waters of the United States). All potential waters of the U.S. were delineated to their jurisdictional limits as defined by 33 CFR 328.4 (Limits of Jurisdiction). Pre-field analysis confirmed the potential presence of both non-wetland waters and wetland waters of the U.S. Therefore, field surveys evaluated the potential for wetland waters of the U.S. in accordance with the *Corps of Engineers Wetland Delineation Manual* (Manual; Environmental Laboratory 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0; Environmental Laboratory 2008), and Applicable USACE Regulatory Guidance Letters (RGLs). Potential non-wetland waters of the U.S., in the absence of federal wetlands exhibiting all three wetland parameters, were delineated based on field indicators to define and identify the lateral extent of the Ordinary High Water Mark (OHWM), as defined by 33 CFR 228.3(c)(7) and according to *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (Lichvar and McColley 2008).

2.3.2 Delineation of State Waters

Potential aquatic features under the purview of the Regional Water Quality Control Board (RWQCB) were delineated pursuant to the federal methodology for wetland and non-wetland waters of the U.S. (see Section 2.4.1, above) *and* Section 13000 *et seq.* of the California Water Code (CWC; 1969 Porter-Cologne Water Quality Control Act). Potential aquatic features under the purview of CDFW were delineated pursuant to Section 1600 *et seq*. of the California Fish and Game Code (CFGC). CDFW usually extends its jurisdictional limit to the top of a stream bank, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider. Therefore, jurisdictional boundaries subject to CFGC §§ 1600-1617 typically encompass an area that is greater than the lateral extent of the OHWM.

3.0 Environmental Setting

This section describes the existing conditions in terms of regional context, general land use, topography and soil, hydrology, and designated critical habitat.

3.1 Regional Context

The Study Area is within the ESL MSHCP area (USA Waste 2001) except for 12.64 acres within the southern portion of the Project site within the updated *First Amended and Restated Second El Sobrante Landfill Agreement* (USA Waste 2018). The MSHCP was prepared to address biology impacts and mitigation of the planned 50-year landfill expansion. The El Sobrante Landfill addresses impacts to two threatened and endangered species, coastal California gnatcatcher (*Polioptila californica californica,* CAGN) and Stephens' kangaroo rat (*Dipodomys stephensi*, SKR), and 29 other sensitive species that were not yet listed as threatened or endangered.

The Western Riverside County (WRC) MSHCP (County 2003) is a comprehensive, multi-jurisdictional effort that includes portions of western Riverside County and fourteen cities to conserve listed and sensitive species and their habitats. Because most of the Project site is within the ESL MSHCP area, impacts on Covered Species, minimization and avoidance measures, and mitigation measures will be addressed by the ESL MSHCP and not the WRC MSHCP.

3.2 General Land Uses

The existing land use within and surrounding the Study Area generally consists of the El Sobrante Landfill and both public and private roads. The Study Area includes the existing North Old Maintenance Shop (Attachment B, Photos 1 and 2) and South Existing Flares (Attachment B, Photos 3 and 4) within the landfill's boundaries. The unpaved parking area to the south of the Dawson Canyon Bridge where the proposed POR is located (Attachment B, Photo 11) is currently used by one food truck on weekdays. Undeveloped open space and the active landfill abut the majority of the Study Area. Industrial businesses, including a tire shop and a construction equipment yard, are also in the vicinity.

3.3 Topography and Soils

Elevations within the Study Area range from approximately 905 feet above mean sea level (amsl) at the southwestern end of the project near the POR to 1,377 feet amsl in the northeastern end of the project near the North Old Maintenance Shop.

Soils within and near the Study Area are displayed on Appendix A, Figure 4. Seven soil series types occur within the Study Area: clay pits, Cortina gravelly loamy sand (2 to 8 percent slopes), Garretson gravelly very fine sandy loam (2 to 8 percent slopes), gullied land, Lodo rocky loam (25 to 50 percent slopes, eroded), Placentia fine sandy loam (5 to 15 percent slopes), and Temescal rocky loam (15 to 50 percent slopes, eroded) (NRCS 2023). The majority of the soil within the Study Area is mapped as gullied land within the South Existing Flares site and portions of Dawson Canyon Road and the North Old Maintenance Shop. Garretson gravelly very fine sandy loam (2 to 8 percent slopes) is mapped within the POR site, and Cortina gravelly loamy sand (2 to 8 percent slopes) is mapped along the Temescal Wash to the northeast of the POR site. Placentia fine sandy loam (5 to 15 percent slopes) is mapped within the remainder of the North Old Maintenance Shop, and also occurs in portions of the Dawson Canyon Road intermixed with the other three soil types mapped within the Study Area.

3.4 Hydrology

The Study Area is within the Lake Mathews Hydrologic Subarea (HU 801.32) of the Santa Ana River Hydrologic Unit; and is within the Bedford Wash - Temescal Wash Watershed (HUC 180702030604). Drainage features adjacent to or that intersect the Study Area are hydrologically connected to the Temescal Wash. One tributary, Coldwater Creek, is an intermittent stream south of Temescal Wash that parallels the POR site and meets Temescal Wash immediately downstream of Dawson Canyon Bridge. The Temescal Wash is a Relatively Permanent Water (RPW), that flows approximately 14 miles to Prado Dam that is on the southwest side of Prado Lake, a Traditional Navigable Water (TNW). Water drains from Prado Dam into the Santa Ana River, an RPW, and towards the Pacific Ocean, a TNW, at Newport Beach.

3.5 Designated Critical Habitat

The nearest critical habitat to the Project is approximately 1.4 miles away for CAGN (Appendix A, Figure 5). No other critical habitat for any other species exists within five miles of the Project.

3.6 Vegetation Communities and Cover Types

Nine vegetation communities/land cover types, including four wetland/aquatic vegetation communities and five upland vegetation communities/land cover types, were mapped within the Study Area (Table 1; Appendix A, Figure 3). A description for each vegetation community/land cover type mapped within the Study Area is provided below.

Table 1. Vegetation Communities/Land Cover Types

Vegetation Community (Holland Code)[1]	Area (Acres)[3]
Wetlands/Aquatic	
Southern Willow Scrub (63320)[3]	0.05
Mule Fat Scrub (63310) [3]	0.01
Herbaceous Wetland (52510)[3]	0.02
Streambed/Unvegetated Habitat (64000)	0.15
Subtotal	*0.23*
Uplands	
Riversidean Sage Scrub (32700)	1.19
Non-native Woodland (79000)	0.17
Disturbed Habitat (11000)	0.54
Urban/Developed (12000)[4]	21.16
Stormwater Detention Basin[5]	0.14
Subtotal	*23.20*
GRAND TOTAL	23.43

1 Preliminary Descriptions of the Terrestrial Natural Communities of California, Holland, 1986.
2 Acreages are rounded to the nearest hundredth; thus, totals reflect rounding.
3 Includes portions of vegetated streambed below the OHWM.
4 Includes developed, concrete-lined streambed below the Dawson Canyon Bridge, and the concrete spillway downstream of the culvert outlet for Coldwater Creek.
5 One basin constructed wholly within uplands for purposes of stormwater detention near South Existing Flares site.

Southern Willow Scrub

Southern Willow Scrub are described as dense, broad-leafed, winter-deciduous riparian thickets dominated by *Salix* species, and typically scattered with emergent cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). Plant species observed within the Southern Willow Scrub mapped within the Temescal Wash include castor bean, cocklebur (*Xanthium strumarium*), cottonwood, dodder (*Cuscuta* sp.), Goodding's black willow (*Salix gooddingii*), hoary nettle (*Urtica dioica* ssp. *holosericea*), red willow (*Salix laevigata*), water cress, and western sycamore.

Mule Fat Scrub

Mule Fat Scrub is characterized by a depauperate, tall, herbaceous riparian scrub strongly dominated by mulefat (*Baccharis salicifolia*) with frequent flooding. Non-native species introduced and established through human action result in disturbed habitat. Plant species observed within the Mule Fat Scrub mapped within the Temescal Wash include castor bean, mulefat, perennial pepperweed, saltcedar, salt heliotrope (*Heliotropium curassavicum* var. *oculatum*), short-pod mustard (*Hirschfeldia incana*), stinknet, water cress, and western sunflower (*Helianthus annuus*).

Herbaceous Wetland

Herbaceous wetlands are seasonal wetlands supporting mainly annual species. These areas do not support species typically associated with Freshwater Marsh (52400). Plant species observed within the Herbaceous Wetland mapped within Temescal Wash include cattail, marsh yellow cress (*Rorippa palustris*), mulefat

(*Baccharis salicifolia*), perennial pepperweed (*Lepidium latifolium*), rush (*Juncus* sp.), and water cress (*Nasturtium officinale*).

STREAMBED

Streambed/Unvegetated Habitat consist of submerged terrestrial wetlands with minimal vegetative cover (less than 2 percent cover of herbaceous species and less than 10 percent cover by tree or shrub species). Plant species observed within the Streambed/Unvegetated Habitat include bicolor cudweed (*Pseudognaphalium biolettii*), castor bean (*Ricinus communis*), cattail (*Typha* sp.), everlasting cudweed (*Pseudognaphalium luteoalbum*), fiddleneck (*Amsinckia* sp.), miner's lettuce (*Claytonia perfoliata*), nutsedge (*Cyperus* sp.), prickly sow thistle (*Sonchus asper* ssp. *asper*), stinknet (*Oncosiphon pilulifer*), saltcedar (*Tamarix ramosissima*), and tree tobacco (*Nicotiana glauca*). Additionally, seep monkeyflower (*Erythranthe guttatus*) was observed scattered along the streambed edges of Coldwater Creek.

RIVERSIDEAN SAGE SCRUB

Riversidean Sage Scrub is the most xeric expression of Coastal Sage Scrub. Typical stands are fairly open and dominated by California sagebrush (*Artemisia californica*), buckwheat (*Eriogonum fasciculatum*), and red brome (*Bromus rubens*). Non-native species introduced and established through human action result in disturbed habitat. Dominant plant species observed within the Riversidean Sage Scrub mapped throughout the Study Area include buckwheat, California sagebrush, and brittlebush (*Encelia farinosa*). Other species observed include annual beard grass (*Polypogon monspeliensis*), California aster (*Corethrogyne filaginifolia*), chia (*Salvia columbariae*), coyote brush (*Baccharis pilularis*), horehound (*Marrubium vulgare*), maltese star-thistle (*Centaurea melitensis*), milk thistle (*Silybum marianum*), phacelia (*Phacelia* sp.), red brome, redstem filaree (*Erodium cicutarium*), scale-broom (*Lepidospartum squamatum*), short-pod mustard, stinknet, and wall barley (*Hordeum murinum*).

NON-NATIVE WOODLAND

Non-native woodland is a woodland consisting of exotic trees, which are not maintained or artificially irrigated. Plant species observed within the Non-native Woodland habitat include eucalyptus (*Eucalyptus* sp.) and Peruvian pepper trees (*Schinus molle*) bordering the POR and southwestern bank of the Temescal Wash.

DISTURBED HABITAT

Disturbed lands are areas lacking vegetation or with vegetative cover often comprising less than 10 percent of the surface area (disregarding natural rock outcrops) or that is dominated by non-native and ruderal plant species that are indicators of soil disturbance and compaction. Areas of disturbed habitat were mapped bordering Dawson Canyon Road.

URBAN/DEVELOPED

Developed areas are those that have been constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is characterized by permanent or semi-permanent structures, pavement or hardscape, and areas where no natural land is evident due to a large amount of debris or other materials being placed upon it. Plant species observed within the Developed areas of the Study Area include black mustard (*Brassica nigra*), redstem filaree, ripgut grass (*Bromus diandrus*), short-pod mustard, and stinknet.

3.7 Special-Status Biological Resources

Evaluations of the potential to occur of special-status plant and wildlife species within the Study Area are listed in Appendix D and E, respectively.

3.7.1 Special Status Plants

Thirty (30) special-status plant species that have been historically documented within 5 miles of the Project were evaluated for their potential to occur within the Study Area (Appendix D). Eleven (11) of those species were determined to have potential to occur within the Study Area and are described below.

Chaparral sand-verbena (*Abronia villosa* var. *aurita*)

Chaparral sand verbena (*Abronia villosa* var. *aurita*) is a California Rare Plant Rank (CRPR) 1B.1 species that is not a Covered Species under the ESL MSHCP. It is an annual herb that blooms from March through August. It occurs in sandy substrates in coastal sage scrub and chaparral communities at elevations below 5,200 feet amsl.

Suitable habitat for chaparral sand verbena occurs within the sandy substrates within or immediately adjacent to Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)

Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*) is a CRPR 1B.2 species that is not a Covered Species under the ESL MSHCP. It is a perennial bulbiferous herb found in chaparral, coastal scrub, and valley and foothill grassland on rocky, calcareous substrates at elevations of 345-2,805 feet amsl.

Suitable habitat for intermediate mariposa lily occurs within rocky, calcareous substrates within or adjacent to Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*)

Smooth tarplant (*Centromadia pungens* ssp. *Laevis*) is a CRPR 1B.1 species that is not a Covered Species under the ESL MSHCP. It is an annual herb found in chenopod scrub, meadows and seeps, playas, riparian woodland, and valley and foothill grassland on alkaline soils at elevations below 2,100 feet amsl.

Suitable habitat for smooth tarplant occurs within alkaline soils in the riparian woodlands and scrub and Herbaceous Wetland around Dawson Canyon Bridge and in the vicinity of the POR. Therefore, this species is likely to occur.

PARRY'S SPINEFLOWER (*CHORIZANTHE PARRYI* VAR. *PARRYI*)

Parry's spineflower (*Chorizanthe parryi* var. *parryi*) is a CRPR 1B.1 species that is not a Covered Species under the ESL MSHCP. It is an annual herb that blooms from April through June. found in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland in sandy or rocky openings between 900-4,005 feet amsl.

Suitable habitat for Parry's spineflower occurs within sandy or rocky edges or openings of Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

LONG-SPINED SPINEFLOWER (*CHORIZANTHE POLYGONOIDES* VAR. *LONGISPINA*)

Long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*) is a CRPR 1B.2 species that is a Covered Species under the ESL MSHCP. It is an annual herb that blooms from April through July. It is found within chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pools, often on clay soils between 100 to 5,020 feet amsl.

Suitable habitat for long-spined spineflower occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

SLENDER-HORNED SPINEFLOWER (*DODECAHEMA LEPTOCERAS*)

Slender-horned spineflower (*Dodecahema leptoceras*) is a federal and State-listed as Endangered CRPR 1B.1 species that is not a Covered Species under the ESL MSHCP. It is an annual herb that blooms from April through June. It is found within alluvial fan habitats of coastal sage scrub and chaparral communities between 650 to 2,300 feet amsl.

Suitable habitat for slender-horned spineflower occurs within Riversidean Sage Scrub around the Dawson Canyon Bridge and the POR. Therefore, this species is likely to occur.

MANY-STEMMED DUDLEYA (*DUDLEYA MULTICAULIS*)

Many-stemmed dudleya (*Dudleya multicaulis*) is a CRPR 1B.2 species that is a Covered Species under the ESL MSHCP. It is a perennial herb that blooms from April through July. It is found in chaparral, coastal scrub, valley and foothill grassland, often on clay, at elevations below 1,970 feet amsl.

Suitable habitat for many-stemmed dudleya occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. This plant is also documented in several locations around the landfill (MSHCP 2001, Riverside County Department of Waste Resources 2018a, 2018b, 2019, 2022, USA Waste 2020, 2021, 2023). Therefore, this species is likely to occur.

PALMER'S GRAPPLINGHOOK (*HARPAGONELLA PALMERI*)

Palmer's grapplinghook (*Harpagonella palmeri*) is a CRPR 4.2 species that is not a Covered Species under the ESL MSHCP. It is an annual herb that blooms from March through May. It is found in chaparral, coastal scrub, clay soils in valley and foothill grassland, and open grassy areas within shrubland at elevations from 65 to 3,135 feet amsl.

Suitable habitat for Palmer's grapplinghook occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

ROBINSON'S PEPPER-GRASS (*LEPIDIUM VIRGINICUM* VAR. *ROBINSONII*)

Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*) is a CRPR 4.3 species that is not a Covered Species under the ESL MSHCP. It is an annual herb that blooms from January through July. It is found in chaparral and coastal scrub at elevations from 5 to 2,905 feet amsl.

Suitable habitat for Robinson's pepper-grass occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

WHITE RABBIT-TOBACCO (*PSEUDOGNAPHALIUM LEUCOCEPHALUM*)

White rabbit-tobacco (*Pseudognaphalium leucocephalum*) is a CRPR 2B.2 species that is not a Covered Species under the ESL MSHCP. It is a perennial herb that blooms from August through November. It is found in chaparral, cismontane woodland, coastal scrub, and riparian woodland on sandy or gravelly soils below 6,890 feet amsl.

Suitable habitat for white rabbit-tobacco occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

SAN BERNARDINO ASTER (*SYMPHYOTRICHUM DEFOLIATUM*)

San Bernardino aster (*Symphyotrichum defoliatum*) is a CRPR 1B.2 species that is not a Covered Species under the ESL MSHCP. It is a perennial rhizomatous that blooms from July through November. It is found in freshwater-marsh habitat within freshwater wetlands, coastal sage scrub, southern oak woodland communities at elevations less than 6,700 feet amsl.

Suitable habitat for San Bernardino aster occurs within the freshwater habitat and Riversidean Sage Scrub around the Dawson Canyon Bridge. Therefore, this species is likely to occur.

3.7.2 SPECIAL STATUS WILDLIFE

Twenty-two (22) special-status wildlife species that have been historically documented within 5 miles of the Project or require pre-impact surveys by the ESL MSHCP were evaluated for their potential to occur within the Study Area (Appendix E). Twelve (12) of those species were determined to have potential to occur within the Study Area and are described below.

Western Spadefoot (*Spea hammondii*)

Western spadefoot (*Spea hammondii*) is a California Species of Special Concern (SSC) and is a Covered Species under the ESL MSHCP. It is a toad species that inhabits lowland, foothill, and mountain habitats including washes, river floodplains, alluvial fans, playas, alkali flats, temporary ponds, vernal pools, mixed woodlands, grasslands, coastal sage scrub, and chaparral. This species prefers open areas with sandy or gravelly soils but may be found in vernal pools containing clay soils.

Suitable habitat for western spadefoot occurs within the riparian scrub, Herbaceous Wetland, Streambed, and Riversidean Sage Scrub around the Dawson Canyon Bridge and POR. Therefore, this species is likely to occur within the Study Area.

Southern California Legless Lizard (*Anniella stebbinsi*)

Southern California legless lizard (*Anniella stebbinsi*) is a California SSC and is not a Covered Species under the ESL MSHCP. This species occurs within moist, warm, loose soils with plant cover in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.

Suitable habitat for southern California legless lizard occurs within the riparian woodlands and scrub, sandy washes, and Herbaceous Wetlands around the Dawson Canyon Bridge and POR. Therefore, this species is likely to occur within the Study Area.

Coastal Western Whiptail (*Aspidoscelis tigris stejnegeri*)

Coastal western whiptail (*Aspidoscelis tigris stejnegeri*) is a California SSC and is a Covered Species under the ESL MSHCP. This lizard occurs within primarily hot and dry open areas with sparse foliage, such as chaparral, woodland, and riparian areas.

Suitable habitat for coastal western whiptail occurs within Riversidean Sage Scrub, riparian scrub, Disturbed areas, and Developed areas adjacent to undeveloped lands at the North Old Maintenance Shop site, the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

Red-diamond Rattlesnake (*Crotalus ruber*)

Red-diamond rattlesnake (*Crotalus ruber*) is a California SSC and is a Covered Species under the ESL MSHCP. This species inhabits arid scrub, coastal chaparral, oak and pine woodlands, rocky grassland, and cultivated areas.

Suitable habitat for red-diamond rattlesnake occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

COAST HORNED LIZARD (*PHRYNOSOMA BLAINVILLII*)

Coast horned lizard (*Phrynosoma blainvillii*) is a California SSC and is a Covered Species under the ESL MSHCP. This species occurs within open chaparral, coastal sage scrub with sandy, loose soil and is partially dependent on harvester ants for forage.

Suitable habitat for coast horned lizard occurs within sandy loose soils in Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, and Riversidean Sage Scrub and riparian scrub around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

YELLOW-BREASTED CHAT (*ICTERIA VIRENS*)

Yellow-breasted chat (*Icteria virens*) is a California SSC that is not a Covered Species under the ESL MSHCP. This bird species is an uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada. It is found up to 4,800 feet asml in valley foothill riparian. This species requires riparian thickets of willow and other brushy tangles near watercourses for nest cover.

Suitable habitat for yellow-breasted chat occurs within Southern Willow Scrub and Mule Fat Scrub around the Dawson Canyon Bridge and around the POR. Therefore, this species is likely to occur.

COASTAL CALIFORNIA GNATCATCHER (*POLIOPTILA CALIFORNICA CALIFORNICA*)

Coastal California gnatcatcher (*Polioptila californica californica*) is a Federal listed as Threatened and California SSC that is a Covered Species under the ESL MSHCP. This bird species is a resident of coastal sage scrub, maritime succulent scrub in arid washes, on mesas, and on slopes of coastal hills.

Suitable habitat for coastal California gnatcatcher occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. This species is also documented in several locations around the landfill (MSHCP 2001, Riverside County Department of Waste Resources 2018a, 2018b, 2019, 2022, USA Waste 2020, 2021, 2023). Therefore, this species is likely to occur.

LEAST BELL'S VIREO (*VIREO BELLII PUSILLUS*)

Least Bell's vireo (*Vireo bellii pusillus*) is a Federal and State listed as Endangered species that is not a Covered Species under the ESL MSHCP. This bird species is a spring and summer resident of willow-dominated successional woodland or scrub, Baccharis scrub, mixed oak/willow woodland, and elderberry scrub in riparian habitat. It nests and forages in vegetation along streams and rivers that measures approximately three to six feet in height and has a dense, stratified canopy.

Suitable habitat for least Bell's vireo occurs within Southern Willow Scrub and Mule Fat Scrub around the Dawson Canyon Bridge and around the POR. Therefore, this species is likely to occur.

Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)

Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*) is a California SSC that is a Covered Species under the ESL MSHCP. It inhabits coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland.

Suitable habitat for northwestern San Diego pocket mouse occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

Stephens' kangaroo rat (*Dipodomys stephensi*)

Stephens' kangaroo rat (*Dipodomys stephensi*) is a Federal listed as Endangered and State listed as Threatened species that is a Covered Species under the ESL MSHCP. It occurs primarily in annual and perennial grassland habitats but may occur in coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas.

Suitable habitat for Stephens' kangaroo rat occurs within Riversidean Sage Scrub at the edges of the North Old Maintenance Shop site and the South Existing Flares site, along the pipeline route, around the Dawson Canyon Bridge, and around the POR. Therefore, this species is likely to occur.

Western mastiff bat (*Eumops perotis californicus*)

Western mastiff bat (*Eumops perotis californicus*) is a California SSC that is not a Covered Species under the ESL MSHCP. This species occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban. It roosts in crevices in cliff faces, high buildings, trees, and tunnels. When roosting in rock crevices, it needs vertical faces to drop off to take flight.

Suitable foraging habitat for western mastiff bat occurs throughout the Study Area, and suitable roosting habitat occurs within the existing tall structures in the Study Area and in cliff faces in the vicinity. Therefore, this species is likely to occur.

Pocketed free-tailed bat (*Nyctinomops femorosaccus*)

Pocketed free-tailed bat (*Nyctinomops femorosaccus*) is a California SSC that is not a Covered Species under the ESL MSHCP. It occurs in a variety of arid areas in Southern California, including pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc. It roosts in rocky areas with high cliffs, caverns, or buildings.

Suitable foraging habitat for pocketed free-tailed bat occurs throughout the Study Area, and suitable roosting habitat occurs within the existing tall structures in the Study Area and in rocky cliff faces in the vicinity. Therefore, this species is likely to occur.

3.8 Jurisdictional Aquatic Resources

Table 2 presents a summary of the type, jurisdiction, and amount of aquatic resources delineated within the Study Area (Artemis Environmental 2024). These features include the Temescal Wash and Coldwater Creek. The Project's ARDR (Artemis Environmental 2024; Appendix C) provides the data supporting the delineation results.

Table 2. Summary of USACE/RWQCB[1] Potential Aquatic Resources within the Study Area

Potential Aquatic Resources Type	Amount	
	Acres[1]	Linear feet
Waters of the U.S. and State (USACE/RWQCB/CDFW)		
Wetland Waters (includes wetlands within the OHWM)[2]	0.04	--
Non-Wetland Waters[3]	0.24	*638*
Subtotal USACE/RWQCB Aquatic Resources	*0.28*	*638*
Waters of the State (CDFW-exclsive)		
Riparian Habitat (includes vegetated streambed)	0.02	--
Unvegetated Streambed and Bank	*0.35*	--*
Subtotal CDFW Aquatic Resources	*0.65*	--*
Total USACE/RWQCB Aquatic Resources	**0.28**	**638**
Total CDFW Aquatic Resources	**0.65**	**638**

USACE = United States Army Corps of Engineers; RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife

[1] All acreages are rounded to the nearest hundredth (0.01); thus, totals reflect rounding.

[2] Wetland Waters of the State below the OHWM are also considered vegetated streambed regulated by the CDFW.

[3] Non-wetland Waters of the State are also considered streambed regulated by the CDFW. Includes developed portions below the Dawson Canyon Bridge and the concrete spillway downstream of the culvert outlet for Coldwater Creek.

* Linear feet of this feature concurrent with and already included in non-wetland waters of the U.S.

3.8.1 Federal Aquatic Resources

Potential federal wetland waters classified as a palustrine system are present in the form of freshwater shrub-scrub wetland and freshwater emergent wetland throughout the length of the Temescal Wash drainage within the Study Area. The herbaceous wetland, mule fat scrub, and southern willow scrub mapped within the active floodplain (defined by the OHWM) of the Temescal Wash, upstream and downstream of the Dawson Canyon Bridge, was were delineated as potential wetland waters of the U.S. Boundaries of potential non-wetland waters of the U.S. within the Study Area were determined by the presence of an OHWM and characterized by an intermittent flow regime in both the Temescal Wash and its tributary, Coldwater Creek.

3.8.2 State Aquatic Resources

All potential federal waters described above potentially also fall within the Federal Clean Water Act (CWA) Section 401 authority of the RWQCB as waters of the State. In addition, CDFW resources are congruent with waters of the State and also extend beyond the OHWM to the top of bank and/or edge of canopy for riparian habitat. Potential wetland waters of the State consisted of herbaceous wetland and mule fat scrub, and portions of southern willow scrub, within the active floodplain (below the OHWM) of the Temescal Wash. These wetland waters of the State were delineated as vegetated streambed under the jurisdiction of the CDFW. Riparian habitat was delineated beyond wetland waters of the State, consisting of two small areas of southern willow scrub along the banks of and above the OHWM of the Temescal Wash. The top of bank associated with the Temescal Wash was delineated extending approximately 100 feet from the upland terrace on the southwestern edge to the slope reinforced with riprap on the northeastern edge. The top of bank associated with the Coldwater Canyon Creek was delineated extending approximately 56 feet from the slope reinforced with riprap on the southeastern edge to the steep, eroded bank on the northwestern edge.

3.8.3 Potential Non-jurisdictional Features

Ditches and erosional features without direct connectivity to potential receiving waters were considered upland features that are potentially non-jurisdictional to the USACE, RWQCB, and CDFW. Approximately 4,519 linear feet of ditches, the majority of which are roadside ditches, were mapped within the Study Area. The majority of roadside ditches along Dawson Canyon Road are concrete-lined and one roadside ditch is earthen. In addition to the roadside ditches, three concrete-lined ditches were mapped within the South Existing Flares site. These three ditches were constructed to divert stormwater runoff from the adjacent upland slopes around the landfill facilities and into stormwater detention basins. One ditch lined with riprap was mapped on the southeastern edge of Dawson Canyon Road between Temescal Canyon Road and Park Canyon Drive; no culverts were visible within the ditch during the field survey and the majority of this ditch is outside the Study Area.

One detention basin was mapped in the Study Area at the South Existing Flares site. This detention basin is artificially excavated in an upland area, isolated from waters or drainages, does not provide wetland/riparian habitat value, and is actively being used to detain stormwater. There are also several offsite brow ditches and pipes that drain adjacent slopes and property towards Dawson Canyon Road.

3.9 Wildlife Movement

Wildlife movement corridors facilitate movement by providing access to the resources (i.e., food, water, and shelter) needed to support species life cycle requirements. The Project vicinity is surrounded by open space reserves to the north, northwest, and east. Wildlife movement is constrained by the Interstate 15 freeway to the south and west with highly developed areas surrounding the freeway. Because the El Sobrante Landfill property is largely ruderal and not as developed nor active with vehicle traffic as an urban or industrial development, it likely provides space for wildlife movement in areas that are not active or blocked with barriers. Movement opportunities for wildlife species within the Study Area are provided by Dawson Canyon Road, which may be utilized by large or meso-predators such as mountain lion, coyote, or bobcat, and Temescal Wash, which may be utilized by primarily fish, amphibian, reptile, bird, and large and small mammals. Risks to wildlife include collisions from vehicle traffic with wildlife that attempt to cross Dawson Canyon Road.

4.0 APPLICABLE REGULATIONS

Biological resources in the project site are subject to regulatory review by federal, state, and local agencies. Under CEQA, impacts associated with a proposed project or program are assessed with regard to significance criteria determined by the CEQA Lead Agency (in this case, the County) pursuant to CEQA Guidelines. Biological resources-related laws and regulations that apply include federal Endangered Species Act (FESA), Migratory Bird Treaty Act (MBTA), CWA, CEQA, California Endangered Species Act (CESA), and CFG Code.

With respect to the proposed project, the USFWS will be responsible for reviewing issues related to migratory birds pursuant to the MBTA and project consistency with the El Sobrante Landfill MSCHP. The USACE will be responsible for reviewing issues related to Waters of the U.S. The RWQCB will be responsible for reviewing issues related to Waters of the State pursuant to the CWA. The CDFW will be responsible for reviewing issues related to riparian habitat and streambeds pursuant to California Fish and Game Code, nesting birds and raptors pursuant to California Fish and Game Code, and project consistency with the El Sobrante Landfill MSCHP.

The County is the lead agency for the CEQA environmental review process in accordance with state law and local ordinances. The County will also be responsible for reviewing the project with respect to consistency with the ESL MSHCP.

Implementation of the ESL MSCHP is overseen by the ESL MSHCP Management Committee (Management Committee) composed of one representative each from USFWS, CDFW, the County, and USA Waste (or the current property owner as appropriate).

5.0 PROJECT IMPACTS

This section analyzes the impacts (based on current design) to biological resources from construction of the proposed Project. Impacts are defined as activities that destroy, damage, alter, or otherwise affect biological resources in a project area. Permanent impacts result in the irreversible loss of biological resources, such as the permanent removal of vegetation or habitat through placement of a concrete foundation or a paved road. Temporary impacts are reversible with the implementation of mitigation measures, such as short-term noise events associated with project operations, or the revegetation of an area cleared during temporary construction activities. Both direct and indirect impacts are anticipated as a result of construction activities.

Construction activities associated with equipment access, laydown, and staging will utilize existing roads or previously areas to minimize ground disturbance and avoid impacts to jurisdictional waters. Nevertheless, the Project involves construction activities that could result in impacts to jurisdictional waters or biological resources. These activities include:

- Vegetation clearing or crushing and grubbing at work areas,
- Destruction of existing structures,
- Trenching and boring activities to install pipeline,
- Minor grading/leveling activities, and
- Installing temporary erosion control fencing, berms, and other erosion control measures to comply with Stormwater Pollution Prevention Plan (SWPPP) requirements.

5.1 THRESHOLDS FOR DETERMINING POTENTIAL SIGNIFICANCE

Guidelines under CEQA provide guidance and interpretation for implementing CEQA statutes (AEP 2024). CEQA significance entails any impact to plant and wildlife species listed by federal or state agencies as threatened or endangered, or of regional or local significance. A significant impact to listed or special-status species could be direct or indirect, with impacts to rare or sensitive habitats also considered significant.

In general, the Project could result in a potentially significant impacts to the environment if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or,
- Conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Avoidance, minimization, and mitigation measures to address each impact to biological resources are identified below.

5.1.1 Special Status Species

The Project could have a potentially significant impact on the environment if it has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS.

Most of the Project is located in areas that are already developed or disturbed (i.e., the North Old Maintenance Shop, South Existing Flares, along Dawson Canyon Road, and the POR near the Dawson Canyon Bridge), so significant habitat loss or modifications are not expected in these areas. The portions of the Project site with the highest potential to be significantly impacted by Project activities are the POR site, where removal is proposed for three non-native Eucalyptus trees (*Eucalpytus* spp.), and Temescal Wash, where natural habitats for multiple special status species occur. Potential impacts include direct destruction of special status plants, special status fossorial mammal burrows, nests of special status birds, and roosts of special status bats; direct destruction of habitat for riparian special status species in Temescal Wash; and indirect effects from water quality impacts, vehicular traffic, noise and human presence, lighting, toxins, entrapment, and the spread of invasive species. However, even without avoidance or mitigation measures, these potential impacts to special status species are expected to be temporary and not significant, lasting only during the construction phase, with the exception of the potential impact of the spread of invasive species into natural habitats, which could degrade the quality of habitat for special status species in the region.

Avoidance and minimization measures are included in the Project design and in construction to reduce any potential significant impacts to none or minimized impacts. The pipeline at Temescal Wash is designed to be bored underneath the riparian area, eliminating any impacts to the natural habitat within and around the riparian area. Other measures include:

- Avoid construction activities during the nesting bird season (February 1 – August 15). If construction activities are to take place during this time period, preconstruction nesting surveys conducted by permitted biologists for California gnatcatcher and least Bell's vireo shall occur, and construction activities will not occur within 200 feet of any active bird nest (except for active California gnatcatcher or least Bell's vireo, in which case activities will not take place within 300 feet of active nests of these species). In addition, any nests within 400 feet (500 feet for California gnatcatcher or least Bell's vireo) will be monitored during construction and the results will be reported to the Management Committee. Based on the monitoring results, the Management Committee will determine if the distances should be altered;

- To avoid or minimize impacts to special status bats from tree trimming or removal activities, a qualified bat biologist will assess the trees for bat roost habitat. If the trees have potential to support bat roosts, trimming and removal activities will be avoided during the bat hibernation season (November 1 – February 15) and bat maternity roost season (April 16 – August 15). If trimming or removal will occur during the maternity roost season (April 16 – August 15), a qualified bat biologist will conduct a night emergence survey prior to trimming or removal to determine if maternity roosts are present, and if so, restrict trimming or removal activities until the season is over. No trimming or removal activities will take place during the hibernation season (November 1 – February 15). A qualified bat biologist will conduct bat roost monitoring during tree trimming or removal, and implement impact avoidance or minimization measures if roosts are present;
- Conducting surveys for long-spined spineflower, many-stemmed dudleya, and the special status plants not covered by the ESL MSHCP that are likely to occur within the Study Area prior to vegetation removal or crushing and grubbing, and avoiding or salvaging as appropriate if species are found,
- Conducting surveys for potential burrows for Stephens' kangaroo rat and northwestern San Diego pocket mouse prior to ground disturbance, and if present, to flag them for avoidance or consult with the ESL MSHCP Management Committee if they cannot be avoided, and
- In accordance with the ESL MSHCP, having a biological monitor present during activities as necessary to maintain grading or operational boundaries and to guide compliance with avoidance and minimization measures.
- In order to prevent the introduction of new invasive plants to the Project site and prevent the spread of invasive plant species to sites outside of the Project area, any equipment used on the Project would be washed prior to entering the project site and washed prior to leaving if it had exposure to invasive plant species.

5.1.2 Riparian Habitat and Sensitive Natural Communities

The Project could have a potentially significant impact on the environment if it has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS.

Most of the Project is located in areas that are already developed or disturbed, so significant habitat loss or modifications are not expected in these areas. The portions of the Project site with the highest potential to be significantly impacted by Project activities are Temescal Wash and Cold Canyon Creek, where riparian habitats and Riversidean Sage Scrub occur (Appendix A, Figure 3). If the Project included trenching through Temescal Wash to install the pipeline, significant impacts could occur temporarily to these sensitive habitats during trenching.

The Project has been designed to avoid impacts to the riparian habitats around Temescal Wash and Cold Canyon Creek and to Dawson Canyon Road Bridge by using a horizontal bore underneath the streambed, so no impacts are expected to occur temporarily or permanently.

Project measures to avoid or minimize impacts to riparian habitat and sensitive natural communicates include:

- Obtaining permits and agreements from the USACE, RWQCB, and CDFW for activities related to horizontal direction drilling (HDD) underneath Temescal Wash.
- Preparing an HDD Frac-out Contingency Plan to be submitted with permit applications and approved by regulatory agencies. The HDD Plan will include drilling procedures and methods prior to, during, and after construction.

5.1.3 Jurisdictional Wetlands

The Project could have a potentially significant impact on the environment if it has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

The Project has been designed to avoid impacts to federally protected wetland within the Temescal Wash downstream of the Dawson Canyon Bridge by using a horizontal bore underneath the streambed, so no impacts are expected to occur temporarily or permanently. Additional measures identified in Section 5.1.2 are included to avoid and minimize impacts to jurisdictional waters.

5.1.4 Wildlife Movement or Nursery Sites

The Project could have a potentially significant impact on the environment if it interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Because El Sobrante Landfill is made up of open space, it likely provides space for wildlife movement in areas that are not active or blocked with barriers. Movement opportunities for wildlife species within the Study Area are provided by Dawson Canyon Road, which may be used by large and small mammals, and Temescal Wash and Coldwater Canyon Creek, which may be utilized by primarily fish, amphibian, reptile, bird, and large and small mammals. Buildings in the Old North Maintenance Shop South Existing Flares sites, and structures such as Dawson Canyon Road Bridge may provide nursery sites for bats. Appropriate soils at the edge of the developed areas or roadsides where construction or trenching will take place may provide habitat for burrowing animals, including Stephens' kangaroo rat and Northwestern San Diego pocket mouse. The Project has potential to raise the likelihood of traffic collisions with wildlife, damage or destroy bat nurseries, and damage or destroy mammal burrows during construction.

Project measures to avoid or minimize impacts to wildlife movement and nurseries include:

- Construction activities will avoid delaying traffic around sunrise and sunset hours, when wildlife are more likely to travel the road, and set reduced speed limits (e.g., 15 mph) during construction activities;
- A qualified bat biologist will assess trees proposed for trimming or removal for potential to support bat roosts. If the trees have potential to support bat roosts, trimming and removal will be avoided

during the bat hibernation season (November 1 – February 15) and bat maternity roost season (April 16 – August 15). If trimming or removal will occur during the maternity roost season (April 16 – August 15), a qualified bat biologist will assess the trees for bat roost habitat, conduct a night emergence survey prior to trimming or removal to determine if maternity roosts are present, and if so, restrict trimming or removal activities until the season is over. During tree trimming or removal, a qualified bat biologist will conduct bat roost monitoring during activities and implement impact avoidance or minimization measures if roosts are present;

- Conducting surveys for potential burrows for Stephens' kangaroo rat and northwestern San Diego pocket mouse prior to ground disturbance, and if present, to flag them for avoidance or consult with the Management Committee if they cannot be avoided;
- In accordance with the ESL MSHCP, having a biological monitor present during activities as necessary to maintain grading or operational boundaries and to guide compliance with avoidance and minimization measures; and
- Avoid impacts to Temescal Wash, Coldwater Canyon Creek, and Dawson Canyon Road Bridge by using a horizontal bore underneath the streambed.

5.1.5 Local Policies, Ordinances, and Habitat Conservation Plan

The Project could have a potentially significant impact on the environment if it conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or if it is conflicts with the provisions of an adopted HCP, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan.

Although the Project may involve trimming or removing Eucalyptus trees, these trees are not protected by Riverside County Ordinance No. 559 regulating the removal of trees because the ordinance only protects native trees in areas above 5,000-foot elevations. The Eucalyptus trees are not native and are not located above 5,000-foot elevations, and therefore, removal of these trees will comply with local ordinances. The Project will comply with the provisions of the ESL MSHCP, and most of the Project is located on already developed or disturbed lands. The portion of the Project that has potential to impact natural habitats associated with Temescal Wash and Coldwater Canyon Creek will be bored underneath the streambed to avoid impacts to these habitats. The Project is in compliance with the ESL MSHCP and does not change or affect the MSHCP.

During the construction phase of the Project, the Project will follow the impact avoidance and reduction measures as described in Section 5 Part D of Part 1 of the ESL MSHCP. These measures are summarized below:

- Conduct surveys following approved USFWS or CDFW protocols (as appropriate and as described in the ESL MSHCP) in potential habitat for the following species within 12 months prior to impact (data from annual monitoring surveys and status reviews for the ESL MSHCP Covered Species may be used as appropriate):
    - Plants: Munz's onion, long-spined spineflower, many-stemmed dudleya

  - Animals: Quino checkerspot butterfly, arroyo toad, western spadefoot toad (in breeding habitat), least Bell's vireo, southwestern willow flycatcher;
- Conduct pre-impact surveys for burrowing owl and American badger if the species or their potential burrow sites or active dens are observed onsite or on nearby lands;
- Avoid vegetation removal or the destruction of existing structures during the nesting bird season (February 1 – August 15);
- If many-stemmed dudleya or long-spined spineflower are found in a proposed impact area, they will be salvaged as described in the ESL MSHCP;
- If burrowing owl or American badger are found in a proposed impact area, they will be trapped and relocated as described in the ESL MSHCP;
- If western spadefoot toads, eggs, or tadpoles are found in a proposed impact area, they will be relocated as described in the ESL MSHCP;
- A biological monitor will be present during activities as necessary to maintain grading or operational boundaries and to guide compliance with avoidance and minimization measures. Prior to Project activities, the biological monitor will identify any sensitive resources adjacent to the impact area and determine if temporary fencing is needed to protect those areas. Where determined necessary, temporary snow fencing will be placed around the perimeter of the areas to be protected;
- Staging areas will be restricted to areas outside of the Conserved Habitat areas and active restoration phases;
- Between February 1 and August 15, blasting will not occur within 200 feet of any active nest until the young have dispersed or the nest is abandoned. In addition, nests within 400 feet will be monitored during the event, and the results will be reported to Management Committee. Based on the monitoring results, the Management Committee will determine if the distances should be altered;
- Lighting in landfill operating areas will be selectively placed, shielded, and directed away from existing habitat and RSS restoration areas;
- Project activities will not take place in undisturbed open space or restored Riversidean Sage Scrub;
- Enact a Worker Education Program in which all personnel and contractors involved in Project activities will be informed of the impact avoidance requirements and the protocols to be followed. A pamphlet describing the resources of concern and the impact avoidance protocols will be prepared and provided to employees and contract workers. All construction personnel will meet with the Biological Monitor to identify the applicable measures and protocols. This meeting will occur after the information pamphlet has been distributed. It will be repeated at intervals as necessary to ensure that new workers are informed. The information pamphlet will be redistributed at intervals and revised as necessary;
- Problems with implementation of the impact minimization measures will be reported to the Management Committee by the biological monitor and USA Waste when they occur. If the Management Committee determines that remedial/contingency actions are necessary, the actions will be determined by the Management Committee working in cooperation with the biological

monitor and, where appropriate, the Habitat Manager. Any changes to impact avoidance and minimization measures must be consistent with the terms and conditions of the approved incidental take permits.

5.2 Direct Impacts

Direct impacts occur when biological resources are altered, disturbed, destroyed, or removed during project implementation. Direct impacts may include direct losses of habitat, potential jurisdictional waters, wetlands, special-status species, and diverting natural surface water flows. Direct impacts are those that involve ground disturbance and loss of the original ground cover due to grading, construction, and maneuvering or staging. The amount of habitat impact has been included in the overall ESL MSHCP.

Direct impacts may occur from construction activities such as vegetation removal or crushing, grubbing, destruction of existing landfill structures that may provide habitat, trenching and boring for pipe installation, minor grading, and BMP installation. Vegetation removal is anticipated to occur within previously disturbed sites in primarily non-native vegetation adjacent to conserved Riparian Sage Scrub areas around the North Old Maintenance Shop site, the South Existing Flares, along the pipeline route along Dawson Canyon Road, and around the POR site. The Project has been designed to avoid impacts to the riparian habitats around Temescal Wash and Cold Canyon Creek and to Dawson Canyon Road Bridge by using a horizontal bore underneath the streambed. Other measures to minimize or avoid direct impacts are discussed in Section 5.1.

5.3 Indirect Impacts

Indirect impacts are those that do not cause ground disturbance but are related to secondary effects, such as dust, noise, ground vibration, and visual disturbance. Examples include pollination interruption, increased environmental toxins, increased invasion and competition by non-native animals and plants, and increased noise, human activity, and light levels.

It is anticipated that there will be some indirect impacts resulting from the Project based on its proximity to sensitive habitat and sensitive species. Potential indirect impacts include increased noise, human activity, and light levels as described below. For each of the indirect impacts described below, an action(s) or measure(s) is described to ensure that these potential indirect impacts can be maintained at less than significant levels.

5.3.1 Runoff, Erosion, and Siltation

Siltation and erosion resulting from the proposed activities are potentially significant indirect impacts associated with this Project because of the proximity of the proposed work area to water features and other sensitive habitats. Surface water quality could be diminished because of pipeline trenching and boring or minor grading. As such, erosion from these activities can remove topsoil necessary for plant growth both in the graded areas and in lower areas affected by increased runoff. The eroded soil can be deposited as silt and alluvium in the drainages. Siltation from these activities can damage wetlands and aquatic habitats and bury vegetation or topsoil. These measures include the use of qualified biologists for monitoring construction activities, minimizing Project footprints, and implementation of an effective SWPPP that employs appropriate BMPs to avoid or limit runoff, erosion, and siltation.

Implementation of best management practices during construction would prevent toxins, chemicals, petroleum products, exotic plant materials, and other elements from being released into areas containing sensitive biological resources.

5.3.2 Vehicular Traffic

Because most of the Project will occur along Dawson Canyon Road, the primary access to the landfill, vehicular traffic may increase due to additional construction equipment, vehicles transporting construction staff to and from activity locations, and construction delays for non-construction traffic causing larger pulses of travelling vehicles. This increases the probability of collisions with wildlife that cross the road or travel along it. In order to avoid or minimize collisions of vehicles with wildlife, construction activities will avoid delaying traffic around sunrise and sunset hours, when wildlife are more likely to travel the road, and set reduced speed limits (e.g., 15 mph) during construction activities.

5.3.3 Noise and Human Presence

Indirect and temporary impacts to wildlife movement due to construction noise, including presence of humans, will be expected during construction of the Project. Noise can adversely affect wildlife by frightening or repelling individuals, masking communication, and impairing foraging success and predator detection. These effects are significant when they adversely affect the lifecycle of sensitive species or constrain wildlife movement through a wildlife corridor; however, these impacts will not be considered significant if the activities were temporary in nature and of short duration.

Indirect construction noise has the potential to impact special-status wildlife known to occur within the Project vicinity, or are likely to occur onsite, including California gnatcatcher and riparian-nesting birds such as the yellow-breasted chat and least Bell’s vireo. The current threshold for significant noise impacts to these species is generally accepted to be 60 decibels during the breeding season, although some species, including least Bell’s vireo, are known to be tolerant of higher noise levels and intense bursts of noise from traffic and trains. If construction were to occur outside of the breeding season for these species, noise impacts will not be considered significant. Indirect noise impacts to other nesting migratory birds, including raptors, if present, could be adverse, but not necessarily significant because of the temporary nature of the impacts, and the varying levels of sensitivity of individual species of birds. The Project is not expected to have a substantial indirect effect on sensitive biological resources from increased noise and human presence. To avoid or minimize impacts from noise and human presence, the following measures will be enacted:

- Enact a Worker Education Program in which all personnel and contractors involved in Project activities will be informed of the impact avoidance requirements and the protocols to be followed.
- Having a biological monitor present during activities as necessary to maintain grading or operational boundaries and to guide compliance with avoidance and minimization measures.

5.3.4 Lighting

If nighttime work is required for the Project, construction lighting may penetrate wildlife habitat within or adjacent to the Project study area and could temporarily impact sensitive wildlife species including the movement of nocturnal species. These temporary impacts would likely be considered adverse, but not significant, and could be avoided if nighttime work did not occur near sensitive areas or where nocturnal species could be affected. However, if nighttime work is required within or adjacent to these areas, prior survey results, pre-construction surveys and biological monitoring would provide additional information to determine if any wildlife species are present that could be potentially affected. Should nighttime work be necessary, lighting would be temporary, downcast and shielded to minimize reflection, and directed inward toward the construction site and away from wildlife habitat.

5.3.5 Toxins

Toxic substances can kill wildlife and plants or prevent new growth where soils or water are contaminated. Toxic substances can be released into the environment through several scenarios including planned or accidental releases, leaching from stored materials, pesticide or herbicide use, or fires, among others. No intentional releases of toxic substances are planned as part of the Project, however accidental releases could occur from several sources such as leaking equipment or fuel spills during the course of construction. The implementation of BMPs during construction will reduce the risk of leaks and fuel spills below a level of significance. A spill contingency plan, written by the construction contractor and approved prior to construction will be in effect during all phases of construction.

5.3.6 Fugitive Dust

Trenching, grading, and vehicle operations associated with the construction of the Project may produce fugitive dust. Excessive dust can damage or degrade vegetation by blocking leaf exposure to sunlight. Implementation of dust control measures and related BMPs as well as compliance with Air Quality Management District rules and standards during construction, will reduce fugitive dust emissions to below a level of significance. Dust control measures will include spraying work or driving areas with water and careful operation of equipment.

5.3.7 Wildlife Entrapment

During construction, open holes, trenches or excavations may entrap wildlife (e.g., reptiles and small mammals). Fencing or secured covers will be maintained for open holes, trenches, and excavations at night. A qualified biologist will clear open holes, trenches, and excavated areas for wildlife at the end of each day (prior to covering) and again prior to resuming work the following day.

5.3.8 Invasive Species

Invasive non-native plant species may out-compete native species, suppress native recruitment, alter community structure, degrade or eliminate habitat for native wildlife, and provide food and cover for undesirable non-native wildlife. The introduction of invasive plant species into a community as a result of soil disturbance and erosion can increase the competition for resources such as water, minerals, and nutrients between native and non-native species as well as alter the hydrology and sedimentation rates. In addition, if the non-native plants form a continuous ground cover, an increase in the natural fire regime may occur, further decreasing any remaining native vegetation, and causing a type conversion to a disturbed/non-native habitat type. The Project site and vicinity currently support invasive plant species. In order to prevent the introduction of new invasive plants to the Project site and prevent the spread of invasive plant species to sites outside of the Project area, any equipment used on the Project would be washed prior to entering the project site and washed prior to leaving if it had exposure to invasive plant species. To avoid attracting nuisance animals, the Project area will be maintained free of trash and food waste.

5.4 Cumulative Impacts

Cumulative impacts are the sum of all impacts from this Project and other local projects on the biological resources of a region. Temporary impacts are expected with construction including ground disturbance, limited vegetation removal, erosion, siltation, increased traffic, fugitive dust, noise, lighting, and possible spread of invasive species. These impacts, when addressed by the aforementioned avoidance and minimization measures, are expected to be limited in scope and duration. Permanent impacts include visual and spatial impacts from the constructed buildings and pipeline. Most of the footprint of the proposed buildings, pipeline, other structures, and their construction are located within already disturbed or developed areas, with limited vegetation removal and disturbance at the edges of natural communities. Impacts to the vegetation communities associated with Temescal Wash and Coldwater Creek will be avoided by boring underneath the streambed. These temporary and permanent impacts are expected to be limited by the Project design and by avoidance and minimization measures, and mitigation measures are already prescribed within the ESL MSHCP. Finally, because the Project is a facility to capture LFG and distribute it as natural gas, it will reduce the carbon footprint of the El Sobrante Landfill and is expected to be a positive impact to natural resources.

6.0 Mitigation

The ESL MSHCP stipulated mitigation measures for the landfill expansion and associated activities, including avoidance and minimization measures during activities, designating and/or acquiring land for conservation and mitigation, and funding mitigation. Portions of the Project site are outside of the ESL MSHCP area and are submitted for approval for inclusion into the ESL MSHCP area. Impacts to these areas are expected to be less than significant with the implementation of the applicable ESL MSHCP measures and the avoidance and minimization measures outlined in Section 5.0. All Project impacts will be mitigated by the mitigation described in the ESL MSHCP.

7.0 ACKNOWLEDGEMENTS AND CERTIFICATION

The following people contributed to fieldwork and/or the preparation of this report:

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I hereby certify that the information and data presented above and in the attached exhibits are true and correct to the best of my knowledge and belief.

7/30/2024

Julie Ogilvie
Project Manager

Date

8.0 References

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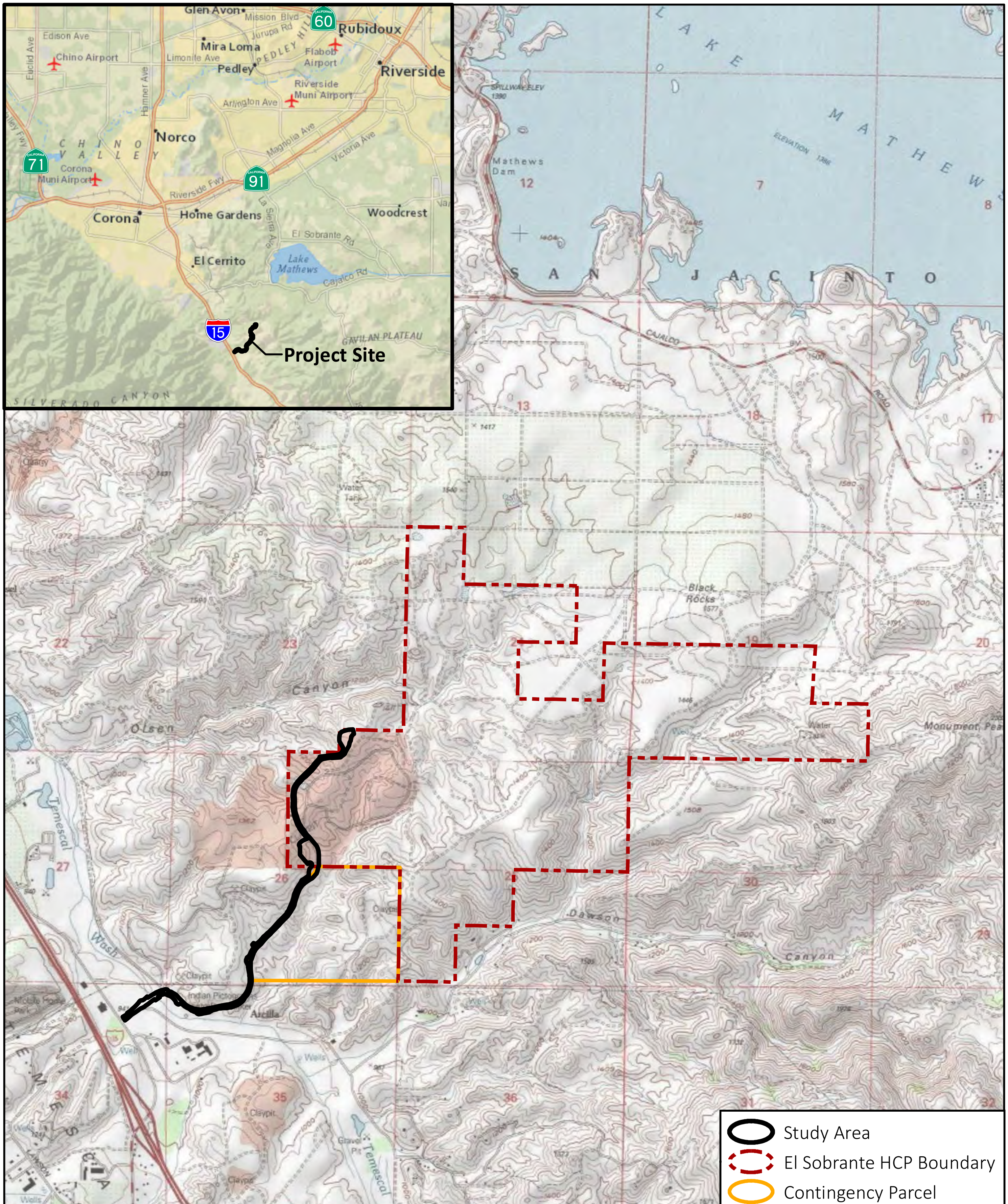
APPENDIX A

Figures



Source: USGS 7.5' Quadrangles (Lake Mathews); T04S, R06W, S 23, 26, 34, 35

Figure 1

Project Vicinity

Artemis Environmental Services, Inc.

N

0 3,000 Feet

BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

Figure 2
Study Area
BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

Figure 3
Page 1 of 6

Vegetation Communities and Land Cover Types

BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

Artemis Environmental Services, Inc.

Study Area

Vegetation Communities and Land Cover Types

Riversidian Sage Scrub

Developed

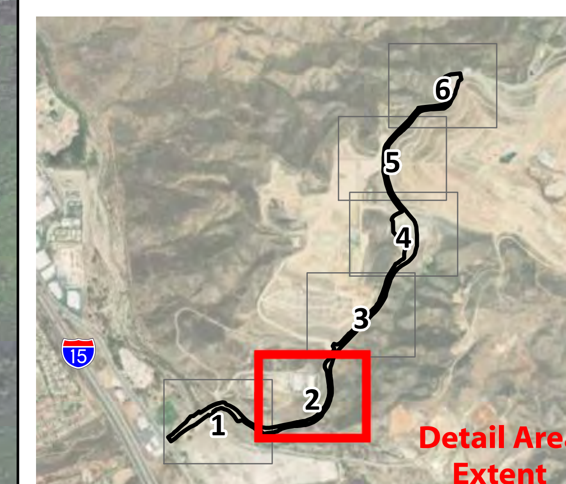


Figure 3

Page 2 of 6

Vegetation Communities and Land Cover Types

BIOLOGICAL RESOURCES TECHNICAL REPORT FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

N

0 150 Feet

Artemis Environmental Services, Inc.

Figure 3
Page 3 of 6

Vegetation Communities and Land Cover Types

BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

Artemis Environmental Services, Inc.

Study Area

Vegetation Communities and Land Cover Types

Basin

Riversidian Sage Scrub

Developed

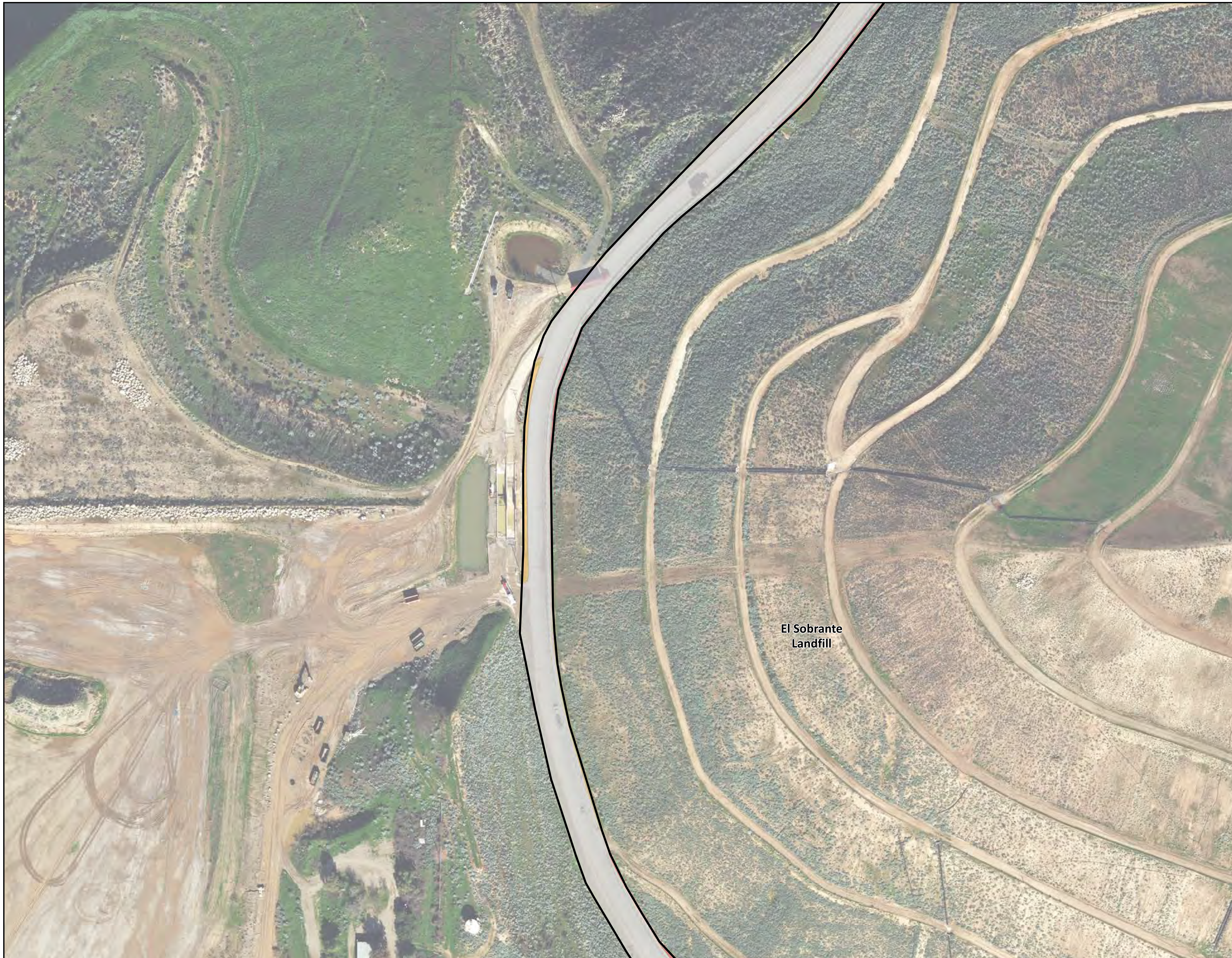
Figure 3

Page 4 of 6

Vegetation Communities and Land Cover Types

BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

Artemis Environmental Services, Inc.



Study Area

Vegetation Communities and Land Cover Types

Riversidian Sage Scrub

Disturbed Habitat

Developed

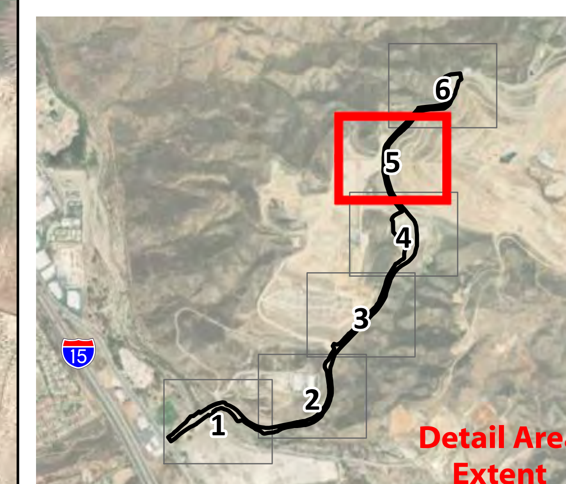


Figure 3

Page 5 of 6

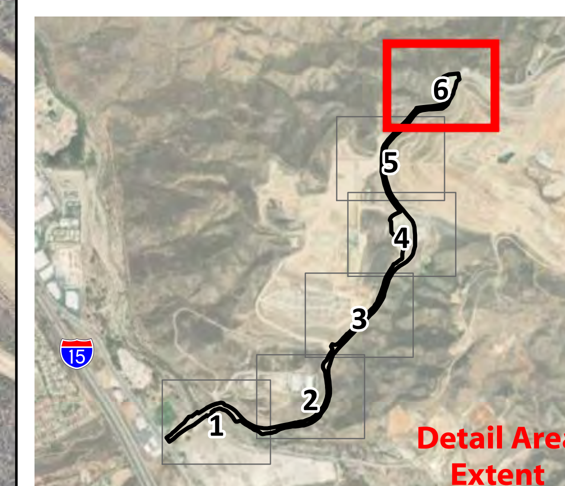
Vegetation Communities and Land Cover Types

BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

N

0 150 Feet

Artemis Environmental Services, Inc.



Study Area

Vegetation Communities and Land Cover Types

Riversidian Sage Scrub

Disturbed Habitat

Developed

Figure 3

Page 6 of 6

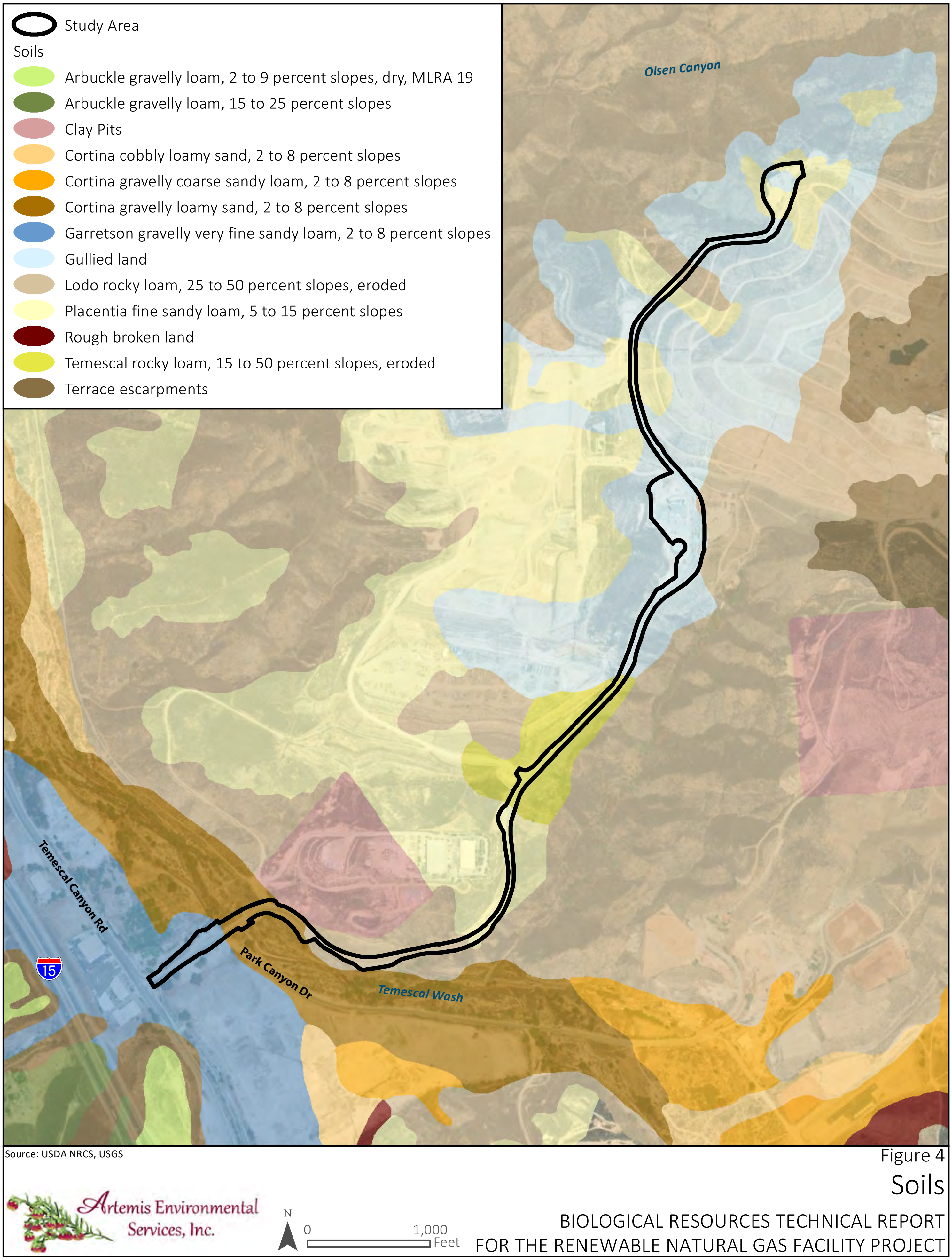
Vegetation Communities and Land Cover Types

BIOLOGICAL RESOURCES TECHNICAL REPORT FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

N

0 150 Feet

Artemis Environmental Services, Inc.



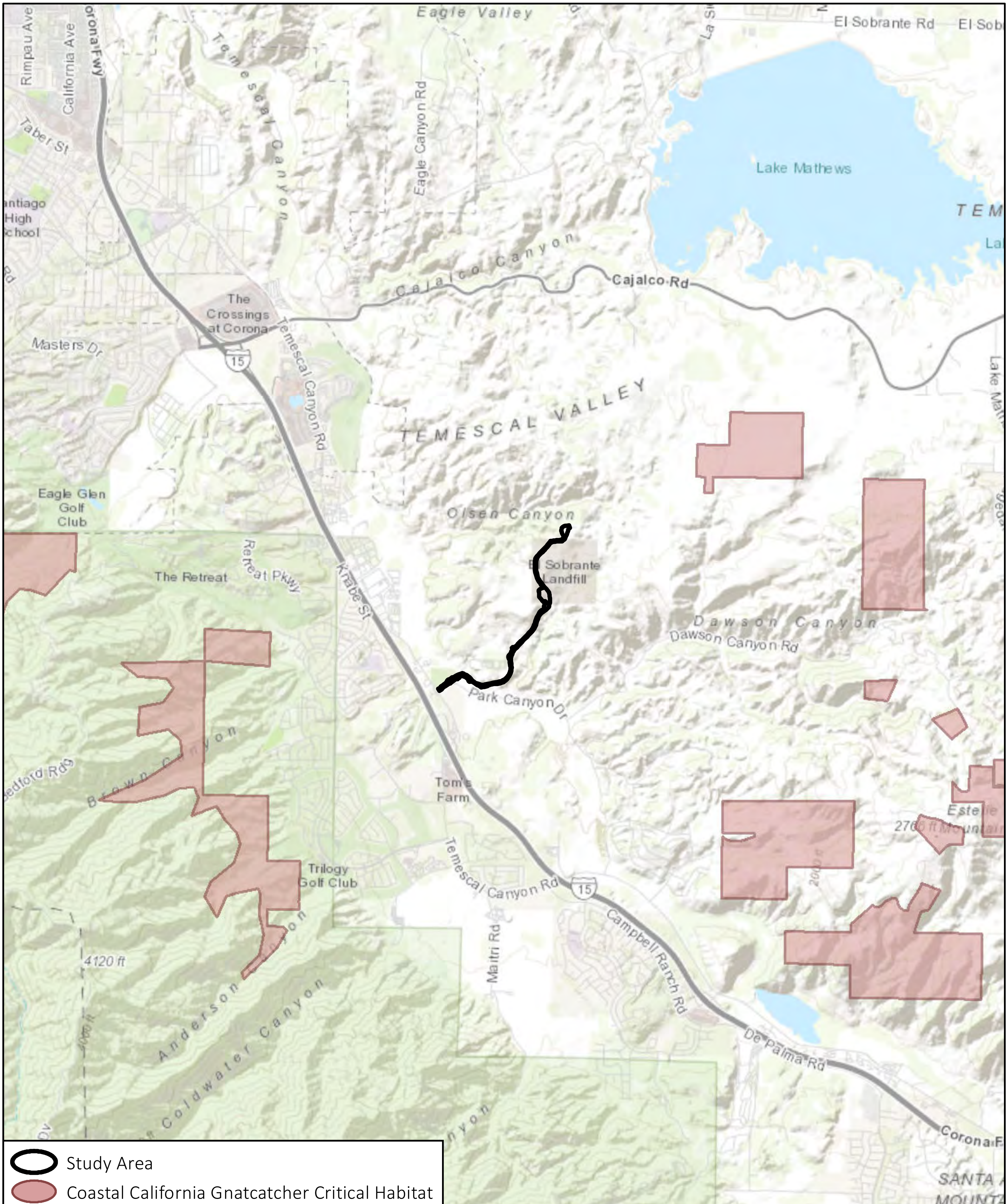
Source: USDA NRCS, USGS

Artemis Environmental Services, Inc.

Figure 4

Soils

BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT



Source: USFWS

Figure 5

Critical Habitat

Artemis Environmental Services, Inc.

N
0 1 Miles

BIOLOGICAL RESOURCES TECHNICAL REPORT
FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

APPENDIX B

Photographs

Photo 1. Overview of North Old Maintenance Shop site, looking southwest. (May 10, 2023)

Photo 2. Overview of North Old Maintenance Shop site, looking south. (May 10, 2023)

Photo 3. Overview of South Existing Flares site, looking northeast. (May 10, 2023)

Photo 4. Detention basin (B-1) within South Existing Flares site, looking southwest. (May 10, 2023)

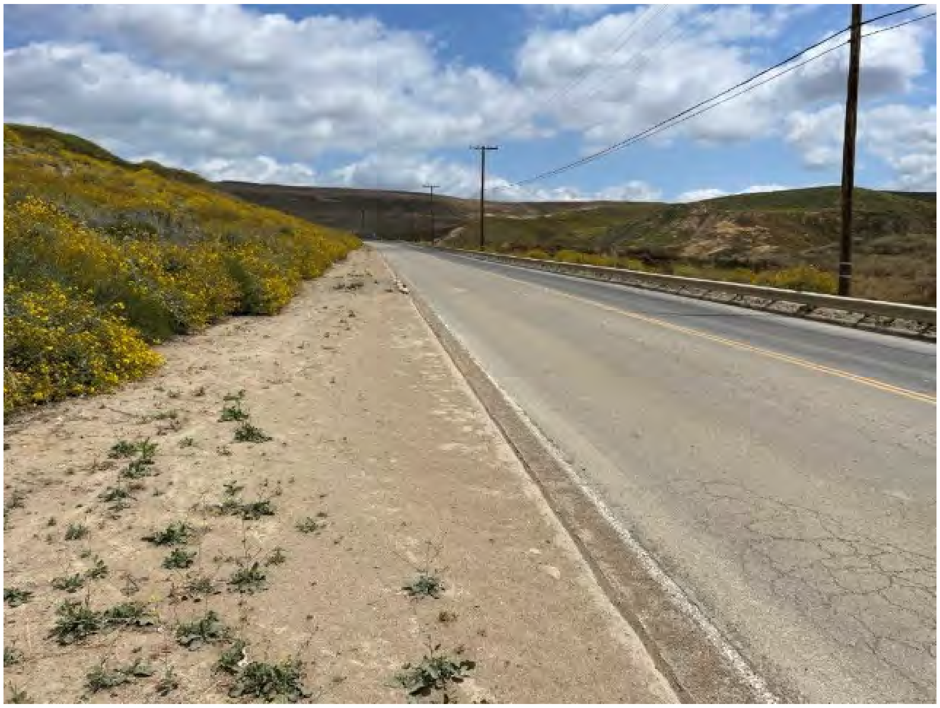


Photo 5. Dawson Canyon Road, looking northeast. (May 10, 2023)

Photo 6. Dawson Canyon Road, looking southwest. (May 10, 2023)

Photo 7. Looking northeast towards landfill and offsite detention basin and drainage. (May 10, 2023)

Photo 8. Looking southeast towards Dawson Canyon Bridge. (December 21, 2023)

Photo 9. Looking southwest towards Temescal Wash and Dawson Canyon Bridge (December 21, 2023)

Photo 10. Overview of Dawson Canyon Bridge (downstream) over the Temescal Wash, looking east. (March 29, 2022)

Photo 11. Overview of Project POR site, looking northeast. (May 10, 2023)

Photo 12. Overview of Coldwater Canyon Creek, looking northeast from box culvert outlet. (May 10, 2023)

APPENDIX C

Aquatic Resources Delineation Report

Artemis Environmental Services, Inc.

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February 14, 2024

Randy Glad
Operations Manager
Toro Energy, LLC
5900 Southwest Parkway, Building 2, Suite 220
Austin, TX 78735
Email: rglad@torolfg.com

Subject: Aquatic Resources Delineation for the Renewable Natural Gas Facility Project at the El Sobrante Landfill, Riverside County, California

Artemis Environmental Services, Inc. (Artemis Environmental) was retained by Toro Energy, LLC. (Toro Energy) to perform a formal aquatic resources delineation for the Renewable Natural Gas (RNG) Facility Project (Project) at the El Sobrante Landfill. Waste Management of California, Inc. (WM) and Toro Energy have entered into an agreement for Toro Energy to install and operate an RNG Facility onsite. The RNG Facility will process existing landfill gas that will be diverted from the existing flares, processed to meet the Southern California Gas Company (SoCalGas) specifications, and sold to SoCalGas through a Point of Receipt (POR) for local distribution. This letter report summarizes the results of the aquatic resources delineation.

Project Location

The Project overlaps the southwestern portion of the El Sobrante Landfill, located south of the City of Corona, east of Interstate (I)-15 and Temescal Canyon Road, in the Temescal Valley of western Riverside County (County), California (Attachment A, Figures 1 through 3). The Project is located within the Western Riverside County Multiple Species Habitat Conservation Plan (WRC MSHCP; County 2003) area within or adjacent to Cell Groups E and F, Criteria Cells 2830, 2932, 2934, 3035, and 3036 (Attachment A, Figure2). Within these Criteria Cells, the Project is within a burrowing owl survey area, a Criteria Area Species Survey Area (CASSA), and a Narrow Endemic Plants Survey Area (NEPSA).

The Survey Area totals approximately 23 acres on multiple parcels owned by WM. The Survey Area includes the three building sites (North Old Maintenance Shop, South Existing Flares, and POR near the Dawson Canyon Bridge), the proposed pipeline route continuing down Dawson Canyon Road that will be located within the road shoulder and cross Dawson Canyon Bridge, and a buffer that extends either to the top or toe of adjacent slopes (nearest slope edge) depending on the locations. The northeastern edge of the Survey Area is located at N33.801704 and W-117.471520 coordinates, and the southwestern edge of the Survey Area is located at N33.783283 and W-115.488759 coordinates. The Survey Area is in Sections 23, 26, 34, and 35, Township 4 South, and Range 6 West of the United States Geological Survey (USGS) Lake Mathews, California 7.5-minute quadrangle map. The elevation ranges from 905 above mean sea level (amsl) to 1,377 amsl.

Directions from Los Angeles: Take I-10 East, exit onto CA-71 South towards Corona, continue 15.6 miles, merge onto CA-91 East towards Riverside, continue 4.6 miles, merge onto I-15 South towards San Diego, continue 8.9 miles, exit and turn left onto Temescal Canyon Road, continue 0.5 mile, exit and turn left onto

Temescal Canyon Road, continue 0.5 mile, turn right onto Dawson Canyon Road and continue 1.3 miles to 10910 Dawson Canyon Road. Check in at the administration trailer on the right to be escorted to the Project site located to the northeast and southwest of the trailers. Access to the southern portion of the Project area is available from parking areas just south of the Dawson Canyon bridge, located to west of the bridge or off of Park Canyon Road to the east of the bridge, approximately 0.1 mile (685 feet) from Temescal Canyon Road. The Project applicant representative will accompany regulatory agencies to the Proposed Project site upon request. Contact information for the Project applicant representative is:

Jason Rolfsness
Project Manager
Third Gen Civil Engineering
Phone: (626) 390-9787
Email: jason@thirdgence.com

Survey Methods

Prior to performing field surveys, the following sources were consulted to gain a better understanding of the physical and hydrologic setting of the Survey Area:

- 7.5-minute USGS topographic quadrangle maps,
- Aerial photos of the Survey Area,
- The Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2023a),
- The National Wetlands Inventory (NWI; USFWS 2023), and
- The Watershed Boundary Dataset (WBD) and National Hydrography Dataset (NHD; USGS 2023).

The soils, NWI, and WBD/NHD maps are provided in Attachment A, Figures 4, 5 and 6, respectively.

An initial field survey was conducted by Artemis Environmental wetland specialists, Jasmine Bakker and Kyle Gunther, on March 29, 2022 within the vicinity of the Dawson Canyon Bridge and included digging soil pits to document presence/absence of potential wetlands within the Temescal Wash. Additional field surveys were conducted throughout the entire Survey Area by Ms. Bakker on May 10, 2023, and by Ms. Bakker and Julie Stout on December 21, 2023. The field surveys involved vegetation mapping and evaluation of potential aquatic resources identified within the Survey Area, including updates to mapping based on Survey Area revisions, changes to aquatic resources regulations, and changes to existing conditions within the Temescal Wash as a result of increased water flows between 2022 and 2023. Aquatic resources were mapped using the Environmental Systems Research Institute Field Maps application for ArcGIS on a smart phone connected to an external global positioning system receiver with sub-meter accuracy. Representative photos of aquatic resources are provided in Attachment B.

Delineation of Federal Waters

All potential waters of the U.S. were delineated to their jurisdictional limits as defined by 33 CFR 328.4 (Limits of Jurisdiction). Potential wetland waters of the U.S. were delineated pursuant to the three-parameter methods and according to the following:

(1) *Corps of Engineers Wetland Delineation Manual* (Manual; Environmental Laboratory 1987),

(2) *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0; Environmental Laboratory 2008), and

(3) Applicable U.S. Army Corps of Engineers (USACE) Regulatory Guidance Letters (RGLs).

Unless paired with a wetland location, if one of the three wetland parameters (i.e., dominance of hydrophytic vegetation) was not observed, no Wetland Determination Data Forms were completed and potential aquatic resources were evaluated for presence of an ordinary high water mark (OHWM), as described below.

Potential non-wetland waters of the U.S., in the absence of federal wetlands exhibiting all three wetland parameters, were delineated based on field indicators to define and identify the lateral extent of the OHWM, as defined by 33 CFR 228.3(c)(7) and according to the following:

(1) *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (Lichvar and McColley 2008),

(2) *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010),

(3) *Distribution of Ordinary High Water Mark (OHWM) Indicators and their Reliability in Identifying the Limits of "Waters Of The United States" in Arid Southwestern Channels* (Lichvar *et al.* 2006),

(4) *Channel Classification across Arid West Landscapes in Support of OHW Delineation* (Lefebvre *et al.* 2013),

(5) Mapping Episodic Stream Activity Field Guide (Brady et al. 2013), and

(6) Applicable USACE RGLs.

Relatively recent changes in regulations have transpired relating to defining waters of the U.S. On August 30, 2021, in the case of *Pascua Yaqui Tribe* v. *U.S. Environmental Protection Agency*, No. CV-20-00266-TUC-RM, a U.S. District Judge for the District of Arizona vacated and remanded the Navigable Waters Protection Rule (NWPR), that went into effect on June 22, 2020. In light of this order, the U.S. Environmental Protection Agency (EPA) and USACE halted implementation of the NWPR and interpreted waters of the U.S. consistent with the pre-2015 regulatory regime until further notice. The pre-2015 regulations require following the guidance developed in 2007 and 2008 for implementing the definition of waters of the U.S. following the *Rapanos v. United States*, and *Carabell v. United States* Supreme Court decisions. On January 18, 2023, the final "Revised Definition of 'Waters of the United States'" rule was published in the Federal Register and became effective on March 20, 2023. The revised definition of Waters of the U.S. codified both the Relatively Permanent test and Significant Nexus test from the *Rapanos v. United States*, and *Carabell v. United States* Supreme Court decisions. However, most recently on May 25, 2023, the U.S. Supreme Court ruled in *Sackett* v. *Environmental Protection Agency* that the definition of "waters" in §1362(7) of the Clean Water Act refers only to "geographic[al] features that are described in ordinary parlance as 'streams, oceans, rivers, and lakes'" and to adjacent wetlands that are "indistinguishable" from those bodies of water due to a *continuous surface connection*. On August 29, 2023 the EPA and USACE issued a final rule to define waters of the U.S. in conformance with the *Sackett* decision (the Conforming Rule), specifically removing the significant nexus test from consideration when identifying tributaries and other waters, and also revising the adjacency test when identifying jurisdictional wetlands. The Conforming Rule became effective upon publication in the Federal Register. Under the Conforming Rule, the USACE regulates tributaries to Traditional Navigable Waters (TNWs) that exhibit "relatively permanent flow", including streams, lakes and ponds that support surface flow or ponding seasonally but not including streams or other aquatic features that only support surface flow or ponding during rainfall or snowfall that is not present once the rainfall or snowfall event ends (e.g, ephemeral).

This ARDR was prepared in accordance with USACE Los Angeles District *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE 2017), *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016), and *Aquatic Resource Delineation Report Submittal Workshop* (USACE 2019).

Delineation of State Waters

Regional Water Quality Control Board (RWQCB)

Potential aquatic features under the purview of the RWQCB were delineated pursuant to the federal methodology for wetland and non-wetland waters of the U.S. (see Section 2.2.1, above) *and* Section 13000 *et seq.* of the California Water Code (CWC; 1969 Porter-Cologne Water Quality Control Act). The term "waters of the state" is defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (CWC § 13050[e]). Waters of the state include those waters also under the jurisdiction of the federal government; however, the definition of waters of the State is broader than that for waters of the U.S. in that all waters are considered to be a water of the state regardless of circumstances or condition, including isolated waters pursuant to the California Porter-Cologne Act. However, waters of the State must still show wetland parameters (defined below) to be considered wetland waters or OHWM-indicators to be considered non-wetland waters.

Additionally, the State Wetland Definition and Procedures for Discharges of Dredged or Fill Materials to Waters of the State (California Wetland Policy) adopted by the State Water Resources Control Board (SWRCB) on April 2, 2019 became effective May 28, 2020 and stipulates additional procedures and requirements for obtaining approval from the water boards for discharge of dredged or fill materials to state waters. The California Wetland Policy largely models the USACE guidance for defining a wetland, but includes areas with wetland hydrology, wetland soils, and (if vegetated) wetland plants—an area may be a wetland even if it does not support vegetation. Therefore, an area may be considered a state wetland even if it is unvegetated at the time of delineation if it has wetland hydrology and hydric soils.

California Department of Fish and Wildlife (CDFW)

Potential aquatic features under the purview of California Department of Fish and Wildlife (CDFW) were delineated pursuant to Section 1600 *et seq*. of the California Fish and Game Code (CFGC). CDFW usually extends its jurisdictional limit to the top of a stream bank, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider. Therefore, jurisdictional boundaries subject to California Fish and Game Code (CFGC) §§ 1600-1617 typically encompass an area that is greater than the lateral extent of the OHWM. Delineation of CDFW-exclusive jurisdictional waters were mapped to include the streambed and, if applicable, the lateral extent of the top of bank above the streambed. Adjacent riparian habitat, if present, was also mapped as CDFW-exclusive jurisdiction.

MSHCP Riparian/Riverine Areas

All riparian habitat and streambed under CDFW jurisdiction are subject to the WRC MSHCP (County 2003, Section 6.1.2) protection of riparian/riverine areas. The purpose of the WRC MSHCP protection is to ensure that the biological functions and values of these riparian/riverine areas throughout the MSHCP Plan Area are maintained such that habitat values for species inside the MSHCP Conservation Area are maintained. The WRC MSHCP defines riparian/riverine areas as "lands which contain habitat dominated by trees, shrubs, persistent emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year." The WRC MSHCP also provides the following exception to this definition: "wetlands created for the purpose of providing wetlands habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, …which are artificially created are not included" (County 2023, p. 6-21, 6-22).

The WRC MSHCP states that documentation for the assessment of riparian/riverine resources shall include mapping and a description of the functions and values of the mapped areas with respect to the species listed under "Purpose" in Section 6.1.2 of the WRC MSHCP (e.g., arroyo toad [*Bufo californicus*] and least Bell's vireo [*Vireo bellii pusillus*]). Factors to be considered include hydrologic regime, flood storage and flood flow modification, nutrient retention and transformation, sediment trapping and transport, toxicant trapping, public use, wildlife habitat, and aquatic habitat. Assessment of wildlife and aquatic habitat is not provided in this ARDR.

Agency Forms

The 2008 Supplement Wetland Determination Data Form-Arid West Region (Environmental Laboratory 2008) was used to document the presence/absence of potential wetlands at four (4) locations within the Survey Area. The 2010 Arid West Ephemeral and Intermittent Streams OHWM Datasheet (Curtis and Lichvar 2010) was completed to document the OHWM at two representative locations for non-wetland waters. All data forms and datasheets are included in Attachment C. Additionally, an Operations and Maintenance Business Information Link (OMBIL) Regulatory Module (ORM) Bulk Upload Spreadsheet for USACE jurisdictional waters was completed and will be submitted to the USACE for verification of this aquatic resource delineation.

Environmental Setting & Climate

General Land Use

The existing land use within and surrounding the Survey Area generally consists of the El Sobrante Landfill and both public and private roads. The Survey Area includes the existing North Old Maintenance Shop (Attachment B, Photos 31 and 32) and South Existing Flares (Attachment B, Photo 23) within the landfill's boundaries. The unpaved parking area to the south of the Dawson Canyon Bridge where the proposed POR is located (Attachment B, Photo 11) is currently used by one food truck on weekdays. Undeveloped open space abuts the majority of the Survey Area.

Hydrology

Surface Water

The NWI, NHD, and aerial photography show that multiple mapped and unmapped drainage features cross or are adjacent to the Survey Area (USFWS 2023 and USGS 2023; Attachment A, Figures 4 and 5). These aquatic resources are hydrologically connected to the Temescal Wash. The Survey Area is within the Lake Mathews Hydrologic Subarea (HU 801.32) of the Santa Ana River HU; and is within the Bedford Wash - Temescal Wash Watershed (HUC 180702030604). USGS watersheds and hydrologic subunits are identified in Attachment A, Figure 5.

The Survey Area contains areas of riverine streambed that ultimately drain to and include Temescal Wash, a Relatively Permanent Water (RPW), that flows approximately 14 miles to Prado Dam that is on the southwest side of Prado Lake, a TNW. Water drains from Prado Dam into the Santa Ana River, an RPW, and towards the Pacific Ocean, a TNW, at Newport Beach.

Aquatic resources within the Survey Area consist of the following two Cowardin Classification codes (Cowardin *et al.* 1979) according to the NWI (USFWS 2023): R2USC and R2UBF are mapped along Temescal

Wash and indicate riverine lower perennial unconsolidated shore and bottom that are seasonally and semipermanently flooded; R4SBCx is mapped along Coldwater Creek and indicates riverine intermittent streambed that is seasonally flooded and excavated by humans; R4SBJr is mapped along one brow ditch and indicates riverine intermittent streambed that is intermittently flooded and has an artificial substrate (e.g, is concrete-lined); and R4SBA is mapped along several drainage features, indicating riverine intermittent streambed that are temporarily flooded (Attachment A, Figure 4; USFWS 2023).

The USACE is in the process of developing and implementing a Stream Duration Assessment Method (SDAM) for the Arid West Region for determining streamflow duration (Environmental Protection Agency [EPA] 2023). The Classification Report generated by the Beta version of the SDAM (version 1.1) for the portion of the Temescal Wash within the Survey Area is classified as intermittent based on field characteristics of many (three or more) hydrophytic plant species, presence of surface water and algae, absence of Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) (EPT) taxa (although a thorough search for aquatic invertebrates was not made), and absence of fish species other than mosquitofish. Although no Classification Report was generated for the tributary (Coldwater Creek) to Temescal Wash, field characteristics of few hydrophytic plant species and presence of water indicate this feature to also be intermittent. The Classification Report is provided in Attachment D, SDAM Classification Reports.

Beneficial Uses

Beneficial uses pertaining to potential receiving waters within the Survey Area Watersheds (Temescal Wash and other tributaries) include municipal and domestic supply, agricultural supply, industrial service supply, groundwater recharge, contact and non-contact water recreation, warm freshwater habitat, and wildlife habitat (Water Quality Control Plan for the San Ana River Basin Plan; RWQCB 1995, updated 2019).

Impaired Waterbodies

Clean Water Act (CWA) Section 303(d)(1)(A) requires states to identify surface waters impaired by pollution (*i.e.*, do not meet water quality standards), and to establish total maximum daily loads for pollutants causing the impairments. The Temescal Wash/Creek is not listed as an impaired waterbody according to the Final 2020-2022 California Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report, SWRCB 2022). Although outside and downstream of the Survey Area, the Santa Ana River, Reach 6 is listed as an impaired waterbody for copper, lead, and cadmium, and Reaches 3 and 4 are listed for copper, lead, and indicator bacteria (SWRCB 2022).

FEMA Floodplain

According to the Federal Emergency Management Agency (FEMA) Flood Hazard maps, the Survey Area is widely unmapped and designated as Zone X: areas of minimal flood hazard determined to be outside the 500-year floodplain and Special Flood Hazard Area (FEMA 2023; Attachment A, Figure 5). The southwestern portion of the Survey Area intersecting the Temescal Wash and adjacent to Coldwater Creek is designated as Flood Zone AE: areas are high risk flood hazard areas with a one percent chance of flooding and for which a detailed analysis of base flood elevations has been completed.

Soils

Soils within and near the Survey Area are displayed on Attachment A, Figure 4. Seven soil series types occur within the Survey Area: clay pits, Cortina gravelly loamy sand (2 to 8 percent slopes), Garretson gravelly very fine sandy loam (2 to 8 percent slopes), gullied land, Lodo rocky loam (25 to 50 percent slopes, eroded), Placentia fine sandy loam (5 to 15 percent slopes), and Temescal rocky loam (15 to 50 percent slopes, eroded) (NRCS 2023a). Cortina gravelly loamy sand (2 to 8 percent slopes) is associated with riverwash and channels and is rated as hydric (NRCS 2023c); this soil is mapped along the Temescal Wash in the Survey Area. Additionally, map unit components (drainageways and depressions) of gullied land and Placentia fine sandy loam (5 to 15 percent slopes) are rated as hydric soils (NRCS 2023c).

Vegetation Communities and Cover Types

Nine vegetation communities/land cover types, including four riparian/wetland/aquatic vegetation communities and five upland vegetation communities/land cover types, were mapped within the Survey Area. Table 1 identifies the vegetation community/land cover type acreages that occur within the Survey Area. Attachment A, Figure 3: Existing Vegetation Communities displays the vegetation mapping conducted within the Survey Area.

Table 1. Vegetation Communities/Land Cover Types within the Survey Area

Vegetation Community (Holland Code)[1]/ Land Cover Type	Area (Acres)[2]
Riparian/Wetlands/Aquatic	
Southern Willow Scrub (63320)[3]	0.05
Mule Fat Scrub (63310)[3]	0.01
Herbaceous Wetland (52510)[3]	0.02
Streambed/Unvegetated Habitat (64000)	0.15
Subtotal	*0.23*
Uplands	
Riversidean Sage Scrub (32700)	1.19
Non-native Woodland (79000)	0.17
Disturbed Habitat (11000)	0.54
Developed (12000)[4]	21.16
Stormwater Detention Basin[5]	0.14
Subtotal	*23.20*
GRAND TOTAL	**23.43**

[1] Holland, 1986.
[2] Acreages are rounded to the nearest hundredth (0.01); thus, totals reflect rounding.
[3] Includes portions of vegetated streambed below the OHWM.
[4] Includes developed, concrete-lined streambed below the Dawson Canyon Bridge, and the concrete spillway downstream of the culvert outlet for Coldwater Creek.
[5] One basin constructed wholly within uplands for purposes of stormwater detention near South Existing Flares site.

Hydrophytic Vegetation

The Survey Area is generally vegetated by Riversidean coastal sage scrub, with smaller patches of non-native vegetation bordering the developed roadways and active landfill sites. Vegetation communities within the Survey Area supporting wetland plant species include southern willow scrub, mule fat scrub, and herbaceous wetland mapped along the Temescal Wash, although herbaceous wetland was not present during the May 2023 field visit as the Temescal Wash exhibited a higher water level with water flow present throughout the entire channel from bank to bank. Only plant species with hydrophytic indicators of Obligate (OBL), Facultative Wetland (FACW), and Facultative (FAC) will be considered for the federal definition of wetlands to meet the hydrophytic plant community wetland parameter (Environmental Laboratory 1987; USACE 2020). Hydrophytic plant species documented within potential aquatic resources along the Temescal Wash and Coldwater Creek included giant reed (*Arundo donax*; FACW), mule fat

(*Baccharis salicifolia*; FAC), nutsedge (*Cyperus* sp.; OBL-FACW), seep monkeyflower (*Erythranthe* [*Mimulus*] *guttatus*; OBL), perennial pepperweed (*Lepidium latifolium*; FAC), water cress (*Nasturtium officinale*; OBL), annual beard grass (*Polypogon monspeliensis*; FACW), cottonwood (*Populus deltoides* ssp. *fremontii*; FAC), marsh yellow cress (*Rorippa palustris*; OBL), willows (*Salix* spp.; FACW), tamarisk (*Tamarix ramosissima*; FAC), cattail (*Typha* sp.; OBL), hoary nettle (*Urtica dioica*; FAC), and cocklebur (*Xanthium strumarium*; FAC).

Climate

In the three months prior to the initial field survey performed on March 29, 2022, there was approximately 0.92 inch of rainfall between January 2022 and March 2022, the majority of which occurred in March, according to the WETS Table for the Elsinore, CA station (NOAA 2023) that is provided in Attachment E. Rainfall totals in both 2021 (7.81 inches) and 2022 (5.38 inches) are below the 30-year annual average total rainfall of 11.21 inches. Rainfall in March 2022 was also below the 30-year average of 1.31 inches for the month of March (NOAA 2023). However, in the three months prior to the field delineation performed on May 10, 2023, 7.9 inches of rainfall was recorded according to the WETS Table for the Elsinore, CA station (NOAA 2023). Rainfall in 2023 totaled 15.49 inches and was above the 30-year average rainfall of 11.21 inches. Additionally, the rainfall in January and March 2023 exceeded the normal range of rainfall recorded for both months.

The Antecedent Precipitation Tool (APT; Versions 1.0.19 and 2.0) is a desktop tool developed by the USACE to support decisions as to whether field data collection and other site-specific observations occurred under normal climatic conditions. The APT is used in aquatic resource delineations to evaluate climatic conditions of a representative watershed. The APT Watershed Sampling Summaries provided in Attachment E summarize precipitation and climatic data for five to seven random sampling points within HUC 180702030604 for the 3 months prior to the three delineation field work dates conducted between March 2022 and December 2023. Overall, these data exhibit that precipitation and climate conditions were drier than normal in March 2022, wetter than normal in May 2023, and normal in December 2023. Site conditions were drier during the field visit in March 2022 when compared to the field visits in May 2023 and December 2023.

Results

The type and amount of aquatic resources occurring within the Survey Area are summarized in Table 2 and illustrated in Attachment A, Figure 7, Page 1 of 10. Overall, 0.65 acre (638 linear feet) of aquatic resources were delineated within the Survey Area, including 0.28 acre and 638 linear feet of waters of the U.S./State (0.04 acre wetland and 0.24 acre/638 linear feet of non-wetland waters) under the purview of both the USACE and RWQCB; and 0.65 acre and 638 linear feet (0.02 acre riparian and 0.63 acres/638 linear feet of streambed/bank) under the purview of the CDFW.

Table 2. Summary of Potential Aquatic Resources within the Survey Area

Aquatic Resource Type	Amount[1]	
	Acres	Linear feet
Potential Waters of the U.S./State (USACE, RWQCB, and CDFW)		
Wetland Waters of the U.S./State[2]	0.04	--
Non-wetland Waters of the U.S./State[3]	0.24	638
Subtotal Waters of the U.S./State (USACE/RWQCB/CDFW)	*0.28*	*638*
Potential Waters of the State (CDFW-exclusive)		
Riparian	0.02	--
Streambed/Bank	0.35	--*
Subtotal Waters of State (CDFW-exclusive)	*0.37*	--*
Total USACE Aquatic Resources	**0.28**	**638**
Total RWQCB Aquatic Resources	**0.28**	**638**
Total CDFW Aquatic Resources	**0.65**	**638**
Grand Total Aquatic Resources	**0.65**	**638**

USACE = United States Army Corps of Engineers; RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife.
[1] All acreages and linear feet are rounded to the nearest hundredth (0.01); thus, totals reflect rounding.
[2] Wetland Waters of the State below the OHWM are also considered vegetated streambed regulated by the CDFW.
[3] Non-wetland Waters of the State are also considered streambed regulated by the CDFW. Includes developed portions below the Dawson Canyon Bridge and the concrete spillway downstream of the culvert outlet for Coldwater Creek.
* Linear feet of this feature concurrent with and already included in non-wetland waters of the U.S.

Federal Aquatic Resources

Potential federal wetland waters classified as a palustrine system are present in the form of freshwater shrub-scrub wetland and freshwater emergent wetland throughout the length of the Temescal Wash drainage within the Survey Area. The herbaceous wetland, mule fat scrub, and southern willow scrub mapped within the active floodplain (defined by the OHWM) of the Temescal Wash, upstream and downstream of the Dawson Canyon Bridge, were delineated as potential wetland waters of the U.S. given the dominance of hydrophytic vegetation and presence of wetland hydrology as documented by Wetland Sample Points 1 and 3 (Attachment C). It was assumed hydric soils were also present within areas which consisted of coarse sand that is often considered a problematic soil. In the Arid West, coarse textured soils commonly occur on vegetated bars above the active channel of rivers and streams (Environmental Laboratory 2008). In some cases, these soils lack hydric soil indicators due to seasonal or annual deposition of new soil material, low iron or manganese content, and low organic matter content (Environmental Laboratory 2008). Additionally, and as noted above, the soil (Cortina gravelly loamy sand, 2 to 8 percent slopes) mapped along the Temescal Wash is associated with riverwash and is rated as hydric (NRCS 2023c). Of the four sample points established during the March 2022 delineation, only Sample Points 1 and 3 are located within federal wetlands. Photos of these sample points are included in Attachment B (Photos 40 through 45).

Boundaries of potential non-wetland waters of the U.S. within the Survey Area were determined by the presence of an OHWM and characterized by an intermittent flow regime according to the SDAM (Appendix D). The OHWM-1 Datasheet was completed to document the unvegetated Temescal Wash drainage both upstream and downstream of the bridge (Attachment B, Photos 1 through 3), and spans the non-wetland aquatic feature labeled NWW-2 that overlapped the cross-section. Evidence of an OHWM within the

Temescal Wash included break in bank slope and changes in average sediment texture (coarse sand below the OHWM transitions to loamy sand or loam above the OHWM), vegetation cover and species. The active floodplain of the Temescal Wash was characterized by presence of bed and bank, changes in vegetation cover, drift and debris, and benches. The portion of the Temescal Wash that is within the Survey Area is characterized by the distinct presence of bed and bank with a width of approximately 64 to 73 feet and a depth of less than 1.0 foot (upstream of the bridge) to approximately 6.0 feet (downstream of the bridge). Although the majority of the Temescal Wash within the Survey Area exhibited no surface water during the March 2022 field visit, surface water extended from bank to bank during the field visits in both May 2023 and December 2023.

A second non-wetland aquatic feature (NWW-1A and NWW-1B) was delineated along the unvegetated drainage of Coldwater Canyon Creek and documented by the OHWM-2 Datasheet (Attachment B, Photos 4 through 10). The Coldwater Canyon Creek exhibited open water and an OHWM with at least seasonal flow that conveys surface water directly to the Temescal Wash (establishing a surface connection) that ultimately drains directly to Prado Lake (a TNW); see also Surface Water, above. Evidence of an OHWM within the Coldwater Canyon Creek included break in bank slope and changes in average sediment texture (primarily cobbles and gravel within the low flow channel bordered by gravelly sand that transitions to fine sand and riprap above the OHWM) and vegetation cover, and the active floodplain was characterized by presence of ripples, bed and bank, and sediment deposition. At the location of the OHWM-2 Datasheet cross-section, the OHWM spanned approximately 20 feet from breaks in banks. No dominance of hydrophytic vegetation was observed along the banks where upland ruderal plant species were abundant before transition to upland scrub species emerging from the riprap.

State Aquatic Resources

All federal waters described above also fall within the CWA Section 401 authority of the RWQCB. CDFW resources are congruent with waters of the State and also extend beyond the OHWM to the top of bank and/or edge of canopy for riparian habitat. Wetland waters of the State consisted of herbaceous wetland and mule fat scrub, and portions of southern willow scrub, within the active floodplain (below the OHWM) of the Temescal Wash. These wetland waters of the State below the OHWM under the jurisdiction of the RWQCB were delineated as vegetated streambed under the jurisdiction of the CDFW. Riparian habitat was delineated beyond wetland waters of the State, consisting of two small areas of southern willow scrub along the banks of and above the OHWM of the Temescal Wash. The top of bank associated with the Temescal Wash was delineated extending approximately 100 feet from the upland terrace on the southwestern edge to the slope reinforced with riprap on the northeastern edge. The top of bank associated with the Coldwater Canyon Creek was delineated extending approximately 56 feet from the slope reinforced with riprap on the southeastern edge to the steep, eroded bank on the northwestern edge.

MSHCP Riparian/Riverine Areas

Potential MSHCP riparian/riverine areas are concurrent with the potential CDFW jurisdictional areas. Within the Survey Area, all CDFW riparian habitat and streambed are also MSHCP riparian/riverine areas. The detention basin and ditches excavated in upland habitat were artificially created, do not provide functions and values of riparian/riverine habitat as defined by the County MSHCP guidelines, and therefore, would not be regulated by the County.

Non-Jurisdictional Features

Ditches and erosional features without direct connectivity to potential receiving waters were considered upland features that are potentially non-jurisdictional to the USACE, RWQCB, and CDFW. Approximately 4,519 linear feet of ditches, the majority of which are roadside ditches, were mapped within the Survey Area.

The majority of roadside ditches along Dawson Canyon Road are concrete-lined (D-8 through D-15; Attachment B, Photos 29 and 30) and one roadside ditch is earthen (D-16; Attachment B, Photos 34 and 35). The roadside ditches were excavated wholly in uplands to drain adjacent upland slopes/graded pads and convey stormwater runoff along Dawson Canyon Road to basins located throughout the landfill property and constructed wholly within uplands for purposes of stormwater detention. No water was observed actively flowing or ponded within the ditches in the Survey Area at the time of the delineation, but a few of the basins located outside the Survey Area held ponded water.

In addition to the roadside ditches, three concrete-lined ditches (D-5, D-6, and D-7) were mapped within the South Existing Flares site (Attachment A, Figure 7, Page 7 and Attachment B, Photos 24 and 25). These three ditches were constructed to divert stormwater runoff from the adjacent upland slopes around the landfill facilities and into stormwater detention basins.

One detention basin (B-1) was mapped in the Survey Area at the South Existing Flares site (Attachment A, Figure 7, Page 7 and Attachment B, Photo 26). This detention basin is artificially excavated in an upland area, isolated from waters or drainages, does not provide wetland/riparian habitat value, and is actively being used to detain stormwater. The basin was constructed in 2018 and no evidence of historic basins or depressions are visible on historic imagery dating back to 1948 (NETR Online 2023).

There are also several offsite brow ditches and pipes that drain adjacent slopes and property towards Dawson Canyon Road. A couple of these ditches (D-3 and D-4) drain into small concrete-lined detention areas with no outlet (Attachment B, Photos 17 and 18), while others (D-1, D-2A, and D-2B) drain directly into a pipe or culvert inlet with no visible outlet in the project vicinity (Attachment B, Photos 13, 15, and 16).

One ditch (RD-1) lined with riprap was mapped on the southeastern edge of Dawson Canyon Road between Temescal Canyon Road and Park Canyon Drive (Attachment A, Figure 7, Page 1 and Attachment B, Photo 12). This roadside, riprap ditch is approximately 536 feet long and appears to have been excavated between 1998 and 2005 based on review of historic imagery (NETR Online 2023). Prior to that, the area appears to have contained upland grasslands and scattered trees between 1948 and 1985, and planted trees along the road are visible in 1994 through 2002 before being removed to excavate or line the ditch with riprap. No culverts were visible within the ditch during the field survey and the majority of this ditch is outside the Survey Area.

Regulatory Options

This ARDR provides the necessary data to support a jurisdictional determination from USACE, RWQCB, CDFW, and the County. Additionally, based on the design and potential construction activities associated with implementation of the Project, this ARDR provides the necessary data to determine whether a regulated activity triggers the need for aquatic resource permits.

Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material into waters of the U.S., which include those waters listed in 33 CFR 328.3(c)(7). USACE regulates any activity that would result in the discharge of dredged or fill material into waters of the U.S. USACE must determine that no discharge of dredged or fill material should be permitted if there is a practicable alternative that would be less damaging to aquatic resources or if significant degradation would occur to waters of the U.S. or wetlands. The portion of the Survey Area that encompasses the Temescal Wash and Coldwater Canyon Creek (Attachment A, Figure 7, Page 1) would be subject to USACE South Pacific Division (Los Angeles District) jurisdiction. If the Project involves regulated activities potentially resulting in a discharge of dredge or fill materials to waters of the U.S., a Section 404 CWA Permit from the USACE may be required. However, based on the current design, all USACE features will be avoided by using horizontal directional drilling (HDD) to install the pipeline below waters of the U.S. and performing all access and staging outside of waters of the U.S.; therefore, it is anticipated that a permit from USACE will not be required. However, the use of HDD includes a risk for frac-out (unintentional seepage of drilling fluid to the ground surface) that could result in materials entering Temescal Wash. USACE coordination is recommended to confirm that a Letter of No Permit Required may be obtained for the project. Should the design change resulting in work in waters of the U.S., then a permit would be required.

Section 401 of the CWA requires states to certify that any activity that may result in a discharge into waters of the U.S. will comply with State water quality standards. All permits issued by USACE under Section 404 of the CWA require certification from the RWQCB pursuant to Section 401. The RWQCB, as delegated by the U.S. EPA and SWRCB, is the State agency responsible for issuing a CWA Section 401 Water Quality Certification or waiver. The portion of the Survey Area that encompasses the Temescal Wash and Coldwater Canyon Creek (Attachment A, Figure 7, Page 1) would be subject to Region 8 (Santa Ana) jurisdiction. If the Project involves regulated activities potentially resulting in a discharge of dredge or fill materials to waters of the U.S. and State, a Section 401 CWA Water Quality Certification from the RWQCB may be required. However, based on the current design, all jurisdictional features will be avoided as described above; therefore, a permit from RWQCB would not be required. Should the design change resulting in work in waters of the U.S. or state, then a permit would be required.

Section 13263 of the 1969 Porter-Cologne Water Quality Control Act (Porter-Cologne) authorizes the RWQCB to regulate discharges of waste and fill material to waters of the State, including isolated waters and wetlands through obtaining a Waste Discharge Requirement or Waiver. If the Project involves regulated activities that could result in a discharge of waste and fill materials to waters of the State, including wetlands, that are not covered by a 401 Certification, a Report of Waste Discharge Requirement from the RWQCB may be required. However, based on the current design, all jurisdictional features will be avoided as described above; therefore, it is anticipated that a permit from RWQCB will not be required. RWQCB coordination is recommended to confirm that a permit would not be required for the project. Should the design change resulting in work in waters of the U.S. or state, then a permit would be required.

CFGC Sections 1600-1617 require consultation with CDFW if a proposed activity has the potential to detrimentally affect a stream, and thereby, wildlife resources that depend on a stream for continued viability. Under CFGC Sections 1600 *et seq.*, CDFW regulates activities that would result in (1) any potentially detrimental impacts associated with the substantial diversion or the obstruction of the natural flow of a stream; (2) substantial changes to the bed, channel, or banks of a stream, or the use of any material from the bed, channel, or banks; and (3) the disposal of debris or waste materials that may pass into a stream. The portion of the Survey Area that contains the riparian habitat and streambed/bank associated with the Temescal Wash and Coldwater Canyon Creek (Attachment A, Figure 7, Page 1) would be subject to CDFW Region 6 (Inland Deserts Region) jurisdiction. If the Project involves regulated activities that could result in any alteration to riparian habitat and/or streambed, a Lake or Streambed Alteration Agreement from CDFW may be required. However, based on the current design, all jurisdictional features will be avoided as described above. While the Project is not expected to result in direct impacts to CDFW aquatic resources, CDFW may require a Streambed Alteration Agreement due to the pipeline being installed under Temescal Wash and the potential for frac-out resulting in materials entering CDFW jurisdictional aquatic resources. Therefore, a Notification of Lake or Streambed Alteration will be submitted to CDFW to determine whether an Agreement will be required.

The WRC MSHCP requires that as projects are proposed within the overall Plan Area, the effect of those projects on riparian/riverine areas and vernal pools must be addressed (County 2003). Pursuant to Volume I, Section 6.1.2 of the MSHCP, projects must consider alternatives providing for 100% percent avoidance of riparian/riverine areas. If avoidance is infeasible, then the unavoidable impacts must be mitigated and a Determination of Biologically Equivalent or Superior Preservation (DBESP) is required. Final compensation for the potential loss of MSHCP riparian/riverine areas would be determined through the DBESP process. The portion of the Survey Area that contains the riparian habitat and streambed/bank associated with the Temescal Wash and Coldwater Canyon Creek (Attachment A, Figure 7, Page 1) would be considered County "riparian/riverine" habitat, as defined by the MSHCP. However, based on the current design, all County jurisdictional features will be avoided as described above. Should the design change resulting in work in County-jurisdictional waters, then an MSHCP review would be required.

Conclusion

The findings and conclusions presented in this report, including the location and extent of aquatic resource areas subject to regulatory jurisdiction, represent the professional opinion of Artemis. These findings and conclusions should be considered preliminary and at the final discretion of the applicable resource agency. The USACE, RWQCB, and CDFW typically would need to review and verify to make a formal determination of the preliminary delineation results.

Sincerely,

Jasmine Bakker
Senior Biologist
Artemis Environmental Services, Inc.

Enclosures:

Attachment A, Figures

Figure 1	Regional Location
Figure 2	Project Vicinity
Figure 3	Survey Area
Figure 4	Soils

Figure 5 NWI
Figure 6 NHD and FEMA
Figure 7 Aquatic Resources Delineation
Attachment B, Representative Photos
Attachment C, Wetland Determination Data Forms and OHWM Datasheets
Attachment D, Stream Duration Assessment Method (SDAM) Classification Report
Attachment E, Climatological Data

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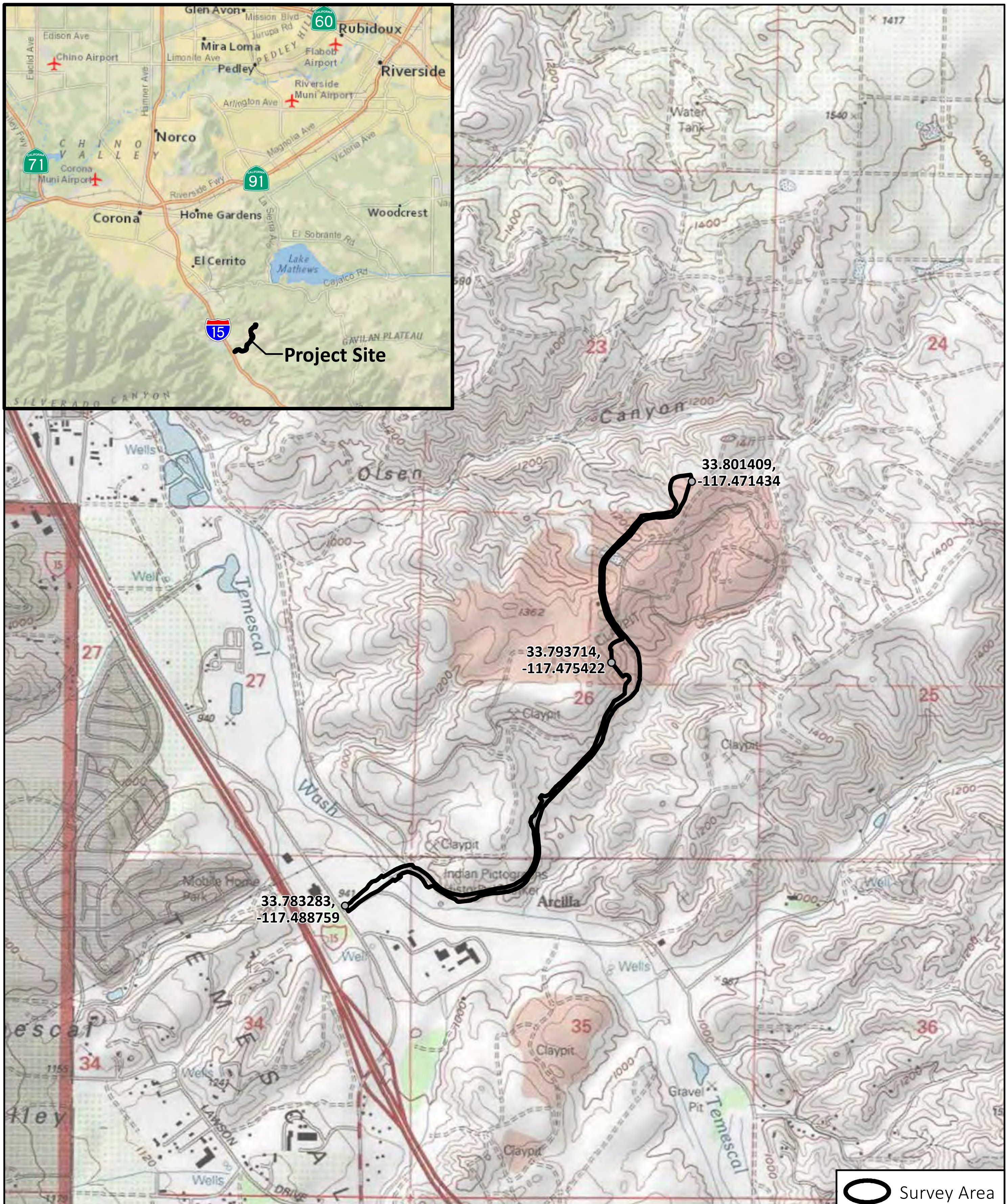
ATTACHMENT A

Figures



Source: USGS 7.5' Quadrangles (Lake Mathews); T04S, R06W, S 23, 26, 34, 35

Figure 1

Project Vicinity Map

AQUATIC RESOURCES DELINEATION FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

Artemis Environmental Services, Inc.

N 0 2,000 Feet

Aerial Photo: Nearmap 2023

Figure 2

Survey Area

AQUATIC RESOURCES DELINEATION FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

Artemis Environmental Services, Inc.

N 0 600 Feet

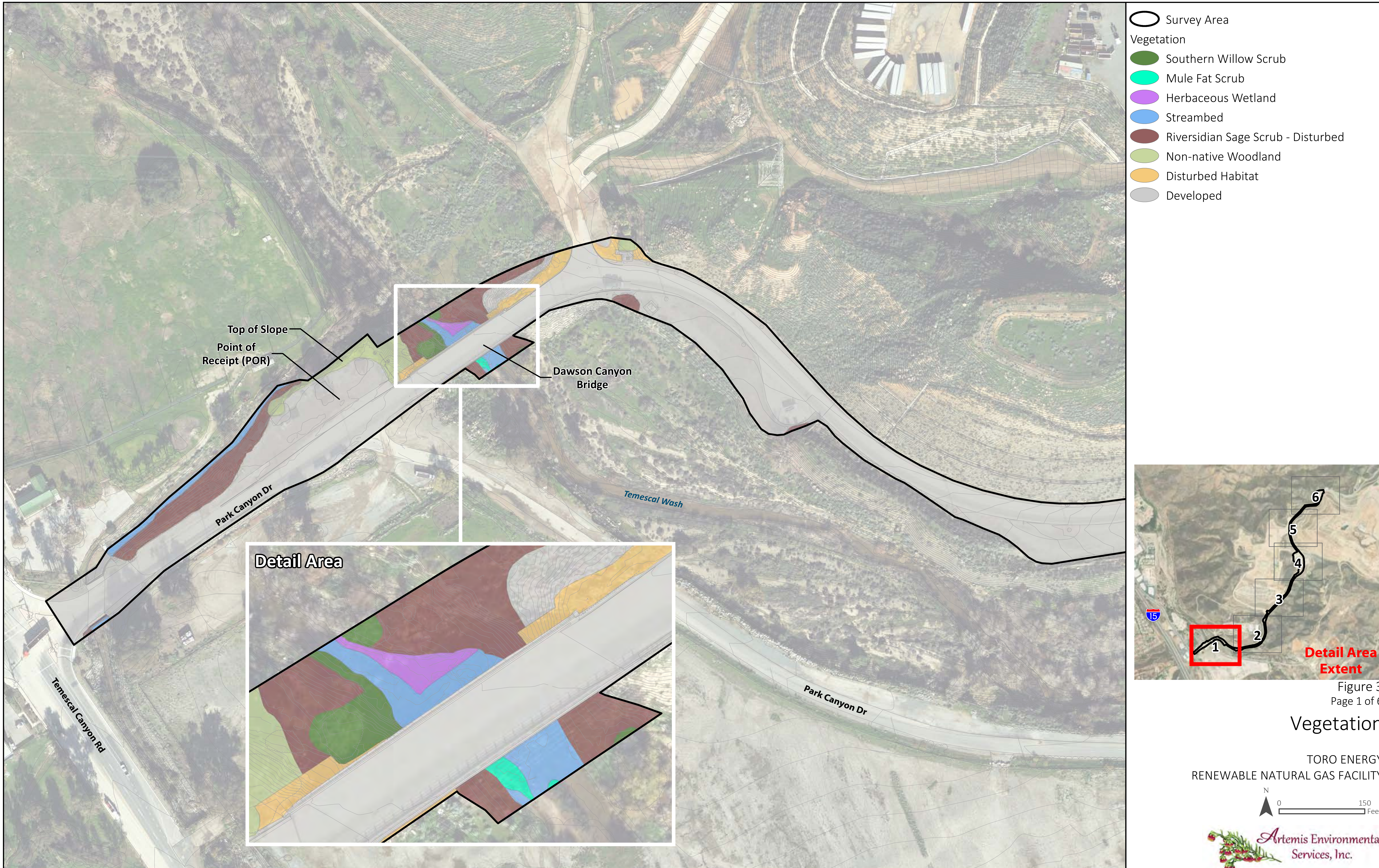
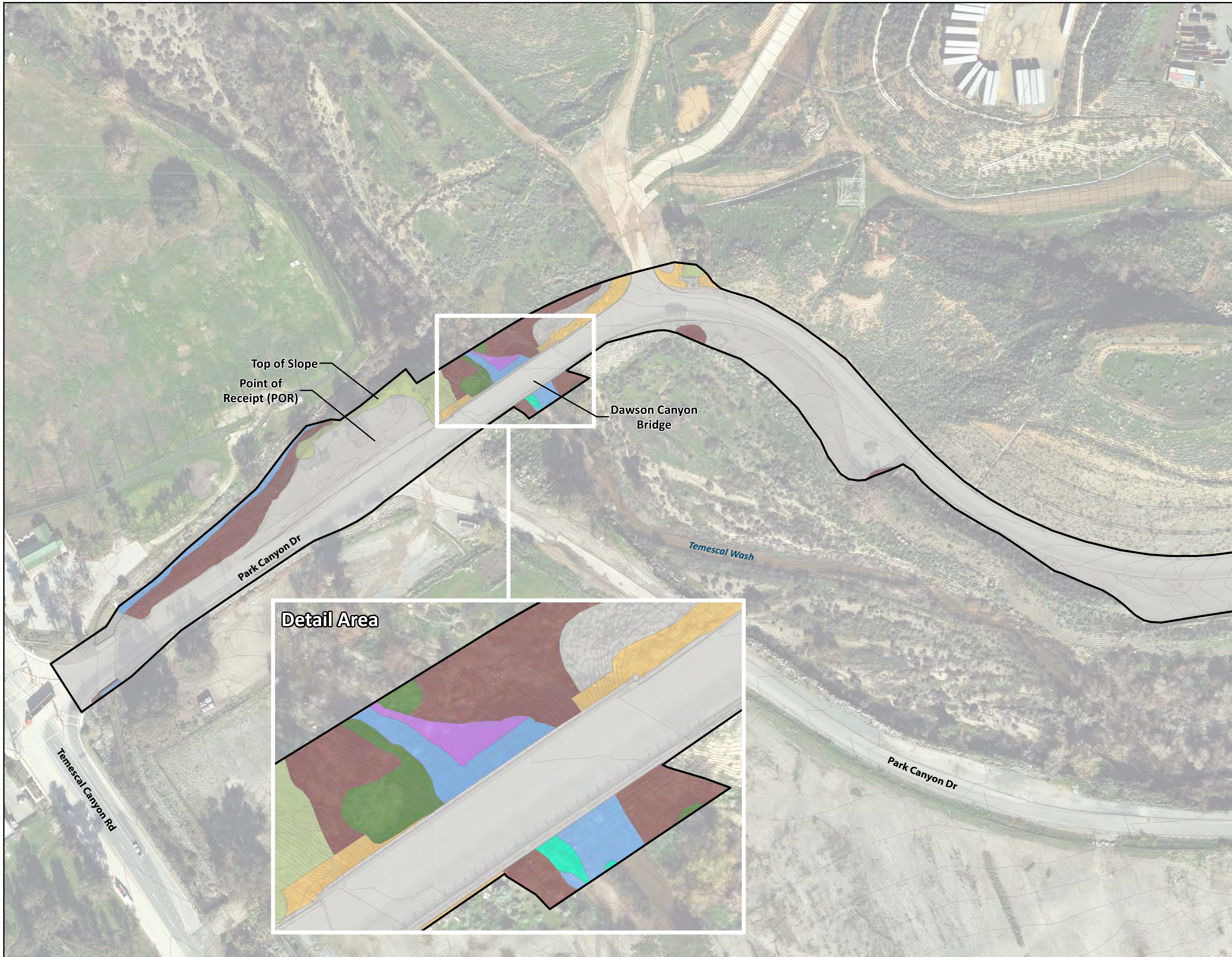


Figure 3
Page 1 of 6

Vegetation

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.



Survey Area

Vegetation
- Southern Willow Scrub
- Mule Fat Scrub
- Herbaceous Wetland
- Streambed
- Riversidian Sage Scrub - Disturbed
- Non-native Woodland
- Disturbed Habitat
- Developed

Figure 3
Page 1 of 6

Vegetation

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.

Survey Area
Vegetation
Riversidian Sage Scrub
Developed

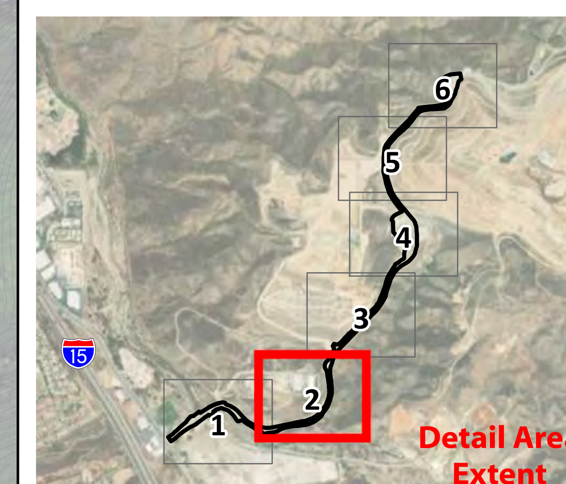


Figure 3
Page 2 of 6

Vegetation

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

N
0 150 Feet

Artemis Environmental Services, Inc.

Survey Area

Vegetation

Riversidian Sage Scrub

Developed

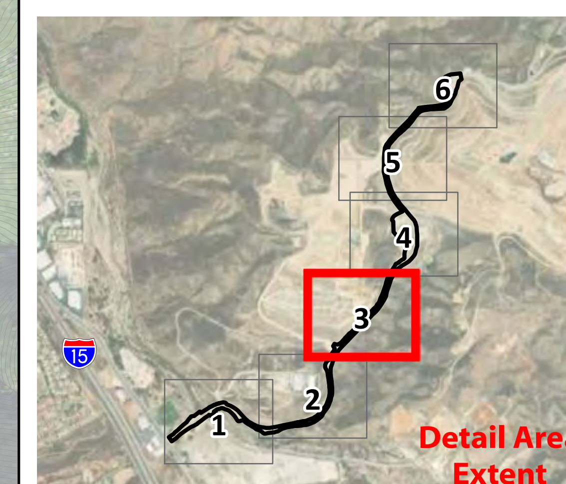


Figure 3

Page 3 of 6

Vegetation

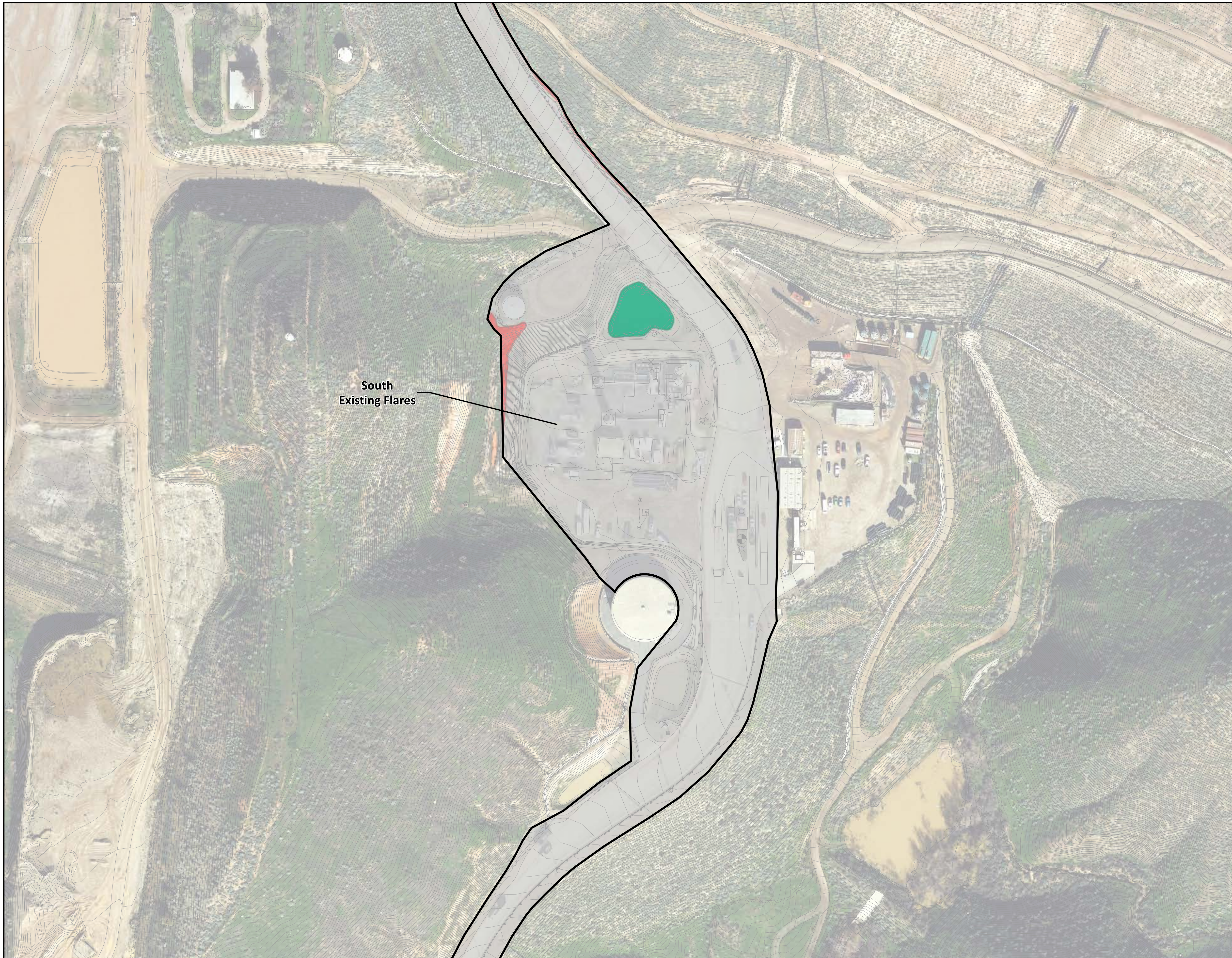
TORO ENERGY

RENEWABLE NATURAL GAS FACILITY

N

0 150 Feet

Artemis Environmental Services, Inc.



Survey Area

Vegetation

Basin

Riversidian Sage Scrub

Developed

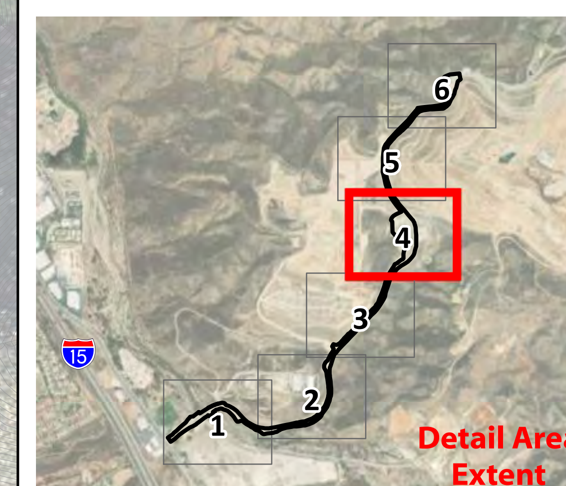


Figure 3

Page 4 of 6

Vegetation

TORO ENERGY

RENEWABLE NATURAL GAS FACILITY

N 0 150 Feet

Artemis Environmental Services, Inc.

Survey Area

Vegetation

Riversidian Sage Scrub

Disturbed Habitat

Developed

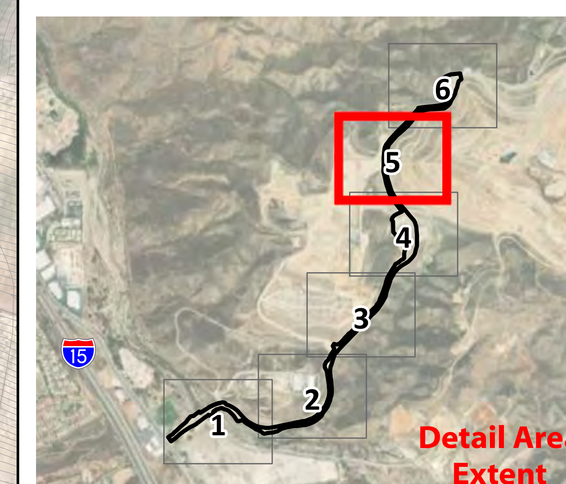


Figure 3
Page 5 of 6

Vegetation

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

N
0 150
Feet

Artemis Environmental Services, Inc.

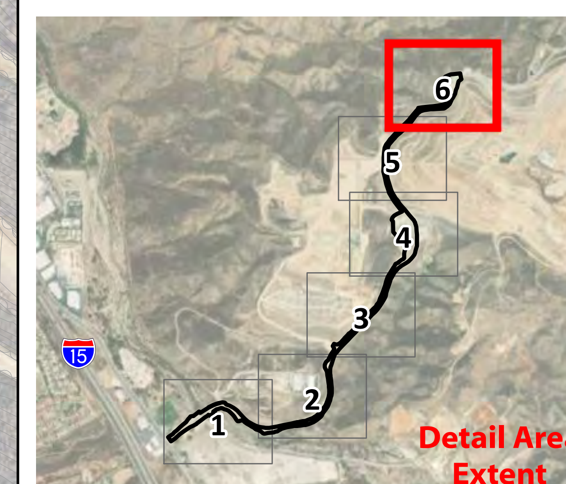
Survey Area

Vegetation

Riversidian Sage Scrub

Disturbed Habitat

Developed



Detail Area Extent

Figure 3

Page 6 of 6

Vegetation

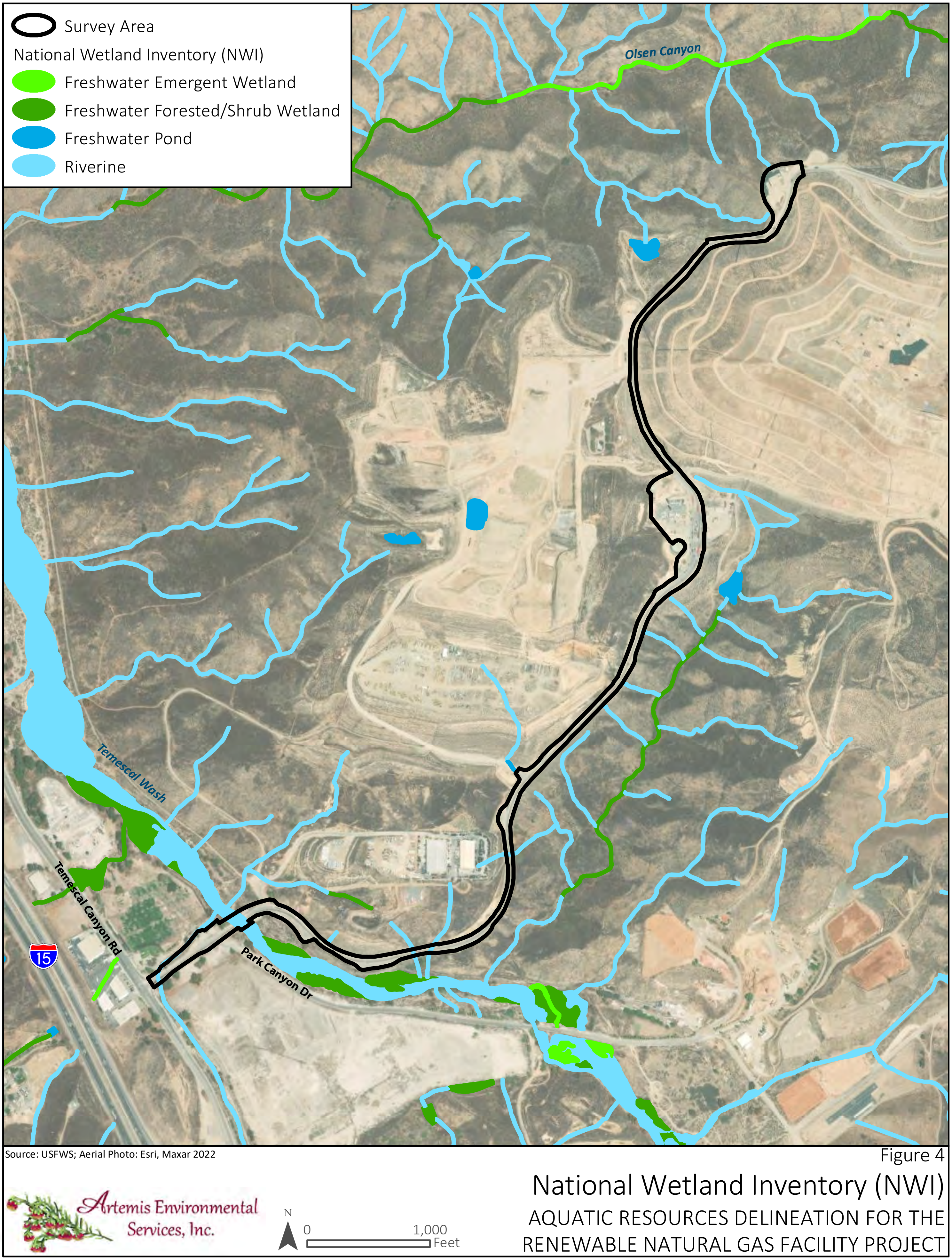
TORO ENERGY

RENEWABLE NATURAL GAS FACILITY

N

0 150 Feet

Artemis Environmental Services, Inc.



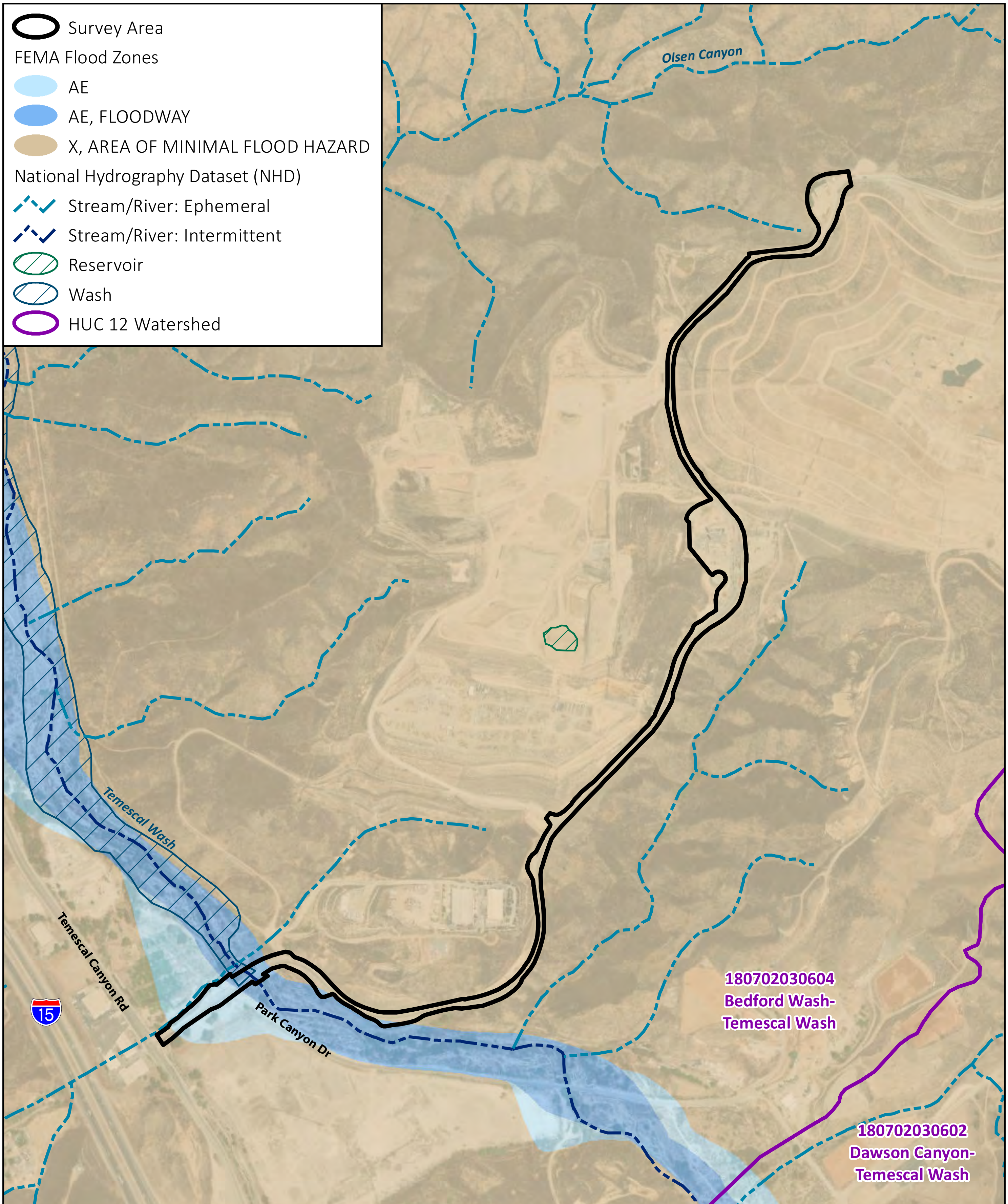
Source: USFWS; Aerial Photo: Esri, Maxar 2022

Artemis Environmental Services, Inc.

Figure 4

National Wetland Inventory (NWI)

AQUATIC RESOURCES DELINEATION FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT



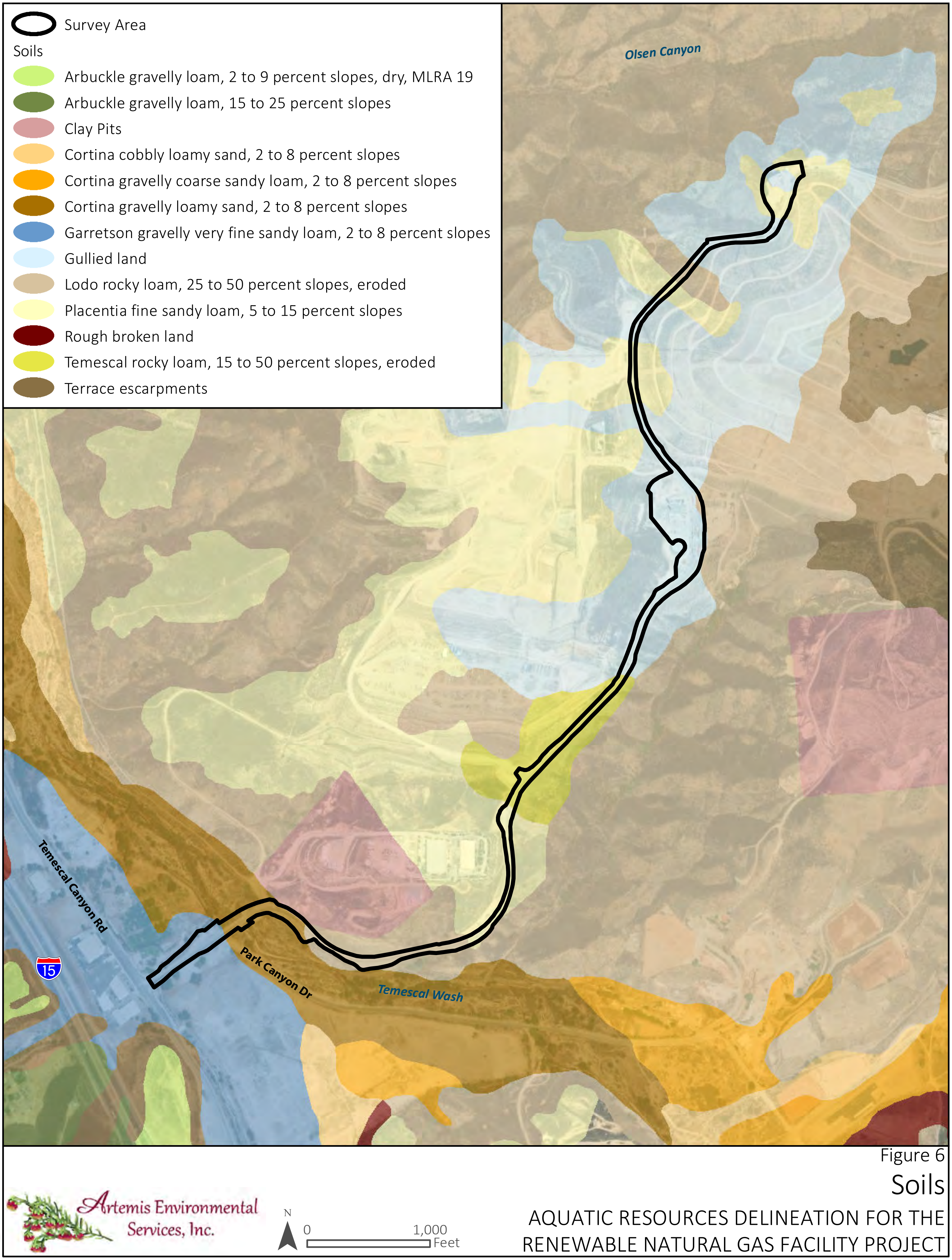
Source: USGS, FEMA; Aerial Photo: Esri, Maxar 2022

Figure 5

National Hydrography Dataset (NHD) and FEMA Flood Zones

Artemis Environmental Services, Inc.

AQUATIC RESOURCES DELINEATION FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT

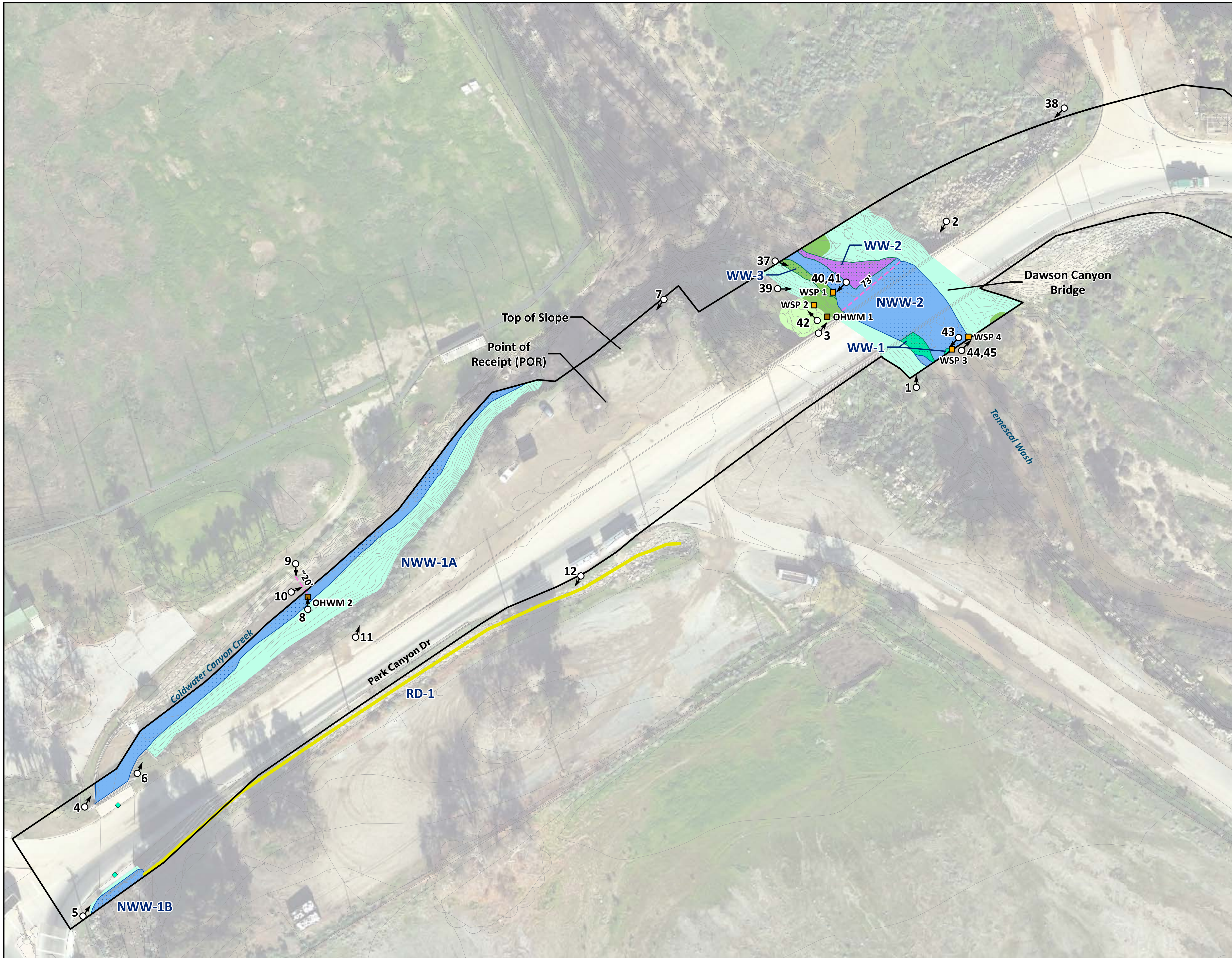


Artemis Environmental Services, Inc.

Figure 6

Soils

AQUATIC RESOURCES DELINEATION FOR THE RENEWABLE NATURAL GAS FACILITY PROJECT



Survey Area
Photo Location
Culvert
Wetland Sample Point
OHWM Data Point
OHWM Cross-section
Potentially Non-jurisdictional Features
Riprap Ditch
Potentially USACE/RWQCB Jurisdictional Features
Non-wetland Waters of the U.S.
Wetland Waters of the U.S.
Potentially CDFW Jurisdictional Features
CDFW Streambed/Bank
Southern Willow Scrub
Mule Fat Scrub
Herbaceous Wetland
Unvegetated Habitat
Upland Habitat
CDFW Riparian Habitat
Southern Willow Scrub

Figure 7, Page 1 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

N
0
80
Feet

Artemis Environmental
Services, Inc.

Figure 7, Page 2 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.

Survey Area
Photo Location
Culvert
Potentially Non-jurisdictional Features
Ditch

Figure 7, Page 3 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

N
0 80 Feet

Artemis Environmental Services, Inc.

Figure 7, Page 4 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.

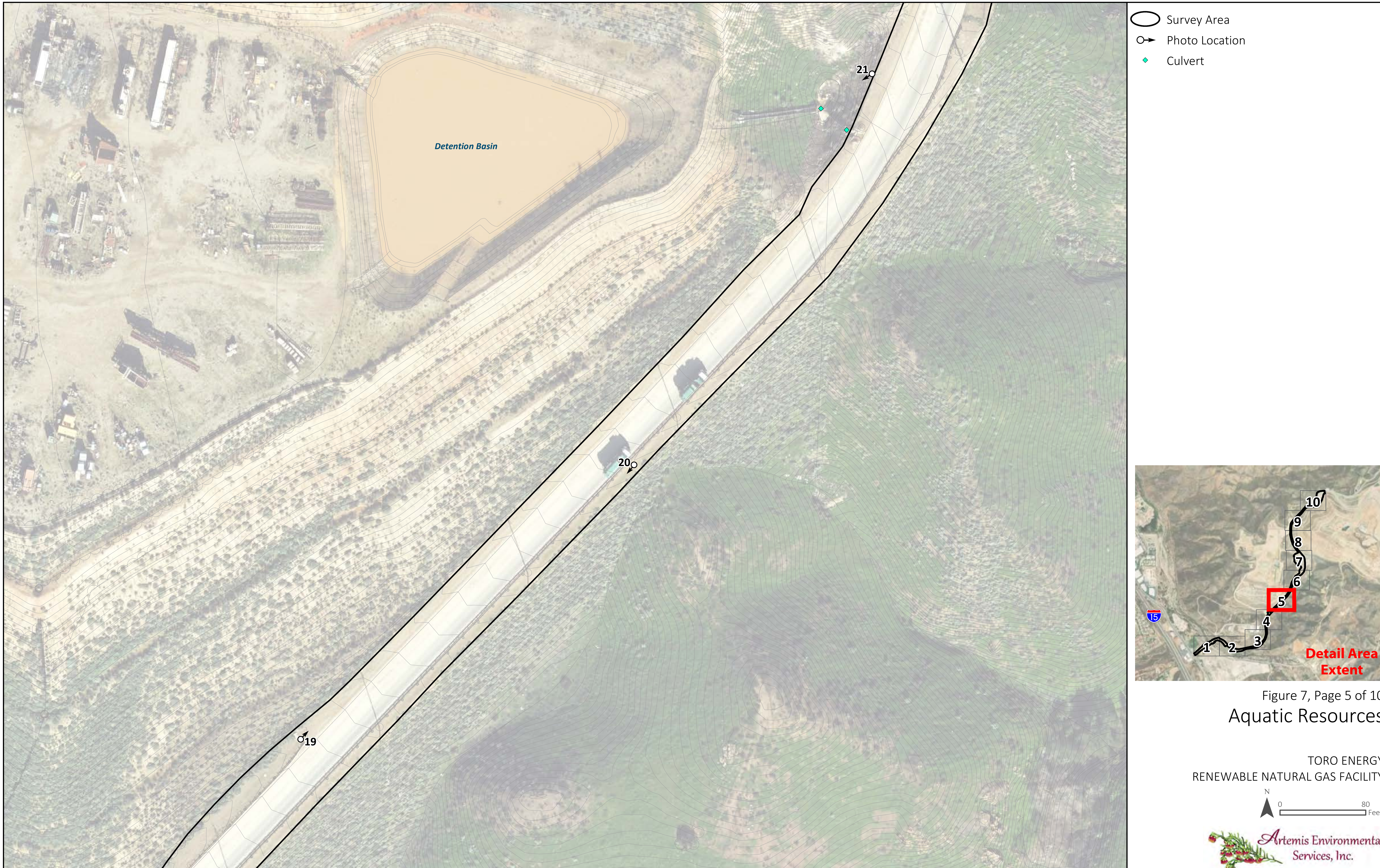


Figure 7, Page 5 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.

Survey Area
Photo Location
Culvert

Figure 7, Page 6 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.

Figure 7, Page 7 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.

Survey Area
Photo Location
Culvert
Potentially Non-jurisdictional Features
Ditch

Figure 7, Page 8 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

N
0 80 Feet

Artemis Environmental Services, Inc.

Survey Area
Photo Location
Culvert
Potentially Non-jurisdictional Features
Ditch

Figure 7, Page 9 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

N
0 80 Feet

Artemis Environmental Services, Inc.

Figure 7, Page 10 of 10

Aquatic Resources

TORO ENERGY
RENEWABLE NATURAL GAS FACILITY

Artemis Environmental Services, Inc.

Attachment B

Representative Photos

Photo 1. Overview of Dawson Canyon Bridge over Temescal Wash (NWW-2), looking downstream/north from upstream bank. (May 10, 2023)

Photo 2. Overview of Dawson Canyon Bridge over Temescal Wash (NWW-2), looking southwest from downstream corner. (May 10, 2023)

Photo 3. OHWM1 cross-section of Temescal Wash (NWW-2) downstream of Dawson Canyon Bridge, looking northeast. (May 10, 2023)

Photo 4. Coldwater Canyon Creek (NWW-1A), looking northeast at box culvert outlet. (May 10, 2023)

Photo 5. Coldwater Canyon Creek (NWW-1B), looking northeast at box culvert inlet. (May 10, 2023)

Photo 6. Overview of Coldwater Canyon Creek (NWW-1A), looking northeast from box culvert outlet. (May 10, 2023)

Photo 7. Overview of Coldwater Canyon Creek (NWW-1A), looking southwest and adjacent to Project POR site. (May 10, 2023)

Photo 8. OHWM2 cross-section of Coldwater Canyon Creek (NWW-1A), looking northwest. (May 10, 2023)

Photo 9. OHWM2 cross-section of Coldwater Canyon Creek (NWW-1A), looking south. (May 10, 2023)

Photo 10. Coldwater Canyon Creek (NWW-1A), looking downstream/northeast from OHWM2 cross-section. (May 10, 2023)

Photo 11. Overview of Project POR site, looking northeast. (May 10, 2023)

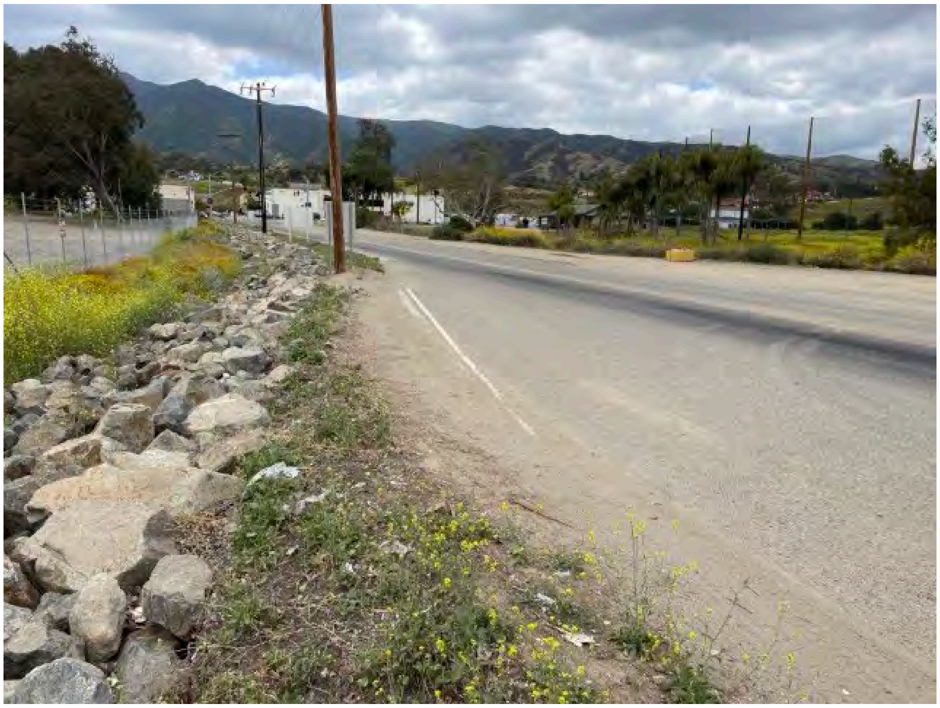


Photo 12. Roadside ditch (RD-1) lined with riprap along Dawson Canyon Road, looking southwest. (May 10, 2023)

Photo 13. Brow ditch (D-1) on slope that drains into pipe/culvert inlet, looking northeast. (May 10, 2023)

Photo 14. Dawson Canyon Road, looking east. (May 10, 2023)

Photo 15. Brow ditch (D-2A) inlet, looking west. (May 10, 2023)

Photo 16. Brow ditch (D-2B) inlet, looking south. (May 10, 2023)

Photo 17. Brow ditch (D-3) that drains into small detention area with no outlet, looking northwest. (May 10, 2023)

Photo 18. Brow ditch (D-4) that drains into small detention area with no outlet, looking west. (May 10, 2023)

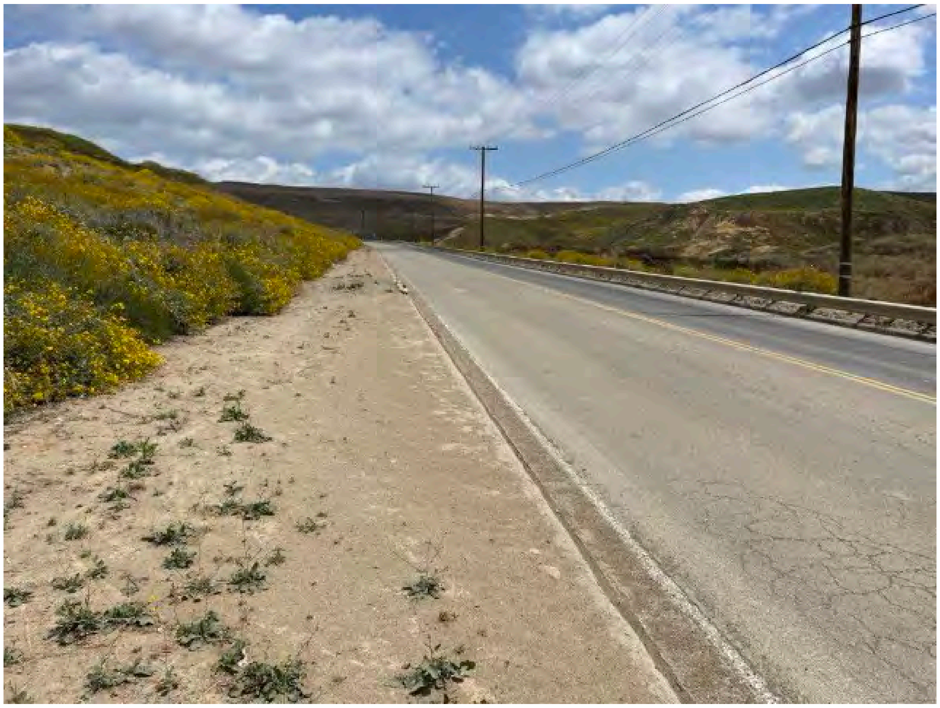


Photo 19. Dawson Canyon Road, looking northeast. (May 10, 2023)

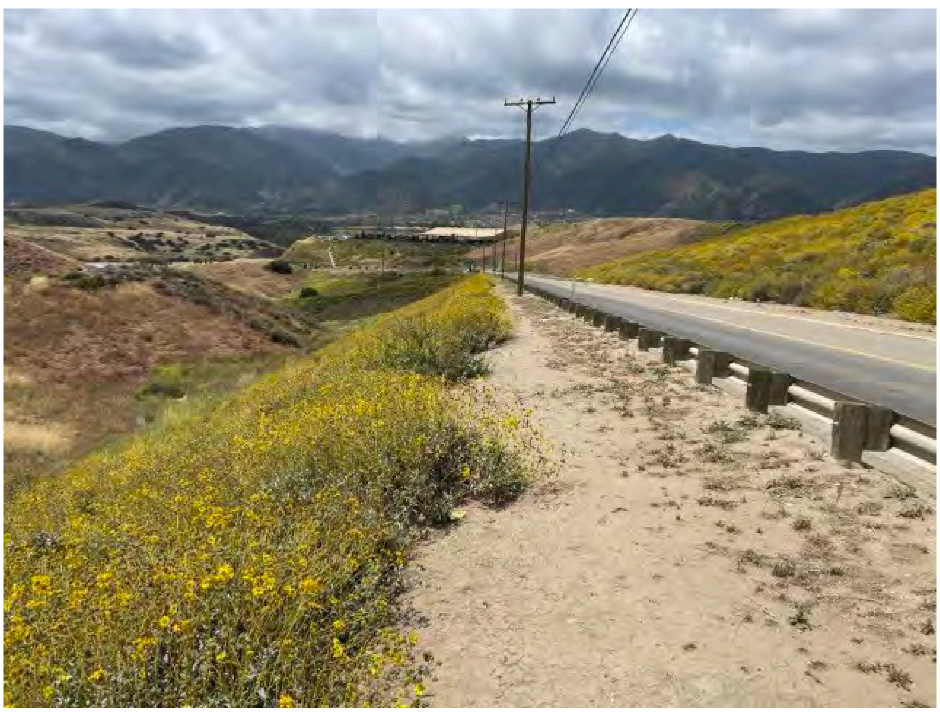


Photo 20. Dawson Canyon Road, looking southwest. (May 10, 2023)

Photo 21. Offsite pipe that drains into small detention area with no outlet, looking southwest. (May 10, 2023)

Photo 22. Looking northeast towards landfill and offsite detention basin and drainage. (May 10, 2023)

Photo 23. Overview of South Existing Flares site, looking northeast. (May 10, 2023)

Photo 24. Ditches (D-6 and D-7) constructed at perimeter of South Existing Flares site, looking northwest. (May 10, 2023)

Photo 25. Ditch (D-6) constructed at perimeter of South Existing Flares site, looking west. Adjacent ditch (D-5) within separate fenced area to the south. (May 10, 2023)

Photo 26. Detention basin (B-1) within South Existing Flares site, looking southwest. (May 10, 2023)

Photo 27. Dawson Canyon Road, looking southeast. (May 10, 2023)

Photo 28. Dawson Canyon Road, looking north. (May 10, 2023)

Photo 29. Roadside ditch (D-9) along Dawson Canyon Road, looking northwest. (May 10, 2023)

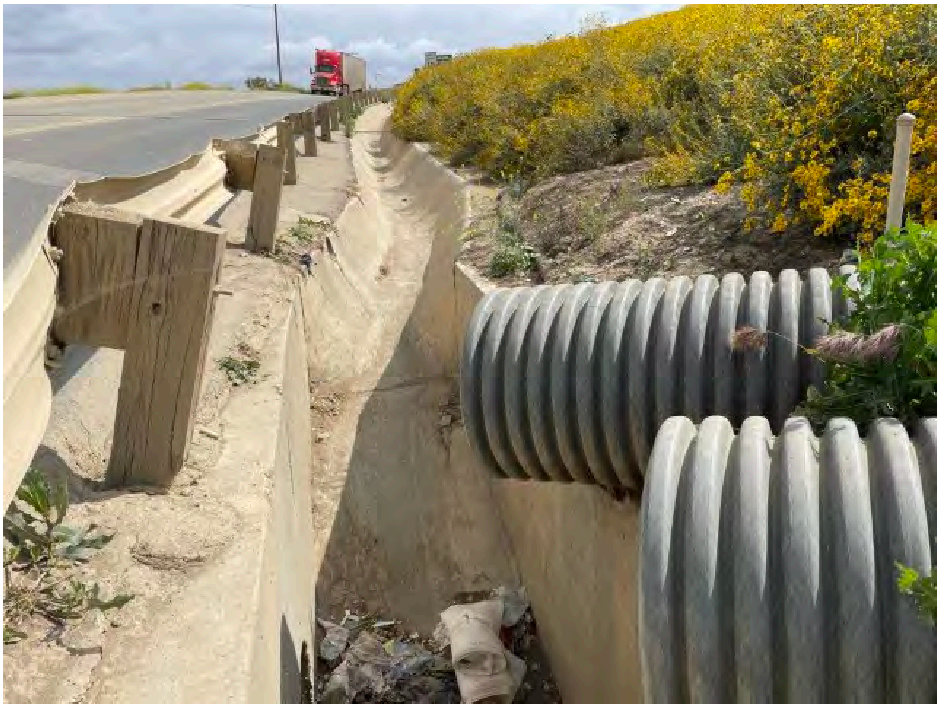


Photo 30. Pipes on adjacent slope draining into roadside ditch (D-13) along Dawson Canyon Road, looking northeast. (May 10, 2023)

Photo 31. Overview of North Old Maintenance Shop site, looking southwest. (May 10, 2023)

Photo 32. Overview of North Old Maintenance Shop site, looking south. (May 10, 2023)

Photo 33. Pipe outlet (P-2) that drains storm water from North Old Maintenance Shop site into a roadside ditch (D-16), looking north. (May 10, 2023)

Photo 34. Roadside ditch (D-16) that conveys storm water runoff from the North Old Maintenance Shop site to an offsite detention basin, looking northeast. (May 10, 2023)

Photo 35. Pipe inlet that drains roadside ditch (D-16) to an offsite detention basin, looking west. (May 10, 2023)

Photo 36. Offsite detention basin southwest of the North Old Maintenance shop that receives water from pipe that drains a roadside ditch (D-16), looking northeast. (May 10, 2023)

Photo 37. Looking southeast towards Dawson Canyon Bridge. (December 21, 2023)

Photo 38. Looking southwest towards Temescal Wash and Dawson Canyon Bridge. (December 21, 2023)

Photo 39. Overview of Dawson Canyon Bridge (downstream) over the Temescal Wash, looking east. (March 29, 2022)

Photo 40. Looking southwest at wetland sample point #1 located within southern willow scrub/herbaceous wetland delineated as wetland waters of the U.S./State. (March 29, 2022)

Photo 41. Soil pit of wetland sample point #1 with high water table present. (March 29, 2022)

Photo 42. Looking northwest at wetland sample point #2 located within upland habitat above the OHWM on the southwestern bank of Temescal Wash. (March 29, 2022)

Photo 43. Looking southwest at wetland sample point #3 located within mule fat scrub delineated as wetland waters of the U.S./State. (March 29, 2022)

Photo 44. Looking northeast at wetland sample point #4 located within upland habitat above the OHWM on the northeastern bank of Temescal Wash. (March 29, 2022)

Photo 45. Soil pit of wetland sample point #4 located within upland habitat with red clay present in lower soil profile. (March 29, 2022)

ATTACHMENT C

Wetland Determination Data Forms and OHWM Datasheets

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Toro Energy RNGF
Project Number:
Stream: Temescal Wash
Investigator(s): Jasmine Bakker

Date: 5/10/2023 **Time:** 1:05pm
Town: Corona,RiversideCo. **State:** California
Photo begin file#: 31 **Photo end file#:** 32

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: OHWM1 - downstream of bridge

Projection: **Datum:** WGS 84
Coordinates: 33.784538, -117.486480

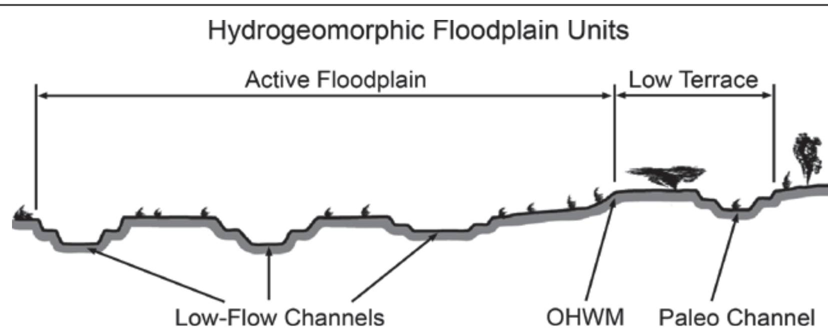
Potential anthropogenic influences on the channel system:
Dawson Cyn Bridge intersects the Temescal Wash; bridge footings have eroded; rip rap placed at downstream edge of bridge where there is a significant drop in elevation. Litter throughout

Brief site description:
Wetland vegetation established further downstream of bridge and riparian but more sparse upstream; streambed largely unvegetated.

Checklist of resources (if available):

- ☑ Aerial photography
  - Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☑ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  - Gage number:
  - Period of record:
    - ☐ History of recent effective discharges
    - ☐ Results of flood frequency analysis
    - ☐ Most recent shift-adjusted rating
    - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event



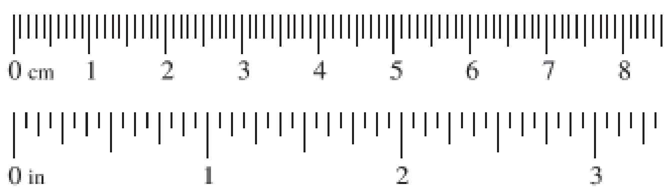
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph ☑ GPS
☐ Digitized on computer ☐ Other:

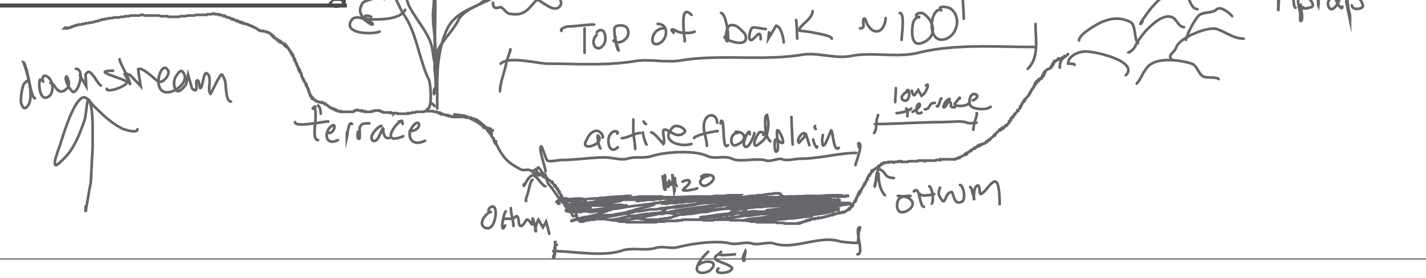
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	Gravel
	0.157	4		
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	Sand
	0.020	0.50		
			Medium sand	Sand
1/2	0.0098	0.25		
			Fine sand	Sand
1/4	0.005	0.125		
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	Silt
1/32	0.00061	0.0156		
			Fine silt	Silt
1/64	0.00031	0.0078		
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: RNGF **Cross section ID:** OHWM 1 **Date:** 5/10/2023 **Time:** 1:05 pm

Cross section drawing:



OHWM

GPS point: 33.784538, -117.486480

Indicators:

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____________
- [ ] Other: ____________

Comments:
Coarse sand below OHWM transitions to loamy sand or loam above OHWM, width of OHWM cross-section ~65 ft

Floodplain unit: [x] Low-Flow Channel [x] Active Floodplain [ ] Low Terrace

GPS point: see OHWM coordinates

Characteristics of the floodplain unit:
Average sediment texture: sand
Total veg cover: 5-10 % Tree: 0 % Shrub: 5 % Herb: 25 %
Community successional stage:

- [ ] NA
- [x] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [x] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____________
- [ ] Other: ____________
- [ ] Other: ____________

Comments:
Mostly unvegetated; active water flow present from bank to bank. Channel becomes more narrow downstream of bridge; riprap impedes flow beneath bridge.

Project ID: RNGF **Cross section ID:** OHWM 1 **Date:** 5/10 **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: 33.784654, -117.486316

Characteristics of the floodplain unit:
Average sediment texture: loamy sand w/rock
Total veg cover: 20 % Tree: 10 % Shrub: 7 % Herb: 5 %
Community successional stage:
- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:
- ☐ Mudcracks
- ☐ Ripples
- ☒ Drift and/or debris
- ☒ Presence of bed and bank
- ☒ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: ____________________
- ☐ Other: ____________________
- ☐ Other: ____________________

Comments:
low flow channel is eroded and ~ 4-5 ft lower elevation from adjacent terrace below top of bank.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________________

Characteristics of the floodplain unit:
Average sediment texture: ___________________
Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%
Community successional stage:
- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:
- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________________
- ☐ Other: ____________________
- ☐ Other: ____________________

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Toro Energy RNGF **Project Number:** **Stream:** Coldwater Creek **Investigator(s):** Jasmine Bakker	**Date:** 5/10/2023 **Time:** 2:00 pm **Town:** Corona,RiversideCo. **State:** California **Photo begin file#:** 39 **Photo end file#:** 42
Y [x] / N [ ] Do normal circumstances exist on the site? Y [ ] / N [x] Is the site significantly disturbed?	**Location Details:** OHWM 2 **Projection:** **Datum:** WGS 84 **Coordinates:** 33.783858, -117.487957

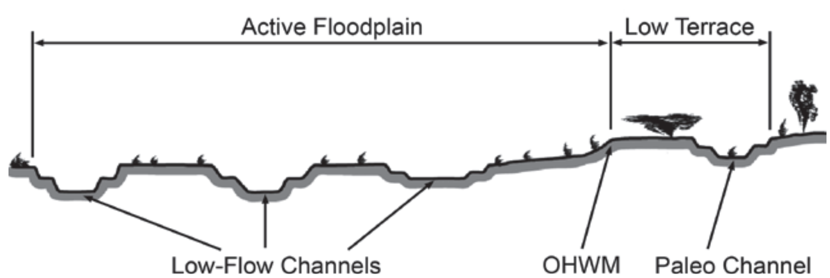
Potential anthropogenic influences on the channel system:
Channel was excavated and is lined with riprap; upstream culvert beneath Dawson Canyon Road at Temescal Canyon Rd intersection.

Brief site description:
Open channel of uniform width that drains northeast into the Temescal Wash just downstream of Dawson Canyon Bridge. Channel is at base of slope below proposed POR site.

Checklist of resources (if available):

- [x] Aerial photography
  Dates:
- [x] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [x] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [x] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

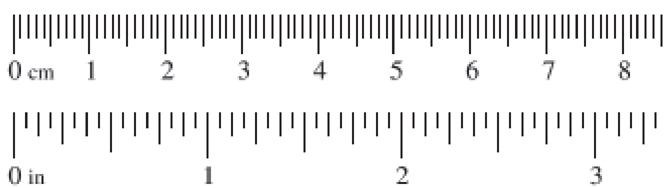


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [ ] Mapping on aerial photograph
   - [x] GPS
   - [ ] Digitized on computer
   - [ ] Other:

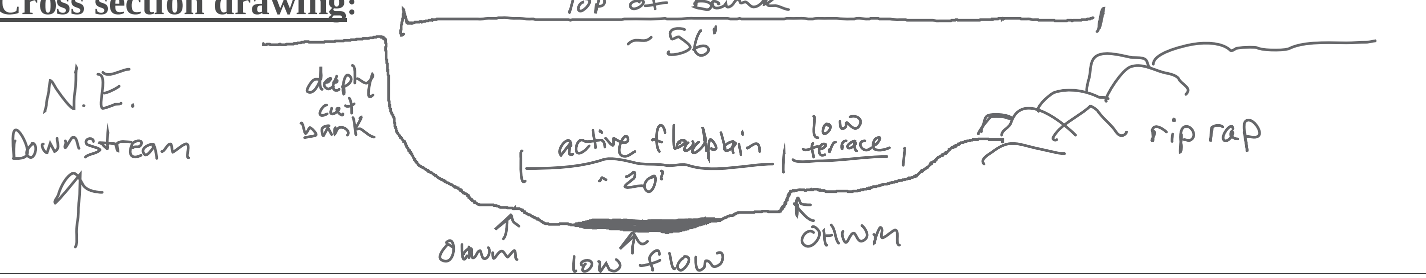
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		Gravel
			Cobble	Gravel
	2.56	64		Gravel
			Pebble	Gravel
	0.157	4		Gravel
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		Sand
			Coarse sand	Sand
	0.020	0.50		Sand
			Medium sand	Sand
1/2	0.0098	0.25		Sand
			Fine sand	Sand
1/4	0.005	0.125		Sand
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		Silt
			Medium silt	Silt
1/32	0.00061	0.0156		Silt
			Fine silt	Silt
1/64	0.00031	0.0078		Silt
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: RNGF **Cross section ID:** OHWM2 **Date:** 5/10/2023 **Time:** 2:00pm

Cross section drawing:



OHWM

GPS point: 33.783862, -117.487955 and 33.783906, -117.487993

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____________________
- [ ] Other: ____________________

Comments:

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: 33.783885, -117.487971

Characteristics of the floodplain unit:

Average sediment texture: cobbles, gravel

Total veg cover: 0 % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [x] Ripples
- [ ] Drift and/or debris
- [ ] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [x] Other: water flow ~3" deep, 6-8 ft wide
- [ ] Other: ____________________
- [ ] Other: ____________________

Comments:

low-flow channel within slight depression at center of OHWM/active floodplain width.

Project ID: LNGF **Cross section ID:** OHWM 2 **Date:** 5/10/2025 **Time:** 2:20pm

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: see OHWM coordinates

Characteristics of the floodplain unit:
Average sediment texture: gravelly sand
Total veg cover: <10 % Tree: 0 % Shrub: <1 % Herb: 5 %
Community successional stage:
- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:
- ☐ Mudcracks
- ☒ Ripples
- ☐ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☒ Other: sediment deposition
- ☐ Other: ____________
- ☐ Other: ____________

Comments:
few plants scattered along sandy deposits bordering low-flow channel: Ery. gut., Bac. sal, Oncosiphon, mustard
No dominant plant cover.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: ____________

Characteristics of the floodplain unit:
Average sediment texture: fine sand bordering riprap
Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %
Community successional stage:
- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☒ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:
- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☒ Soil development
- ☐ Surface relief
- ☒ Other: change in veg species
- ☐ Other: ____________
- ☐ Other: ____________

Comments:
low terrace -above- between OHWM & riprap-enforced bank.
Upland ruderal plant species: Oncosiphon (FACU), Ricinus communis (FACU), mustard (UPL), bromes (UPL), Cor. fil (UPL), Bac sar (UPL); Encelia & other scrub species emerging from riprap above terrace.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Dawson Canyon Bridge City/County: Corona/Riverside County Sampling Date: 3/29/2022

Applicant/Owner: USA Waste of California, El Sobrante State: CA Sampling Point: 1

Investigator(s): Jasmine Bakker, Kyle Gunther Section, Township, Range: S 34, T 4S, R 6W

Landform (hillslope, terrace, etc.): streambed Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): C: California Mediterranean Lat: 33.784580 N Long: 117.486485 W Datum: WGS84

Soil Map Unit Name: Cortina gravelly sand, 2 to 8 percent slopes NWI classification: Riverine (R2USC)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ✓, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ✓	No ___
Is the Sampled Area within a Wetland?	**Yes ✓**	**No ___**

Remarks:

Sample point located downstream of bridge/rip rap. Coarse sand considered problematic soil. Results = Wetland Waters
Note: rain totals within 24 hours prior to sampling date = 0.51 inch

VEGETATION – Use scientific names of plants.

Stratum / Species	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: r=30')			
1. Populus deltoides	10	Y	FAC
2. Salix gooddingii	5	Y	FACW
3. Baccharis salicifolia	5	Y	FAC
4.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: r=15')			
1. Populus deltoides	10	Y	FAC
2. Baccharis salicifolia	3	N	FAC
3. Urtica dioica	3	N	FAC
4. Ricinus communis	3	N	FACU
5. Tamarix ramosissima	1	N	UPL
	20	= Total Cover	
Herb Stratum (Plot size: r=5')			
1. Nasturtium officinale	66	Y	OBL
2. Lepidium latifolium	5	N	FAC
3. mustard sp.	5	N	UPL
4. Oncosiphon piluliferum	2	N	FACU
5. Hordeum murinum	7	N	UPL
6.			
7.			
8.			
	85	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

Vegetation type = southern willow scrub dominated by willow and cottonwood, and herbaceous wetland dominated by watercress.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1.5	10YR 3/2	100					loam	
1.5-8	10YR 4/3	70					sand	very coarse sand
1.5-8	10YR 3/4	30					sand	very coarse sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ✓ No ____

Remarks:

Wet, coarse sand (problematic soil). Soil map unit is rated hydric by NRCS (contains 10 percent Riverwash). Because both hydrophytic vegetation and wetland hydrology are present, hydric soil is also presumed to be present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ✓ No ____ Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 5

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

FAC-Neutral Test = 2:5 (and <50% FAC, FACW, and OBL)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Dawson Canyon Bridge City/County: Corona/Riverside County Sampling Date: 3/29/2022

Applicant/Owner: USA Waste of California, El Sobrante State: CA Sampling Point: 2

Investigator(s): Jasmine Bakker, Kyle Gunther Section, Township, Range: S 34, T 4S, R 6W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C: California Mediterranean Lat: 33.784541 N Long: 117.486567 W Datum: WGS84

Soil Map Unit Name: Cortina gravelly sand, 2 to 8 percent slopes NWI classification: Riverine (R2USC)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

Sample point located downstream of bridge/rip rap on terrace above the OHWM. Results = Upland
Note: rain totals within 24 hours prior to sampling date = 0.51 inch

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	8	Y	FAC
2.			
3.			
4.			
	8 = Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1. Artemisia dracunculus	4	Y	FACU
2. Baccharis salicifolia	1	N	FAC
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: r=5')			
1. Oncosiphon piluliferum	15	Y	FACU
2. mustard sp.	15	N	UPL
3. Phacelia sp.	3	N	UPL
4. Erodium cicutarium	3	N	UPL
5. Bromus sp.	1	N	UPL
6.			
7.			
8.			
	37 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	9	x 3 = 27
FACU species	19	x 4 = 76
UPL species	22	x 5 = 110
Column Totals:	41 (A)	213 (B)

Prevalence Index = B/A = 5.19

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Vegetation type = disturbed land with sparse upland shrub cover; one large cottonwood present on terrace at edge of sample plot.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5YR 3/2	100					loam	
1-3	10YR 3/3	100					loamy sa	
3-14	10YR 4/3	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ______ **No** ✓

Remarks:

Soil map unit is rated hydric by NRCS (contains 10 percent Riverwash). Because both hydrophytic vegetation and wetland hydrology are absent, hydric soil is also presumed to be absent.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______

Water Table Present? Yes ______ No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ______

Wetland Hydrology Present? **Yes** ______ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present; sample point located above OHWM and Top of Bank.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Dawson Canyon Bridge City/County: Corona/Riverside County Sampling Date: 3/29/2022

Applicant/Owner: USA Waste of California, El Sobrante State: CA Sampling Point: 3

Investigator(s): Jasmine Bakker, Kyle Gunther Section, Township, Range: S 34, T 4S, R 6W

Landform (hillslope, terrace, etc.): bench Local relief (concave, convex, none): convex Slope (%): 1-3

Subregion (LRR): C: California Mediterranean Lat: 33.784410 N Long: 117.486208 W Datum: WGS84

Soil Map Unit Name: Cortina gravelly sand, 2 to 8 percent slopes NWI classification: Riverine (R2UBF)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ✓, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ✓	No ___

Is the Sampled Area within a Wetland? Yes ✓ No ___

Remarks:

Sample point located upstream of bridge/rip rap. Coarse sand considered problematic soil. Results = Wetland Waters
Note: rain totals within 24 hours prior to sampling date = 0.51 inch

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: r=30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1. Baccharis salicifolia	25	Y	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: r=5')			
1. Nasturtium officinale	25	Y	OBL
2. Lepidium latifolium	3	N	FAC
3. mustard sp.	2	N	UPL
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

Vegetation type = mule fat scrub dominated located on bench / plant hummock in center of streambed.

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					loam	root layer
3-15	10YR 4/3	70					sand	gravelly, very coarse sand
3-15	10YR 3/4	30					sand	gravelly, very coarse sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

Coarse sand (problematic soil). Soil map unit is rated hydric by NRCS (contains 10 percent Riverwash). Because both hydrophytic vegetation and wetland hydrology are present, hydric soil is also presumed to be present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ___	No ✓	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

FAC-Neutral Test: 1:1 (and >50% FAC, FACW, and/or OBL)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Dawson Canyon Bridge City/County: Corona/Riverside County Sampling Date: 3/29/2022

Applicant/Owner: USA Waste of California, El Sobrante State: CA Sampling Point: 4

Investigator(s): Jasmine Bakker, Kyle Gunther Section, Township, Range: S 34, T 4S, R 6W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C: California Mediterranean Lat: 33.784459 N Long: 117.486117 W Datum: WGS84

Soil Map Unit Name: Cortina gravelly sand, 2 to 8 percent slopes NWI classification: Riverine (R2USC)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

Sample point located upstream of bridge/rip rap on terrace above the OHWM. Results = Upland
Note: rain totals within 24 hours prior to sampling date = 0.51 inch

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix laevigata	5	Y	FACW
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: r=15')			
1. Helianthus annuus	27	Y	FACU
2. Encelia farinosa	2	N	UPL
3.			
4.			
5.			
	29 = Total Cover		
Herb Stratum (Plot size: r=5')			
1. Oncosiphon piluliferum	50	Y	FACU
2. Hirschfeldia incana	15	Y	UPL
3. Lepidium latifolium	3	N	FAC
4. Erodium cicutarium	1	N	UPL
5. Festuca sp.	1	N	UPL
6. Sonchus oleraceus	1	N	UPL
7. Medicago polymorpha	1	N	FACU
8. Silybum marinum	1	N	UPL
	73 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	3	x 3 =	9
FACU species	78	x 4 =	312
UPL species	21	x 5 =	105
Column Totals:	107 (A)		436 (B)

Prevalence Index = B/A = 4.07

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Vegetation type = disturbed land with sparse upland shrub cover; one large cottonwood present on terrace at edge of sample plot.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/2	100					loamy sa	loamy sand
1-2	10YR 2/1	100					muck	thin dark organic layer
2-3	10YR 4/2	100					loam	
3-8	10YR 4/3	100					loam	
8-10	2.5YR 4/6	100					clay	hard red clay at bottom of pit

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ______ No ✓

Remarks:

Soil map unit is rated hydric by NRCS (contains 10 percent Riverwash). Because both hydrophytic vegetation and wetland hydrology are absent, hydric soil is also presumed to be absent.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ____________

Water Table Present? Yes ______ No ______ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present; sample point located above OHWM.

ATTACHMENT D

Stream Duration Assessment Method (SDAM) Classification Report

Streamflow Duration Assessment Method for the Arid West Classification Report

Online Report Generating Tool Version 1.1

Report generated on: January 22, 2024

Classification:

`Intermittent`

General Site Information

Site code or identifier:

`N/A`

Project name or number:

`Renewable Natural Gas Facility Project`

Assessor(s):

`Jasmine Bakker, Julie Stout`

Waterway name:

`Temescal Wash`

`This stream is classified as: Intermittent`

Visit date:

`12/21/2023`

Current weather conditions:

`Cloudy`

Notes on current or recent weather conditions:

`recent rain (~0.1 inch day prior)`

Location:

`33.784531 N, -117.486334 W`

Datum:

`WGS84`

Surrounding land use within 100 m:

`Developed open-space`

Description of reach boundaries:

`50 feet upstream and downstream of bridge`

Mean channel width (m):

`20`

Reach length (m):

`45`

Disturbed or difficult conditions:

`Other (explain in notes)`

Notes on disturbances or difficult site conditions:

`cemented with riprap beneath bridge`

Observed hydrology:

Percent of reach with surface flow:

`50`

Percent of reach with surface and sub-surface flows:

`50`

Number of isolated pools:

`0`

Comments on observed hydrology:

`water ponded downstream of bridge`

Site Photos

Top of reach looking downstream:

Middle of reach looking upstream:

Middle of reach looking downstream:

Bottom of reach looking upstream:

Site Sketch

Hydrophytic Vegetation

Hydrophytic species found in or near the channel:

`3+ species`

Figure 1: Rorippa (OBL) and Lemna (OBL)

Notes on hydrophytic vegetation:

`Enter text...`

Aquatic Invertebrates

Number of individuals observed:

`None`

Are EPT present?

`No`

Notes on aquatic invertebrates

`Thorough search not performed`

Algae Cover

Cover of live or dead algae in the streambed:

`Yes >10% cover`

`NA`

Notes on algae cover:

`Areas with 10-30% of submerged algae`

Single Indicators

Fish:

`No, only mosquito fish observed`

Algae cover:

Yes >10% cover

Supplemental Information

Enter text...

Additional photo(s)

Additional notes about the assessment:

Enter text...

ATTACHMENT E

Climatological Data

WETS Table

WETS Station: ELSINORE, CA								
Requested years: 1993 - 2023								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	67.2	40.8	54.0	2.80	0.61	2.79	4	-
Feb	68.1	41.7	54.9	2.71	0.73	3.05	4	-
Mar	73.3	44.8	59.0	1.31	0.57	1.50	3	-
Apr	77.5	47.7	62.6	0.55	0.16	0.54	1	-
May	82.8	53.2	68.0	0.20	0.00	0.16	1	-
Jun	90.9	57.7	74.3	0.02	0.00	0.00	0	-
Jul	97.4	62.7	80.1	0.17	0.00	0.00	0	-
Aug	99.1	63.6	81.3	0.12	0.00	0.03	0	-
Sep	94.1	60.6	77.3	0.19	0.00	0.12	0	-
Oct	84.0	53.3	68.6	0.54	0.00	0.37	1	-
Nov	74.3	44.6	59.4	0.63	0.25	0.68	2	-
Dec	66.6	40.1	53.3	1.96	0.72	2.19	3	-
Annual:					7.14	12.79		
Average	81.3	50.9	66.1	-	-	-	-	-
Total	-	-	-	11.21			21	-

GROWING SEASON DATES			
Years with missing data:	24 deg = 12	28 deg = 16	32 deg = 12
Years with no occurrence:	24 deg = 19	28 deg = 14	32 deg = 4
Data years used:	24 deg = 19	28 deg = 15	32 deg = 19
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	Insufficient data	Insufficient data	Insufficient data
70 percent *	Insufficient data	Insufficient data	Insufficient data
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1897			M0.77	0.00	0.03			0.29	0.26	1.06	T	0.19	2.60
1898	2.29	0.15	0.82	0.23	1.32	M0.01				0.00	0.04	1.38	6.24
1899	3.43	0.48	0.96		T	M0.18		T	T	0.98	0.69	0.55	7.27
1900	1.56	0.00	0.39	0.77	1.04	0.00	T	T	T	0.06	5.04	0.00	8.86
1901	3.59	4.61	0.42	0.10	0.47	T	0.00	0.74	0.00	1.08	0.35	0.00	11.36
1902	2.30	2.03	2.64	0.30	T	0.21	0.08	0.00	0.00	0.13	1.26	3.04	11.99
1903	0.81	2.50	6.55	1.71	T	0.00			0.40	0.05	0.00	T	12.02
1904	0.19	1.49	4.14	0.28	0.03	0.00	0.00	1.12	0.82	T	0.00	0.91	8.98
1905	5.32	7.72	4.36	0.30	0.92	0.00	0.00	0.00	T	0.12	5.61	0.20	24.55
1906	1.25	1.04	7.65	0.93	0.32	T		T	0.17	0.04	2.99	5.09	19.48

1907	M4.79	2.24	3.68	0.07	0.04	0.05	T	0.00	0.00	2.99	0.08	0.41	14.35
1908	4.93	2.80	0.47	0.18	0.04	0.00	0.00	0.73	0.30	0.53	0.24	0.82	11.04
1909	M6.13	3.57	2.29	0.00	0.00	0.04	0.00	0.55	0.00	0.09	1.43	6.65	20.75
1910	3.74	0.14	1.19	0.35	0.00	0.00	0.09	0.00	T	0.53	0.19	0.14	6.37
1911	5.81	3.24	1.38	0.25	0.00	0.00	0.00	0.00	0.58	0.15	0.20	0.80	12.41
1912	0.08	0.00	6.73	1.80	0.13	0.00	T	0.10	0.00	0.87			9.71
1913													
1914													
1915				1.15	0.78			T	M0.01		0.56	5.19	7.69
1916	14.83	0.78	1.14	0.20				0.02	0.51	0.95	M0.04	2.23	20.70
1917	3.12	3.09	0.45	0.99	M0.09		M2.10	MT		MT	M0.11		9.95
1918	M1.30	3.38	4.54	M0.24	M0.30		M0.17	M0.21	0.19	0.83	0.71	M0.81	12.68
1919	0.11	2.35	M1.48	0.25	0.33		T	M0.04	M0.35	M0.46	M0.66	M1.08	7.11
1920	M0.67	3.94	4.63	0.15	M0.58				M0.03	M0.97	M0.12	M0.42	11.51
1921	M3.46	M0.41	M2.02	M0.05	2.33		M0.08	M0.06	M1.37	M0.05	M0.11	M13.22	23.16
1922	M6.42	M2.28	M1.93	M0.27	M0.43		MT	M0.01	M0.01	M0.16	M1.67	M1.41	14.59
1923	M1.47	M1.55	M0.22	M0.88			MT	MT	M0.04	M0.20	M0.67	1.56	6.59
1924	0.16	0.01	3.70	M1.32	0.00					M0.27	0.44	1.68	7.58
1925	0.13	0.20	1.42	1.14	M0.56	M0.40	0.00			M2.50	M0.36	0.98	7.69
1926	1.00	2.51	0.45	6.30		0.00	0.00	0.00	0.00	0.12	1.35	2.73	14.46
1927	0.33	9.57	1.84	0.43	0.05	0.03	0.06	0.00	0.00	2.15	0.12	3.14	17.72
1928	0.50	1.06	0.64	0.06	0.29	0.00	0.00	0.00	0.00	0.70	0.76	1.73	5.74
1929	1.37	0.54	1.00	1.12	0.00	0.00	0.00	0.08	1.03	0.00	0.00	0.00	5.14
1930	M6.41	0.47	4.74	2.07	2.27	0.00	0.00	0.00	0.00	0.23	1.24	0.00	17.43
1931	2.23	5.84	0.00	1.43	0.33	0.04	0.00	0.51	0.12	0.58	2.12	4.91	18.11
1932	1.04	9.60	0.16	0.49	0.00	0.14	0.00	0.00	0.24	1.16	0.04	1.91	14.78
1933	5.28	0.00	0.00	0.31	0.39	0.00	0.00	0.00	0.00	0.22	0.13	4.09	10.42
1934	0.26	1.45	1.55	0.03	0.00	0.28	T	0.51	0.11	1.51	1.81	3.15	10.66
1935	2.62	3.11	2.70	1.41	0.35	0.00	0.00	0.42	T	0.15	0.47	0.41	11.64
1936	0.09	5.95	1.39	0.45	T	0.00	0.09	0.07	2.22	3.75	0.08	7.66	21.75
1937	2.03	5.70	4.39	0.19	0.17	0.00	0.02	T	0.10	0.00	0.01	1.17	13.78
1938	1.73	5.68	9.39	0.70	0.11	0.00	0.06	0.07	0.05	0.18	T	6.34	24.31
1939	2.44	2.08	0.81	0.45	0.15	0.00	0.00	T	3.48	0.30	0.85	0.43	10.99
1940	3.28	3.77	0.29	0.95	0.00	0.00	0.00	0.00	0.01	0.87	0.21	6.97	16.35
1941	1.33	6.72	6.35	3.44	0.06	0.00	T	0.07	0.00	2.50	0.83	3.08	24.38

1942	0.73	0.92	1.12	1.95	0.00	0.00	0.00	0.46	0.00	0.13	0.02	0.72	6.05
1943	8.75	2.33	1.82	0.48	0.00	0.00	0.00	0.00	0.25	0.34	0.02	8.52	22.51
1944	0.46	5.64	0.69	0.61	0.03	0.00	0.00	0.00	0.00	0.00	3.54	0.72	11.69
1945	0.08	2.33	3.38	0.04	0.00	0.00	T	0.99	T	0.36	0.20	3.20	10.58
1946	0.15	0.06	2.51	0.26	T	0.00	T	T	0.52	0.23	4.03	1.37	9.13
1947	0.18	0.10	1.15	0.05	0.26	0.00	0.00	T	T				1.74
1948								M0.00	0.00	0.55	0.00	1.78	2.33
1949	3.97	1.08	0.66	0.00	0.11	0.00	M0.00	0.00	T	0.44	0.89	0.75	7.90
1950	1.87	0.88	0.71	0.53	0.10	0.00	0.07	0.00	0.00	0.00	0.68	0.00	4.84
1951	1.47	0.68	0.77	0.79	0.00	0.00	0.00	0.20	0.17	0.44	0.73	4.64	9.89
1952	5.67	0.53	4.47	1.00	0.00	0.00	0.00	0.00	0.59	0.00	2.80	2.68	17.74
1953	0.62	0.25	0.71	0.59	0.01	0.00	0.02	0.00	0.00	0.02	0.67	0.11	3.00
1954	4.51	2.00	3.00	0.05	0.00	T	0.03	0.00	0.00	0.00	2.23	0.71	12.53
1955	3.08	1.10	0.07	0.42	0.98	0.00	0.00	0.00	0.00	0.00	0.78	0.41	6.84
1956	3.12	0.24	0.00	1.31	0.22	0.00	0.16	0.00	0.00	0.08	0.00	0.24	5.37
1957	5.03	0.77	0.67	0.67	0.83	0.02	0.00	0.00	0.00	2.12	1.00	1.91	13.02
1958	0.77	3.89	4.58	4.27	0.12	0.00	0.00	0.24	0.05	0.06	0.17	0.00	14.15
1959	1.06	2.87	0.00	0.13	0.00	0.00	0.00	0.05	0.00	0.11	0.34	2.35	6.91
1960	2.64	2.22	0.11	1.26	0.01	0.00	0.00	0.00	0.02	0.00	0.98	0.15	7.39
1961	1.37	0.10	0.34	0.02	0.00	0.00	0.00	1.18	0.00	0.02	1.07	1.78	5.88
1962	2.99	4.10	1.17	0.00	0.30	0.07	0.00	0.00	0.00	0.00	0.02	0.05	8.70
1963	0.09	3.24	1.77	1.09	0.00	0.03	0.00	0.20	3.24	0.26	1.91	0.00	11.83
1964	1.49	0.16	1.77	0.56	0.36	0.03	0.00	0.00	0.00	0.14	2.47	0.87	7.85
1965	0.13	0.00	2.43	2.42	T	0.00	0.31	0.00	0.18	0.00	7.33	4.43	17.23
1966	0.74	0.53	0.45	0.02	0.06	0.00	0.01	0.00	0.01	0.23	1.14	8.67	11.86
1967	2.35	T	1.13	2.16	0.01	0.00	0.00	0.00	0.03	0.00	3.50	1.29	10.47
1968	0.57	0.37	2.66	0.12	0.10	0.00	0.28	0.00	0.00	0.12	0.55	0.94	5.71
1969	9.40	10.09	1.06	0.44	0.27	0.00	0.00	0.00	0.00	0.00	0.68	0.04	21.98
1970	1.31	2.18	2.54	0.33	0.00	0.00	0.00		0.00	0.07	3.26	4.46	14.15
1971	0.84	0.31	0.14	0.28	0.25	0.00	0.00	0.00	0.00	0.89	0.02	4.81	7.54
1972	T	0.16	0.00	0.00	0.05	0.32	0.00	0.00	0.00	0.78	0.60	0.80	2.71
1973	2.73	3.09	2.31	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.61	0.16	8.94
1974	6.03	0.02	2.22	0.29	0.01	0.00	0.00	0.00	0.02	0.46	0.00	3.67	12.72
1975	0.28	2.85	1.79	2.16	0.00	0.00	0.00	0.00	0.00	M0.00		0.05	7.13
1976		4.37	2.26			0.00	0.00	0.00	4.	0.	0.37	0.38	11.

									26	28			92
1977	2.26	0.78	0.86	T	2.02	0.00	0.00	3.13	0.00	0.00	T	4.04	13.09
1978		10.58	9.83	1.07		0.00	0.00	0.00	1.08	0.00	1.45	2.68	26.69
1979	8.31	1.79	2.93		0.00	0.00							13.03
1980	6.01			0.25	0.00		0.00	0.00	0.00	0.00	0.00	0.47	6.73
1981	M0.21	M0.44	2.31	0.29	0.36	0.00	0.00	0.00	0.00	0.42	1.49	0.29	5.81
1982	3.60	M1.07	5.21	M0.89	M0.41	0.00	0.00	0.11	M0.19	M0.07	3.28	2.21	17.04
1983	2.13	M5.01	8.07	2.42	0.18	0.00	M0.00	0.00	1.01	0.26	1.99	1.95	23.02
1984	0.04	0.00	0.02	0.15	0.00	M0.00	1.67	0.00	0.48	0.00	0.93	4.49	7.78
1985	M0.53	M0.45	0.98	0.00	0.00	0.00	M0.00	0.00	0.55	0.19	M3.09	0.61	6.40
1986	1.10	2.07	M1.60	0.49	0.00	0.00	0.06	0.00	0.00	0.69	M0.24	0.83	7.08
1987	1.11	1.24	1.09	0.03	M0.00	0.00	0.00	0.00	0.00	M3.65	1.18	2.64	10.94
1988		1.07	0.55	2.02	M0.11	0.00	0.00		0.00	0.00	0.72	2.44	6.91
1989	0.90	1.72	0.35	0.00	T	0.00	0.00	0.00	0.46	0.16	0.00	0.04	3.63
1990	1.64	2.22	M0.29	M1.12	0.58	0.16	0.35	0.00	T	0.00	0.47	0.02	6.85
1991	M1.56	2.29	8.40	0.00	0.03	0.00	0.09	0.00	0.04	0.00	T	2.41	14.82
1992	2.10	4.55	2.56	0.17	0.67	0.00	0.23	0.00	0.00	0.74	0.00	M4.39	15.41
1993	13.94	6.15	1.57	0.00	0.00	M0.00	0.00	0.00	0.00	0.25	0.85	0.48	23.24
1994	0.44	3.38	2.16	0.56	0.12	0.00	0.00	0.00	0.00	0.48	0.55	0.41	8.10
1995	10.13	1.39	3.33	0.80	0.10	0.25	0.10	0.00	0.00	0.00	0.00	0.72	16.82
1996	1.03	2.21	0.95	0.10	0.00	0.00	0.00	0.00	0.00	0.48	1.56	1.60	7.93
1997	1.79	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.03	1.13	3.35	7.45
1998	2.55	11.94	1.67	1.19	1.25	0.00	0.00	0.15	0.23	0.00	1.53	0.75	21.26
1999	0.99	0.69	0.09	1.11	0.04	0.00	0.45	0.00	0.00	0.00	0.00	0.20	3.57
2000	0.46	3.91	1.56	0.48	0.00	0.00	0.00	0.05	0.00	0.78	0.13	0.00	7.37
2001	3.77	5.45	0.65	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.10	M0.72	11.63
2002	0.20	0.01	0.34	0.24	0.00	0.00	0.00	0.00	0.00	0.00	M2.10	M1.76	4.65
2003	M0.16	6.45	3.15	1.14	0.02	0.00	0.17	0.00	0.00	M0.00	0.98	0.43	12.50
2004	M0.00	3.03	0.00	0.00	MT	0.00	0.00	0.00	0.00	7.66	0.18	4.47	15.34
2005	11.76	8.28	0.67	0.75	M0.35	0.00	2.50	0.00	1.65	0.22	0.00		26.18
2006	M0.00	3.03	M1.42	M2.36	MT	M0.00	M0.00	M0.00	0.00	0.00	0.00	M0.05	6.86
2007	M0.00	M0.01	M0.00	0.32	0.00	M0.00	M0.00		M0.00	M0.00	M0.00	0.00	0.33
2008	M0.52	0.00	0.00	M0.00	M0.34	0.00	0.00	0.00	0.00	0.00	M0.19	4.05	5.10
2009	0.18	3.97	0.13	0.05	0.00	0.00	0.00	0.01	0.00	0.22	0.07	3.76	8.39
2010	8.88	1.81	0.44	1.23	0.13	0.00	0.00	0.00	0.	1.	1.06	11.	26.

									00	61		67	83
2011	0.70	3.07	2.96	0.46	0.78	0.07	0.10	0.09	0.03	0.44	1.37	0.74	10.81
2012	0.55	0.67	1.51	1.18	0.00	0.00	0.30	0.05	0.24	0.36	0.30	1.78	6.94
2013	0.91	0.46	0.46	0.00	0.14	0.00	0.00	0.00	0.00	0.16	0.53	0.70	3.36
2014	0.13	1.28	1.27	0.50	0.00	0.00	0.00	0.66	0.45	0.00	0.21	3.65	8.15
2015	0.55	0.37	0.44	0.11	0.96	0.00	1.29	0.00	1.08	0.11	0.12	0.58	5.61
2016	2.79	0.30	0.74	0.28	0.06	0.00	0.00	0.00	0.10	0.39	1.18	3.81	9.65
2017	8.23	3.27	0.08	0.02	0.29	0.00	0.00	0.26	0.04	0.01	0.05	0.00	12.25
2018	2.01	0.20	1.11	0.02	0.05	0.00	0.00	0.00	0.00	1.40	0.62	1.88	7.29
2019	2.95	6.28	1.97	0.04	1.13	0.00	0.10	0.00	0.00	0.00	2.27	4.26	19.00
2020	0.30	0.38	3.39	2.52	0.00	0.05	0.00	0.00	0.00	0.00	0.36	1.03	8.03
2021	1.58	0.04	1.40	0.00	0.00	0.00	0.17	0.00	0.00	0.62	0.00	4.00	7.81
2022	0.03	0.31	0.58	0.18	0.00	0.07	0.00	0.02	1.32	0.52	1.11	1.24	5.38
2023	4.26	2.34	5.34	0.00	0.26	0.00	0.00	2.23	0.04	0.00	0.28	0.74	15.49
2024	M0.27												0.27
Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.													
Data missing for all days in a month or year is blank.													
Creation date: 2024-01-31													

Antecedent Precipitation Tool v.1.0 - Watershed Sampling Summary

Generated on 2022-04-17

User Inputs

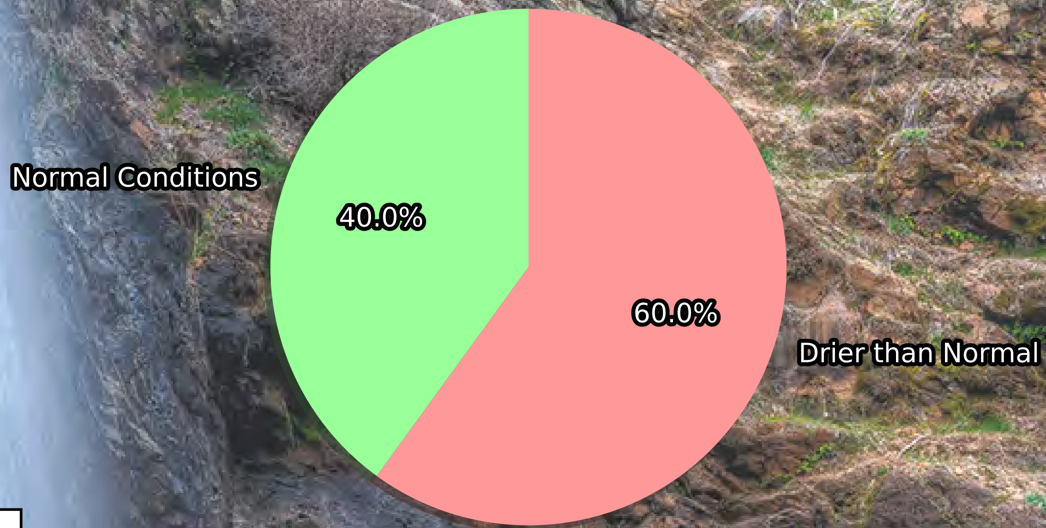
Coordinates	33.784535, -117.486364
Date	2022-03-29
Geographic Scope	HUC12

Intermediate Data

Hydrologic Unit Code	180702030604
Watershed Size	37.06 mi^2
# Random Sampling Points	5

Preliminary Result

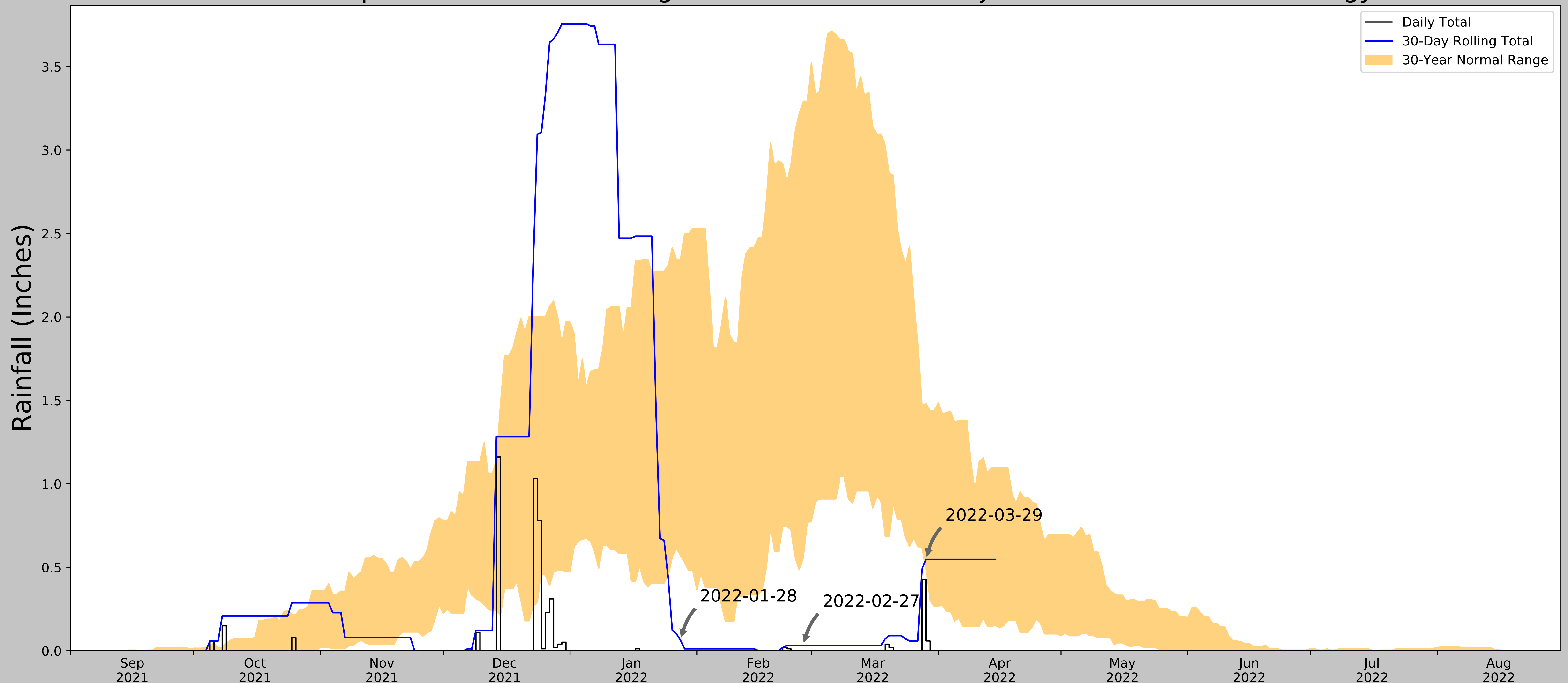
Average Antecedent Precipitation Score	9.6
Preliminary Determination	Drier than Normal



Sampling Point Breakdown

Antecedent Precipitation Score	Antecedent Precipitation Condition	WebWIMP H_2O Balance	Drought Index (PDSI)	# of Points
12	Normal Conditions	Wet Season	Extreme drought	2
9	Drier than Normal	Wet Season	Extreme drought	2
6	Drier than Normal	Wet Season	Extreme drought	1

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.784535, -117.486364
Observation Date	2022-03-29
Elevation (ft)	926.46
Drought Index (PDSI)	Extreme drought
WebWIMP H_2O Balance	Wet Season

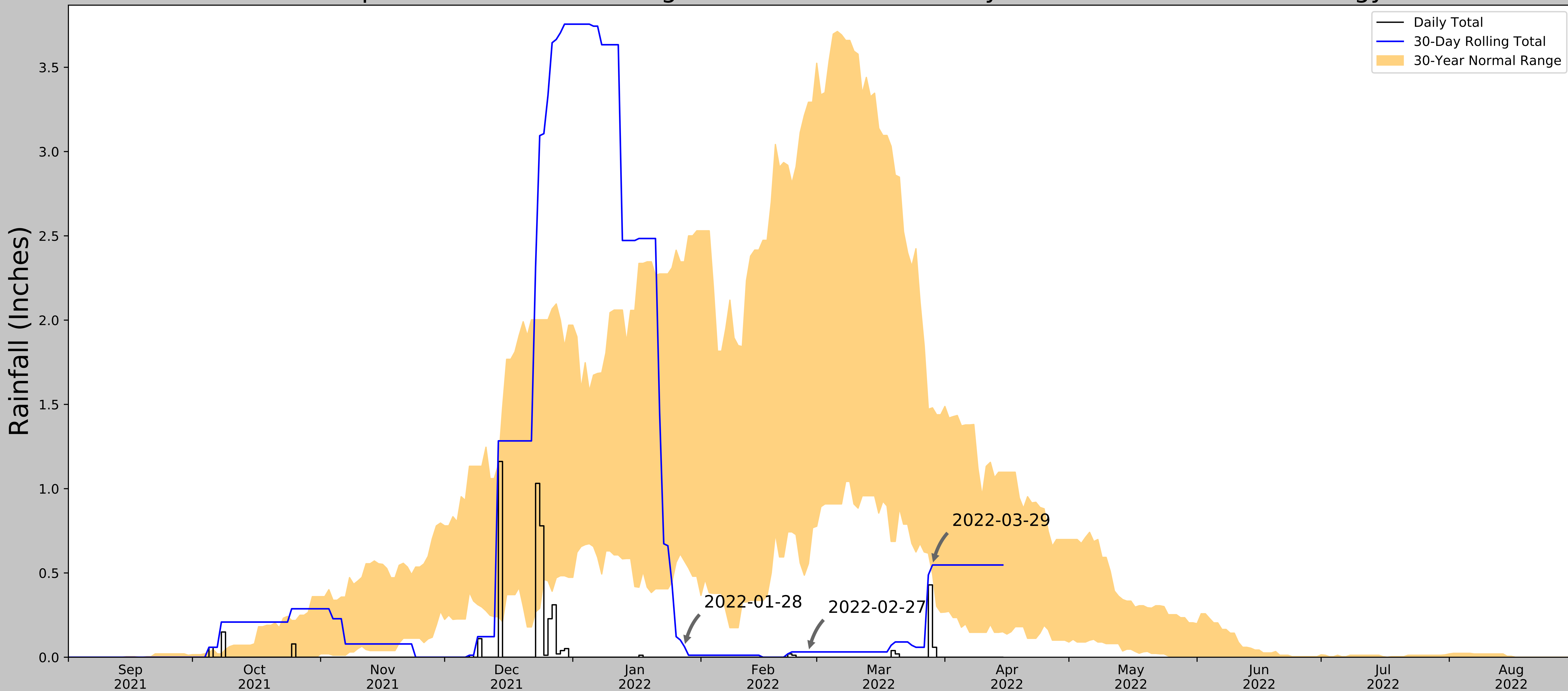
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-29	0.496063	1.479528	0.547244	Normal	2	3	6
2022-02-27	0.555906	3.292913	0.031496	Dry	1	2	2
2022-01-28	0.57126	2.345669	0.062992	Dry	1	1	1
Result							Drier than Normal - 9

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
RIVERSIDE MUNI AP	33.9519, -117.4386	805.118	11.884	121.342	6.79	8115	90
RIVERSIDE 3.8 NW	33.9793, -117.4541	840.879	2.091	35.761	1.016	6	0
RIVERSIDE FIRE STN 3	33.9511, -117.3881	839.895	2.895	34.777	1.403	3179	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	4.544	180.774	2.866	53	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.770764, -117.568368
Observation Date	2022-03-29
Elevation (ft)	926.46
Drought Index (PDSI)	Extreme drought
WebWIMP H_2O Balance	Wet Season

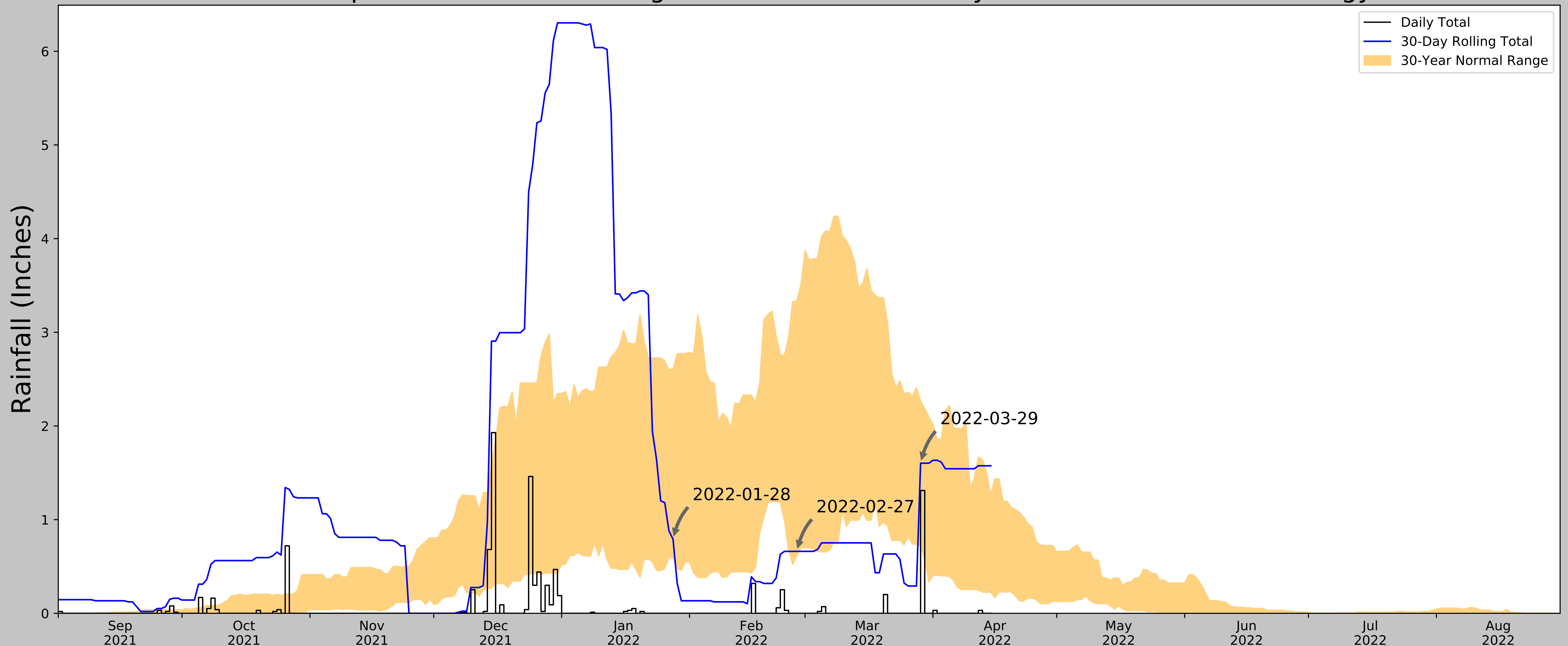
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-29	0.496063	1.479528	0.547244	Normal	2	3	6
2022-02-27	0.555906	3.292913	0.031496	Dry	1	2	2
2022-01-28	0.57126	2.345669	0.062992	Dry	1	1	1
Result							Drier than Normal - 9

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
RIVERSIDE MUNI AP	33.9519, -117.4386	805.118	14.562	121.342	8.32	8115	90
RIVERSIDE 3.8 NW	33.9793, -117.4541	840.879	2.091	35.761	1.016	6	0
RIVERSIDE FIRE STN 3	33.9511, -117.3881	839.895	2.895	34.777	1.403	3179	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	4.544	180.774	2.866	53	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.77861, -117.488157
Observation Date	2022-03-29
Elevation (ft)	1019.16
Drought Index (PDSI)	Extreme drought
WebWIMP H_2O Balance	Wet Season

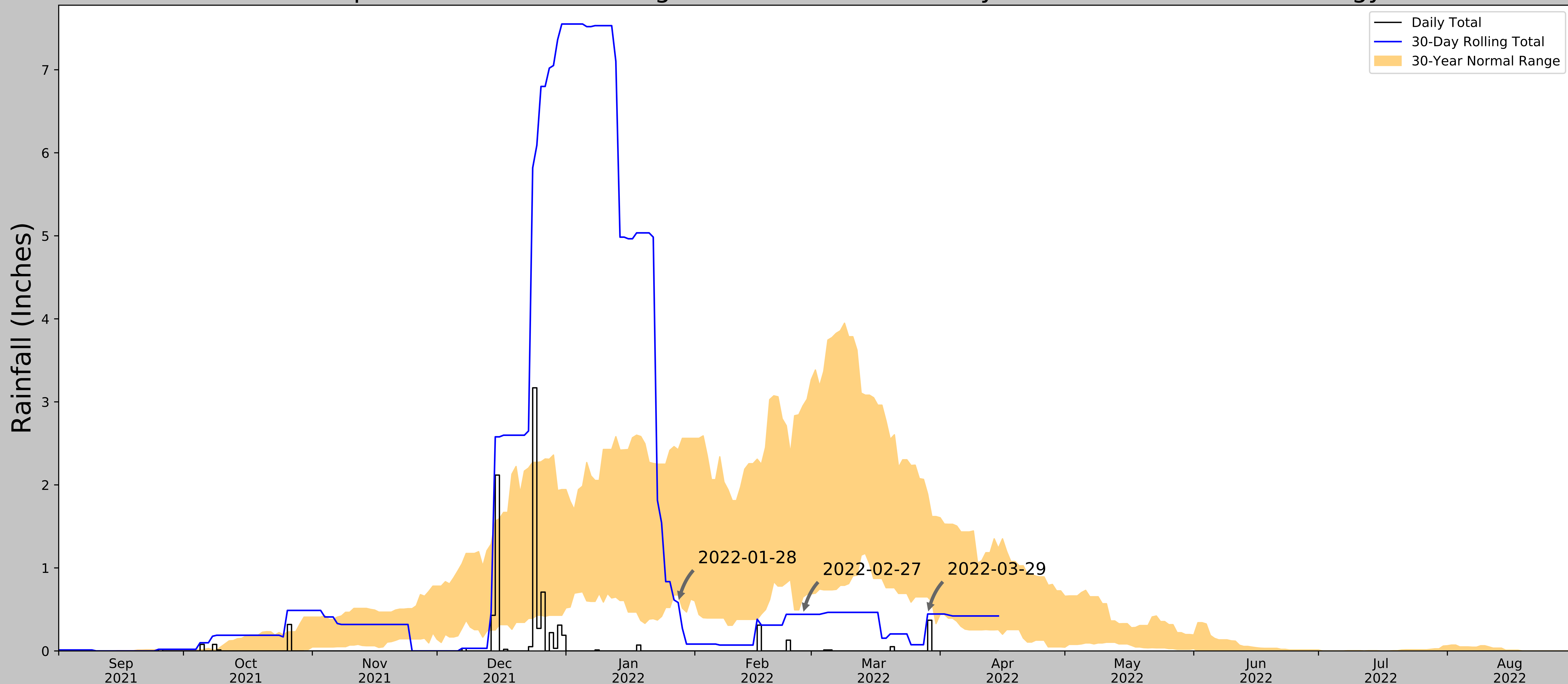
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-29	0.718898	2.264961	1.602362	Normal	2	3	6
2022-02-27	0.615354	3.333071	0.661417	Normal	2	2	4
2022-01-28	0.593307	2.61063	0.791339	Normal	2	1	2
Result							Normal Conditions - 12

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
CORONA 12.5 SE	33.7346, -117.4315	1301.837	4.454	282.677	3.263	149	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	4.802	384.711	4.008	4443	0
NORCO 2.3 SE	33.9059, -117.5178	1090.879	8.958	71.719	4.674	1	0
TRABUCO CANYON 0.2 N	33.6654, -117.5891	1051.837	9.738	32.677	4.7	25	15
RANCHO SANTA MARGARITA 0.8 NE	33.6501, -117.5939	1069.882	10.76	50.722	5.388	44	7
PORTOLA HILLS 1.7 WNW	33.69, -117.6604	997.047	11.638	22.113	5.494	1	0
CORONA 2.3 W	33.8644, -117.6095	868.11	9.146	151.05	5.497	166	65
PERRIS 10.6 W	33.8209, -117.4051	1585.958	5.593	566.798	5.687	11	3
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	14.904	33.268	7.203	6419	0
ELSINORE	33.6861, -117.3458	1268.045	10.381	248.885	7.255	64	0
RIVERSIDE MUNI AP	33.9519, -117.4386	805.118	12.306	214.042	8.172	30	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.830039, -117.505416
Observation Date	2022-03-29
Elevation (ft)	978.27
Drought Index (PDSI)	Extreme drought
WebWIMP H_2O Balance	Wet Season

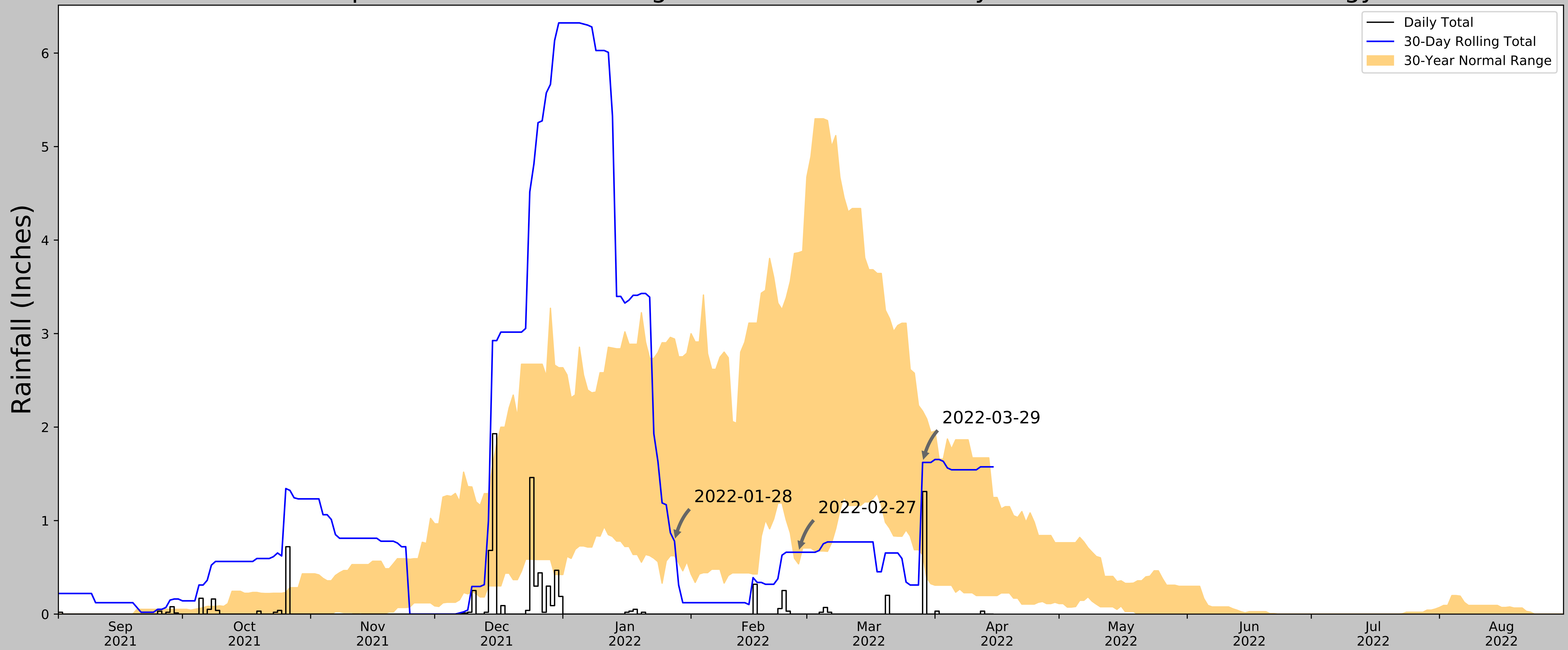
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-29	0.650787	1.890158	0.444882	Dry	1	3	3
2022-02-27	0.648819	2.951969	0.440945	Dry	1	2	2
2022-01-28	0.674016	2.422835	0.582677	Dry	1	1	1
Result							Drier than Normal - 6

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
NORCO 2.3 SE	33.9059, -117.5178	1090.879	5.289	112.609	2.976	4020	0
CORONA 2.3 W	33.8644, -117.6095	868.11	6.427	110.16	3.6	222	87
NORCO 1.2 S	33.908, -117.548	661.089	5.915	317.181	4.538	78	3
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	12.555	7.622	5.745	6849	0
RIVERSIDE MUNI AP	33.9519, -117.4386	805.118	9.251	173.152	5.765	183	0
RIVERSIDE FIRE STN 3	33.9511, -117.3881	839.895	10.735	138.375	6.316	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.717189, -117.522375
Observation Date	2022-03-29
Elevation (ft)	4790.09
Drought Index (PDSI)	Extreme drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-29	0.63622	2.170866	1.622047	Normal	2	3	6
2022-02-27	0.537008	3.865354	0.661417	Normal	2	2	4
2022-01-28	0.624016	2.942126	0.779528	Normal	2	1	2
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PORTOLA HILLS 1.4 E	33.684, -117.6073	1543.963	5.393	3246.127	19.933	133	0
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.359	3488.253	21.105	149	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.526	3386.219	21.199	4310	0
TRABUCO CANYON 0.2 N	33.6654, -117.5891	1051.837	5.246	3738.253	21.972	26	15
SILVERADO 1.0 ESE	33.7455, -117.6199	1394.029	5.936	3396.061	22.83	222	75
ELSINORE	33.6861, -117.3458	1268.045	10.375	3522.045	41.21	5970	0
IRVINE RCH	33.72, -117.7231	540.026	11.537	4250.064	54.225	441	0
EL TORO MCAS	33.6667, -117.7333	380.906	12.617	4409.184	61.308	23	0
SAN JUAN CANYON	33.5319, -117.5525	375.0	12.919	4415.09	62.852	74	0
RIVERSIDE MUNI AP	33.9519, -117.4386	805.118	16.915	3984.972	75.018	4	0
RIVERSIDE FIRE STN 3	33.9511, -117.3881	839.895	17.905	3950.195	78.785	1	0

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Antecedent Precipitation Tool v2.0 - Watershed Sampling Summary

Generated on 2024-01-31

User Inputs

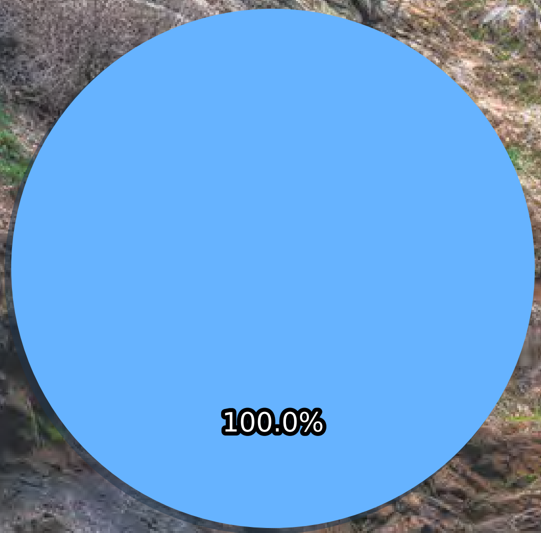
Coordinates	33.784535, -117.486364
Date	2023-05-10
Geographic Scope	HUC12
Used Gridded Precipitaton	False

Intermediate Data

Hydrologic Unit Code	180702030604
Watershed Size	37.06 mi^2
# Random Sampling Points	7

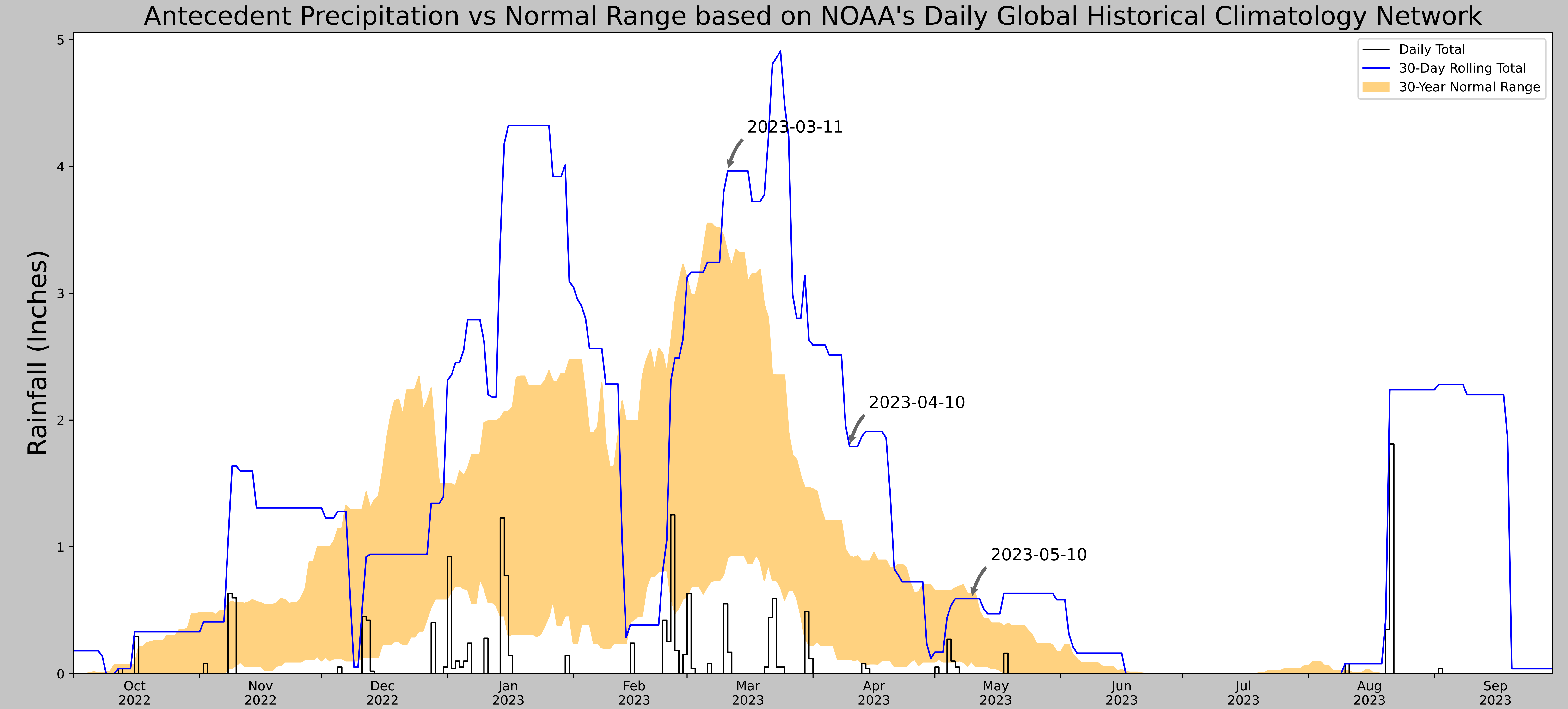
Preliminary Result

Average Antecedent Precipitation Score	15.29
Preliminary Determination	Wetter than Normal



Sampling Point Breakdown

Antecedent Precipitation Score	Antecedent Precipitation Condition	WebWIMP H_2O Balance	Drought Index (PDSI)	# of Points
17	Wetter than Normal	Dry Season	Severe wetness	1
15	Wetter than Normal	Dry Season	Severe wetness	6



Coordinates	33.784535, -117.486364
Observation Date	2023-05-10
Elevation (ft)	909.894
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-10	0.096063	0.630315	0.590551	Normal	2	3	6
2023-04-10	0.115748	0.929134	1.791339	Wet	3	2	6
2023-03-11	0.915354	3.317323	3.964567	Wet	3	1	3
Result							Wetter than Normal - 15

US Army Corps of Engineers

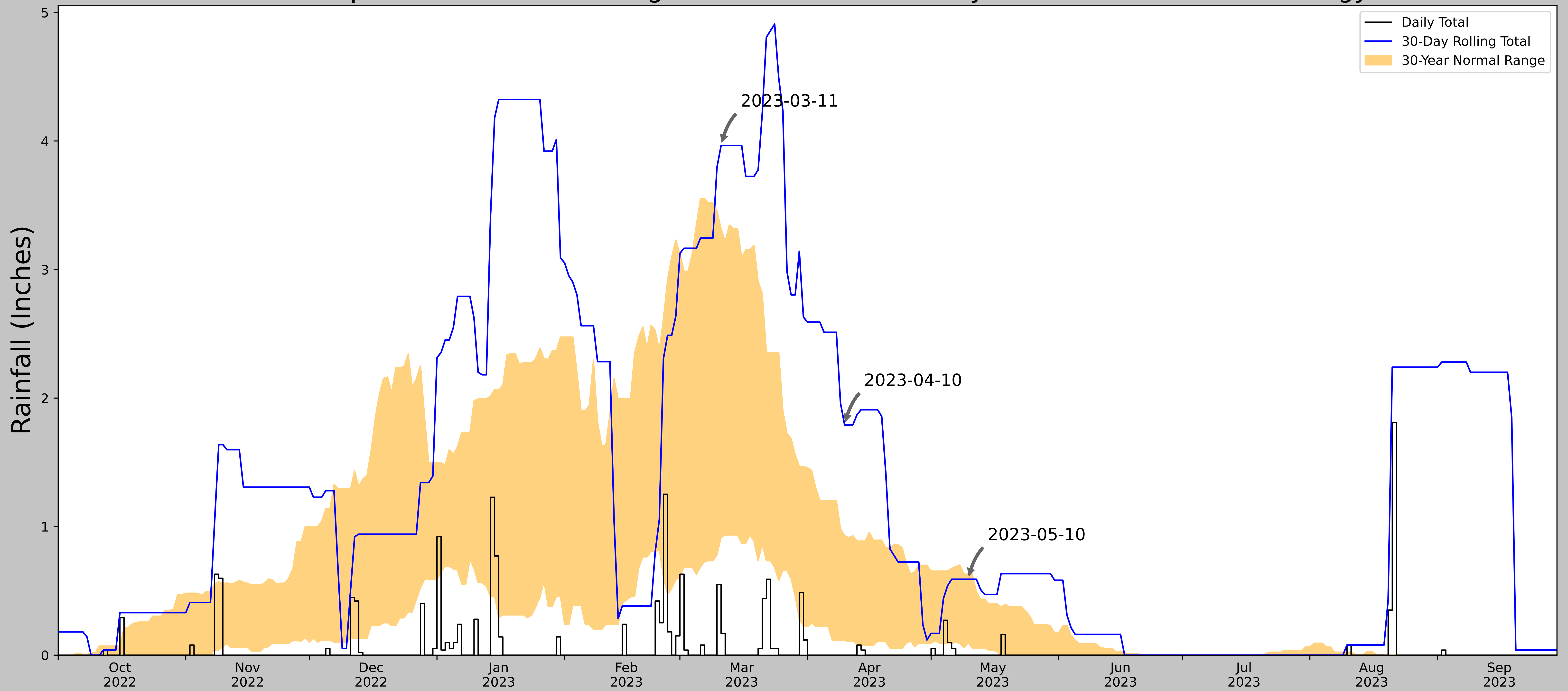
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
RIVERSIDE FIRE STN 3	33.9511, -117.3881	839.895	12.815	69.999	6.664	10480	90
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	1.88	145.997	1.12	279	0
RIVERSIDE MUNI AP	33.9528, -117.4353	845.144	2.708	5.249	1.233	590	0
RIVERSIDE 3.8 NW	33.9793, -117.4541	840.879	4.254	0.984	1.918	4	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.81481, -117.537
Observation Date	2023-05-10
Elevation (ft)	909.894
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-10	0.096063	0.630315	0.590551	Normal	2	3	6
2023-04-10	0.115748	0.929134	1.791339	Wet	3	2	6
2023-03-11	0.915354	3.317323	3.964567	Wet	3	1	3
Result							Wetter than Normal - 15

US Army Corps of Engineers

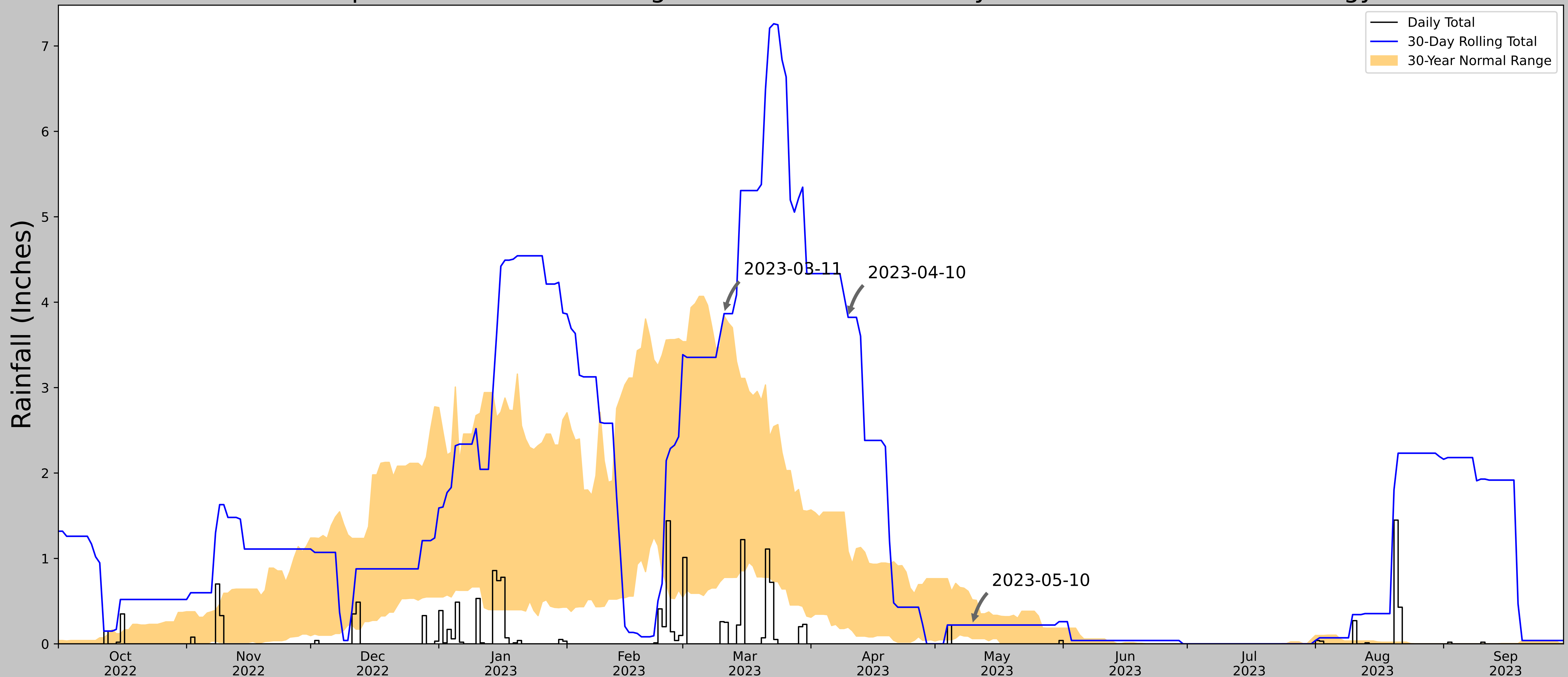
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
RIVERSIDE FIRE STN 3	33.9511, -117.3881	839.895	12.713	69.999	6.611	10480	90
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	1.88	145.997	1.12	279	0
RIVERSIDE MUNI AP	33.9528, -117.4353	845.144	2.708	5.249	1.233	590	0
RIVERSIDE 3.8 NW	33.9793, -117.4541	840.879	4.254	0.984	1.918	4	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.770479, -117.496722
Observation Date	2023-05-10
Elevation (ft)	1126.093563
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-10	0.061417	0.515748	0.220472	Normal	2	3	6
2023-04-10	0.194882	1.082283	3.822835	Wet	3	2	6
2023-03-11	0.777953	3.838977	3.866142	Wet	3	1	3
Result							Wetter than Normal - 15

US Army Corps of Engineers

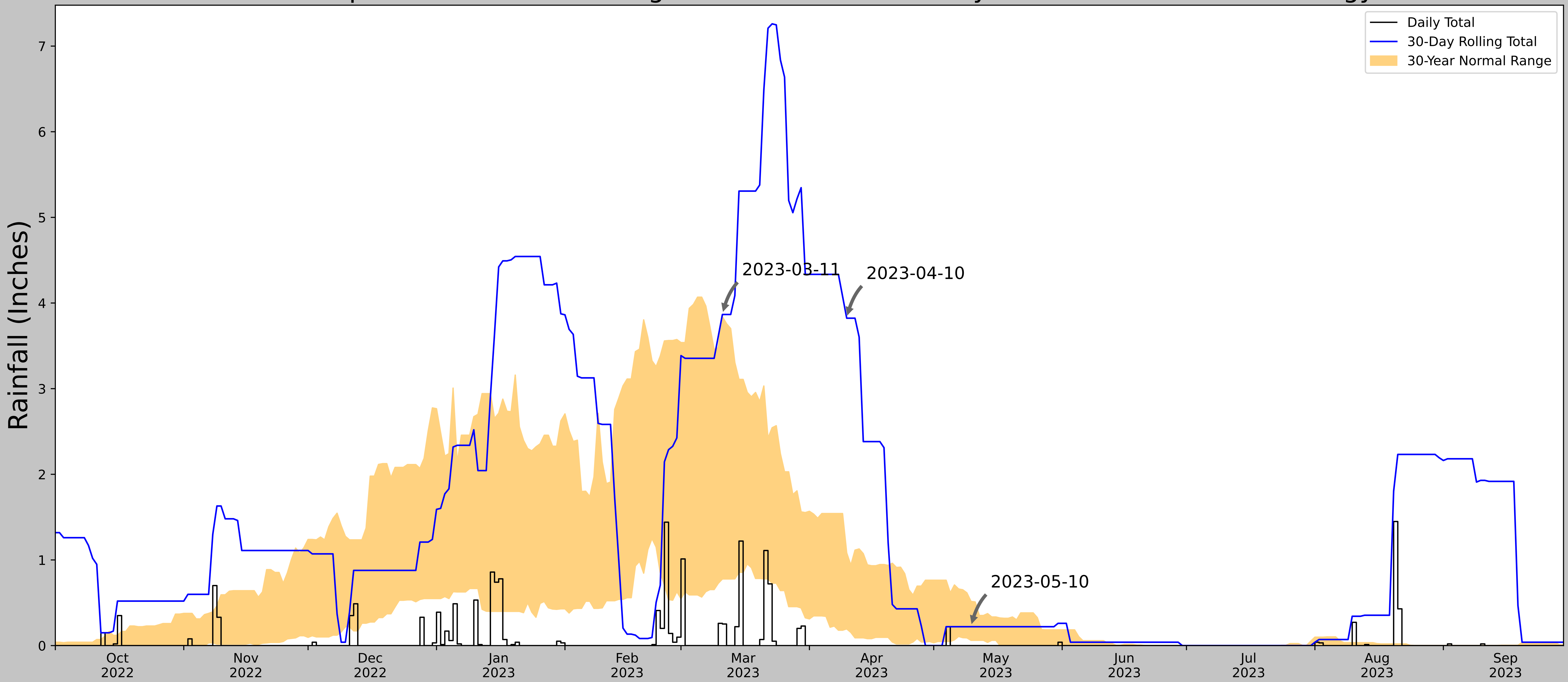
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	10.45	141.951	6.186	10808	90
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	121	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.712986, -117.533234
Observation Date	2023-05-10
Elevation (ft)	5461.687879
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-10	0.061417	0.515748	0.220472	Normal	2	3	6
2023-04-10	0.194882	1.082283	3.822835	Wet	3	2	6
2023-03-11	0.777953	3.838977	3.866142	Wet	3	1	3
Result							Wetter than Normal - 15

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

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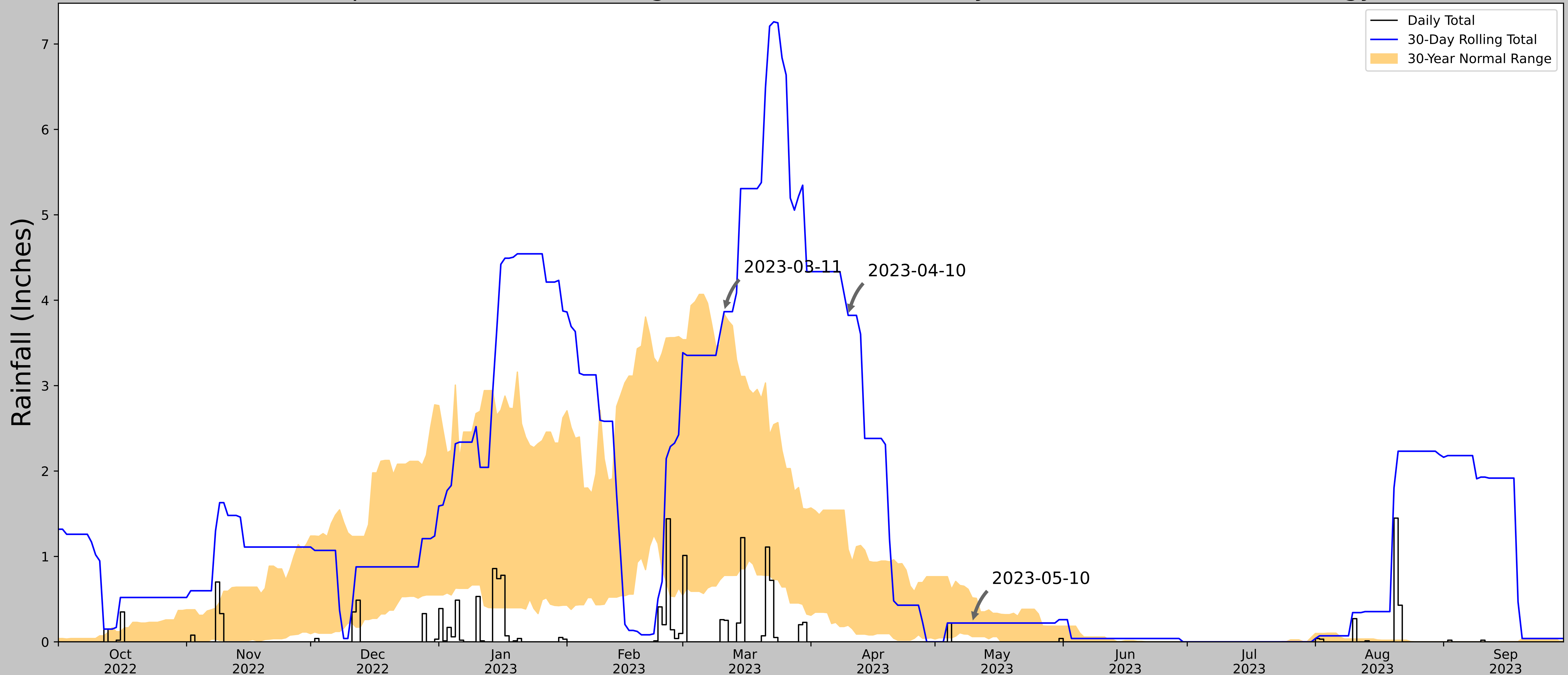
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	10.933	4193.643	50.77	10808	90
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	121	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.813436, -117.451003
Observation Date	2023-05-10
Elevation (ft)	1408.4062
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

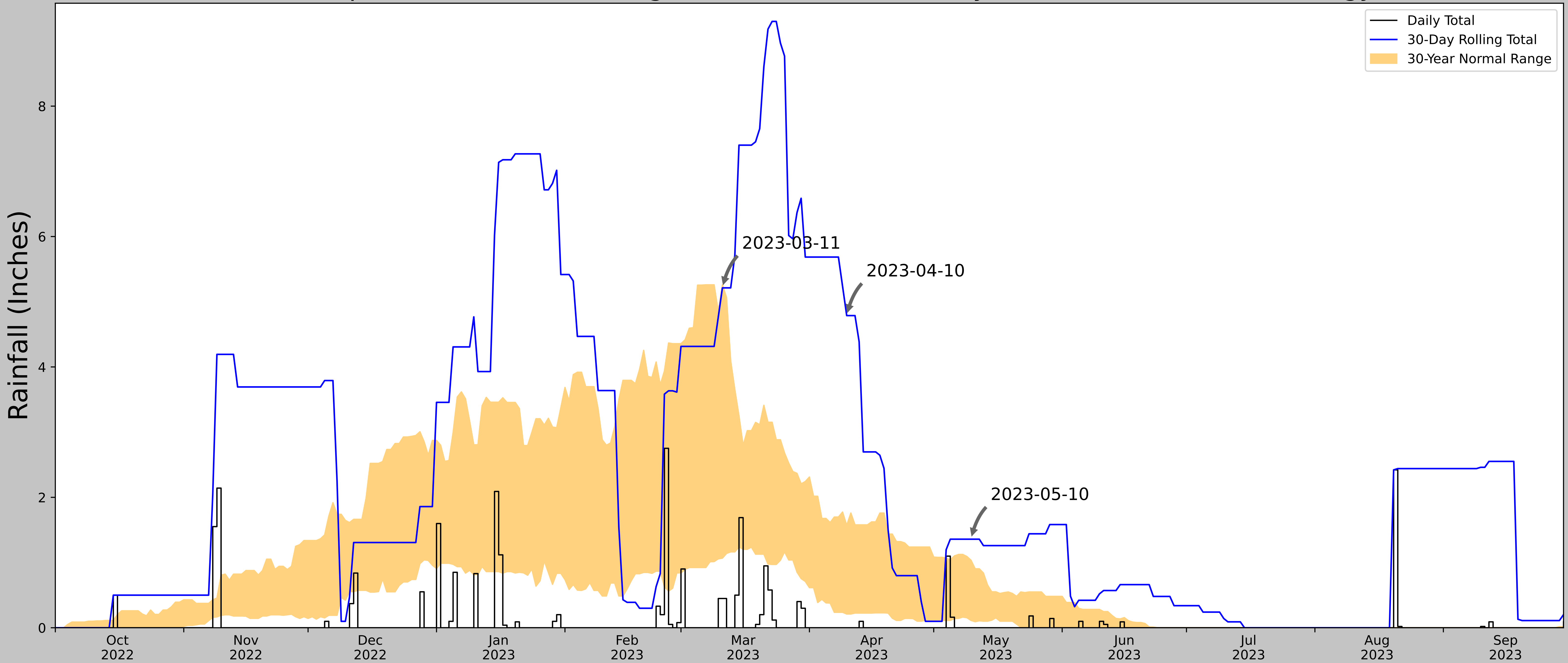
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-10	0.061417	0.515748	0.220472	Normal	2	3	6
2023-04-10	0.194882	1.082283	3.822835	Wet	3	2	6
2023-03-11	0.777953	3.838977	3.866142	Wet	3	1	3
Result							Wetter than Normal - 15

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	10.674	140.362	6.302	10808	90
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	121	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.766816, -117.571978
Observation Date	2023-05-10
Elevation (ft)	3284.389571
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-10	0.112205	1.035433	1.358268	Wet	3	3	9
2023-04-10	0.21063	1.569685	4.787402	Wet	3	2	6
2023-03-11	1.067323	5.259843	5.212599	Normal	2	1	2
Result							Wetter than Normal - 17

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
IRVINE RCH	33.72, -117.7231	540.026	9.265	2744.363	29.597	6808	90
TUSTIN IRVINE RCH	33.7025, -117.7539	234.908	2.144	305.118	1.619	4226	0
EL TORO MCAS	33.6667, -117.7333	380.906	3.729	159.12	2.271	95	0
IRVINE 4.1 NNE	33.7183, -117.7721	151.903	2.818	388.123	2.362	2	0
FOOTHILL RANCH 0.3 NW	33.689, -117.664	1044.948	4.016	504.922	3.835	2	0
ORANGE 3.5 ENE	33.8291, -117.77	811.024	8.005	270.998	5.772	2	0
MISSION VIEJO 1.3 SSE	33.5954, -117.6442	704.068	9.732	164.042	5.976	1	0
SANTA ANA FIRE STN	33.7442, -117.8667	134.843	8.419	405.183	7.2	127	0
SANTA ANA JOHN WAYNE AP	33.6797, -117.8675	42.979	8.755	497.047	8.291	90	0

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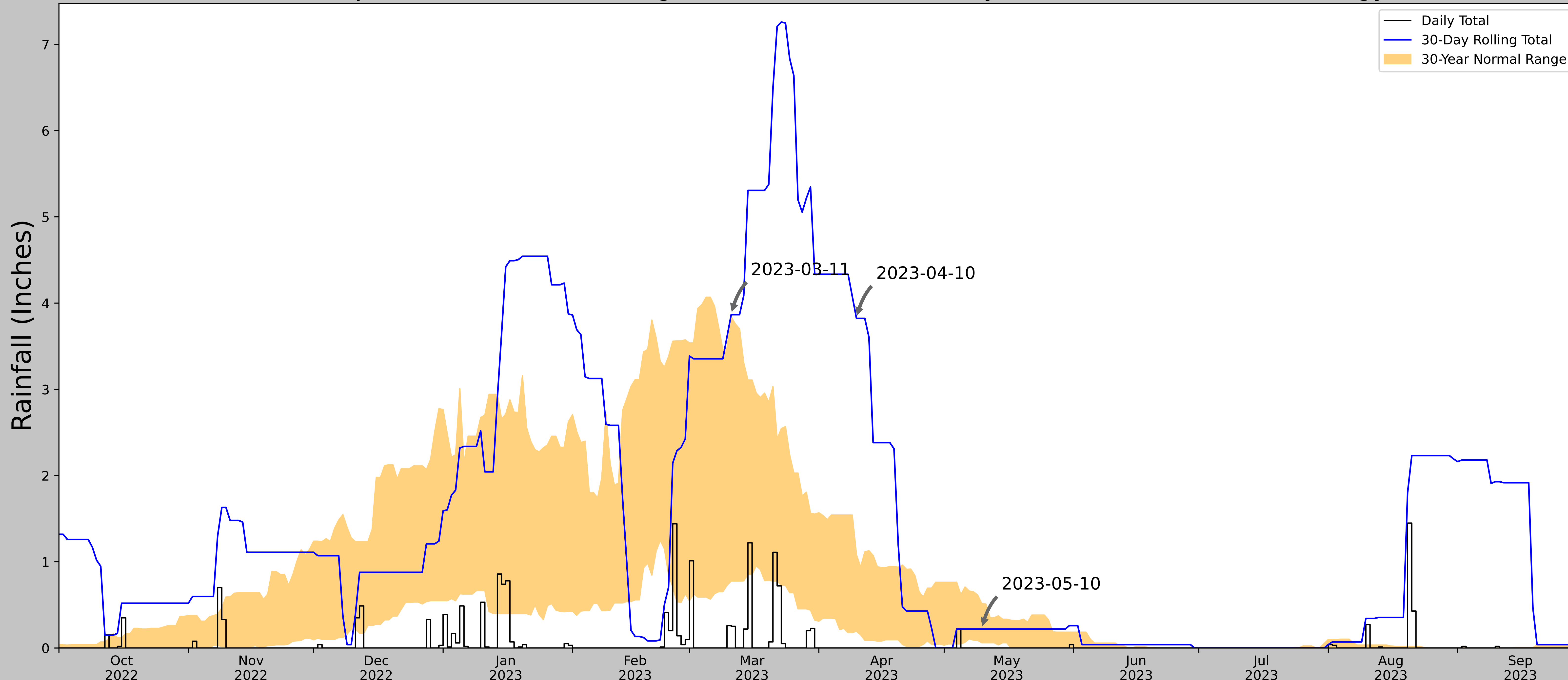
Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.858957, -117.496615
Observation Date	2023-05-10
Elevation (ft)	1345.197065
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-05-10	0.061417	0.515748	0.220472	Normal	2	3	6
2023-04-10	0.194882	1.082283	3.822835	Wet	3	2	6
2023-03-11	0.777953	3.838977	3.866142	Wet	3	1	3
Result							Wetter than Normal - 15

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Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	14.754	77.152	7.777	10808	90
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	121	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0

Antecedent Precipitation Tool v2.0 - Watershed Sampling Summary

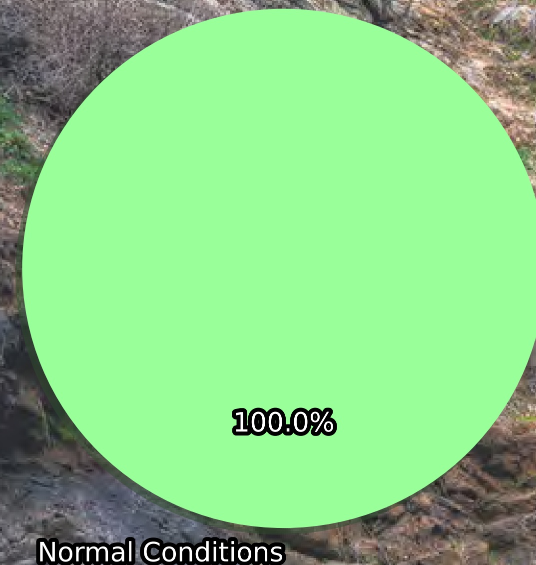
Generated on 2024-01-31

User Inputs

Coordinates	33.784535, -117.486364
Date	2023-12-21
Geographic Scope	HUC12
Used Gridded Precipitaton	False

Intermediate Data

Hydrologic Unit Code	180702030604
Watershed Size	37.06 mi^2
# Random Sampling Points	5



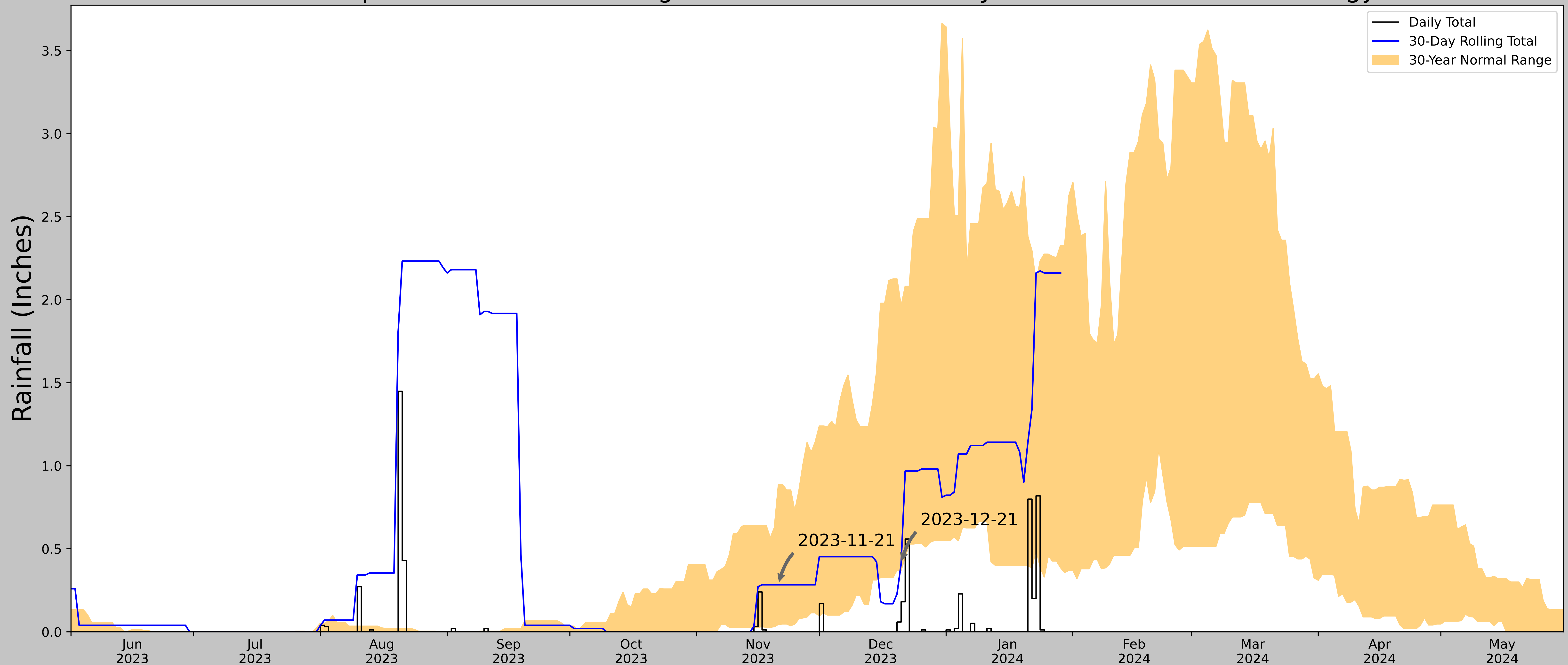
Preliminary Result

Average Antecedent Precipitation Score	12.0
Preliminary Determination	Normal Conditions

Sampling Point Breakdown

Antecedent Precipitation Score	Antecedent Precipitation Condition	WebWIMP H_2O Balance	Drought Index (PDSI)	# of Points
12	Normal Conditions	Wet Season	Incipient wetness	5

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.784535, -117.486364
Observation Date	2023-12-21
Elevation (ft)	1345.197065
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-21	0.37126	1.959843	0.409449	Normal	2	3	6
2023-11-21	0.045276	0.887008	0.283465	Normal	2	2	4
2023-10-22	0.0	0.22874	0.0	Normal	2	1	2
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	10.559	77.152	5.566	10809	77
LAKE ELSINORE 2.8 SSW	33.6308, -117.3397	1356.955	3.837	88.91	2.068	0	13
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	119	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0

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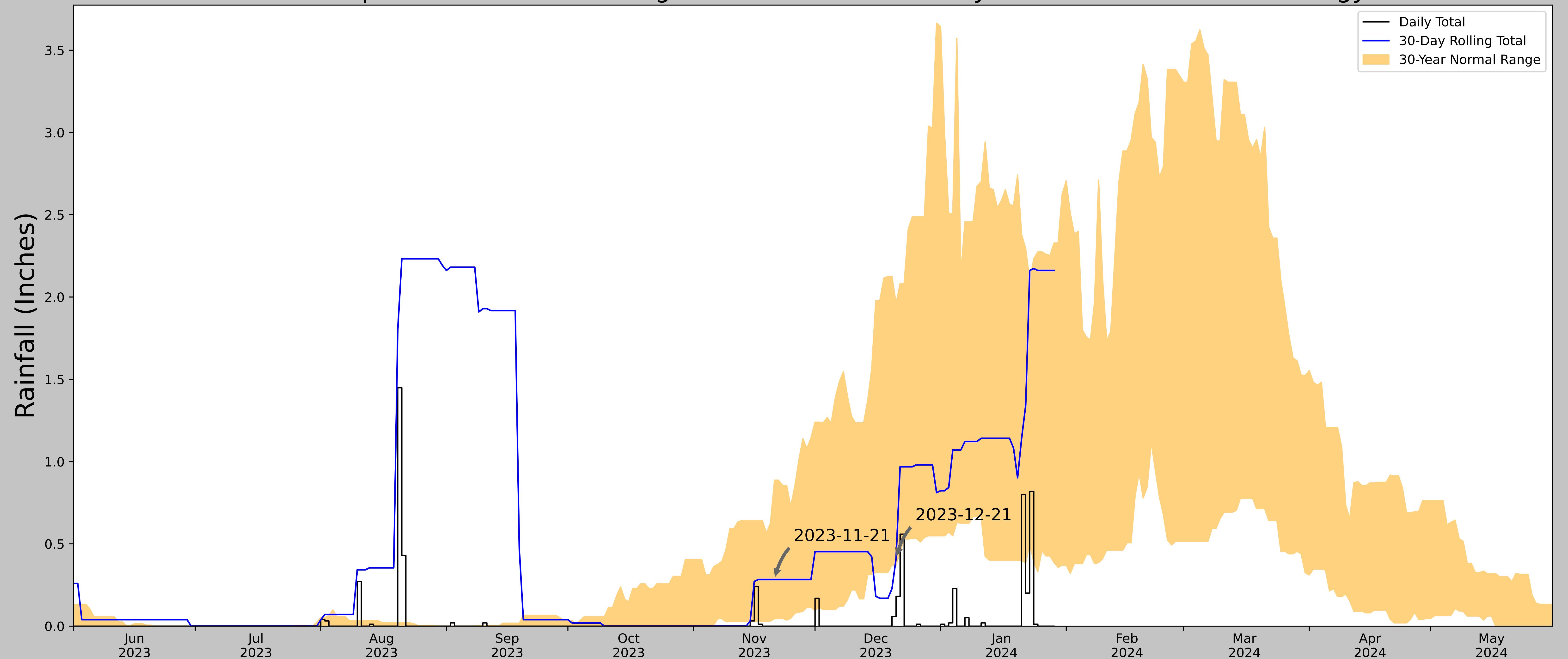
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.778176, -117.478033
Observation Date	2023-12-21
Elevation (ft)	1104.341477
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-21	0.37126	1.959843	0.409449	Normal	2	3	6
2023-11-21	0.045276	0.887008	0.283465	Normal	2	2	4
2023-10-22	0.0	0.22874	0.0	Normal	2	1	2
Result							Normal Conditions - 12

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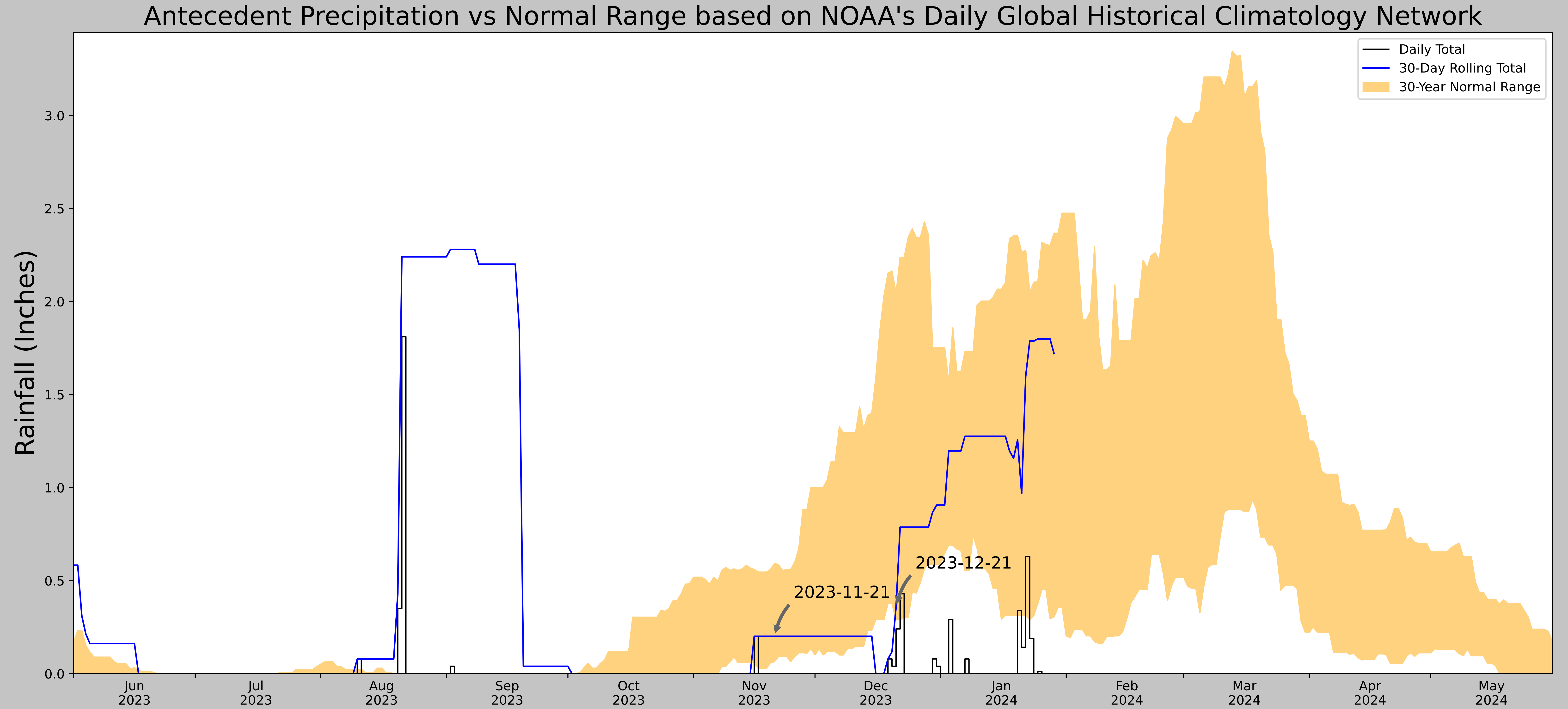
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	9.91	163.703	6.082	10809	77
LAKE ELSINORE 2.8 SSW	33.6308, -117.3397	1356.955	3.837	88.91	2.068	0	13
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	119	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0



Coordinates	33.83344, -117.522482
Observation Date	2023-12-21
Elevation (ft)	909.102461
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-21	0.289764	2.04252	0.358268	Normal	2	3	6
2023-11-21	0.064567	0.592913	0.200787	Normal	2	2	4
2023-10-22	0.0	0.30315	0.0	Normal	2	1	2
Result							Normal Conditions - 12

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Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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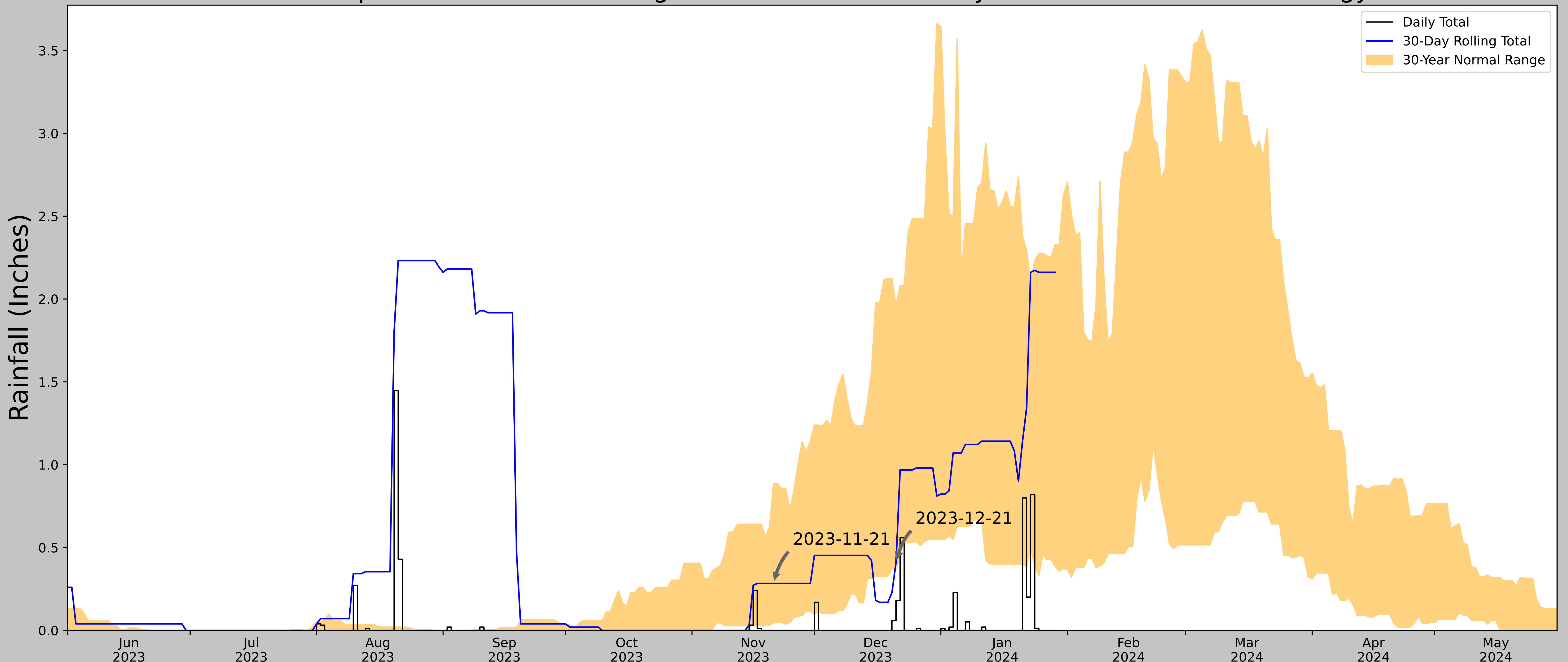
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
RIVERSIDE FIRE STN 3	33.9511, -117.3881	839.895	11.202	69.207	5.816	10480	74
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	1.88	145.997	1.12	278	0
RIVERSIDE MUNI AP	33.9528, -117.4353	845.144	2.708	5.249	1.233	590	16
RIVERSIDE 3.8 NW	33.9793, -117.4541	840.879	4.254	0.984	1.918	4	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.720528, -117.533548
Observation Date	2023-12-21
Elevation (ft)	4275.149585
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-21	0.37126	1.959843	0.409449	Normal	2	3	6
2023-11-21	0.045276	0.887008	0.283465	Normal	2	2	4
2023-10-22	0.0	0.22874	0.0	Normal	2	1	2
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	11.051	3007.105	38.204	10809	77
LAKE ELSINORE 2.8 SSW	33.6308, -117.3397	1356.955	3.837	88.91	2.068	0	13
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	119	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0

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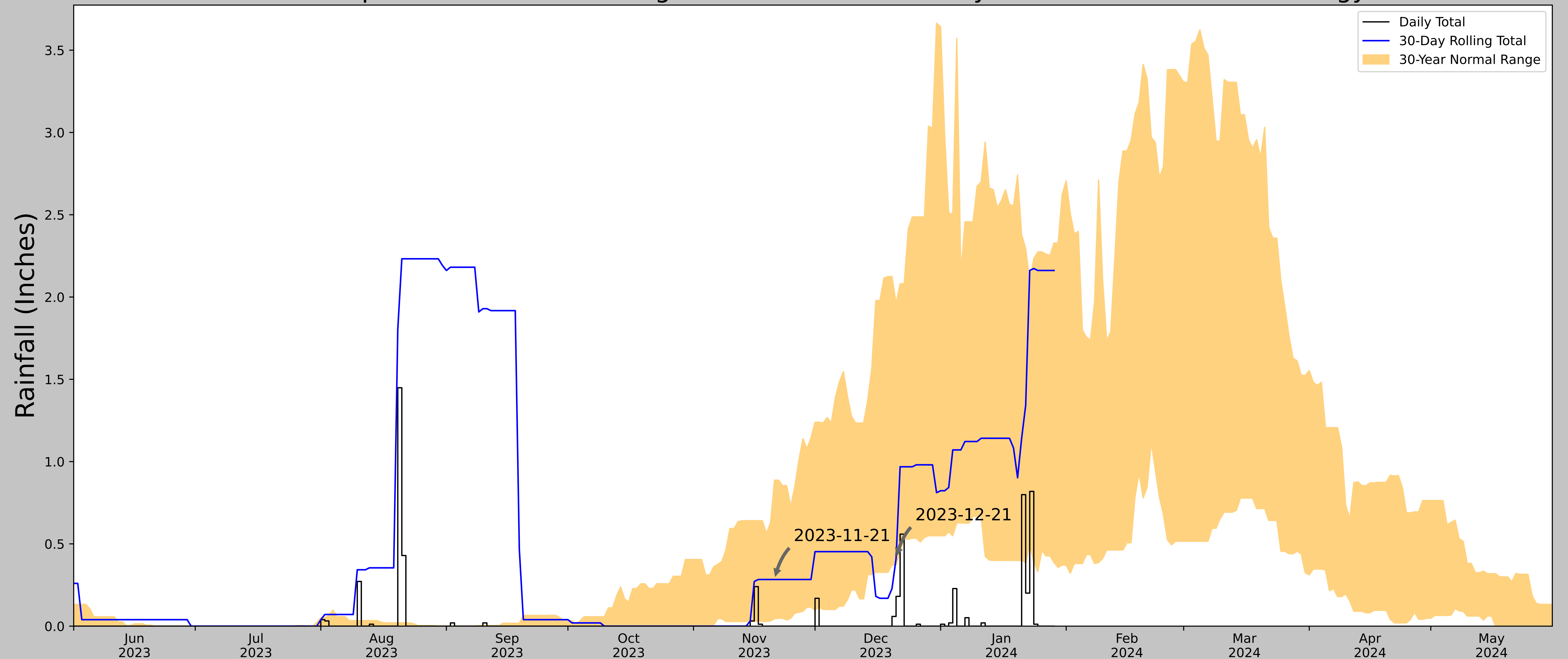
Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.790093, -117.571031
Observation Date	2023-12-21
Elevation (ft)	2389.02823
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-21	0.37126	1.959843	0.409449	Normal	2	3	6
2023-11-21	0.045276	0.887008	0.283465	Normal	2	2	4
2023-10-22	0.0	0.22874	0.0	Normal	2	1	2
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ELSINORE	33.6861, -117.3458	1268.045	14.802	1120.984	23.254	10809	77
LAKE ELSINORE 2.8 SSW	33.6308, -117.3397	1356.955	3.837	88.91	2.068	0	13
CORONA 12.5 SE	33.7346, -117.4315	1301.837	5.957	33.792	2.882	2	0
CORONA 12.8 SE	33.7307, -117.4276	1403.871	5.621	135.826	3.293	2	0
SUN CITY	33.7156, -117.19	1419.948	9.185	151.903	5.528	119	0
FALLBROOK 5 NE	33.4392, -117.1903	1140.092	19.266	127.953	11.135	9	0
RIVERSIDE CITRUS EXP	33.9669, -117.3614	985.892	19.422	282.153	14.22	381	0
REDLANDS	34.0369, -117.1947	1410.105	25.742	142.06	15.241	30	0

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Figures and tables made by the Antecedent Precipitation Tool Version 2.0

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APPENDIX D

Special Status Plants Potential to Occur

SPECIAL-STATUS PLANT SPECIES EVALUATION OF POTENTIAL TO OCCUR

Scientific Name Common Name	—Status—		Flowering Period	Habitat	Potential to Occur and Analysis
Abronia villosa var. *aurita* Chaparral sand-verbena	Fed: State: CRPR: REG:	-- -- 1B.1 --	Mar-Aug	Annual herb found in sandy substrates in coastal sage scrub and chaparral. < 5200 feet (ft)	Likely. Suitable habitat in sandy substrates in Study Area.
Allium marvinii Yucaipa onion	Fed: State: CRPR: REG:	-- -- 1B.2 --	Mar-Apr	Perennial herb (bulb) found on dry slopes and ridges. 980 -4,100 ft	Does Not Occur. Presumed extirpated.
Allium munzii Munz's onion	Fed: State: CRPR: REG:	FE ST 1B.1 --	Mar-May	Perennial herb (bulb) found in foothill woodland, chaparral, valley grassland, and pinyon-juniper woodland. 980-2,900 ft	Does Not Occur. No suitable habitat.
Ambrosia pumila San Diego ambrosia	Fed: State: CRPR: REG:	FE -- 1B.1 --	Apr-Oct	Perennial herb found in vernal pools within freshwater wetlands, coastal sage scrub, chaparral, and valley grassland communities. 160 - 1,970 ft	Does Not Occur. No suitable habitat in Study Area.
Atriplex parishii Parish's brittlescale	Fed: State: CRPR: REG:	-- -- 1B.1 --	Jun-Oct	Annual herb found in chenopod scrub, playas, and alkaline vernal pools. 80-6,235 ft.	Does Not Occur. No suitable habitat in Study Area.
Atriplex serenana var. *davidsonii* Davidson's saltscale	Fed: State: CRPR: REG:	-- -- 1B.2 --	Apr-Oct	Annual herb found in wetland-riparian and coastal sage scrub communities. < 650 ft	Unlikely. Although suitable habitat is present, the only known locations of this species in Western Riverside County do not occur in the Study Area and are located east of Perris.
Brodiaea filifolia Thread-leaved brodiaea	Fed: State: CRPR: REG:	FT SE 1B.1 --	Mar-Jun	Perennial bulbiferous herb found in vernal pools of freshwater wetlands, coastal sage scrub, foothill woodland, valley grassland, and wetland-riparian communities, often on clay soils. 80-3,675 ft	Does Not Occur. No suitable habitat in Study Area.

Scientific Name Common Name	—Status—		Flowering Period	Habitat	Potential to Occur and Analysis
California macrophylla Round-leaved filaree	Fed: State: CRPR: REG:	-- -- -- --	Mar-May	Annual herb found in foothill woodland and valley grassland. < 3,900 ft	Does Not Occur. No suitable habitat in Study Area.
Calochortus weedii var. *intermedius* Intermediate mariposa lily	Fed: State: CRPR: REG:	-- -- 1B.2 --	May-Jul	Perennial bulbiferous herb found in chaparral, coastal scrub, and valley and foothill grassland on rocky, calcareous substrates. 345-2,805 ft	Likely. Suitable habitat within the Study Area.
Centromadia pungens ssp. *laevis* Smooth tarplant	Fed: State: CRPR: REG:	-- -- 1B.1 --	Apr-Sep	Annual herb found in chenopod scrub, meadows and seeps, playas, riparian woodland, and valley and foothill grassland on alkaline soils. 0-2,100 ft	Likely. Suitable habitat within the Study Area.
Chorizanthe parryi var. *parryi* Parry's spineflower	Fed: State: CRPR: REG:	-- -- 1B.1 --	Apr-Jun	Annual herb found in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland in sandy or rocky openings. 900-4,005 ft	Likely. Suitable habitat within the Study Area.
Chorizanthe polygonoides var. *longispina* Long-spined spineflower	Fed: State: CRPR: REG:	-- -- 1B.2 ESL	Apr-Jul	Annual herb found in chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pools, often on clay soils. 100-5,020 ft	Likely. Suitable habitat within the Study Area.
Clinopodium chandleri San Miguel savory	Fed: State: CRPR: REG:	-- -- 1B.2 --	Mar-Jul	Perennial herb found in riparian habitat of coastal sage scrub, foothill woodland, chaparral, and valley grassland communities. < 3,600 ft	Unlikely. The only known locations of this species in Western Riverside County do not occur in the Study Area and are located near Lake Elsinore.
Dodecahema leptoceras Slender-horned spineflower	Fed: State: CRPR: REG:	FE SE 1B.1 --	Apr-Jun	Annual herb found in alluvial fan habitats of coastal sage scrub and chaparral communities. 650-2,300 ft	Likely. Suitable habitat within the Study Area.

Scientific Name Common Name	—Status—		Flowering Period	Habitat	Potential to Occur and Analysis
Dudleya multicaulis Many-stemmed dudleya	Fed: State: CRPR: REG:	-- -- 1B.2 ESL	Apr-Jul	Perennial herb found in chaparral, coastal scrub, valley and foothill grassland, often on clay. < 1,970 ft	Likely. Suitable habitat within the Study Area and recent records within 1 mile of the Study Area.
Harpagonella palmeri Palmer's grapplinghook	Fed: State: CRPR: REG:	-- -- 4.2 --	Mar-May	Annual herb found in chaparral, coastal scrub, clay soils in valley and foothill grassland; and open grassy areas within shrubland. 65-3,135 ft	Likely. Suitable habitat within the Study Area.
Hesperocyparis forbesii Tecate cypress	Fed: State: CRPR: REG:	-- -- 1B.1 --		Perennial evergreen tree found in closed-cone coniferous forest and chaparral on clay gabbroic or metavolcanic substrates. 260-4,920 ft	Does Not Occur. No suitable habitat in Study Area.
Lasthenia glabrata ssp. *Coulteri* Coulter's goldfields	Fed: State: CRPR: REG:	-- -- 1B.1 --	Feb-Jun	Annual herb found in coastal salt marshes, playas, and vernal pools. 5-4,005 ft	Does Not Occur. No suitable habitat in Study Area.
Lepechinia cardiophylla Heart-leaved pitcher sage	Fed: State: CRPR: REG:	-- -- 1B.2 --	Apr-Jul	Shrub found in closed-cone coniferous forest, foothill woodland, and chaparral. 1,900-4,000 ft	Does Not Occur. No suitable habitat in Study Area.
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	Fed: State: CRPR: REG:	-- -- 4.3 --	Jan-Jul	Annual herb found in chaparral, and coastal scrub. 5-2,905 ft	Likely. Suitable habitat within the Study Area.
Monardella hypoleuca ssp. *intermedia* Intermediate monardella	Fed: State: CRPR: REG:	-- -- 1B.3 --	Apr-Sep	Perennial rhizomatous herb found in chaparral, cismontane woodland, and lower montane coniferous forest. 1,310-4,100 ft	Unlikely. Low quality habitat is within the Study Area.

Scientific Name Common Name	—Status—		Flowering Period	Habitat	Potential to Occur and Analysis
Monardella macrantha ssp. *hallii* Hall's monardella	Fed: State: CRPR: REG:	-- -- 1B.3 --	Jun-Oct	Perennial rhizomatous herb found in yellow pine forest, mixed evergreen forest, foothill woodland, chaparral, and valley grassland. 1,900-6,500 ft	Does Not Occur. No suitable habitat in Study Area.
Myosurus minimus ssp. *apus* Little mousetail	Fed: State: CRPR: REG:	-- -- 3.1 --	Mar-Jun	Annual herb found in vernal pool habitats of freshwater wetlands, coastal sage scrub, valley grassland, and wetland-riparian communities. < 6,900 ft	Does Not Occur. No suitable habitat in Study Area.
Navarretia fossalis Spreading navarretia	Fed: State: CRPR: REG:	FT -- 1B.1 --	Apr-Jun	Annual herb found in chenopod scrub, assorted shallow freshwater marshes and swamps, playas, and vernal pools. 100-2,150 ft	Does Not Occur. No suitable habitat in Study Area.
Orcuttia californica California Orcutt grass	Fed: State: CRPR: REG:	FE SE 1B.1 --	Apr-Aug	Annual grasslike herb found in vernal pool habitat of freshwater wetland, valley grassland, and wetland-riparian communities. < 2,300 ft	Does Not Occur. No suitable habitat in Study Area.
Phacelia keckii Santiago Peak phacelia	Fed: State: CRPR: REG:	-- -- 1B.3 --	May-Jun	Annual herb found in closed-cone pine forest and chaparral. 1,640-5,250 ft	Does Not Occur. No suitable habitat in Study Area.
Pseudognaphalium leucocephalum White rabbit-tobacco	Fed: State: CRPR: REG:	-- -- 2B.2 --	(Jul) Aug-Nov (Dec)	Perennial herb found in chaparral, cismontane woodland, coastal scrub, and riparian woodland on sandy or gravelly soils. 0-6,890 ft.	Likely. Suitable habitat within the Study Area.
Sibaropsis hammittii Hammitt's clay-cress	Fed: State: CRPR: REG:	-- -- 1B.2 --	Mar-Apr	Annual herb found in open chaparral. 1,640-5,250 ft	Unlikely. The only known locations of this species in Western Riverside County do not occur in the Study Area and are located south of Lake Elsinore.

Scientific Name Common Name	—Status—		Flowering Period	Habitat	Potential to Occur and Analysis
Symphyotrichum defoliatum San Bernardino aster	Fed: State: CRPR: REG:	-- -- 1B.2 --	Jul-Nov	Perennial rhizomatous herb found in freshwater-marsh habitat within freshwater wetlands, coastal sage scrub, southern oak woodland communities. < 6,700 ft	Likely. Suitable habitat within the Study Area.
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	Fed: State: CRPR: REG:	-- -- 2B.1 --		Annual herb found in riparian, meadows, marsh, and vernal pool habitat within freshwater wetlands and wetland-riparian communities. < 1,640 ft	Does Not Occur. No suitable habitat in Study Area.

<u>Sensitivity Status Key</u>
CRPR = California Rare Plant Rank
CNDDB = California Natural Diversity Database

<u>Federal:</u>
FE = Listed as endangered under the Federal Endangered Species Act
FT = Listed as threatened under the Federal Endangered Species Act
FC = Candidate for listing under the Federal Endangered Species Act
-- = No Listing

<u>Regional:</u>
ESL = El Sobrante Landfill MSHCP Covered Species

<u>State:</u>
SE = Listed as endangered under the California Endangered Species Act
ST = Listed as threatened under the California Endangered Species Act
SP = Proposed for listing under the California Endangered Species Act
RARE = California listed as rare
-- = No Listing

<u>California Rare Plant Rank:</u>
1A = Plants presumed extinct in California
1B = Plants rare and endangered in California and throughout their range
2 = Plants rare, threatened, or endangered in California but more common elsewhere in their range
3 = Plants about which more information is needed; a review list
4 = Plants of limited distribution; a watch list

APPENDIX E

Special Status Wildlife Potential to Occur

SPECIAL-STATUS WILDLIFE SPECIES EVALUATION OF POTENTIAL TO OCCUR

Scientific Name Common Name (Note)	——Status——		Habitat and Known Locations	Potential to Occur and Analysis
INSECTS				
Euphydryas editha quino Quino checkerspot butterfly	Fed: State: CDFW REG:	FE -- -- --	Populations are known to exist only as several, probably isolated, colonies in southwestern Riverside County, southern San Diego County, and northern Baja California, Mexico. Potential habitat includes vegetation communities with areas of low-growing and sparse vegetation. These habitats include open stands of sage scrub and chaparral, adjacent open meadows, old foot trails and dirt roads.	Does Not Occur. Nearest existing records indicate possibly extirpated; no recent (< 40 years) records near Study Area.
CRUSTACEANS				
Branchinecta lynchi vernal pool fairy shrimp	Fed: State: CDFW REG:	FT -- -- --	Endemic to California and the Agate Desert of southern Oregon. It has the widest geographic range of the federally-listed vernal pool crustaceans, but it is seldom abundant where found, especially where it co-occurs with other species Exists only in vernal pools or vernal pool-like habitats. Does not occur in riverine, marine, or other permanent bodies of water. Occurs only in cool-water pools.	Does Not Occur. No suitable habitat present (vernal pools or soils to support vernal pools) within Study Area.

Scientific Name Common Name (Note)	——Status——		Habitat and Known Locations	Potential to Occur and Analysis
FISH				
Oncorhynchus mykiss irideus pop. 10 steelhead - southern California DPS	Fed: State: CDFW: REG:	FE -- -- --	Inhabits a small breeding range in streams in coastal southern California. Most populations have been extirpated.	Does Not Occur. Nearest existing records indicate possibly extirpated.
AMPHIBIANS				
Spea hammondii western spadefoot	Fed: State: CDFW: REG:	-- -- SSC ESL	Found in lowland, foothill, and mountain habitats including washes, river floodplains, alluvial fans, playas, alkali flats, temporary ponds, vernal pools, mixed woodlands, grasslands, coastal sage scrub, and chaparral. Prefers open areas with sandy or gravelly soils but may be found in vernal pools containing clay soils. Surface activity can occur from October through April depending on rainfall, and oviposition occurs between late February and May in temporal pools and slow-moving sections of streams.	Likely. Suitable habitat within species' elevation range. Recent records within < 1 mile of Study Area.

Scientific Name Common Name (Note)	——Status——		Habitat and Known Locations	Potential to Occur and Analysis
Anaxyrus californicus arroyo toad	Fed: State: CDFW: REG:	FE -- SSC ESL	Found in semi-arid regions near washes or intermittent streams. Habitats used include valley-foothill and desert riparian as well as a variety of more arid habitats including desert wash, palm oasis, and Joshua tree, mixed chaparral and sagebrush. Often found near rivers with sandy banks, willows, cottonwoods, and sycamores in valley-foothill and desert riparian habitats. Found in loose gravelly areas of streams in drier portions of its range.	Unlikely. Suitable habitat present, but no records within 5 miles of Study Area.
REPTILES				
Anniella stebbinsi southern California legless lizard	Fed: State: CDFW: REG:	-- -- SSC --	Occurring throughout Western Riverside County, within moist, warm, loose soils with plant cover. Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.	Likely. Suitable habitat present, and even though there are no recent records within 1 mile of the Study Area, this species is cryptic and difficult to detect.
Aspidoscelis tigris stejnegeri coastal western whiptail	Fed: State: CDFW: REG:	-- -- SSC ESL	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage, such as chaparral, woodland, and riparian areas.	Likely. Suitable habitat present. Recent (< 25 years) records within < 1 mile of Study Area.

Scientific Name Common Name (Note)	——Status——		Habitat and Known Locations	Potential to Occur and Analysis
Crotalus ruber red-diamond rattlesnake	Fed: State: CDFW: REG:	-- -- SSC ESL	Inhabits arid scrub, coastal chaparral, oak and pine woodlands, rocky grassland, cultivated areas. On the desert slopes of the mountains, it ranges into rocky desert flats.	Likely. Suitable habitat present. Recent (< 25 years) records within < 1 mile of Study Area.
Phrynosoma blainvillii coast horned lizard	Fed: State: CDFW: REG:	-- -- SSC ESL	Open chaparral, coastal sage scrub with sandy, loose soil. Partially dependent on harvester ants for forage.	Likely. Suitable adjacent habitat present and records within < 1 mile of Study Area.
BIRDS				
Agelaius tricolor tricolored blackbird (nesting colony)	Fed: State: CDFW: REG	-- ST SSC --	Freshwater marshes, agricultural areas, lakeshores, parks. Localized resident. Breeding colonies well documented.	Does Not Occur. No suitable habitat present in Study Area.
Athene cunicularia burrowing owl (burrow sites & some wintering sites)	Fed: State: CDFW: REG:	-- -- SSC ESL	A yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Formerly common in appropriate habitats throughout the state, excluding the humid northwest coastal forests and high mountains.	Unlikely. suitable grassland habitat adjacent to Study Area; however no suitable habitat within Study Area.

Scientific Name Common Name (Note)	——Status——		Habitat and Known Locations	Potential to Occur and Analysis
Coturnicops noveboracensis yellow rail	Fed: State: CDFW: REG:	-- -- SSC --	A small rail occupying shallow marshes with short vegetation. Often found nesting among *Carex* species. Occurs year round in California, but in two primary seasonal roles: currently as a very local breeder in the northeastern interior and as a winter visitor (early Oct to mid-Apr) on the coast and in the Suisun Marsh region	Does Not Occur. No suitable habitat present in Study Area.
Empidonax traillii extimus southwestern willow flycatcher (nesting)	Fed: State: CDFW: REG:	FE SE -- --	Breeding range in southwestern United States. Nests in relatively dense riparian vegetation where surface water is present or soil moisture is high enough to maintain the appropriate vegetation characteristics.	Unlikely. Habitat in Study Area is too hydrologically dynamic to support suitable dense vegetation; more suitable habitat upstream and downstream of Study Area.
Haliaeetus leucocephalus bald eagle (nesting and wintering)	Fed: State: CDFW: REG:	Delisted SE FP --	Rivers, lakes. Rare winter visitor, rare fall migrant. Feeds mainly on fish.	Does Not Occur. No suitable habitat present.
Icteria virens yellow-breasted chat (nesting)	Fed: State: CDFW: REG:	-- -- SSC --	An uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada. Found up to about 1,450 m (4,800 ft.) in valley foothill riparian, and up to 2,050 m (6,500 ft.) east of the Sierra Nevada in desert riparian habitats. Requires riparian thickets of willow and other brushy tangles near watercourses for nest cover.	Likely. Suitable habitat present immediately upstream of Study Area; nearby records are recent (< 25 years).

Scientific Name Common Name (Note)	——Status——		Habitat and Known Locations	Potential to Occur and Analysis
Polioptila californica californica coastal California gnatcatcher	Fed: State: CDFW: REG:	FT -- SSC ESL	Coastal sage scrub, maritime succulent scrub in arid washes, on mesas, and on slopes of coastal hills.	Likely. Suitable habitat present. Recent (< 25 years) records < 1 mile from Study Area.
Vireo bellii pusillus least Bell's vireo (nesting)	Fed: State: CDFW: REG:	FE SE -- --	Willow-dominated successional woodland or scrub, *Baccharis* scrub, mixed oak/willow woodland, and elderberry scrub in riparian habitat. Nests and forages in vegetation along streams and rivers that measures approximately three to six feet in height and has a dense, stratified canopy.	Likely. Suitable habitat present immediately upstream of Study Area. Recent (< 25 years) records < 1 mile from Study Area.
MAMMALS				
Chaetodipus fallax fallax northwestern San Diego pocket mouse	Fed: State: CDFW: REG:	-- -- SSC ESL	Habitats include coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland.	Likely. Suitable habitat present and records within 3 miles of Study Area.

Scientific Name Common Name (Note)	——Status——		Habitat and Known Locations	Potential to Occur and Analysis
Dipodomys stephensi Stephens' kangaroo rat	Fed: State: CDFW: REG:	FE ST -- ESL	Occurs primarily in annual and perennial grassland habitats but may occur in coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas. Preferred perennials are buckwheat and chamise; preferred annuals are brome grass and filaree.	Likely. Suitable habitat present. Recent (< 25 years) records < 1 mile from Study Area.
Eumops perotis californicus western mastiff bat	Fed: State: CDFW: REG:	-- -- SSC --	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban. Roosts in crevices in cliff faces, high buildings, trees, and tunnels. When roosting in rock crevices, needs vertical faces to drop off to take flight.	Likely. Suitable foraging habitat present in Study Area. Suitable roosting habitat present in the buildings in the Study Area and in cliffs in the near vicinity.
Nyctinomops femorosaccus pocketed free-tailed bat	Fed: State: CDFW: REG:	-- -- SSC --	Variety of arid areas in Southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc. Roosts in rocky areas with high cliffs, caverns, or buildings.	Likely. Suitable foraging habitat present in the Study Area, and suitable roosting habitat present in the buildings in the Study Area and in cliffs and rocky outcrops in the near vicinity.
Taxidea taxus American badger	Fed: State: CDFW: REG:	-- -- SSC ESL	Occurs in a variety of herbaceous, shrub, and open stages of most habitats with dry, friable soils.	Unlikely. Suitable grassland and scrub habitat adjacent to Study Area; however no suitable habitat within Study Area.

Sensitivity Status Key
BGEPA = Bald and Golden Eagle Protection Act
CDFW = California Department of Fish and Wildlife special animals list
REG = Regional Planning

State:
SE = State-listed, endangered
ST = State-listed, threatened
SP = Proposed for listing under the California Endangered Species Act

Federal:
FE = Federally listed, endangered
FT = Federally listed, threatened
FC = Candidate for listing under the Federal Endangered Species Act
SS = Bureau of Land Management Sensitive Species
-- = No Listing

SSC = California Species of Special Concern
FP = Fully protected species under the California Fish and Game Code
WL = Watch list
-- = No Listing

Regional:
ESL = El Sobrante Landfill MSHCP Covered Species

Appendix D
Cultural Resources Report

Cultural Resources Report

El Sobrante Landfill Expansion (SCH# 1990020076), Solid Waste Facility Permit Revision, and Renewable Natural Gas Facility Project

Project number: 60723843

July 15, 2024

Delivering a better world

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Table of Contents

Executive Summary 1

Introduction 1

Project Location 1

Project Description 5

RNG Components 5

South RNG Site 5

North RNG Site 5

Gas POR Site 6

Underground Piping 6

SoCal Gas Pipeline Interconnection 6

Construction and Operation Details 7

Project Personnel 7

Project Setting 8

Regulatory Setting 8

State Regulations 8

California Environmental Quality Act, Public Resources Code Sections 21000 et seq. 8

Assembly Bill 52 9

Local Regulations 10

Natural Setting 10

Geology and Hydrology 10

Cultural Setting 11

Precontact Overview 11

Ethnographic Context 12

Historic Context 14

Dawson Canyon and Cajalco Canyon 15

El Sobrante Landfill 16

Archival Research 17

Records Search 17

Previous Cultural Resource Investigations 17

Previously Recorded Cultural Resources 19

P-33-003832 21

P-33-000078 21

California Historical Landmarks 21

Supplemental Research 22

Archaeological Sensitivity 22

Native American Heritage Commission Sacred Lands File Search 23

Field Survey and Results 24

Survey Methodology 24

Survey Results 24

Previously Recorded Cultural Resources 27

Findings 30

Conclusions and Recommendations 31
Archaeological Recommendations 31
Built Environment Recommendations 32

References 33

Appendices

Appendix A – EIC Records Search (*Confidential*)
Appendix B – NAHC SLF and Contact Program
Appendix C – DPR Forms (Confidential)
Appendix D – Project Figures (Confidential)

List of Figures

Figure 1. Project Vicinity Map........ 2
Figure 2. Project Location Map 3
Figure 3. Proposed Project Components 4
Figure 4. Ethnographic Territories 13
Figure 5. Cultural Resources Map........ 1

List of Photos

Photo 1. Overview of North RNG site, view to the southwest 25
Photo 2. Overview of underground piping area between North and South RNG sites, view to the west........ 25
Photo 3. Overview of South RNG site, view to the northeast 26
Photo 4. Overview of underground piping area between South RNG site and Gas POR, view to the northeast 26
Photo 5. Overview of Temescal Wash from Gas POR site, view to the northeast........ 27
Photo 6. Overview of mapped location of P-33-003832 in the project area, view to the southeast........ 28
Photo 7. West end of P-33-003832 railroad berm adjacent to the project area, view to the east........ 28
Photo 8. P-33-003832 railroad berm adjacent to the project area, view to the east........ 29
Photo 9. East end of P-33-003832 railroad berm adjacent to the project area, view to the west 29
Photo 10. Overview of P-33-000078 adjacent to P-33-003832 outside the project area, view to the southwest........ 30

List of Plates

Plate 1. View of Temescal Tin Mines circa 1890 15
Plate 2. View of Lake Mathews in 1941 16

List of Tables

Table 1. Previous Investigations Conducted within 0.5 Mile of the Project Area 17
Table 2. Previously Recorded Resources within 0.5 Mile of the Project Area 20

Acronyms and Abbreviations

AB	Assembly Bill
A.D.	Anno Domini
BP	before present
BTU	British thermal unit
ca.	circa
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CRHR	California Register of Historical Resources
CRMMP	cultural resource monitoring and mitigation plan
DPR	California Department of Parks and Recreation
EIC	Eastern Information Center
EIR	Environmental Impact Report
HDD	horizontal directional drilling
HDPE	high-density polyethylene
LFG	landfill gas
MET	Metropolitan Water Department
NAHC	Native American Heritage Commission
POR	Point of Receipt
PRC	Public Resources Code
proposed project	El Sobrante Landfill, Solid Waste Facility Permit Revision, and Renewable Natural Gas Facility Project
RNG	renewable natural gas
SCH	State Clearinghouse
SEIR	Supplemental Environmental Impact Report
SLF	Sacred Lands File
SoCal Gas	Southern California Gas Company
Toro	Toro Energy of California-SLO, LLC
WEAP	worker environmental awareness program
WM	Waste Management

Executive Summary

AECOM was contracted to conduct a cultural resources assessment in support of the Renewable Natural Gas (RNG) Facility as part of the El Sobrante Landfill, Solid Waste Facility Permit Revision, and Renewable Natural Gas Facility Project (proposed project), in the Temescal Valley in Riverside County, California. This assessment considers the potential effects of the proposed project on cultural resources. This work was conducted in support of an Addendum to the certified 1998 Environmental Impact Report (EIR)/2009 Supplemental EIR for the El Sobrante Landfill. The Riverside County Department of Waste Resources, acting on behalf of Riverside County, is the lead agency for the proposed project pursuant to the California Environmental Quality Act (CEQA), in accordance with the 1998 and 2009 EIRs.

Toro Energy of California – El Sobrante, LLC (Toro) has entered into a property lease agreement with Waste Management (WM) to install and operate the proposed RNG Facility within three previously disturbed areas of the WM-owned El Sobrante Landfill, involving the following elements: a South RNG site; a North RNG site; a Gas Point of Receipt (POR) site; an underground pipeline connecting the three sites to convey existing landfill gas and processed gas; and an underground pipeline interconnection between the POR site and Southern California Gas Company's main pipeline in Temescal Canyon Road.

This Cultural Resources Report was prepared by AECOM in compliance with CEQA under Section 21000 et seq. of the Public Resources Code, and with the State CEQA Guidelines under Section 15000 et seq of the California Code of Regulations. The project area encompasses the approximately 5.5 acres of proposed disturbance and is located at 10910 Dawson Canyon Road south of the City of Corona, in the northwestern portion of the county.

A records search for the project area and a 0.5-mile search radius was completed on February 28, 2024, in the California Historical Resources Information System at the Eastern Information Center (EIC), located at the University of California, Riverside (Appendix A). The EIC records search identified 20 previously recorded cultural resources mapped within the records search area. Of the 20 previously recorded cultural resources, one previously recorded cultural resource (P-33-003832), an abandoned railroad segment, is mapped in the proposed project area. In addition, one previously recorded pictograph site (P-33-000078) is adjacent to the project area, within 30 meters. Supplemental research included review of the National Register of Historic Places; California Register of Historical Resources; and other national, state, and local registers. Additional archival research included research of online repositories, specifically review of historic maps (historic aerials, historic topographical maps), the Built Environment Resources Directory, geology maps, and ethnographic maps prepared by local historians, early anthropologists, and modern Native American tribal leaders.

A Sacred Lands File (SLF) request was solicited from the Native American Heritage Commission on January 25, 2024, to identify tribal cultural resources and traditional sites that might be impacted by the proposed project. A response was received February 22, 2024, indicating that the results of the SLF search were positive and the Pechanga Band of Indians should be contacted for more information (Appendix B). On May 3, 2024 AECOM sent an email letter to the Pechanga Band of Indians to respectfully request any knowledge they wish to share regarding tribal history of the area and potential impacts to cultural resources in the proposed project area. A follow up phone call was placed on May 17, 2024 and a voicemail was left detailing the purpose of the call and contact information should they wish to discuss the project. No response has been received to date.

An intensive-level pedestrian archaeological survey of the project area was performed on May 24, 2024, by AECOM cultural resources staff who meet the Secretary of the Interior's Standards for Archaeology. Two previously recorded sites within and adjacent to the proposed project area (P-33-003832 and P-33-000078) were investigated and determined not to be present in the project footprint. No built environment resources were identified during the survey. A site record updated was prepared for P-33-003832 (Appendix C)

Based on the results of archival research, the Native American outreach program, and the field survey, no new or previously recorded cultural resources were identified in the project area. Sites P-33-003832 and P-33-000078 were confirmed to be present in the project vicinity, outside the project footprint. However, an assessment of archaeological sensitivity indicates that the southern end of the project area exhibits moderate potential to encounter archaeological resources, based on proximity to previously recorded resources, natural setting, and presence of soils with potential for buried deposits.

The proposed project would include excavation activities, which could have the potential to inadvertently uncover archaeological resources, tribal cultural resources, and unknown human remains. AECOM recommends that the project proponent retain a Secretary of the Interior-qualified archaeologist before the start of the project, to oversee development and implementation of worker environmental awareness program training before the start of construction and archaeological and tribal monitoring in sensitive portions of the project area.

Introduction

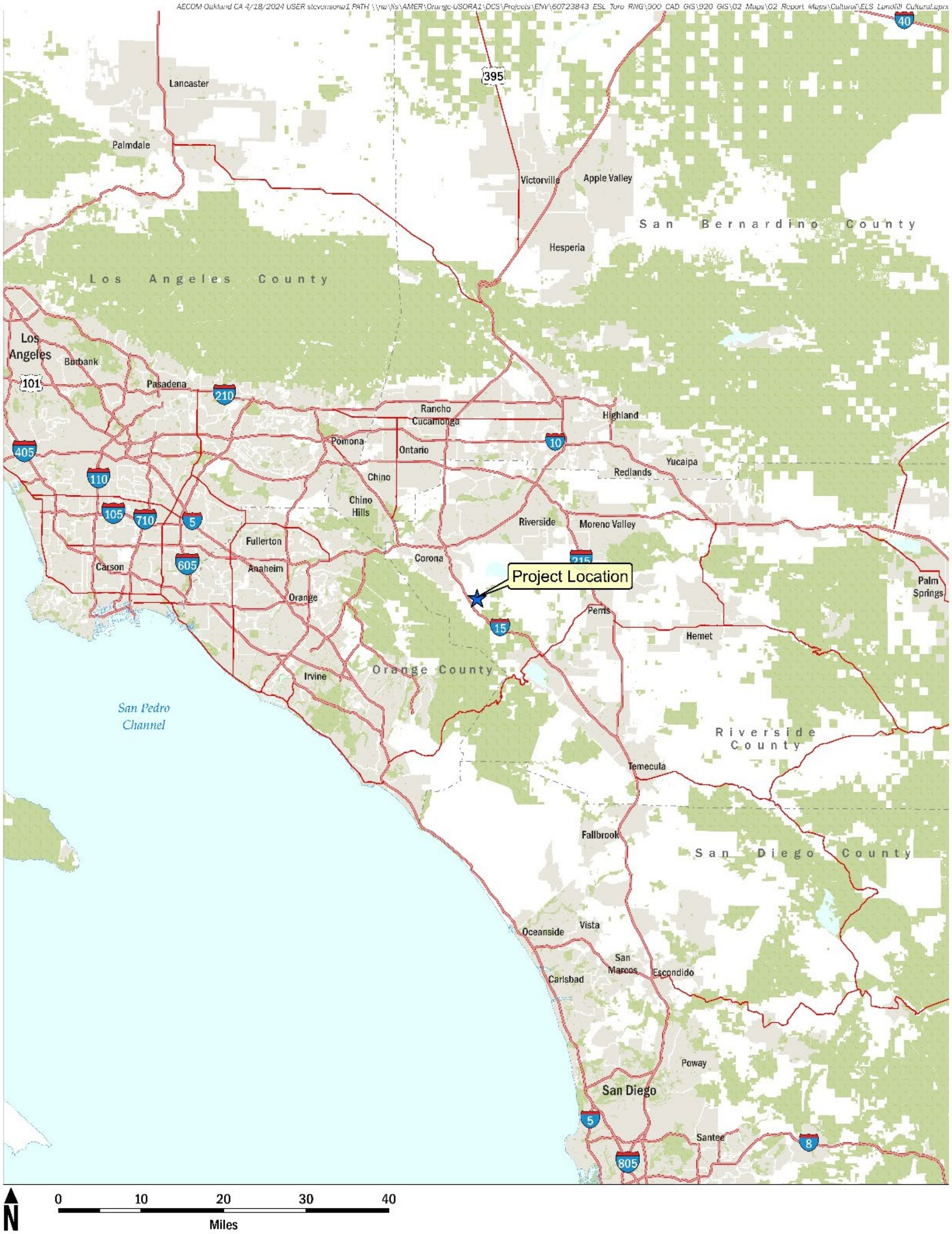
AECOM was contracted to conduct a cultural resources assessment in support of the Renewable Natural Gas (RNG) Facility as part of the El Sobrante Landfill, Solid Waste Facility Permit Revision, and Renewable Natural Gas Facility Project (proposed project). An Environmental Impact Report (EIR) for the El Sobrante Landfill was certified by the Riverside County Board of Supervisors on September 1, 1998 (State Clearinghouse [SCH] No. 1990020076). A Supplemental EIR (SEIR) was certified by the Riverside County Board of Supervisors on March 31, 2009 (SCH No. 2007081054). Preparation of an Addendum to the certified 1998 EIR/2009 SEIR was deemed appropriate to comply with the California Environmental Quality Act (CEQA) for the proposed project. The proposed project would install an RNG Facility on Waste Management (WM)-owned property at El Sobrante Landfill (refer to Figures 1 and 2 for project vicinity and location maps), using existing landfill gas (LFG) that would be diverted from landfill flares and processed to meet Southern California Gas Company (SoCal Gas) specifications for local distribution via an existing SoCal Gas pipeline. The Riverside County Department of Waste Resources, acting on behalf of Riverside County, is the lead agency for the proposed project, pursuant to CEQA.

Toro Energy of California – El Sobrante, LLC (Toro) has entered into a property lease agreement with WM to install and operate the proposed RNG Facility within three previously disturbed areas, involving the following elements (refer to Figure 3): a South RNG site; a North RNG site; a Gas Point of Receipt (POR) site; an underground pipeline connecting the three sites to convey the LFG and processed gas; and an underground pipeline interconnection between the POR site and the SoCal Gas main pipeline in Temescal Canyon Road.

Toro and WM are separate corporate entities; therefore, the RNG Facility and El Sobrante Landfill are owned and operated independently. Each source will maintain separate permits and reporting.

Project Location

El Sobrante Landfill is at 10910 Dawson Canyon Road south of the city of Corona, in the northwestern portion of Riverside County, California (Figure 2). The project area lies within Temescal Valley, southwest of Lake Mathews and just east of Interstate 15. The project area starts at the intersection of Temescal Canyon Road and Dawson Canyon Road, trending generally northeast along Dawson Canyon Road. The approximately 5.5-acre project area is within Sections 23, 26, 34, and 35 of Township 4 South, Range 6 West of the San Bernardino Base Meridian, as shown on the Lake Mathews, CA 7.5' U.S. Geological Survey topographic quadrangle maps (Figure 2). The elevation of the project area ranges from approximately 1,360 to 920 feet above mean sea level.



AECOM

Waste Management National Services, Inc.
Renewable Natural Gas (RNG) Facility Project
PROJECT: 60723843

FIGURE 1
Cultural Resources - Vicinity Map

Figure 1. Project Vicinity Map

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Waste Management National Services, Inc.
Renewable Natural Gas (RNG) Facility Project
PROJECT: 60723843

FIGURE 2
Cultural Resources - Vicinity Map

Figure 2. Project Location Map

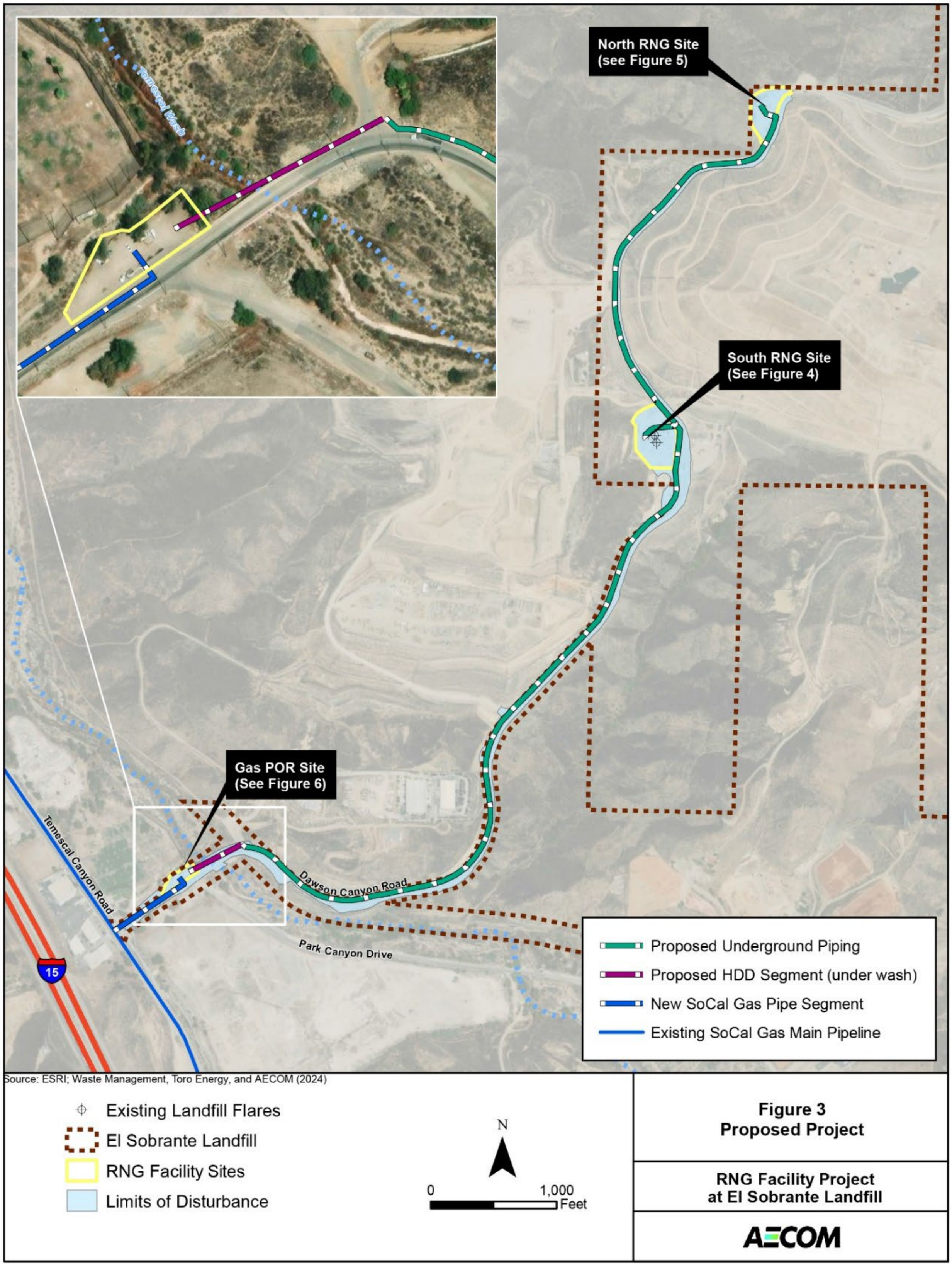

Figure 3. Proposed Project Components

Project Description

The proposed project would install an RNG Facility on WM-owned property at El Sobrante Landfill, to utilize LFG that would be diverted from existing landfill flares and processed to meet SoCal Gas specifications for local distribution via an existing SoCal Gas pipeline. Toro has entered into a property lease agreement with WM to install and operate the proposed RNG Facility within three previously disturbed areas, which would involve the following elements (as shown previously on Figure 3): a South RNG site; a North RNG site; a Gas POR site; an underground pipeline connecting the three sites to convey LFG and processed gas; and an underground pipeline interconnection between the POR site and the SoCal Gas main pipeline in Temescal Canyon Road. The project components are discussed next.

RNG Components

South RNG Site

The South RNG site would be an approximately 0.3-acre area adjacent to El Sobrante Landfill's two existing LFG flares (flare station). The 0.3-acre area currently contains three concrete pads that were used previously for co-gen power generation; these existing concrete pads would be removed and replaced with concrete specifically designed for the equipment to be used at the site. The South RNG site location is part of a larger graded area that is associated with the existing landfill entry and scales.

The RNG process would begin at the South RNG site through interception of LFG by tapping into the discharge manifold header piping before the gas is burned at the existing flare station. The diverted, raw LFG would be conveyed to the North RNG site using a 30-inch-diameter pipe, which would be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road. The North RNG site would treat the LFG that meets minimum specifications for processing; LFG that does not meet minimum specifications would be returned within a separate pipe (LFG reject line) in the same pipe trench back to the South RNG site.

After the initial treatment process at the North RNG site, the partially treated gas would sent via another pipe in the pipe trench to be refined at the South RNG Site (i.e., final nitrogen removal) sufficient to meet SoCal Gas specifications.. It then would be diverted via a sales gas compressor to a dedicated underground sales gas main, to be placed within an underground pipe trench within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road and sent southward to the Gas POR site. Waste gas from the refining process would be sent via another pipe in the pipe trench to be refined at the South RNG Site (i.e., final nitrogen removal) sufficient to meet SoCal Gas specifications. Ancillary equipment to be located at the South RNG site would include sales gas compressors, nitrogen rejection units, condensate treatment equipment, gas coolers, various tanks, transformers/switch gear, and a utilities building. The South RNG site also would include an approximately 3,200-square-foot maintenance and office building, which would be used as an equipment control center as well as for routine equipment maintenance, required for the RNG Facility (e.g., instrument repair/swap out, inspections, oil and filter parts for changes). For vehicle access to, and parking at, the South RNG site, a 25-foot-wide access easement would be dedicated between the proposed equipment and structures and the flare station. Building and equipment heights at the South RNG site typically would range between 5 and 12 feet above ground surface, but the housing for the nitrogen rejection units would be 80 feet above ground surface.

North RNG Site

The North RNG site would be an approximately 1.2-acre area on an existing graded landfill pad, approximately 0.5 mile north of the South RNG site. This pad currently contains the landfill's former maintenance shop, a trailer, a concrete pad, a 40,000-gallon reclaimed water storage tank, and potable water booster tanks. The North RNG site is where initial treatment/refining of the LFG would occur and is referred to herein as the "RNG Facility." The RNG Facility would use the existing concrete pads when and where available but would require removal of the existing canopy structure of the former maintenance facility and the existing trailer. The existing water storage tank and potable water booster tanks would be protected in place (i.e., these tanks would not be part of the 1.2-acre RNG Facility). The RNG Facility would consist of various equipment on separate concrete pads with, above, and below ground pipe connections. This equipment would include scrubbers, blowers, coolers, LFG compressors, absorbers, strippers, oxidizers, exchangers, filters, tanks, amine treatment, utilities building, and a motor control center building, etc., with heights ranging from 5 to 80 feet above ground surface. The RNG Facility would be bordered by 12-foot-high fencing with colored slats (to match the adjacent natural terrain), with sound-attenuating drapes on the inside of the fence.

Once the gas has met certain carbon dioxide, hydrogen sulfide, volatile organic compounds, and moisture concentrations, it would be diverted via the amine treatment unit back to the South RNG site for final nitrogen removal and compression into a 6-inch-diameter sales gas main, to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road between the South RNG and Gas POR sites.

Gas POR Site

The RNG process would conclude at the 0.2-acre Gas POR site in the southwest portion of the El Sobrante Landfill, within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection. A temporarily closed Temescal Driving Range is to the north, and a potential future Temescal Valley Commercial Center development area is south (across Dawson Canyon Road) of the Gas POR site. The 6-inch-diameter sales gas RNG main would be brought to the POR underground via horizontal directional drilling (HDD) drilling beneath Temescal Canyon Wash and brought to grade/connected within the fence-enclosed POR. SoCal Gas would have various pieces of equipment to receive the RNG (including a gas analyzer, gas odorant equipment, electrical equipment) that would be housed within shelters or canopies. Equipment at the POR would be supported on concrete slabs, to be placed above 3- to 5-feet of over excavation of the existing on-site soils. The overall POR facility would be on a raised fill pad so that it would be 1 foot above the base flood elevation. An approximately 3-foot-high masonry retaining wall would support the fill on its southern side, between Dawson Canyon Road and an internal POR access road/driveway. The entire POR facility would be surrounded by 6-foot-high decorative fencing. It would be installed, owned, and maintained by SoCal Gas.

Underground Piping

Between the South RNG Site and North RNG Site an approximate 5-foot-8-inch wide by 8.5-foot-deep pipe trench, approximately 3,700 linear feet in length, would be installed via open cut trenching within the existing pavement or shoulder of the landfill access road. This pipe trench would house six separate lines: a 30-inch, high-density polyethylene (HDPE) LFG supply line to send raw LFG to the RNG plant; a 6-inch FlexSteel line to send partially treated gas from North RNG Site to the exchanger at the South RNG Site for semi-treatment; a 12-inch HDPE line to send partially treated waste gas from the South RNG Site to the recuperative oxidizer at the North Site for further treatment and release; a 4-inch HDPE fuel gas line to service the recuperative oxidizer and amine heater at the North RNG Site; a 20-inch HDPE LFG reject line from the North to South site to the existing flare station; and a 2-inch HDPE condensate line.

Between the South RNG Site and the north side of Temescal Canyon Wash (opposite the Gas POR Site) an approximate 4-foot-wide by 5-foot-deep pipe trench, approximately 6,700 linear feet in length, would be installed via open cut trenching (within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road). This pipe trench would house four separate lines: a 6-inch FlexSteel sales gas main delivering RNG to the POR; a 4-inch HDPE reject gas line for rejected gas from the POR back to South RNG Site; a 4-inch HDPE fuel gas line (from a service meter tap near the POR) to the North RNG Site; and a 2-inch treated condensate line from the South RNG Site to a manhole at the Dawson Canyon Road Bridge.

Underground piping would then be accomplished via HDD boring to cross beneath, and avoid disturbance of, Temescal Canyon Wash. Two bores of approximately 500 linear feet, one for the 6-inch sales gas main and one for the two 4-inch lines (fuel gas and rejected gas lines), would be drilled beneath the wash with minimum depths of 20-foot below the surface at the center of the wash.

SoCal Gas Pipeline Interconnection

The RNG will ultimately be delivered to SoCal Gas' main pipeline located underground in the public right-of-way within Temescal Canyon Road, approximately 600 linear feet southwest from the POR. This would require approximately 600 feet of trenching performed by SoCal Gas within Dawson Canyon Road (between the Gas POR Site and existing SoCal Gas main pipeline) to install an underground pipeline interconnection between the POR and existing main pipeline.

Construction and Operation Details

Construction

Project construction is anticipated to begin in October 2024 and take approximately 18 months to complete (with completion anticipated in February 2026). A crew of approximately 6 to 12 construction workers (daily) would be in the project area during construction. Temporary construction staging areas adjacent to Dawson Canyon Road (approximately 0.6 acre), about 500 feet northeast of the Dawson Canyon Road Bridge over Temescal Canyon Wash at the South RNG site (approximately 0.08 acre), and at the North RNG site (approximately 0.07 acre) would be used for equipment staging and laydown. All three sites would have materials (e.g., demolition and soil) stockpiled on a short-term basis. Any excess material requiring disposal would use El Sobrante Landfill. Temporary lane closures would occur along the landfill access road/Dawson Canyon Road; however, access to El Sobrante Landfill would be maintained for normal landfill operations throughout the construction period, with the use of construction flaggers (e.g., during trenching in roadways).

Construction activities would include grading, trenching, horizontal directional drilling, import of construction materials (i.e., asphalt concrete, aggregate base, decomposed granite, and fill material), soil compaction, equipment installations, building construction, etc. Major equipment to be used during construction includes, but it not limited to: backhoe, boom truck, concrete pump rig, crane, dozer, excavator, skid loader, vibratory compacter/roller, generator, loader, motor grader, paving machine, roller, sheeps foot, dump truck, flatbed truck, oil/lube truck, pickup truck, water truck, 18-wheel low boy, fuel truck, horizontal directional drill, Redi-Mix truck, etc.

The total construction-related disturbance footprint for the proposed project, both permanent and temporary, would cover approximately 5.5 acres.

Operation

The proposed project would be sized to process up to 15,000 standard cubic feet per minute of LFG, which would translate to a maximum RNG output of 8,600 million British thermal units (BTUs) per day. Operation of the RNG Facility would require the use of fuel gas for heating certain refining/treatment equipment at the North RNG Site. Waste gas from the treatment/refining process would be directed to the recuperative oxidizer for further treatment and release (with less overall methane [emissions] in it than flared LFG). The proposed project does not increase the production of LFG at El Sobrante Landfill, but would reduce the overall amount of LFG that is flared.

Toro expects to hire seven full-time employees and up to three part-time employees for operation of the RNG Facility. Regular deliveries of materials (e.g., oil, chemicals, spare parts such as filters) are expected to require one truck trip per week. Infrequent maintenance truck trips (limited to emergency instrument repairs/swap outs, inspections, and other maintenance needs such as oil changes) would require up to seven vehicle trips spanning up to 10 calendar days a year.

Toro and WM are separate corporate entities; therefore, the RNG Facility and El Sobrante Landfill are owned and operated independently. Each source would maintain separate permits and reporting.

Project Personnel

AECOM staff who meet the Secretary of the Interior’s Professional Qualification Standards in Archaeology and Architectural History prepared this study. The archaeological component of this technical study was prepared by Archaeologist Allison Hill, M.A., RPA, who also conducted the field survey. Architectural Historian Monica Wilson conducted a review of built environmental resources and contributed to the report. Stephanie Jow, M.A., RPA and Andy York, PhD, RPA provided project oversight and quality review of the report. Geographic Information System and report mapping support was provided by Alec Stevenson, M.A., RPA.

Project Setting

Regulatory Setting

This proposed project would be subject to local and State regulatory compliance. This section summarizes applicable State and local regulations, statutes, and ordinances.

State Regulations

California Environmental Quality Act, Public Resources Code Sections 21000 et seq.

CEQA is intended to prevent significant avoidable impacts on the environment by requiring feasible alternatives or mitigation measures. If cultural resources are identified within a project's Area of Potential Effects, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the cultural resource.

The CEQA Guidelines, under Title 14, Section 15000 et seq. of the California Code of Regulations (CCR), are administrative regulations governing CEQA implementation and reflect the requirements set forth in the Public Resources Code (PRC). The CEQA Guidelines (Title 14, CCR Section 15064.5[a]) define a "historical resource" as the following:

1. California properties formally determined eligible for, or listed in, the California Register of Historical Resources (CRHR).
2. Those resources included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC, or identified as significant in a historical resources survey meeting the requirements of Section 5024.1(g) of the PRC.
3. Those resources that a lead agency determines to be historically significant, provided the determination is based on substantial evidence.
4. Resources not listed in or previously determined eligible for listing in the State or local registers but determined by a lead agency as historical resources as defined in Section 5020.1(j) or Section 5024.1 of the PRC.

CEQA also requires lead agencies to consider whether a project will have an impact on "unique archaeological resources." Section 21083.2(g) of the PRC defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, a high probability exists that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

A cultural resource is considered to be a "historical resource" under CEQA if the resource meets the criteria for listing in the CRHR (PRC Section 5024.1; Title 14 CCR Section 4852). The CRHR was designed to be used by State and local agencies, private groups, and citizens to identify existing historical resources within the state, and to indicate which of those resources should be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR consists of properties that are listed automatically as well as those that must be nominated through an application and public hearing process. Properties eligible for listing in the CRHR may include buildings, sites, structures, objects, and historic districts. Some properties may not retain sufficient integrity to meet the criteria for listing in the NRHP, but they still may be eligible for listing in the CRHR. An altered property still may have sufficient integrity for listing in the CRHR if it maintains the potential to yield significant scientific or historical information or specific data (CCR Section 4852 [c]). To be eligible for listing in the CRHR, a resource must be at least 45 years of age and possess significance at the local, State, or national level, under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.
2. It is associated with the lives of persons important to local, California, or national history.
3. It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values.
4. It has yielded or has the potential to yield information important in the prehistory or history of the local area, California, or the nation.

A resource less than 45 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand its historic importance. Although the enabling legislation for the CRHR is less rigorous with regard to the issue of integrity, the expectation is that properties reflect their appearance during their period of significance (PRC Section 4852).

Assembly Bill 52

Assembly Bill (AB) 52, enacted in September 2014, established a new class of resources under CEQA: tribal cultural resources. This bill provides a new definition of cultural resource, tribal cultural resource, which is separate from the definitions for “historical resource” and “archaeological resource.” A tribal cultural resource is defined as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe. AB 52 also provides both federal and non-federally recognized tribes with the right to formal consultation with project lead agencies (PRC Section 21080.3.2[a]).

The certified 1998 EIR/2009 SEIR for the El Sobrante Landfill, under which the proposed project is being conducted, were completed before establishment of AB 52, and thus AB 52 would not apply to the proposed project. Though the proposed project would not be subject to AB 52, tribal input would be sought as a best practice measure to address potential impacts on any potential cultural resources in the project area.

Public Resources Code Sections 5097.99, 5097.991

These sections establish that it is a felony to obtain or possess Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions. They also mandate that the policy of the State of California is to repatriate Native American remains and associated grave goods.

Public Resources Code Section 21084.1

This section sets forth that a project which may cause a significant adverse change in a significant historical resource is a project that may be considered to have adverse effects on the environment. Historical resources not listed in the CRHR or other local lists still may be considered historical resources at the discretion of a project’s lead agency.

Health and Safety Code Sections 7050.5, 7051, and 7052

This code establishes that any person who knowingly mutilates, disinters, wantonly disturbs, or willfully removes any human remains in or from any location without authority of the law is guilty of a misdemeanor. It further defines procedures for the discovery and treatment of Native American remains.

Health and Safety Code Sections 8010–8011

This code is intended to provide consistent State policy, to ensure that all California Indian human remains and cultural materials are treated with dignity and respect. The code extends policy coverage to non-federally recognized tribes, as well as to federally recognized groups.

Local Regulations

The Riverside County General Plan initially was developed in 1987 and has been revised since, more than 300 times (Riverside County 2024). The Multipurpose Open Space (MPOS) Element was adopted in October 2008 and outlines the County's intentions for protecting cultural and archaeological resources. The cultural and paleontological sections MPOS was amended in 2011, and the full MSOP was amended in 2015 (Riverside County 2015). The relevant goals and policies listed in the Riverside County General Plan Multipurpose Open Space Element include the following:

OS 19.1. Cultural resources (both prehistoric and historic) are a valued part of the history of the County of Riverside.

OS 19.2. The County of Riverside shall establish a Cultural Resources Program in consultation with Tribes and the professional cultural resources consulting community that, at a minimum would address each of the following: application of the Cultural Resources Program to projects subject to environmental review; government-to-government consultation; application processing requirements; information database(s); confidentiality of site locations; content and review of technical studies; professional consultant qualifications and requirements; site monitoring; examples of preservation and mitigation techniques and methods; curation and the descendant community consultation requirements of local, state and federal law.

OS 19.3. Review proposed development for the possibility of cultural resources and for compliance with the cultural resources program.

OS 19.4. To the extent feasible, designate as open space and allocate resources and/or tax credits to prioritize the protection of cultural resources preserved in place or left in an undisturbed state.

OS 19.5. Exercise sensitivity and respect for human remains from both prehistoric and historic time periods and comply with all applicable laws concerning such remains.

Natural Setting

Geology and Hydrology

The project area lies within the Peninsular Ranges geomorphologic province. The Peninsular Ranges run predominantly north-south. Rocks in the ranges are dominated by Mesozoic granitic rocks, derived from the same massive batholith that forms the core of the Sierra Nevada in California. Within the province, it lies on the Perris Block, separated from the backside of the Santa Ana Mountains by the Elsinore Fault. The project footprint lies on the east half of Temescal Valley. The Older Alluvium was deposited in the area by streams. Older Alluvium manifested as a broad, gently sloping apron at the foot of the Santa Ana Mountains. Locally, this apron forms such a slope, stretching from just north of Elsinore to almost Corona. Temescal Wash truncates and is incised into the northeast edge of this apron.

The project area is within the Santa Ana Hydrologic Basin, which discharges into the Santa Ana River. Within the Santa Ana Basin is the Bedford Hydrologic Subarea of the Lake Mathews Hydrologic Area. The project area is east of Temescal Wash, and several perennial drainages that feed into the wash are present along the surrounding canyons in the foothills where the project area is situated.

Climate

Temescal Valley lies across three ecoregions, which include, from west to east, the Santa Ana Mountains, Inland Valleys, and Indland Hills (Plantmaps 2024). The west side of Temescal Valley is comprised of the Santa Ana Mountains ecoregion, consisting of steep mountains with narrow canyons and narrow to rounded summits. The elevations range from about 700 to 5,687 feet at Santiago Peak. Annual precipitation is estimated at 14 to 24 inches, which is greater than in the adjacent lower elevation ecoregions. The region generally is hotter and drier on the inland side.

The Inland Valleys ecoregion is south of the San Gabriel and San Bernardino mountains and consists of alluvial fans and basin floors, and some floodplains along the Santa Ana River. The ecoregion now is heavily urbanized. A few areas of pasture or cropland persist. The Inland Hills ecoregion is in a hotter and drier environment than the coastal hills to the west and comprises the eastern edge of Temescal Valley. It consists of moderately steep slopes, with elevations between 1,000 and 3,000 feet. The average annual rainfall ranges from 10 to 14 inches (Plantmaps 2024).

Flora and Fauna

Because of the variation of elevations in the region, plant communities can vary widely. In the more mountainous areas to the west, chamise chaparral, coastal sage scrub, coast live oak, and grasslands are present. Common trees include canyon live oak, bigcone Douglas-fir, and sparse Coulter pine are at high elevations. The inland valleys have Riversidean coastal sage scrub, valley grasslands, and riparian woodlands. Interior or riversidian sage scrub is more widespread than coastal sage scrub communities in the interior. Grasslands and chapparal are present across Temescal Valley (Plantmaps 2024). Plants found across these vegetation habitats include buckwheat, white sage, and scrub grasses, Laurel sumac, cholla, beavertail cactus, juniper, and small willows (Salpas 1984).

Mammals in western Riverside County include bobcat, mountain lion, weasel, kangaroo rat, mice, squirrels, jackrabbits, and woodrats. A variety of bird species are present in the region, including burrowing owl and other owl species, Cactus wren, gnatcatchers, golden eagle, sparrows, and Least Bell's vireo. Several reptiles and amphibians are found, including different types of frogs, toads, lizards, and snakes (CDFW 2023).

Cultural Setting

As a framework for discussing the types of cultural resources that may be encountered during project implementation, the following section summarizes the current understanding of major developments of inland coastal Southern California from the time before the arrival of Europeans, known as the precontact or prehistoric period, through the historic period.

Precontact Overview

People are known to have inhabited southern California beginning at least 13,000 years Before Present (B.P.) (Arnold et al. 2004), sometimes referred to as the Paleo-Indian period. The limited evidence of Paleo-Indian hunting technology observed in the California archaeological record and the more recent identification of early sites along the Pacific Coast of the U.S. suggest that the earliest people to colonize California likely arrived along the shores and settled into these rich coastal environments (Erlandson et al. 2007; Willis and Des Lauriers 2011). In the Southern California coastal region, the earliest evidence of human occupation comes from a handful of sites where early tools and some human remains have been identified, dating from 7,000 to around 13,000 years ago (Erlandson 2012:21; Erlandson and Braje 2022). Traditional theory contends that the earliest humans to occupy California were highly mobile hunters and gatherers, people termed Paleoindians. Assemblages of the Paleoindian Period (ca. 12,000–7,000 BP) are suggested to be divided into a Fluted Point tradition (12,000–10,000 BP) and a Western Pluvial Lakes Tradition (10,000–7,000 BP). Although several fluted points have been recovered on the shoreline of Lake Mojave, far northeast of the project area, none have been documented in the project vicinity (Bettinger and Taylor 1974; Davis 1978; Basgall and Hall 1992, 1994; Erlandson et al. 2007; Sutton 1996; Beck and Jones 1997:163-164; Rondeau and Taylor 2007; Rondeau et al. 2007; Rondeau 2009).

Based on dates derived from excavations at sites near Lake Perris (Perris Reservoir), approximately 20 miles east of the project area, and Diamond Valley Lake (Eastside Reservoir), approximately 16 miles northeast of the project area, human occupation of the project area and vicinity appears to have begun approximately 9,000 B.P. and is associated with a period known as the Millingstone Cultural Horizon (Wallace 1955; Warren 1968). Millingstone populations established permanent settlements that were located primarily on the coast and in the vicinity of estuaries, lagoons, lakes, streams, and marshes where a variety of resources, including seeds, fish, shellfish, small mammals, and birds, were exploited. Early Millingstone occupations are typically identified by the presence of handstones (manos) and millingstones (metates), while those Millingstone occupations dating later than 5000 B.P. often contain a mortar and pestle complex as well, signifying the exploitation of acorns in the region.

Although many aspects of Millingstone culture persisted, by 3500 B.P., a number of socioeconomic changes occurred (Erlandson 1994; Wallace 1955; Warren 1968) that are associated with the period known as the Intermediate Horizon (Wallace 1955). Increasing population size necessitated the intensification of existing terrestrial and marine resources (Erlandson 1994). This intensification was accomplished in part through use of new technological innovations such as the circular shell fishhook on the coast, and in inland areas, use of the mortar and pestle to process an important new vegetal food staple, acorns; and the dart and atlatl resulting in a more diverse hunting capability. Evidence for shifts in settlement patterns has been noted as well at a variety of locations at this time and is seen by many researchers as reflecting increasingly territorial and sedentary populations. The Intermediate Horizon marks a period in which specialization in labor emerged, trading networks became an increasingly important means by which both utilitarian and non-utilitarian materials were acquired, and travel routes were extended.

The Late Prehistoric period, spanning from approximately 1500 years B.P. to the Spanish mission era, is the period associated with the florescence of contemporary Native American groups. Pre-contact subsistence consisted of hunting, fishing, and gathering. Small terrestrial game was hunted with deadfalls, rabbit drives, and by burning undergrowth, while larger game such as deer were hunted using bows and arrows. Fish were taken by hook and line, nets, traps, spears, and poison (Bean and Smith 1978; Reid 1939 [1852]). The primary plant resources were the acorn, gathered in the fall and processed with mortars and pestles, and various seeds that were harvested in late spring and summer and ground with manos and metates. The seeds included chia and other sages, various grasses, and islay or holly-leafed cherry (Reid 1939 [1852]).

Ethnographic Context

What is now western Riverside County was inhabited by a number of ethnographically distinct tribes who spoke languages of the Takic branch of the Uto-Aztecan language family. including the Luiseño, Gabrielino, Juaneño, and Cahuilla and Serrano. Temescal Valley likely was visited and used by many of these distinct cultural groups through time and makes up part of the traditional use area of the Luiseño, Juaneño, and Gabrielino people (Figure 4). The names for these groups are based on their associations, post European contact, with Mission San Juan Capistrano, Mission San Luis Rey, or Mission San Gabriel. The Juaneño were closely related to the Luiseño (Bean and Shipek 1978; White 1963).

At the time of European contact, the territory of the Luiseño/Juaneño extended from the southern Orange County area, east into Riverside County, and south into northern San Diego County, while the Gabrielino occupied a larger territory including the entire Los Angeles Basin and beyond. This territory extended along the Pacific coast from Aliso Creek to Malibu and included parts of the Santa Monica Mountains, the San Fernando Valley, the San Gabriel Valley, the San Bernardino Valley, a northern portion of the Santa Ana Mountains, and much of the middle to lower Santa Ana River basin, as well as the islands of Santa Catalina, San Clemente, and San Nicolas (Kroeber 1976; Bean and Smith 1978). Their settlement patterns included seasonally based, permanent base camps with associated task-oriented sites. Acorns from a variety of oak species were one of the most heavily used plant foods, while a variety of waterfowl, fish, mollusks, and mammals also were exploited (Bean and Smith 1978; Bean and Shipek 1978).

Technology was based on flaked stone projectile points, scrapers, choppers, and drills, as well as on bedrock mortars, groundstone milling stones, handstones, mortars, and pestles. Other major tools included the bow and arrow, wooden throwing sticks, traps, nets, burden baskets, carrying nets, and a small number of ceramic forms that generally were undecorated. The Gabrielino also manufactured and traded soapstone items. Houses were mainly conical, partially subterranean, and thatched with reeds, bark, or various other forms of local vegetation. Near such dwellings usually stood brush-covered ramadas, under which domestic chores were done, and each village had several granaries. A round, partially subterranean, earth-covered sweat lodge also was a common structure in settlements, as were various other ceremonial structures (Bean and Smith 1978; Bean and Shipek 1978; McCawley 1996).

AECOM

Waste Management National Services, Inc.

Renewable Natural Gas (RNG) Facility Project

PROJECT: 60723843

FIGURE 4

Cultural Resources - Ethnographic Map

Figure 4. Ethnographic Territories

At the time of prolonged contact with Euroamericans in the late 1700s, the Luiseño/Juaneño population may have been as large as 10,000. Population estimates for the Gabrielino during this period are scant, although upwards of 5,000 Gabrielino may have been present immediately before Spanish contact. However, initial contacts with Europeans quickly led to the deterioration of traditional ways of life. This process began with the introduction of diseases to which the natives had no immunity, resulting in severe population reductions (Bean and Smith 1978; Bean and Shipek 1978). The introduction of Christianity into Native culture also represented a substantial change in the social fabric. Although natives who were affiliated with the Missions were encouraged to maintain their own settlements and subsistence practices, agriculture was introduced, including the raising of certain European grain staples like wheat, oats, and barley (Bean and Shipek 1978).

When the missions were secularized in 1834 by the Mexican government, many of the native people were forced to work on Mexican ranchos, although those living further from the ranchos maintained their traditional lifestyles longer. After California became a part of the U.S., homesteading increased, and many of the areas traditionally used by Native Americans for hunting and gathering were fenced for ranches and farms. Federal Indian reservations were established in the 1870s, to offset this encroachment, but instead many natives were forced to adopt a more sedentary lifestyle based on Anglo economics as an alternative to moving to reservations (Bean and Shipek 1978).

Several Gabrielino or Luiseno placenames have been documented around Corona and Temescal Valley near the project area. The Corona area was called Siisovet or Shiishonga, although a similar placename has been assigned to Azusa. According to ethnographer and archaeologist Alfred Kroeber, the village of PaXávXanga was on Temescal Creek. Native informant José Zalvidea indicated that this villages was below Pamajam, a Gabrielino place in the Santa Ana Mountains meaning piece of mountain (McCawley 1996:49).

Historic Context

The Spanish Period (1769–1821) represented a period of Euroamerican exploration and colonization. Dual military and religious contingents led by Father Junipero Serra and Gaspar de Portola established the San Diego Presidio and the San Diego Mission in 1769. The Spanish then began to establish Franciscan missions (e.g., San Fernando, San Buenaventura, San Gabriel) along the California coast (Parker et al. 2004:9).

The Mexican empire gained independence and formed what would become the state of Alta California in 1821. The authority of the California missions gradually declined, culminating with their secularization in 1834. Although the Mexican government directed that each mission's lands, livestock, and equipment be divided among its converts, the majority of these holdings quickly fell into non-Indigenous hands. Mission buildings were abandoned and quickly fell into decay. If mission life was difficult for Native Americans, secularization typically was worse. After two generations of dependence on the missions, they were suddenly disenfranchised.

The first party of U.S. immigrants arrived in Los Angeles in 1841, although surreptitious commerce previously had been conducted between Mexican California and residents of the U.S. and its territories. As the possibility of a takeover of California by the U.S. loomed large, the Mexican government increased the number of land grants in an effort to keep the land in the hands of upper-class Californios like the Domínguez, Lugo, and Sepúlveda families (Wilkman and Wilkman 2006:14–17). Governor Pío Pico and his predecessors made more than 600 rancho grants between 1833 and 1846, putting most of the State's lands into private ownership for the first time (Gumprecht 1999).

The U.S. took control of California after the Mexican–American War of 1846, and seized Monterey, San Francisco, San Diego, and Los Angeles (then the State capital) with little resistance. Local unrest soon bubbled to the surface, however, and Los Angeles slipped from U.S. control in 1847. Hostilities officially ended with the signing of the Treaty of Guadalupe Hidalgo in 1848, in which the U.S. agreed to pay Mexico $15 million for the conquered territory, which included California, Nevada, and Utah, and parts of Colorado, Arizona, New Mexico, and Wyoming. The conquered territory represented nearly half of Mexico's pre-1846 holdings. California joined the U.S. in 1850 as the 31st state (Wilkman and Wilkman 2006:15).

Dawson Canyon and Cajalco Canyon

The project area is within Dawson Canyon, in the Temescal Valley and mountain range, and is south of Lake Mathews Reservoir (originally Cajalco Reservoir). Dawson Canyon is within the boundaries of the former Rancho San Jacinto Sobrante and Rancho Temescal; both of which had unclear and disputed borders. Originally named, El Sobrante de San Jacinto, the Rancho San Jacinto Sobrante was a land grant owned by Maria del Rosario Estudillo de Aguirre and her husband, José Antonio Aguirre in 1846, that was patented in 1867. Leandro Serrano took possession of Rancho Temescal in 1818. His widow, Josefa Montalva de Serrano attempted to patent the land grant in 1852 with the U.S. Public Land Commission. However, the claim was rejected after many appeals. By 1875, most of Rancho Temescal had been purchased and divided by land speculators.

In 1857, Temescal Station was established as a stop along the Butterfield Overland Stage route, which followed Temescal Canyon Road between Corona and Lake Elsinore. Daniel Sexton is credited with discovering tin in Temescal in 1858, after following advice from his father-in-law, Chief Solano, who indicated the location was an area rich in metal that was used as a medicine by the Indians (Lech 2015). The discovery of tin was a rare mineral resource in California, as most of the tin used in North America had to be imported from Wales (Lech 2015). Sexton and Fenton S. Slaughter of the Yorba/Slaughter Adobe quickly sold their holdings of the property, and later the San Jacinto Tin Company took over the Temescal Tin Mine (later Cajalco Tin Mine) (Plate 1). However, tin mining operations were brief and ended by the late 1890s. The tin mines were reopened briefly in 1927, but were closed because of the Great Depression in 1929; and were reopened between 1942 and 1945, to supply the military (Dever and Whitson 2007). Aside from tin mining, several gold mines also operated in the vicinity, including the Good Hope, Gavilan, and Santa Rosa mines (Sampson 1935).

Source: Lech 2015

Plate 1. View of Temescal Tin Mines circa 1890

Riverside County was formed in 1893 and included land consolidations from San Bernardino County, including Gavilan, Corona, Rincon, Alessandro, Moreno, Beaumont; and from San Diego County including Menifee, Perris, Murrieta, Winchester, Elsinore, Wildomar, Temecula, San Jacinto, Hemet, Aguanga, Palm Springs, part of Banning, and other Coachella Valley communities (Dever and Whitson 2007). The term "Cahalco" was used by Sexton to describe the area as "Medicine Hill," and the Los Angeles Star referred to it as "Cajalco" in 1861 (Dever and Whitson 2007). Neither Cahalco, Cajalco, or other versions of this name are claimed by Native American tribes in the area, and some people have speculated that this was merely Sexton's version of a Native American word (Dever and Whitson 2007). Daniel Jay Dawson purchased 160 acres of land in the Cajalco/Temescal area in 1905 and renamed it Dawson Canyon (Holmes 1912). Dawson was born in Leavenworth, Kansas in 1867 and later moved to San Bernardino, California. He served as the Postmaster for Temescal and was a successful rancher and apiarist who shipped his honey all over the world (Holmes 1912). In the 1920s, Lawrence Holmes Sr. purchased land in Cajalco Canyon, north of Dawson Canyon. There, he cultivated carob orchards, but quickly fell into an extensive eminent domain property battle with the Metropolitan Water Department (MET) over development of a reservoir. The MET eventually secured the land and constructed the dam in 1939, and began water diversions into the reservoir in 1941 (Mathews 2018) (Plate 2). The reservoir is the terminus of the aqueduct from the Colorado River. Temescal Canyon Road and Cajalco Canyon Road (Cajalco Road) were paved in the 1930s as part of construction of the Cajalco Reservoir. The reservoir was renamed Lake Mathews in 1940, after William Burgess Mathews, the attorney who drafted the laws creating both the Hoover Dam and MET (WEF n.d.). The 13,000 acres surrounding the reservoir were established as the Lake Mathews Estelle Mountain Reserve in 1982 (WEF n.d.).

Source: Field 1941

Plate 2. View of Lake Mathews in 1941

El Sobrante Landfill

The California Waste Management Board approved the El Sobrante Landfill in 1985, to replace the East Corona Landfill, which was at capacity and subsequently closed in 1986 (LAT 1985a, 1985b). El Sobrante Landfill in Dawson Canyon was opened in 1986, and was developed and managed by Western Waste Industries Inc. (later Western Waste Management). The landfill was the first site to be developed under the new water quality laws that were passed in the early 1980s, which provided for stricter controls for protecting groundwater supplies (LAT 1985a). The Owl Rock Quarry northwest of the site near the Prado Dam also was considered for development as a landfill to supplement El Sobrante. However, the quarry included a tailing pond that was used for wastewater collection from sand and gravel operations, posing groundwater contamination risks. Therefore, the Dawson Canyon site was the only location selected. The landfill was expanded from 8 million tons to 100 million tons in 1996 (The Californian 1996).

Archival Research

As part of this cultural resources assessment, archival research was conducted to identify known cultural resources in the project area, to provide a context for evaluation of cultural resources that are 45 years old or older, and to inform interpretations regarding the potential to encounter previously unidentified cultural resources in the course of ground-disturbing work associated with the project. The archival research included a records search at the Eastern Information Center (EIC) and a review of the California Office of Historic Preservation's Historic Resources Inventory in the Built Environment Resource Directory, local cultural resource registers, and historical aerial photographs and maps. Supplemental research also was conducted to provide prehistoric and historic contexts for project area use.

Records Search

A records search of the project area and a 0.5-mile radius was conducted at the EIC, at the University of California, Riverside on February 28, 2024, to provide background information pertaining to previously conducted cultural resources investigations and site records for previously recorded archaeological and built environment resources (Appendix A).

Previous Cultural Resource Investigations

A total of 41 previous cultural resources investigations that were documented at the EIC have been conducted within a 0.5-mile radius of the project area (Table 1). Approximately 50 percent of the project area and 70 percent of the records search area have been subject to previous studies, according to reports on file at the South Central Coastal Information Center.

These investigations included 19 archaeological survey reports/assessments, five environmental impact evaluations, two archaeological studies identified for Environmental Impact Reports, and a handful of other report types, including a rock art study, monitoring report, preliminary cultural resource assessment, one report containing an archaeological and paleontological survey report, an archaeological testing program, and an evaluation of historical properties, an archaeological historic evaluation report, a Phase I archaeological and paleontological survey report, a records search and site visit letter report, and a cultural resources inventory report.

Of these 41 previous cultural resources investigations, nine overlap the project area (Table 1). Studies RI-1877, 1878, 1879, 1880, 3306, and 4466 encompass the northern end of the project area and generally are associated with previous work that has been conducted on the El Sobrante Landfill property. The remaining studies, RI-1949, 2270, and 1479 appear to bisect the southern end of the project area and generally are unrelated to the landfill. The middle third of the project area has not been subject to previous studies.

Four additional investigations on the El Sobrante Landfill were provided by WM to AECOM for review. These are shown at the bottom of Table 1 and include environmental impact reports, a paleontological survey report, and an archaeological survey report.

Table 1. Previous Investigations Conducted within 0.5 Mile of the Project Area

Author	Report #	Description	Date
Tadlock, Jean and W. Lewis Tadlock	RI-00281	Archaeological Element of an Environmental Impact Report, Leighton Project No. 77023-1, (Tallichet-Hurford Ranch)	1977
Dover, Christopher E.	RI-00282	Environmental Impact Evaluation: A Reassessment of Cultural Resources for Tentative Parcel Map 22328, Riverside, California	1987
Brewer, Christina	RI-00336	An Archaeological Survey of Parcel Nos. 1, 2, and 3 on Parcel Map 11561, Riverside County, California	1978
Rosenthal, Jane	RI-00337	Archaeological Assessment for Corona Clay Parcels 1, 2, and 3 Temescal Canyon Vicinity, Riverside County, California	1996

Author	Report #	Description	Date
Jenkins, Richard C.	RI-00875	Environmental Impact Evaluation: An Archaeological Assessment of Tentative Parcel 16228, Temecula Valley Area of Riverside County, California	1980
Swenson, James D.	RI-00926	Environmental Impact Evaluation: An Archaeological Assessment of Tentative Parcel 14993, Temescal Valley, Riverside County, California	1980
Momyer, George R.	RI-01035	Indian Picture Writing in Southern California	1937
Salpas, Jean A.	RI-01077	An Archaeological Assessment of 7.92 Acres in the Temescal Valley (Portion of Parcel 2, Parcel Map 7239)	1980
McCarthy, Daniel F.	RI-01238	Environmental Evaluation: An Archaeological Assessment Of a 9.9 ACRE Parcel of Land in Temescal Canyon, Riverside County, California.	1986
Schroth, Adella	RI-01479*	Archaeological Assessment of The Temescal Valley Project, County of Riverside, California	1982
Salpas, Jean	RI-01877*	An Archaeological Assessment of Proposed Class II Sanitary Landfill Site No. 8, Riverside County, California	1984
Drover, Christopher E.	RI-01878*	An Archaeological Assessment of The El Sobrante Landfill Expansion Temescal Canyon, Riverside County, California.	1990
Drover, Christopher E.	RI-01879*	Environmental Impact Evaluation: A Cultural Resources Assessment Of The 1100 Acre El Sobrante Landfill Project; Lake Mathews USGS Quadrangle, Riverside County, California	1991
Bergin, Kathleen	RI-01880*	Report: Reconnaissance Survey of Previously Recorded Sites - Proposed El Sobrante Landfill Expansion Project Area, Riverside County, California	1993
Bouscaren, Stephen	RI-01949*	Final Report: An Archaeological Assessment of The Proposed Valley-Serrano 500kV Transmission Line Corridor, Orange and Riverside Counties	1985
Hammond, Stephen R.	RI-01976	Archaeological Survey Report for the Proposed Widening of Interstate Route 15 between Glen Ivy Undercrossing and 0.4 mile South of Ontario Avenue 08-Riv-15, P.M. 33.3/38.3	1985
Drover, C.E.	RI-02270	An Archaeological Assessment of the Proposed Temescal Wash Sand and Gravel Mining Operation, Temescal Canyon, Riverside County, California	1988
Bergin, Kathleen A. and Randal P. Preston	RI-02650	Technical Report 3: Archaeological Research Report for the Temescal Canyon Composing Facility EIR, Riverside County, California. SCH #88100318	1989
Love, Bruce	RI-02651	Letter Report: Cultural Resources Monitoring, Temescal Canyon Composting Project	1991
McCarthy, Daniel	RI-02743	Archaeological Assessment of the Morger Property in Olsen Canyon in Temescal Valley, Riverside County, California	1990
Swope, Karen	RI-03175	Cultural Resources Assessment: Temescal Valley Project, Riverside County, California	1991
Freeman, Trevor A. and David M. Van Horn	RI-03306*	Archaeological Survey Report: Cultural Resource Assessment of the Seigal Farms Property Lake Mathews, Riverside County, California	1989
Love, Bruce And Bai “Tom” Tang	RI-04144	Cultural Resources Report: Temescal Valley Regional Interceptor, Santa Ana Watershed Project Authority, Riverside County, California	1998
Stickel, E. Gary	RI-04446	A Preliminary Cultural Resource Assessment of Properties in Temescal Valley, Riverside County, California	1987
Price, Harry J.	RI-04466*	Pre-Grading Archaeological Survey of El Sobrante Landfill Expansion, Phases VII and VIII and Significance Evaluation of Archaeological Site ES-1	2002
Hoover, Anna M., Kristie R. Blevins,	RI-04765	An Archaeological and Paleontological Phase I Survey, A Phase II Significance Testing Program, and a Historic Properties Evaluation	2004

Author	Report #	Description	Date
Hugh M. Wagner, and Stephen Van Wormer		Report, The Serrano Specific Plan (SSP), Case #441, Riverside County, California	
Hoover, Anna M. and Kristie R. Blevins	RI-04899	An Archaeological Historic Evaluation Report on Two Structures within APNs 283-140-004, and 006 through 010, 42-Acre Property, Riverside County, California	2005
Hoover, Anna M., Kristie R. Blevins, and Hugh M. Wagner	RI-04910	A Phase I Archaeological and Paleontological Survey Report, APNs 283-140-004, and 006 through 010, +42-Acre Property, Riverside County, California	2005
Bonner, Wayne and Marnie Aislin-Kay	RI-08145	Letter Report: Cultural Resource Records Search and Site Visit Results for American Tower Facility Candidate	2008
Sanka, Jennifer M. and Marnie Aislin-Kay	RI-08171	Cultural Resources Assessment Public Safety Enterprise Communication Project, Riverside, Orange, San Bernadino, and San Diego Counties, FM 04174400010	2008
Tang, Bai “Tom”	RI-08348	Historical/Archaeological Resources Survey for Lee Lake Water District Sewer Pipeline Project (Clay Canyon), Glen Ivy Area, Riverside County, California	2009
Schmidt, James J.	RI-08534	Letter Report: Deteriorated Pole Replacements Projects (WO 6088-4800; 0-4876, 0-4877, 0-4881, 0-4883.2010), Riverside County, California	2010
Sanka, Jennifer M. and William R. Gillean	RI-08585	Phase I Cultural Resources Assessment, Temescal Canyon Road Improvement Project, Corona Vicinity, Riverside County, California	2011
Cotterman, Cary D. and Evelyn N. Chandler	RI-08632	Cultural Resources Inventory of Seven Proposed Pole Replacements in Temescal Valley and Dawson Canyon, Riverside County, California (WO 6088-4800, AI 9-4812)	2009
Tang, Bai “Tom”, Deirdre Encarnacion, Terri Jacquemain, Daniel Ballester, and Nina Gallardo	RI-10302	Phase I Cultural Resources Assessment: Dawson Canyon Reclamation Plan-Corona Clay, CUP No. 03265, Temescal Valley Area, Riverside County, California	2017
Langenwalter II, Paul E.	--	A Paleontological Survey and Assessment of the Sobrante Landfill, Temescal Canyon, Riverside County, California	1991
Environmental Solutions, Inc.	--	Environmental Impact Report, El Sobrante Landfill Expansion	1994
Harding, Jeramy	--	Final Supplemental Environmental Impact Report; El Sobrante Landfill Solid Waste Facility Permit Revision	2009
Yerka, Nathaniel	--	Cultural Resources Update Survey for the El Sobrante Landfill	2016

Note:
* South Central Coastal Information Center Study in the Project Area

Previously Recorded Cultural Resources

The EIC records search identified 20 previously recorded cultural resources that were mapped within a 0.5-mile radius of the project area (Table 2). Sites in the records search area included two pictograph sites, one seasonal habitation site, one lithic and groundstone scatter, two lithic scatters, two bedrock milling sites, two lithic procurement and production sites, the original location of the Serrano tanning vats and the current reconstructed location, ruins of the third Serrano adobe, three isolated milling implements, two historic built environment residences, one abandoned railroad segment, and one clay mining site. One previously recorded cultural resource (P-33-003832), an abandoned railroad segment, is in the project area. In addition, one of the previously recorded pictograph sites (P-33-000078) is adjacent to the project area, within 30 meters. Both P-33-003832 and P-33-000078 are discussed in more detail below.

Table 2. Previously Recorded Resources within 0.5 Mile of the Project Area

Primary Number (P-33-)	Historic Name/Description	Time Period	NRHP/CRHR Status Code
000078	Secondary deposition boulder with eroded pictographs. The rock art boulder is designated California Historical Landmark 190 (CHL 190) and exhibits a 1927 plaque from the Corona Woman's Improvement Club.	Precontact	7L
001099	Seasonal habitation site with bedrock milling, groundstone tools, flaked stone artifacts, and shell. Site has been heavily impacted by years of development.	Precontact	7R
001148	Artifact scatter consisting of a basalt core, hammer fragment, one portable metate, and debitage comprised of quartzite, obsidian, chert, and basalt.	Precontact	7R
001725	Bedrock milling site featuring six milling slicks and one bedrock mortar. Originally recorded in 1979 and suggested as mis-mapped when an attempt to revisit the site was unsuccessful in 1985.	Precontact	7R
003531	Lithic procurement and production site with cores and flakes of on-site bedded, altered limestone from the Bedford Canyon Formation.	Precontact	7R
003532	Lithic procurement and production site with one bifacial core and flakes from a bedded altered course-grained limestone with calcite crystal inclusions.	Precontact	7R
003830	Weathered pictograph on a granitic boulder.	Precontact	7R
003831	Bedrock milling site consisting of one boulder with a single milling slick.	Precontact	7R
003832*	Original alignment of the Atchison, Topeka, and Santa Fe Railway.	Historic (1896–1970s)	6Y
004111	Serrano Tanning Vats (CHL 186). Reconstructed tanning vats belonging to Don Leandro Serrano and noted to have been constructed originally and operated by the Luiseño crew. Primary reconstruction undertaken by Boy Scouts in 1962, and secondary reconstruction by Billy Holcomb Chapter of E Clampus Vitus in 1981, at current location that is not associated with historical significance. This location marks the current location of the reconstructed vats.	Historic (circa 1819)	7L
006438	Serrano Tanning Vats (CHL 186). Original tanning vats belonging to Don Leandro Serrano and noted to have been constructed originally and operated by the Luiseño crew. Primary reconstruction undertaken by Boy Scouts in 1962, and secondary reconstruction by Billy Holcomb Chapter of E Clampus Vitus in 1981, at current location that is not associated with historical significance. This location marks the original location of the vats.	Historic (circa 1819)	5
006441	Ruins of Third Serrano Adobe (CHL 224). The original adobe ruins do not appear to be extant any longer, and a historical plaque for this resource is near P-33-004111, not near the original location.	Historic (circa 1867–1898)	7L
011089	Isolated granitic metate was encountered during construction monitoring	Precontact	6Z
011090	Isolated vesicular basalt pestle and granitic mano artifacts was observed during construction monitoring.	Precontact	6Z
011091	Isolated biface granitic mano fragment was observed during construction monitoring.	Precontact	6Z
014101	Single family residence.	1957	6Z
014102	Pump house on single family property.	circa 1952	6Z
025503	Low density lithic scatter consisting of porphyritic metavolcanic flakes and cores with a subsurface depth of 30 centimeters.	Precontact	7R
025504	Low density lithic scatter with a subsurface depth of 30 centimeters.	Precontact	7R
028055	Chute associated with clay mining operations.	circa 1917	6Z

Notes:
* Indicates resource is in the project area.

5 Properties recognized as historically significant by local government
6Y Determined ineligible for NR by consensus through Section 106 process; not evaluated for CR or local listing
6Z Found ineligible for NR, CR, or local designation
7L State Historical Landmarks 1-769 and Points of Historical Interest, designated prior to January 1998; needs to be re-evaluated using current standards
7R Identified in reconnaissance level survey; not evaluated

One previously recorded resource, the abandoned Atchison, Topeka, and Santa Fe Railway, was documented in the project area from this records search. A second site, a relocated boulder with pictographs was found to be within 30 meters of the project area. Both are summarized below.

P-33-003832

P-33-003832 (also known as Atchison, Topeka and Santa Fe Railway) is a historical railroad east of Temescal Canyon Road. The site has been recorded many times in different segments along the railway, but first was recorded in 1990 by Daniel F. McCarthy as consisting of remains of a power pole line, a railroad grade, and various metal and nails (McCarthy 1990). In 1996, a 22-mile-long stretch of the railroad was recorded, along with various artifacts consisting of railroad gravel, old tires, and other historical artifacts (Love and Tang 1996). Several other smaller portions of the alignment have been recorded or updated outside the project area and are appended to the original site record on file at the EIC.

The Atchison, Topeka and Santa Fe Railway between Lake Elsinore and Corona (P-33-003832) originally was constructed in 1896 to service coal and clay mines around Alberhill (Love and Tang 1996). In 1927, this line spur was modified to extend through Temescal Valley for reconstructing the Santa Fe Railroad's connection between Temecula and Riverside. This service ended in 1935, when the Santa Fe Railroad permanently discontinued service between Lake Elsinore and Temecula, and this included removing the tracks from the area. The remaining segment between Corona and Lake Elsinore remained active until the 1970s, when the entire segment was abandoned and removed (Love and Tang 1996).

The site was evaluated previously as not eligible for the NRHP because of loss of integrity (Love and Tang 1996), and subsequent recordings and assessments of the resource have supported the evaluation that the site does not retain sufficient integrity to be eligible for listing (Garrison 2020). The site does not appear to have been evaluated for eligibility for listing on the CRHR.

P-33-000078

Site P-33-000078 consists of a single metamorphic boulder with faint red pictographs, which was formally recorded first in 1935 (Gould 1935). This object of cultural importance to the Luiseno people of the region was located originally somewhere nearby but was displaced by the construction of the Atchison, Topeka and Santa Fe Railway (P-33-003832) in 1927. Documentation at the South Central Coastal Information Center indicates that Janet Williams Gould, Chairman of the History and Landmakrs Committee of the Woman's Improvement Club of Corona, intervened with the president of the road, presumably the Santa Fe Railroad, to prevent destruction of the rock art. The face of the boulder with paint was relocated and preserved in a concrete base adjacent to the railroad. The record goes on to state that the rock art was identified as belonging to the Luiseno people by Chief Lafio of Temecula, who indicated that it may represent a flood record, a map, an account of a fiesta, or other ceremonial purposes. Photos of the site before impacts from railroad construction indicate that a bedrock milling feature was at the base of the rock art boulder, which appears to have contained five mortars. What happened to the milling feature that originally was associated with the site is unclear.

Documentation of the site through the years indicates that the pictographs appear to be in increasingly poor condition because of graffiti, rock spalling, and the settling of dust on and weathering of the pictographs (McCarthy 1988). Although not documented in the project area at this time, site P-33-000078 is in close proximity to the project footprint and is noted as not being in its original location. The original location may have been in the project footprint.

California Historical Landmarks

Temescal Valley exhibits several California Historical Landmarks, three of which have been documented within 0.5 mile of the project area (Table 2). These include Serrano Tanning Vats (CHL 186), Painted Rock (CHL 190), and Ruins of Third Serrano Adobe (CHL 224). A California Historical Landmark plaque also has been erected for the Old Temescal Road (CHL 638), approximately 1.4 miles south of the project area. Although the marker itself is not within the records search buffer, it identifies Old Temesacal Road as a historical route, first used by Luiseno and Gabrieleno Indians and later for several historical purposes, such as early non-indigenous exploration, gold seeker emigration between 1849 and 1851, as the Overland Mail route from 1858 to 1861, and as a military road in the 1860s.

Supplemental Research

To supplement the research that was completed at the EIC, the following publicly available sources were reviewed to identify cultural resources in or near the project area:

- Historical newspapers
- University of California, Santa Barbara Online Historic Aerials (FrameFinder).
- Built Environment Resources Directory
- Los Angeles County Library
- Nationwide Environmental Title Research (NETR Historic Aerial Photographs
- Calisphere
- California Digital Newspaper Collection
- U.S. Geological Survey TopoView online map database
- U.S. Department of Agriculture Web Soil Survey

No additional historical or archaeological cultural resources were identified in the project area on review of these sources.

In addition to the above sources, WM staff provided one cultural resources survey letter report that was not filed at the EIC: Cultural Resources Update Survey for the El Sobrante Landfill (Yerka 2016). This report covers previously recorded archaeological sites adjacent to the project area. The update survey was performed in compliance with the 1994 El Sobrante Landfill Expansion EIR and consisted of site visits to assess the conditions of previously recorded resources. None of the previously recorded resources in this report are in the project area.

Archaeological Sensitivity

The archaeological sensitivity of the project area was assessed on the basis of the archival research, an examination of environmental characteristics known to influence the potential to encounter archaeological materials, and a review of the project area's history of past ground disturbance.

The archival research indicated that several pre-contact Native American sites and early historical period sites for the region are within a half-mile of the project footprint. Prominent among these are multiple rock art locations, habitation sites, and activity areas that are representative of the intensive use of the project vicinity by the Luiseno people through time. One site, P-33-000078, consists of a remaining single boulder with rock art that once was located near its current location, in association with a bedrock milling feature that no longer is present. As currently mapped, the boulder is 30 meters outside the project area, and the original location of this boulder is unknown. Historical-age sites dating to the earliest settlement of the region by non-indigenous people also are present nearby, including several sites associated with Leandro Serrano, who first took ownership of Rancho Temescal in 1818. One historical period resource, the Atchison, Topeka and Santa Fe Railway (P-33-003832), is recorded in the project area.

A review of the geologic map of the Lake Mathews 7.5' quadrangle, Riverside County, California indicates that the southern portion of the project area is in quaternary Holocene alluvium. It is mapped as a gray unconsolidated alluvium, consisting of fine-grained sand and silt. It generally occurs in Temescal Valley and channels in dissected, very old alluvial fan deposits on the south side of Lake Mathews (Morton et al. 2002). Remaining geologic deposits in the project area include the Lake Mathews formation, consisting of mudstone, conglomerate, and poorly bedded sandstone from the Miocene and Mesozoic metasedimentary rocks, which present a variety of low metamorphic-grade rocks. A review of the U.S. Department of Agriculture's Soil Web indicates that much of the project area in the hills is within disturbed gullied lands or Lodo and Temescal rock loams that are present at slopes between 15 to 50 percent. Pockets of Placential fine sandy loam are present in the project area in the hills as well. At the south end closer to Temescal Creek are Cortina gravelly loamy sands. A review of geological and soil deposits suggests that the southern end of the project area within the Holocene age alluvium exhibits the potential for buried archaeological deposits, while the central and northern portions of the project area are in older geologic units with soils on steeper slopes, with little potential for buried archaeological deposits.

In addition to the geological setting, other aspects of the natural environment may be factors in determining whether a region may have been unstable for use, such as relatively low slopes and proximity to important resources, such as fresh water and plants that could be used for a variety of economic purposes. Although the central and northern portions of the project area are in steep terrain, the southern portion is adjacent to Temescal Creek and a lush riparian zone, having the potential for previously unrecorded archaeological resources.

Furthermore, a review of historical maps and aerial images indicated that the project footprint has been subject to significant modifications through time. These include construction of the Atchison, Topeka and Santa Fe Railway and several roads and bridges, the realignment of Temescal Creek, and the construction and expansion of the El Sobrante Landfill. Aerial images from 1948 (available on the NETR Online Historic Aerials online map viewer) showed that much of the project area was undeveloped, with only the railroad and a few roads intersecting the project. By 1966, much of the southern end of the project area had been modified by grading and road development. A gravel mine also appears to have impacted the flow of the creek in the area. By the 1980s, the hills near the project footprint had been impacted by massive grading, and by 1994, the current road along the project area was constructed. A review of historical aerials and current satellite images suggests that every portion of the project area has been subject to some form of disturbance. However, the depth and degree of disturbance in some areas, particularly at the southern end where the soils exhibit archaeological sensitivity, remain unknown.

Although the shallow deposits are likely to have been disturbed by the long history of use in the area, the potential remains for the presence of unidentified archaeological resources, particularly at the south end of the project area, in proximity to Temescal Creek.

Native American Heritage Commission Sacred Lands File Search

Information concerning sacred lands in the project vicinity was solicited from the Native American Heritage Commission (NAHC). An email was sent to the NAHC on January 25, 2024, requesting a search of its Sacred Lands File (SLF) to identify tribal cultural resources in the area. A response was received on February 22, 2024, indicating that the results of the SLF search were positive and the Pechanga Band of Indians should be contacted for more information. The NAHC also provided a list of tribal contacts that are affiliated culturally with the project area. However, the proposed project would be implemented under the 1998 EIR and 2009 Supplemental EIR, and would not be subject to the AB 52 guidelines that were established in 2015. The contact list is provided in Appendix B.

On May 3, 2024, AECOM sent an e-mail request to the Pechanga Band of Indians for any insights or knowledge that they may wish to share regarding tribal history of the area and potential impacts on cultural resources in the project area. The letter included a description of the project location and undertaking, a summary of the ongoing archival research, and a map of the project area. The letter indicated that any information provided by the tribe would be included in the cultural resources assessment being conducted for the project, and would be submitted to the lead agency. A follow-up phone call was placed on May 17, 2024, and a voicemail message was left, detailing the purposed of the call and contact information if anyone wished to discuss the project. No response has been received to date. Copies of the NAHC communications and contact letter are provided in Appendix B.

Field Survey and Results

Survey Methodology

AECOM staff performed an intensive-level survey of the project area. The survey covered all accessible portions of the project area, including the entire 5.5 acres of potential disturbance. The purpose of the survey was to record archaeological and historical resources and evaluate any discovered resources for significance under CRHR criteria.

Cultural resources can consist of archaeological resources, tribal cultural resources, or built environment resources. Archaeological resources represent evidence of past human behavior and include portable artifacts, such as stone tools, glass bottles, and tin cans; non-portable "features" such as cooking hearths, foundations, and privies; and residues such as food remains and charcoal. Archaeological remains can be virtually any age, from recent historical period materials to prehistoric deposits that are thousands of years old. An archaeological resource can be determined to be a tribal cultural resource or a historical resource, following State regulations. Tribal cultural resources are defined as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to California Native American tribes that are listed or eligible for listing on the CRHR, are listed in local historical registers, or determined by a lead agency to be significant resources. Built environment resources include the human-made features that make up the recognizable architectural built environment. This typically includes extant aboveground buildings and structures that date from the earliest territorial settlements until the present day.

The survey was conducted within all portions of the project area where exposed soils were present, vegetation density was not prohibitive, and the slope was less than 30 degrees. The project area was surveyed in transects that were spaced approximately 15 meters apart, when accessibility allowed. When cultural resources were identified during the survey, locational information was taken using handheld global positioning system units with submeter accuracy, and resources were documented photographically and recorded on appropriate California Department of Parks and Recreation (DPR) 523 forms (Appendix C). No artifacts were collected as part of this survey effort.

Survey Results

The survey was completed on May 24, 2024 by AECOM archaeologist Allison Hill, M.A. RPA, who meets the Secretary of the Interior's Professional Qualification Standards in Archaeology. The survey was undertaken in tandem with the paleontological survey that was conducted by AECOM qualified paleontologist Joe Stewart. Soils varied throughout the survey area, ranging from a moderate to high compaction light tan sandy loam to a reddish-brown silty sand, indicative of Pleistocene-age deposits. Along the mountainous parts of the project area, angular metamorphic gravel and cobble inclusions were observed. Near the south end of the project area, both rounded and angular inclusions of gravel and cobbles were found. Most of the project area exhibited evidence of previously disturbed soils, which had been subject to previous grading and was covered in gravel and asphalt or had pipelines, channels, roads, and structures constructed on it. In some areas, possible undisturbed sediments underlaying road cuts were seen, but to what depth the disturbance extends across the site was unclear. Abundant modern refuse was observed across the survey area and included glass, plastic, metal, and wood materials. Ground visibility was variable, with much of the project area under pavement or graded gravel covered pads. Where soils were exposed, visibility was fair, generally with 70 to 100 percent visibility. Sparse patches of poor visibility at approximately 25 to 50 percent occurred in places with dense vegetation, which included low grasses, buckwheat, and rabbit brush. With the exception of some steep slopes at the north end of the project area, the entire project area was surveyed in transects at approximately 15-meter intervals (Photo 1 to Photo 5). Where the slopes made 15-meter transects unsafe, wider transects were walked, following topographic features, and the areas between were examined visually to determine whether any archaeological features were present.

Photo 1. Overview of North RNG site, view to the southwest

Photo 2. Overview of underground piping area between North and South RNG sites, view to the west

Photo 3. Overview of South RNG site, view to the northeast

Photo 4. Overview of underground piping area between South RNG site and Gas POR, view to the northeast

Photo 5. Overview of Temescal Wash from Gas POR site, view to the northeast

Subsequent to this survey, one previously recorded resource in the project area was revisited (P-33-003832), and one previously recorded site adjacent to the project area (P-33-000078) was inspected visually to confirm that its location was outside the project footprint. No new resources were identified by this survey.

Previously Recorded Cultural Resources

Two previously recorded cultural resources (P-33-003832 and P-33-000078) were revisited during the survey. One of these (P-33-003832) was recorded previously in the project area. Although both sites were relocated, neither were in the project area.

P-33-003832 consists of the remnants of the abandoned Atchison, Topeka and Santa Fe Railway, which extended from Riverside to Temecula and passed through Temescal Canyon. As discussed in the records search section of this report, the portion of the site in the project area was constructed in 1927 and was abandoned in the 1970s. Previously recorded segments of the railroad, documented on the ground at other locations, often observed railroad grades or berm, historical refuse such as metal and glass insulators, and cut segments of metal tracks. At the time of the current survey, no artifacts or features indicative of the railroad were observed within the project footprint (Photo 6), and the track, railroad bed, and associated infrastructure no longer appeared to be extant in the project area. However, a small segment of the railroad berm appeared to be present directly adjacent to the project area (Photo 7 to Photo 9). The berm measured approximately 400 feet long, running parallel to Dawson Canyon Road, just south of the road and north of Temescal Creek. It is approximately 10 feet tall and approximately 75 feet wide at the base. Although the berm is covered in gravel, it appears to be similar to the naturally occurring metavolcanic material in the region. The berm was inspected for any associated cultural material, such as historical refuse, track segments, spikes, and ties. No artifacts associated with the historical use of the berm was observed, and it appeared to have been abandoned completely in the 1970s, as previously described.

Photo 6. Overview of mapped location of P-33-003832 in the project area, view to the southeast

Photo 7. West end of P-33-003832 railroad berm adjacent to the project area, view to the east

Photo 8. P-33-003832 railroad berm adjacent to the project area, view to the east

Photo 9. East end of P-33-003832 railroad berm adjacent to the project area, view to the west

While examining the berm, a visual inspection of P-33-000078 was conducted. P-33-000078 is the remnant boulder of a precontact Luiseno site, which contained both pictographs and a bedrock milling feature. Its original location is unknown, but it was identified in close proximity to the current location. When P-33-003832 originally was constructed through the area in 1927, efforts by a local women's club were undertaken to preserve the rock art. According to site records, the women's club, in coordination with the railroad company, kept the portion of the boulder with pictographs and it was placed just south of the railroad berm. Although the railroad construction destroyed the original location of the site, P-33-000078 currently sits at the base of the berm of the abandoned railroad, just above Temecula Creek to the south (Photo 10).

Photo 10. Overview of P-33-000078 adjacent to P-33-003832 outside the project area, view to the southwest

P-33-000078 is a registered California Historic Landmark and does not have any potential to be affected by the project because it is 30 meters outside the project footprint.

A site record update has been completed for P-33-003832, to document the previous destruction of the berm in the project area. The update also includes information on the remaining berm segment outside the project area (Appendix C).

Findings

Based on the survey, no cultural resources have been identified in the project area. One previously recorded site, the Atchison, Topeka and Santa Fe Railway (P-33-003832), was documented in the project area from the EIC records search. However, the field survey determined that no remnants of the site are in the project area, and it likely was removed in the years of development following the abandonment of the resource in the 1970s. Although a small segment of the railroad berm is directly adjacent to the project area, it does not extend into the project footprint and is not anticipated to be affected by project activities. Because the site no longer is present in the project area and will not be affected by the proposed project, no CRHR evaluation has been conducted.

A nearby pre-contact site, P-33-000078, was inspected visually, to confirm that the location was outside the project footprint. The site was south of the railroad berm (discussed above), and both resources were outside the project footprint.

Conclusions and Recommendations

Based on the archival research and field investigation, the study has determined that no previously recorded cultural resources are present in the project area (Figure 5, Confidential Appendix D). The portion of P-33-003832 that passes through the project area, as shown by the EIC records search, was determined during the present survey to have been destroyed previously. This site was evaluated previously as not eligible for the NRHP (Love and Tang 1996), and there is little potential to encounter remnants of the site within the project footprint. The unanticipated identification of any associated artifacts or features within the project footprint would be unlikely to change the eligibility evaluation and would not be likely be eligible for the CRHR. An updated site record has been prepared, recording detailed information on the current condition of the project area. No further work is required for the resource at this time. In the event that the proposed project design changes and extends into the remaining railroad berm, further evaluation may be required.

However, an assessment of archaeological sensitivity indicates that the southern end of the project area exhibits a moderate potential to encounter archaeological resources. One previously recorded pre-contact site (P-33-000078) was documented in the area. Although it was relocated to its current location in 1927 and it is not within the project footprint, it indicates an increased potential for encountering archaeological materials that would be of significance to associated tribes and may constitute significant archaeological resources per CEQA. The results of the survey demonstrate that the southern project area has been heavily impacted and modified from years of development. However, the degree of subsurface disturbance is unknown, and the potential determined in the archaeological sensitivity assessment remains accurate.

The proposed project would include excavation activities, which could have the potential to inadvertently uncover cultural resources and unknown human remains. Thus, implementation of the proposed project would have the potential to cause a substantial adverse change in the significance of archaeological resources, pursuant to Section 15064.5 of the CEQA Guidelines and Sections 21083.2 and 21084.1 of the PRC. In addition, project implementation would have the potential to disturb human remains. Therefore, the following measures are recommended to reduce the potential impact to a less-than-significant level.

Archaeological Recommendations

Although the cultural resources investigation revealed no intact archaeological remains that would be affected by the proposed project, there is a moderate potential that archaeological resources could be encountered during ground-disturbing activities associated with the proposed construction. Therefore, it is recommended that the project proponent retain a Secretary of the Interior-qualified archaeologist to oversee development and implementation of worker environmental awareness program (WEAP) training before the start of construction and to conduct and coordinate archaeological and tribal monitoring in sensitive portions of the project area.

The WEAP training that would be implemented for the proposed project would equip work crews with necessary knowledge regarding the types of cultural resources that may be present in the area, where they may be encountered, and what procedures should be followed in the event of an inadvertent discovery. The WEAP training should be provided to all crew involved in ground-disturbing activities, before the start of work. This training should be provided by, or under the direction of, a qualified archaeologist meeting the Secretary of the Interior Professional Qualifications Standards for Archaeology. The proposed project would not be subject to AB 52 consultation; however, the tribe(s) identified by the NAHC should be contacted to seek input on the WEAP training for cultural resources of concern to the tribe(s).

The sensitivity of the area for pre-contact resources warrants archaeological and Native American monitoring of the initial ground-disturbing activities in the southern portion of the project area, extending from the intersection of Temescal Canyon Road and Dawson Canyon Road, along Dawson Canyon Road until the road turns north and starts going uphill. No monitoring is recommended at this time for construction activities where Dawson Canyon Road turns north and ascends northward upslope, because soils in this area exhibit more clear evidence of disturbance, they likely are older and less likely to contain archaeological resources, and the project area is not as close to previously recorded sites and sensitive landscape features, such as low slopes and fresh water resources.

Monitoring should be limited to vegetation clearing, grading, trenching, or excavation work in the project area as described above. If warranted, the monitoring may be discontinued at the discretion of the archaeologist, in consultation with the lead agency and interested tribes. A cultural resource monitoring and mitigation plan (CRMMP) should be prepared for the proposed project. The plan should be prepared by an archaeologist who meets the Secretary of the Interior Professional Qualifications Standards for Archaeology. The CRMMP should define preconstruction coordination, archaeological and Native American monitoring methods and protocols, and outline procedures for halting or diverting construction, identification of cultural resources, treatment of cultural resource discoveries, curation, and reporting requirements. The plan should be prepared before the start of project work.

In the event that human remains are encountered during construction, work should stop within 50 feet of the find, and Section 7050.5 of the Health and Safety Code and the protocol in Sections 5097 and 5098 of the PRC should be followed, per the CRMMP.

If archaeological resources are encountered during ground-disturbing activities in areas determined not to require monitoring or following completion of monitoring in the archaeologically sensitive area, work should be halted temporarily in the vicinity of the find and the project proponent should contact a qualified archaeologist to evaluate and determine appropriate treatment of the resource, in accordance with Section 21083.2(i) of the PRC.

Built Environment Recommendations

This analysis did not identify any potential historical resources in the project area. Therefore, no specific treatments are recommended for the subject parcels.

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Appendix A – EIC Records Search (*Confidential - Redacted*)

Appendix B – NAHC SLF and Contact Program

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Renewable Natural Gas (RNG) Facility Project

County: Riverside County

USGS Quadrangle Name: Lake Mathews, Ca

Township: 4S **Range:** 6W **Section(s):** 23,26,34,35

Company/Firm/Agency: AECOM, Inc.

Street Address: 3027 Townsgate Road, Suite 140

City: Westlake Village **Zip:** 91361

Phone: (818) 439-6082

Fax: N/A

Email: Alec.Stevenson@aecom.com

Project Description:

The goal of the Renewable Natural Gas Facility Project is to provide a modified checklist/addendum to an Environmental Impact Report (EIR) in compliance with CEQA for the El Sobrante Landfill (ESL). The ESL is located at 10910 Dawson Canyon Road within unincorporated Riverside County. The modified portion of the project includes three building sites (North Old Maintenance Shop, South Existing Flares, and POR near the Dawson Canyon Bridge), a proposed pipeline route continuing down Dawson Canyon Road that will be located within the road shoulder and cross Dawson Canyon Bridge, and a buffer that extends either to the top or toe of adjacent slopes (nearest slope edge) depending on the locations. Recently, some areas along the haul road were widened to make sure the shoulders covered, and a 20’ offset buffer extends from the outer edge on the directional boring location in the wash. This includes a buffer of the Dawson Canyon bridge (northwest edge only) to approximately 65 ft.

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento, California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

February 22, 2024

Alec Stevenson
AECOM, Inc.

Via Email to: Alec.Stevenson@aecom.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Renewable Natural Gas (RNG) Facility Project, Riverside County

Dear Mr. Stevenson:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

    - Any report that may contain site forms, site significance, and suggested mitigation measures.

      All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was positive. Please contact the Pechanga Band of Indians on the attached list for more information.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
Agua Caliente Band of Cahuilla Indians	F	Lacy Padilla, THPO Operations Manager	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 333-5222	(760) 699-6919	ACBCI-THPO@aguacaliente.net	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	1/11/2024
Augustine Band of Cahuilla Indians	F	Tribal Operations,	84-001 Avenue 54 Coachella, CA, 92236	(760) 398-4722			Cahuilla	Imperial,Riverside,San Bernardino,San Diego	11/30/2023
Cabazon Band of Mission Indians	F	Doug Welmas, Chairperson	84-245 Indio Springs Parkway Indio, CA, 92203	(760) 342-2593	(760) 347-7880	jstapp@cabazonindians-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	
Cahuilla Band of Indians	F	Anthony Madrigal, Tribal Historic Preservation Officer	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		anthonymad2002@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	6/28/2023
Cahuilla Band of Indians	F	BobbyRay Esaprza, Cultural Director	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		besparza@cahuilla-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	6/28/2023
Cahuilla Band of Indians	F	Erica Schenk, Chairperson	52701 CA Highway 371 Anza, CA, 92539	(951) 590-0942	(951) 763-2808	chair@cahuilla-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	2/1/2024
Campo Band of Diegueno Mission Indians	F	Ralph Goff, Chairperson	36190 Church Road, Suite 1 Campo, CA, 91906	(619) 478-9046	(619) 478-5818	rgoff@campo-nsn.gov	Diegueno	Imperial,Orange,Riverside,San Diego	
Ewiiaapaayp Band of Kumeyaay Indians	F	Michael Garcia, Vice Chairperson	4054 Willows Road Alpine, CA, 91901	(619) 933-2200	(619) 445-9126	michaelg@leaningrock.net	Diegueno	Imperial,Orange,Riverside,San Diego	

Ewiiaapaayp Band of Kumeyaay Indians	F	Robert Pinto, Chairperson	4054 Willows Road Alpine, CA, 91901	(619) 368-4382	(619) 445-9126	ceo@ebki-nsn.gov	Diegueno	Imperial,Orange,Riverside,San Diego	
Gabrieleno Band of Mission Indians - Kizh Nation	N	Christina Swindall Martinez, Secretary	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
Gabrieleno Band of Mission Indians - Kizh Nation	N	Andrew Salas, Chairperson	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
Gabrieleno/Tongva San Gabriel Band of Mission Indians	N	Anthony Morales, Chairperson	P.O. Box 693 San Gabriel, CA, 91778	(626) 483-3564	(626) 286-1262	GTTribalcouncil@aol.com	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Ventura	12/4/2023
Gabrielino /Tongva Nation	N	Sandonne Goad, Chairperson	106 1/2 Judge John Aiso St., #231 Los Angeles, CA, 90012	(951) 807-0479		sgoad@gabrielino-tongva.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	3/28/2023
Gabrielino Tongva Indians of California Tribal Council	N	Robert Dorame, Chairperson	P.O. Box 490 Bellflower, CA, 90707	(562) 761-6417	(562) 761-6417	gtongva@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
Gabrielino Tongva Indians of California Tribal Council	N	Christina Conley, Cultural Resource Administrator	P.O. Box 941078 Simi Valley, CA, 93094	(626) 407-8761		christina.marsden@alumni.usc.edu	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
Gabrielino-Tongva Tribe	N	Sam Dunlap, Cultural Resource Director	P.O. Box 3919 Seal Beach, CA, 90740	(909) 262-9351		tongvatcr@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	5/30/2023
Gabrielino-Tongva Tribe	N	Charles Alvarez, Chairperson	23454 Vanowen Street West Hills, CA, 91307	(310) 403-6048		Chavez1956metro@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	5/30/2023
Juaneno Band of Mission Indians	N	Sonia Johnston, Chairperson	P.O. Box 25628 Santa Ana, CA, 92799			sonia.johnston@sbcglobal.net	Juaneno	Orange,Riverside,San Diego	

Juaneno Band of Mission Indians Acjachemen Nation - Belardes	N	Joyce Perry, Cultural Resource Director	4955 Paseo Segovia Irvine, CA, 92603	(949) 293-8522		kaamalam@gmail.com	Juaneno	Los Angeles,Orange,Riverside,San Bernardino,San Diego	3/17/2023
Juaneno Band of Mission Indians Acjachemen Nation 84A	N	Heidi Lucero, Chairperson, THPO	31411-A La Matanza Street San Juan Capistrano, CA, 92675	(562) 879-2884		jbmian.chairwoman@gmail.com	Juaneno	Los Angeles,Orange,Riverside,San Bernardino,San Diego	3/28/2023
La Jolla Band of Luiseno Indians	F	Norma Contreras, Chairperson	22000 Highway 76 Pauma Valley, CA, 92061	(760) 742-3771			Luiseno	Orange,Riverside,San Diego	
La Posta Band of Diegueno Mission Indians	F	Gwendolyn Parada, Chairperson	8 Crestwood Road Boulevard, CA, 91905	(619) 478-2113	(619) 478-2125	LP13boots@aol.com	Diegueno	Imperial,Orange,Riverside,San Diego	
Los Coyotes Band of Cahuilla and Cupeño Indians	F	Ray Chapparosa, Chairperson	P.O. Box 189 Warner Springs, CA, 92086-0189	(760) 782-0711	(760) 782-0712		Cahuilla	Imperial,Riverside,San Bernardino,San Diego	
Manzanita Band of Kumeyaay Nation	F	Angela Elliott Santos, Chairperson	P.O. Box 1302 Boulevard, CA, 91905	(619) 766-4930	(619) 766-4957		Diegueno	Imperial,Orange,Riverside,San Diego	
Mesa Grande Band of Diegueno Mission Indians	F	Michael Linton, Chairperson	P.O Box 270 Santa Ysabel, CA, 92070	(760) 782-3818	(760) 782-9092	mesagrandeband@msn.com	Diegueno	Imperial,Orange,Riverside,San Diego	
Morongo Band of Mission Indians	F	Ann Brierty, THPO	12700 Pumarra Road Banning, CA, 92220	(951) 755-5259	(951) 572-6004	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	
Morongo Band of Mission Indians	F	Robert Martin, Chairperson	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110	(951) 755-5177	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	

Pala Band of Mission Indians	F	Christopher Nejo, Legal Analyst/Researcher	PMB 50, 35008 Pala Temecula Road Pala, CA, 92059	(760) 891-3564		cnejo@palatribe.com	Cupeno Luiseno	Orange,Riverside,San Bernardino,San Diego	11/27/2023
Pala Band of Mission Indians	F	Shasta Gaughen, Tribal Historic Preservation Officer	PMB 50, 35008 Pala Temecula Road Pala, CA, 92059	(760) 891-3515		sgaughen@palatribe.com	Cupeno Luiseno	Orange,Riverside,San Bernardino,San Diego	11/27/2023
Pala Band of Mission Indians	F	Alexis Wallick, Assistant THPO	PMB 50, 35008 Pala Temecula Road Pala, CA, 92059	(760) 891-3537		awallick@palatribe.com	Cupeno Luiseno	Orange,Riverside,San Bernardino,San Diego	11/27/2023
Pauma Band of Luiseno Indians	F	Temet Aguilar, Chairperson	P.O. Box 369 Pauma Valley, CA, 92061	(760) 742-1289	(760) 742-3422	bennaecalac@aol.com	Luiseno	Orange,Riverside,San Diego	
Pechanga Band of Indians	F	Tuba Ebru Ozdil, Pechanga Cultural Analyst	P.O. Box 2183 Temecula, CA, 92593	(951) 770-6313	(951) 695-1778	eozdil@pechanga-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	8/2/2023
Pechanga Band of Indians	F	Steve Bodmer, General Counsel for Pechanga Band of Indians	P.O. Box 1477 Temecula, CA, 92593	(951) 770-6171	(951) 695-1778	sbodmer@pechanga-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	8/2/2023
Quechan Tribe of the Fort Yuma Reservation	F	Manfred Scott, Acting Chairman - Kw'ts'an Cultural Committee	P.O. Box 1899 Yuma, AZ, 85366	(928) 210-8739		culturalcommittee@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
Quechan Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P.O.Box 1899 Yuma, AZ, 85366	(760) 919-3600		executivesecretary@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
Quechan Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85366	(928) 261-0254		historicpreservation@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023

Ramona Band of Cahuilla	F	Joseph Hamilton, Chairperson	P.O. Box 391670 Anza, CA, 92539	(951) 763-4105	(951) 763-4325	admin@ramona-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	
Rincon Band of Luiseno Indians	F	Laurie Gonzalez, Tribal Council/Culture Committee Member	One Government Center Lane Valley Center, CA, 92082	(760) 484-4835		lgonzalez@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	5/31/2023
Rincon Band of Luiseno Indians	F	Denise Turner Walsh, Attorney General	One Government Center Lane Valley Center, CA, 92082	(760) 689-5727		dwalsh@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	7/7/2023
Rincon Band of Luiseno Indians	F	Joseph Linton, Tribal Council/Culture Committee Member	One Government Center Lane Valley Center, CA, 92082	(760) 803-3548		jlinton@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	5/31/2023
Rincon Band of Luiseno Indians	F	Cheryl Madrigal, Cultural Resources Manager/Tribal Historic Preservation Officer	One Government Center Lane Valley Center, CA, 92082	(760) 648-3000		cmadrigal@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	5/31/2023
Santa Rosa Band of Cahuilla Indians	F	Lovina Redner, Tribal Chair	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	lsaul@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	
Soboba Band of Luiseno Indians	F	Jessica Valdez, Cultural Resource Specialist	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-6261	(951) 654-4198	jvaldez@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
Soboba Band of Luiseno Indians	F	Joseph Ontiveros, Tribal Historic Preservation Officer	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-5279	(951) 654-4198	jontiveros@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
Torres-Martinez Desert Cahuilla Indians	F	Mary Belardo, Cultural Committee Vice Chair	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300		belardom@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	10/30/2023

Torres-Martinez Desert Cahuilla Indians	F	Thomas Tortez, Chairperson	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300	(760) 397-8146	thomas.tortez@tmdci.org	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	10/30/2023
Torres-Martinez Desert Cahuilla Indians	F	Abraham Becerra, Cultural Coordinator	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300		abecerra@tmdci.org	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	10/30/2023
Torres-Martinez Desert Cahuilla Indians	F	Gary Resvaloso, TM MLD	P.O. Box 1160 Thermal, CA, 92274	(760) 777-0365		grestmtm@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	10/30/2023
Torres-Martinez Desert Cahuilla Indians	F	Alesia Reed, Cultural Committee Chairwoman	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300		lisareed990@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	10/30/2023

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Renewable Natural Gas (RNG) Facility Project, Riverside County.

Record: PROJ-2024-001013
Report Type: AB52 GIS
Counties: Riverside
NAHC Group: All

Appendix C – DPR Forms (Confidential - Redacted)

Appendix D – Project Figures (Confidential - Redacted)

Appendix E
Energy Impacts Study

Technical Memorandum

TO: Jane Chang
AECOM

FROM: Terry A. Hayes Associates Inc.

DATE: July 25, 2024

RE: El Sobrante Landfill Renewable Natural Gas Facility Project Energy Impacts Study

Introduction

Terry A. Hayes Associates Inc. (TAHA) has completed an Energy Impacts Assessment for the El Sobrante Landfill (ESL) Renewable Natural Gas (RNG) Facility Project (proposed project) in accordance with the provisions of California Environmental Quality Act Statute and Guidelines (CEQA Guidelines). This memorandum documents the methodology and results of the energy resource analyses, and the potential environmental impacts associated with construction and future operation of the proposed project. This Assessment is organized as follows:

- Introduction
- Executive Summary
- Project Description
- Energy Resources Topical Information
- Regulatory Framework
- Existing Setting
- Significance Thresholds
- Methodology
- Impacts Assessment
- References

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Executive Summary

The content and format of this technical memorandum were prepared to satisfy CEQA requirements in support of an Addendum to previously approved environmental documentation. Several prior CEQA documents have been prepared and approved for the projects at the ESL since 1998. However, environmental impacts related to energy resources were not previously analyzed within the 1998 Environmental Impact Report (EIR) for the El Sobrante Landfill Expansion, the 2009 Supplemental EIR (SEIR) for the El Sobrante Landfill Solid Waste Facility Permit Revision, or the 2018 Addendum to the EIR and SEIR. In 2018, updates to the CEQA Guidelines included guidance to address environmental impacts related to energy, which involved several sections of the code and the addition of Appendix F: Energy Conservation and Appendix G Environmental Checklist criteria for Energy.

The 2018 CEQA Guidelines amendments included the following language that is relevant to the assessment of Energy impacts for the proposed project:

> ***§ 15126.2(a) Energy Impacts.*** *If analysis of the project's energy use reveals that the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources, the EIR shall mitigate that energy use. This analysis should include the project's energy use for all project phases and components, including transportation-related energy, during construction and operation. In addition to building code compliance, other relevant considerations may include, among others, the project's size, location, orientation, equipment use and any renewable energy features that could be incorporated into the project… This analysis is subject to the rule of reason and shall focus on energy use that is caused by the project."*

Furthermore, Appendix F: Energy Conservation was added to the CEQA Guidelines as part of the 2018 amendments, which includes the following language relevant to assessing energy impacts under CEQA:

> *"**I. Introduction:** The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:*
>
> 1) *Decreasing overall per capita energy consumption,*
> 2) *Decreasing reliance on fossil fuels such as coal, natural gas, and oil, and*
> 3) *Increasing reliance on renewable energy sources.*
>
> *In order to assure that energy implications are considered in project decisions, CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy."*
>
> *"**II. EIR Contents,** C. Environmental Impacts may include:*
>
> 1. *The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.*
> 2. *The effects of the project on local and regional energy supplies and on requirements for additional capacity.*
> 3. *The effects of the project on peak and base period demands for electricity and other forms of energy.*
> 4. *The degree to which the project complies with existing energy standards.*
> 5. *The effect of the project on energy resources.*
> 6. *The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives."*

Table 1 presents the Energy impact criteria that were added to the CEQA Guidelines Environmental Checklist.

TABLE 1: SUMMARY OF PREVIOUS ENVIRONMENTAL DOCUMENT CONCLUSIONS AND PROJECT CHANGES TO CONCLUSIONS					
Environmental Checklist Impact Criteria	**Where Impact Was Analyzed in Prior Environmental Documents.**	**Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?**	**Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?**	**Any New Information Requiring New Analysis or Verification?**	**Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?**
ENERGY. Would the project:					
a. Result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	N/A	No	No	No	No
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	N/A	No	No	No	No
SOURCE: Riverside County Waste Management Department, *El Sobrante Landfill Expansion Draft Environmental Impact Report*, April 1994.; Riverside County Waste Management Department, *El Sobrante Landfill Solid Waste Facility Permit Revision Final Supplemental Environmental Impact Report*, March 31, 2009.; Riverside County Department of Waste Resources, *Addendum to the Environmental Impact Report for the El Sobrante Landfill Expansion & the El Sobrante Landfill Solid Waste Facility Permit Revision Supplemental Environmental Impact Report*, January 2018.					

Project Description

The proposed project involves the installation of an RNG Facility at the Waste Management (WM)'s ESL site to utilize existing landfill gas (LFG) that would be diverted from existing landfill flares and processed to meet Southern California Gas Company (SoCal Gas) specifications for local distribution via an existing SoCal Gas pipeline. Specifically, the Project would include the following elements:

SOUTH RNG SITE

The South RNG Site would be an approximately 0.3-acre area located adjacent to ESL's two existing LFG flares (flare station). The 0.3-acre area currently contains three concrete pads that were previously used for co-gen power generation; these existing concrete pads would be removed and replaced with concrete specifically designed for the equipment to be utilized at the site. The South RNG Site location is part of a larger graded area associated with the existing landfill entry and scales.

The RNG process would begin at the South RNG Site through the interception of LFG by tapping into the discharge manifold header piping prior to the gas being burned at the existing flare station. The diverted, raw LFG would be conveyed to the North RNG Site utilizing a 30-inch diameter pipe to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road. The North RNG Site would treat LFG that meets minimum specifications for processing; LFG that does not meet minimum specifications would be returned within a separate pipe (LFG reject line) in the same pipe trench back to the South RNG Site.

After the initial treatment process at the North RNG Site, the partially treated gas would be sent via another pipe in the pipe trench to be refined at the South RNG Site (i.e., final nitrogen removal) sufficient to meet SoCal Gas specifications. It would then be diverted via a sales gas compressor to a dedicated underground sales gas main to be placed within an underground pipe trench within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road and sent southward to the Gas POR Site. Waste gas from the refining process would be sent (via separate pipe in the pipe trench) to the recuperative oxidizer at the North RNG site for further treatment and release. Ancillary equipment to be located at the South RNG Site would include sales gas compressors, nitrogen rejection units, condensate treatment equipment, gas coolers, various tanks, transformers/switch gear, and a utilities building.

The South RNG Site would also include an approximately 3,200-square foot maintenance and office building, which would be used as an equipment control center as well as for routine equipment maintenance required for the RNG Facility (e.g., instrument repair/swap out, inspections, oil and filter parts for compressor changes, etc.). For vehicle access to, and parking at, the South RNG Site a 25-foot-wide access easement would be dedicated between the proposed equipment and structures at the South RNG Site and the existing flare station. Building and equipment heights at the South RNG Site would typically range between 5 and 12 feet above ground surface, but with the housing for the nitrogen rejection units being 80 feet above ground surface.

NORTH RNG SITE

The North RNG Site would be an approximately 1.2-acre area on an existing graded landfill pad, approximately 0.5-mile north of the South RNG Site. This pad currently contains the landfill's former maintenance shop, a trailer, a concrete pad, a 40,000-gallon reclaimed water storage tank, and potable water booster tanks. The North RNG Site is where initial treatment/refining of the LFG would occur and is referred herein as the 'RNG Facility'. The RNG Facility would utilize the existing concrete pads when and where available but would require removal of the existing canopy structure of the former maintenance facility and the existing trailer. The existing water storage tank and potable water booster tanks would be protected in place (i.e., these tanks would not be part of the 1.2-acre RNG Facility).

The RNG Facility would consist of various equipment, which would be located on separate concrete pads with above and below ground pipe connections. Equipment would include scrubbers, blowers, coolers, LFG compressors, absorbers, strippers, oxidizers, exchangers, filters, tanks, amine treatment, utilities building, motor control center building, etc., with heights ranging from 5 to 80 feet above ground surface. The RNG Facility would be bordered by 12-foot-high fencing with colored slats (to match the adjacent natural terrain) with sound-attenuating drapes on the inside of the fence.

Once the gas has met certain carbon dioxide (CO_2), hydrogen sulfide (H_2S), volatile organic compounds (VOCs), and moisture concentrations it would be diverted via the amine treatment and hydration unit back to the South RNG Site for final nitrogen removal and compression into a 6-inch sales gas main to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road between the South RNG and Gas POR Sites.

GAS POINT OF RECEIPT (POR) SITE

The RNG process concludes at the 0.2-acre SoCal Gas POR Site that will be located at the southwest portion of the ESL within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection. A temporarily closed Temescal Driving Range is located to the north, and a potential future Temescal Valley Commercial Center (TVCC) development area is located to the south (across Dawson Canyon Road) of the Gas POR Site. The 6-inch sales gas RNG main will be brought to the POR underground via HDD drilling beneath Temescal Canyon Wash and brought to grade/connected within the fence-enclosed POR. The Southern California Gas Company (SoCalGas) will have various pieces of equipment to receive the RNG, including gas analyzer, gas odorant equipment, electrical equipment, etc., that would be housed within shelters or canopies. Equipment at the POR would be supported on concrete slabs to be placed above 3- to 5-feet of over excavation of the existing onsite soils. The overall POR facility would be on a raised fill pad so that it is one foot above the base flood elevation. An approximately 3-foot-high masonry retaining wall would support the fill on its southern side between Dawson Canyon Road and an internal POR access road/driveway. The entire POR facility would be surrounded by 6-foot-high decorative fencing. It will be installed, owned, and maintained by SoCalGas.

UNDERGROUND PIPING

Between the South RNG Site and North RNG Site an approximate 5-foot-8-inch wide by 8.5-foot-deep pipe trench, approximately 3,700 linear feet in length, would be installed via open cut trenching within the existing pavement or shoulder of the landfill access road. This pipe trench would house six separate lines: a 30-inch, high-density polyethylene (HDPE) LFG supply line to send raw LFG to the RNG plant; a 6-inch FlexSteel line to send partially treated gas from North RNG Site to the exchanger at the South RNG Site for semi-treatment; a 12-inch HDPE line to send partially treated waste gas from the South RNG Site to the recuperative oxidizer at the North Site for further treatment and release; a 4-inch HDPE fuel gas line to service the recuperative oxidizer and amine heater at the North RNG Site; a 20-inch HDPE LFG reject line from the North to South site to the existing flare station; and a 2-inch HDPE condensate line.

Between the South RNG Site and the north side of Temescal Canyon Wash (opposite the Gas POR Site) an approximate 4-foot-wide by 5-foot-deep pipe trench, approximately 6,700 linear feet in length, would be installed via open cut trenching (within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road). This pipe trench would house four separate lines: a 6-inch FlexSteel sales gas main delivering RNG to the POR; a 4-inch HDPE reject gas line for rejected gas from the POR back to South RNG Site; a 4-inch HDPE fuel gas line (from a service meter tap near the POR) to the North RNG Site; and a 2-inch treated condensate line from the South RNG Site to a manhole at the Dawson Canyon Road Bridge.

Underground piping would then be accomplished via HDD boring to cross beneath, and avoid disturbance of, Temescal Canyon Wash. Two bores of approximately 500 linear feet, one for the 6-inch sales gas main and one for the two 4-inch lines (fuel gas and rejected gas lines), would be drilled beneath the wash with minimum depths of 20-foot below the surface at the center of the wash.

SoCalGas Pipeline Interconnection

The RNG will ultimately be delivered to SoCal Gas' main pipeline located underground in the public right-of-way within Temescal Canyon Road, approximately 600 linear feet southwest from the POR. This would require approximately 600 feet of trenching performed by SoCal Gas within Dawson Canyon Road (between the Gas POR Site and existing SoCal Gas main pipeline) to install an underground pipeline interconnection between the POR and existing main pipeline.

On the ensuing pages of this memorandum, **Figure 1** shows the regional location of the proposed project, **Figure 2** depicts an overview of the proposed project site, and **Figure 3** through **Figure 5** display the proposed project site plans: the South RNG site, the North RNG Site, and the Gas POR Site, respectively.

Construction Activities

X Construction of the proposed project is anticipated to begin in October 2024 and take approximately 18 months to complete (with completion anticipated in February 2026). A crew of approximately 6 to 12 construction workers (daily) would be in the project area during construction. Temporary construction staging areas adjacent to Dawson Canyon Road (approximately 0.6 acre) about 500 feet northeast of the Dawson Canyon Road Bridge over Temescal Canyon Wash, at the South RNG Site (approximately 0.08 acre), and at the North RNG Site (approximately 0.07 acre) would be used for equipment staging and laydown; all three sites would have materials (e.g., demolition and soil) stockpiled on short-term bases. Any excess material requiring disposal would utilize ESL. Temporary lane closures along the landfill access road/Dawson Canyon Road would occur; however, access to ESL for normal landfill operations would be maintained throughout the construction period with the use of construction flaggers (e.g., during trenching within roadways, etc.).

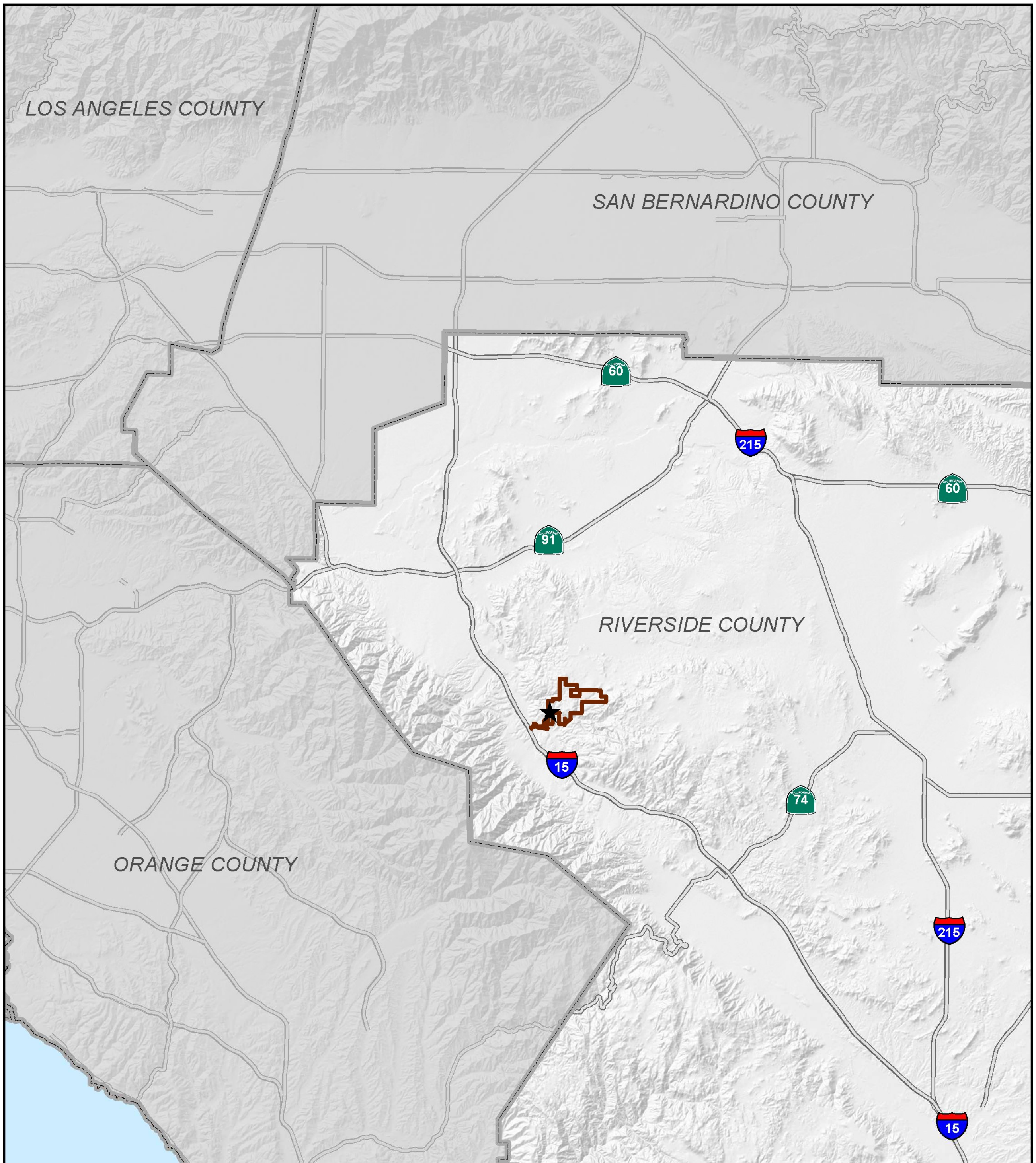
Construction activities will include grading, trenching, directional drilling, import of construction materials (asphalt concrete, aggregate base, decomposed granite, and fill material), soil compaction, equipment installations, building construction, etc.).

Major equipment to be used during construction of the proposed project would include, but are not limited to: backhoes, boom truck, concrete pump rig, crane, dozer, excavators, skid loaders, vibratory compacter/roller, generators, loader, motor grader, paving machine, roller, sheepsfoot, dump truck, flatbed truck, oil/lube truck, pickup truck, water truck, 18-wheel low boy, fuel truck, horizontal directional drill, Redi-Mix truck, etc.

The total construction-related disturbance footprint for the proposed project, both permanent and temporary, would be approximately 5.5 acres.

Project Operations

The proposed project has been sized to process up to 15,000 standard cubic feet per minute (SCFM) of LFG, which would translate to a maximum RNG output of 8,600 million British thermal units (MMBTU) per day. Operation of the RNG Facility would require the use of fuel gas for heating certain refining/treatment equipment at the North RNG Site. Waste gas from the treatment/refining process would be directed to the recuperative oxidizer for further treatment and release (with less overall methane [emissions] in it than flared LFG). The Project does not increase the production of LFG at ESL, but would reduce the overall amount of LFG that is flared.



Source: ESRI; Waste Management, Toro Energy, and AECOM (2024)

★ Project Location
El Sobrante Landfill
County Boundaries

N

0 6 Miles

Figure 1
Regional Map

RNG Facility Project at El Sobrante Landfill

AECOM

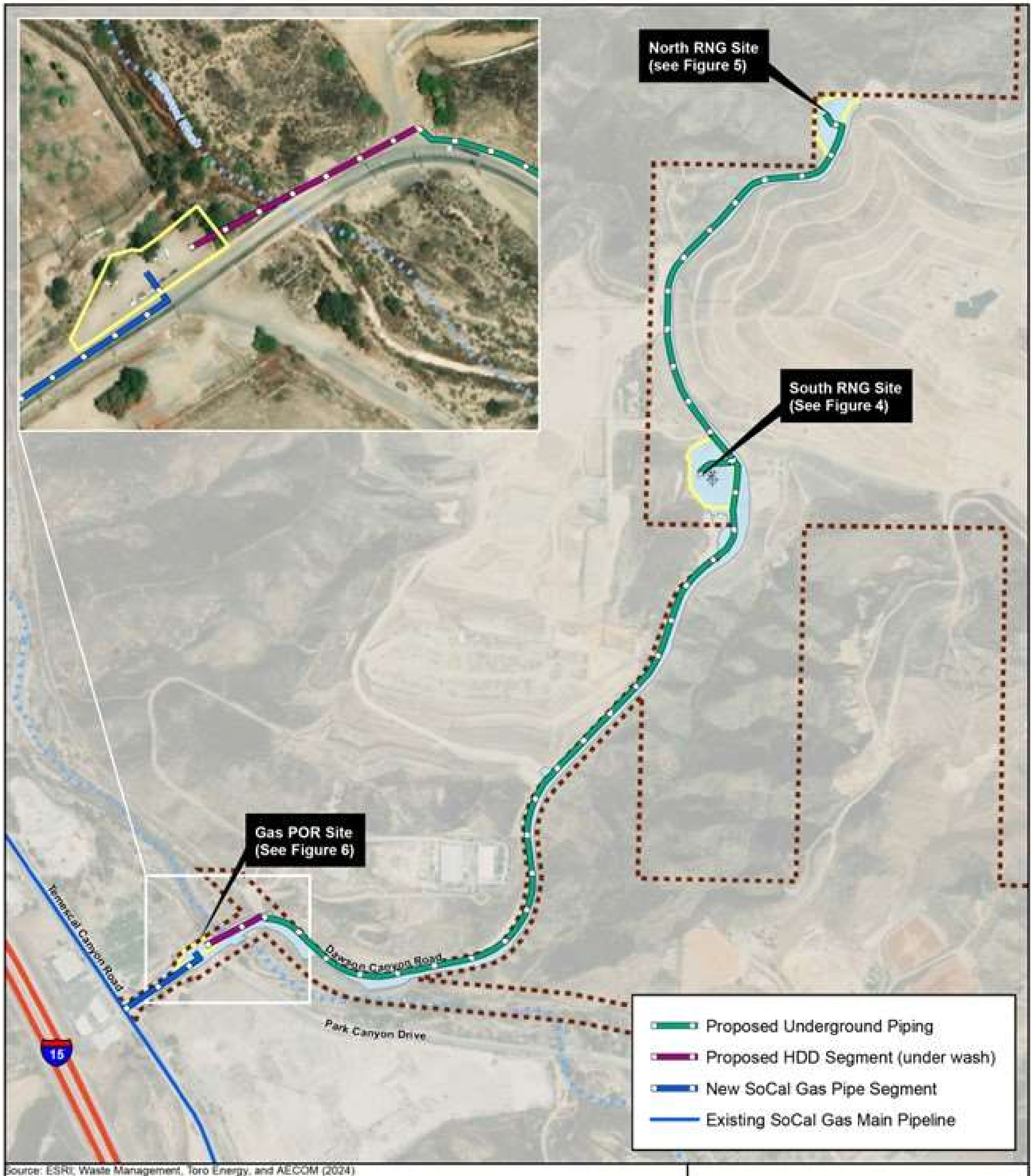
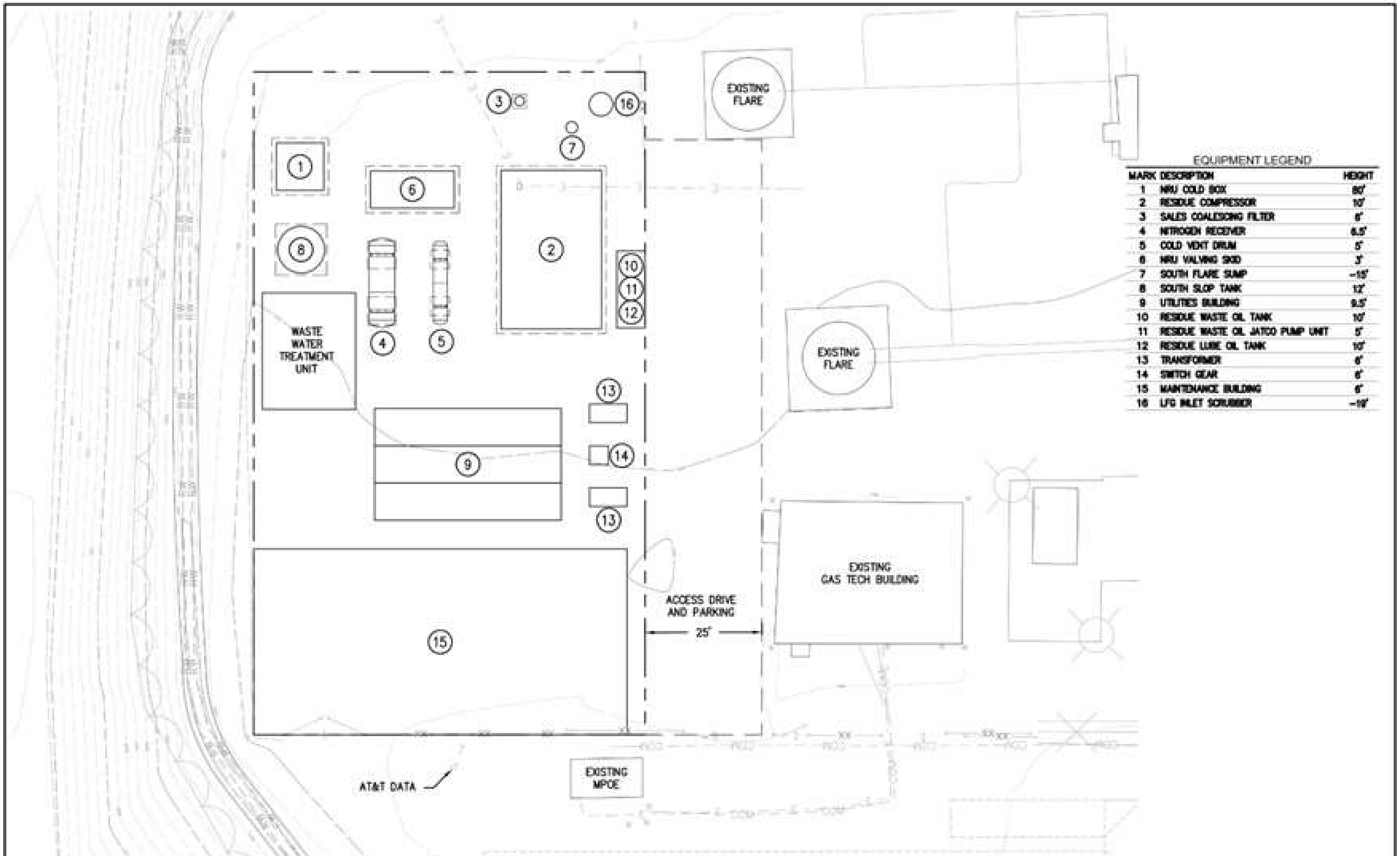


Figure 2
Proposed Project

RNG Facility Project
at El Sobrante Landfill

AECOM



Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

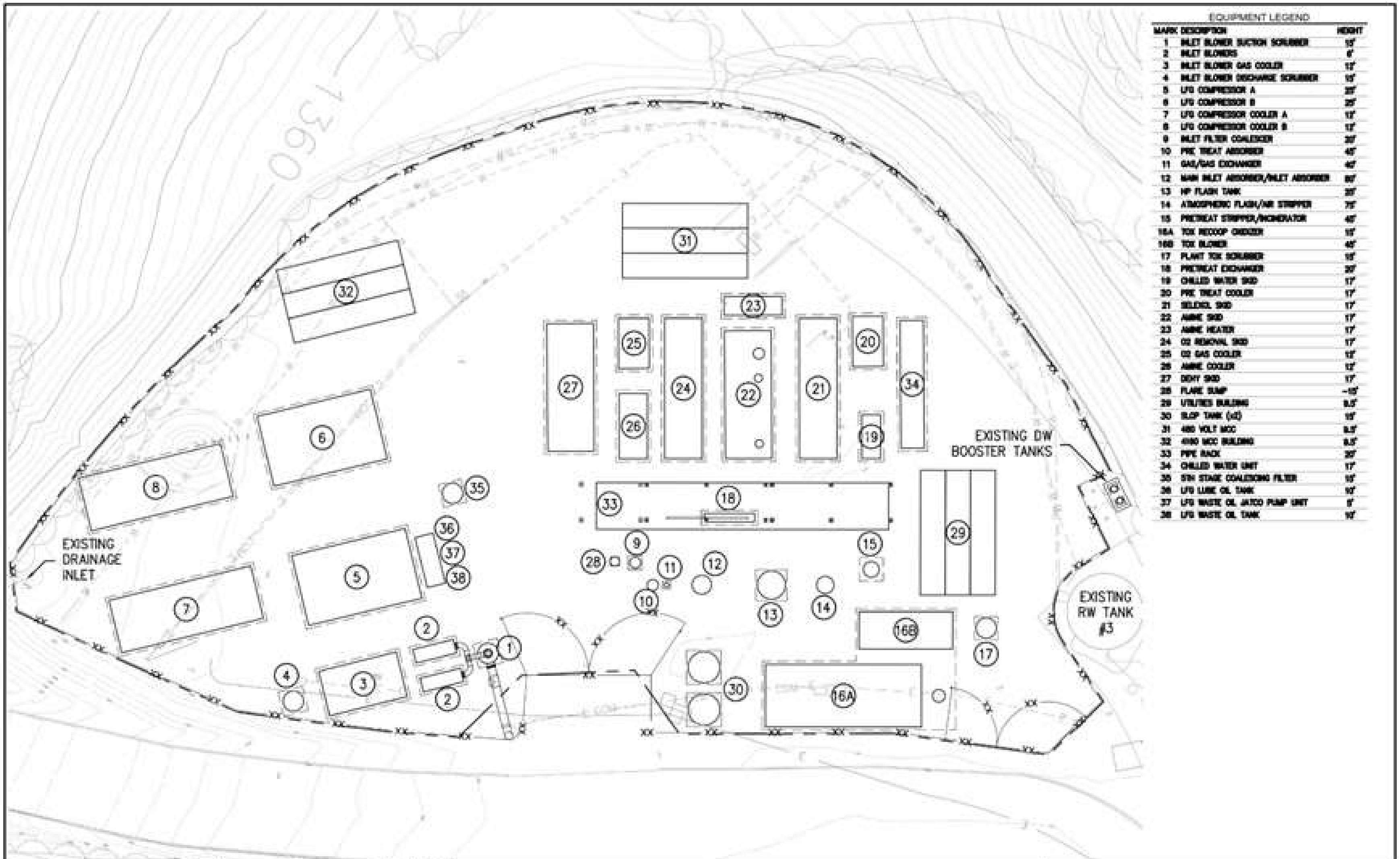
N

Not to Scale

Figure 3
South RNG Site

RNG Facility Project at El Sobrante Landfill

AECOM



Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

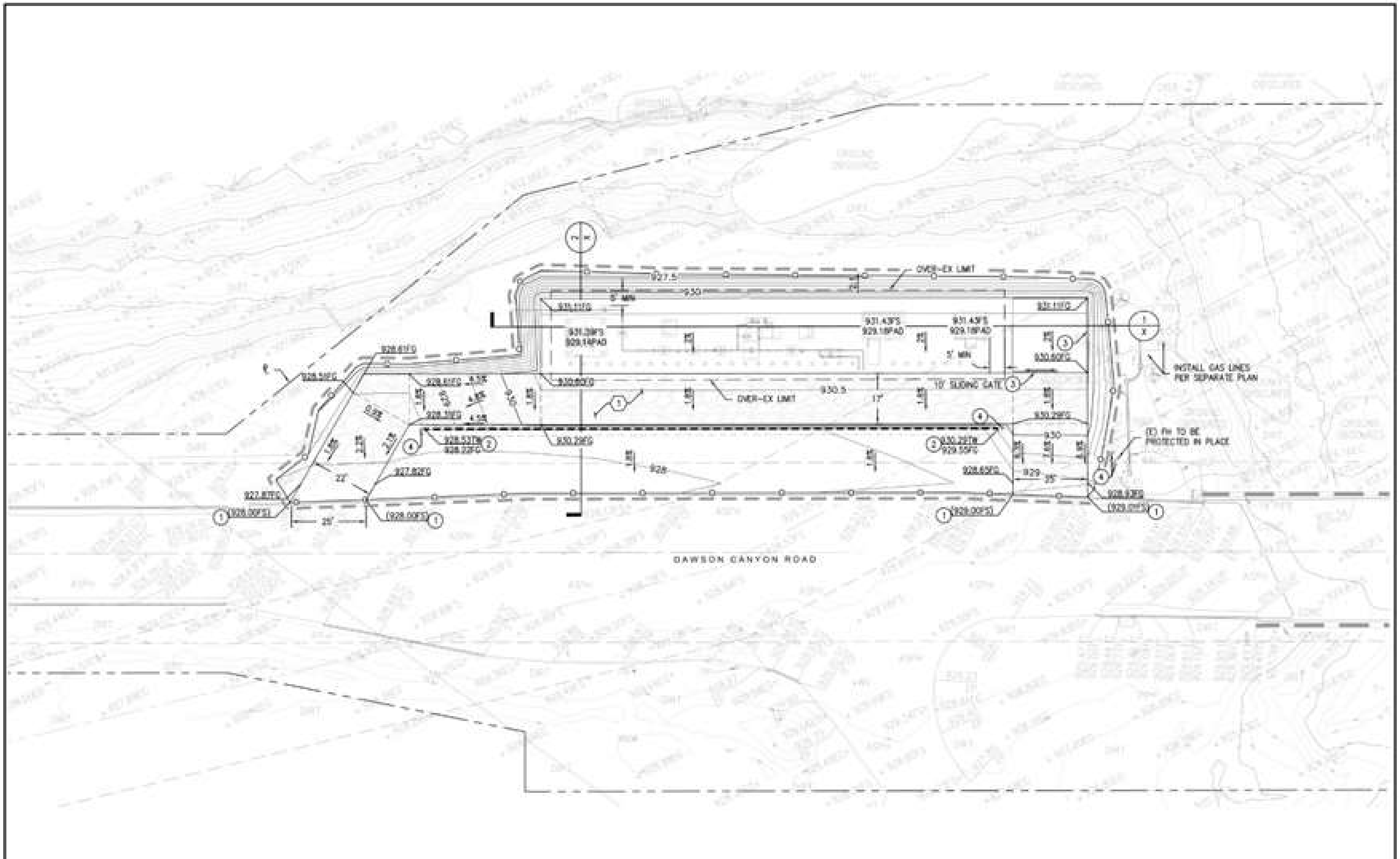
N

Not to Scale

Figure 4
North RNG Site

RNG Facility Project at El Sobrante Landfill

AECOM



Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

LEGEND

RIDGE LINE / GRADE BREAK
OVER-EX LIMIT
GRADING DAYLIGHT LIMIT
LIMIT OF WORK

CONSTRUCTION NOTES

1. JOIN EXISTING CURB AND MATCH GRADE.
2. CONSTRUCT MASONRY RETAINING WALL PER SPPWC STANDARD PLAN 618-3 TYPE A.
3. CONSTRUCT 6' CHAIN LINK FENCE AND GATES PER SPPWC STANDARD PLAN 600-4. DRIVE GATE OPENING WIDTHS PER PLAN. (FOR CHAIN LINK PER SEPARATE SGC PLANS)
4. INSTALL CONCRETE BOLLARD PER SEPARATE STRUCTURAL PLANS

PAVING LEGEND

UNPAVED ROAD
PLACE 18" MINIMUM ¾ INCH MINUS, CLASS 2 AGGREGATE BASE PER CALTRANS STANDARD SPECIFICATIONS, COMPACTED TO AT LEAST 95% RELATIVE COMPACTION UNDERLAIN BY A GEOTEXTILE LAYER AS DESCRIBED IN THE GEOTECHNICAL REPORT.

N

Not to Scale

Figure 5
Gas POR Site

RNG Facility Project
at El Sobrante Landfill

AECOM

Toro expects to hire seven additional full-time employees and up to three part-time employees to manage the operation of the RNG Facility. Regular deliveries of materials (oil, chemicals, spare parts [e.g., filters]) are expected to require one truck trip per week. Infrequent maintenance truck trips (limited to emergency instrument repairs/swap outs, inspections, and other maintenance needs [e.g., oil changes]) would require up to seven vehicle trips spanning up to 10 calendar days out of a year.

Toro and WM are separate corporate entities; therefore, the RNG Facility and ESL are owned and operated independently. Each source will maintain separate permits and reporting.

Energy Resources Topical Information

Energy relates directly to environmental quality. Energy use, when sourced from fossil fuels, can adversely affect air quality and generate greenhouse gas (GHG) emissions that contribute to climate change. Fossil fuels are burned to create electricity to power residences and commercial/industrial buildings, heat and cool buildings, and power vehicles. Transportation energy use is related to the fuel efficiency of on-road vehicles including cars, trucks, and public transit; choices involving preferred mode of transportation; and miles traveled by the various on-road modes of transportation. Construction and routine operation and maintenance of transportation infrastructure also consume energy.

Energy is generally transmitted either in the form of electricity measured in kilowatt-hours (kWh) or megawatt-hours (MWh), or natural gas measured in British thermal units (BTU) or standard cubic feet (scf). Petroleum-based transportation fuel, such as gasoline and diesel, is typically measured in gallons or barrels (one U.S. barrel is equivalent to 42 gallons).

The analysis of direct and indirect energy resource consumption associated with implementation of the proposed project focused on the forecasted consumption of petroleum-based transportation fuels during construction, and incremental changes in transportation fuels, electricity consumption, and natural gas production during future operations at the Toro RNG facility on the ESL property.

PETROLEUM FUELS

The spark-ignited internal combustion engines of on-road motor vehicles and off-road equipment use fossil fuel petroleum energy. Motor gasoline and diesel fuel are formulations of fossil fuels refined for use in various applications. Gasoline is the primary fuel source for most passenger automobiles, and diesel fuel is the primary fuel source for most off-road equipment and medium- and heavy-duty trucks. According to data compiled by the United States Energy Information Administration (U.S. EIA), California was the sixth-largest producer of crude oil out of the 50 states in 2022, and ranked third in refining capacity at the beginning of that year accounting for nearly 10 percent of the nation's petroleum production.[1] Although California's annual crude oil production has steadily declined from its peak of 394 million barrels in 1985, the state still produced more than 122 million barrels of crude oil in 2022. In 2022, weekly statewide refinery production ranged between approximately six to seven-and-a-half million barrels (252–315 million gallons) of gasoline and between approximately one-and-a-half to two-and-a-half million barrels (63–105 million gallons) of diesel fuel.[2]

The State of California is the second largest consumer of refined petroleum products in the country and accounts for about eight percent of nationwide consumption.[3] As of 2019, approximately 15.37 billion gallons of gasoline and 1.76 billion gallons of diesel were sold annually through retail outlets within California.4

[1] U.S. EIA, *California State Profile and Energy Estimates*, Last Updated May 16, 2024.

[2] CEC, *California Refinery Inputs and Production*, Accessed July 2024.

[3] U.S. EIA, *State Energy Data System – Table 16: Total Petroleum Consumption Estimates*, 2020.

[4] CEC, *2010–2022 CEC-A15 Results and Analysis*, 2024.

Approximately 97 percent of all gasoline consumed in California is utilized by light-duty cars, pickup trucks, and sport utility vehicles. Nearly all heavy-duty trucks, delivery vehicles, buses, trains, ships, boats and barges, as well as farming, construction, and heavy-duty military vehicles, have diesel engines. The California Energy Commission (CEC) estimated that approximately 3.06 billion gallons of gasoline and 224 million gallons of diesel fuel were purchased and consumed by Riverside County retail customers in 2022.[5]

ELECTRICITY

Electricity, a consumptive utility, is a manufactured resource. The production of electricity requires the consumption or conversion of natural resources—such as water, wind, oil, gas, coal, solar, geothermal, or nuclear resources—into energy. The electricity delivery system has several components, including substations and transformers. Electricity is distributed through a network (power grid) of transmission and distribution lines. Conveyance of electricity through transmission lines is typically responsive to market demands. Statewide electricity consumption was estimated to be approximately 277,773 gigawatt-hours (GWh) in 2020.[6] Approximately 33 percent of the statewide power mix was supplied by renewable resources in 2020.

Electricity at the ESL facility is provided by Southern California Edison (SCE), which supplied approximately 37 percent of all electricity consumed statewide in 2020, totaling between 103,500–105,750 GWh depending on the estimation method.[7] The CEC forecasts that SCE customer consumption will reach up to 138,000 GWh in 2035 under the High Demand Case model. According to its Power Content Label, the SCE power mix was comprised of approximately 31 percent renewably sourced electricity in 2020 and 2021, and that proportion increased to 33 percent in 2022.[8,9]

NATURAL GAS

Natural gas would be provided to the project by SoCalGas. The following summary of natural gas resources and service providers, delivery systems, and associated regulation is excerpted from information provided by the. The California Public Utilities Commission (CPUC) regulates natural gas utility service for approximately 11 million customers that receive natural gas from Pacific Gas and Electric (PG&E), Southern California Gas (SoCalGas), San Diego Gas & Electric (SDG&E), Southwest Gas, and several smaller investor-owned natural gas utilities. The vast majority of California's natural gas customers are residential and small commercial customers, referred to as "core" customers. Larger volume gas customers, like electric generators and industrial customers, are called "noncore" customers. Although very small in number relative to core customers, noncore customers consume about 65% of the natural gas delivered by the state's natural gas utilities, while core customers consume about 35%. The PUC regulates the California utilities' natural gas rates and natural gas services, including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing. Most of the natural gas used in California comes from out-of-state natural gas basins. In 2017, for example, California utility customers received 38% of their natural gas supply from basins located in the U.S. Southwest, 27% from Canada, 27% from the U.S. Rocky Mountain area, and 8% from production located in California."[10]

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[5] CEC, *2010–2022 CEC-A15 Results and Analysis*, 2024.

[6] CEC, *California Energy Demand (CED) Forecast 2021–2035 Baseline Forecast – High Demand Case*, 2022.

[7] CEC, *Energy Consumption Database – Electricity Consumption by Planning Area*, 2022.

[8] SCE, *2021 Power Content Label*, October 2022.

[9] SCE, *2022 Power Content Label*, October 2023.

[10] CPUC, *Natural Gas and California*, available at http://www.cpuc.ca.gov/natural_gas/, Accessed July 2024.

Regulatory Framework

This section of the Assessment provides a brief summary of regulations and policies most pertinent to energy resources consumption associated with the proposed project. The contents of this section do not represent an exhaustive list of all regulations and policies.

FEDERAL

Federal Energy Policy and Conservation Act. In 1975, Congress enacted the Federal Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic Safety Administration is responsible for establishing additional vehicle standards. In 2012, new fuel economy standards for passenger cars and light trucks were approved for model years 2017 through 2021 (77 *Federal Register* 62624–63200). Fuel economy is determined based on each manufacturer's average fuel economy for the fleet of vehicles available for sale in the United States.

Alternative Motor Fuels Act of 1988. The Alternative Motor Fuels Act amended a portion of the Energy Policy and Conservation Act to encourage the use of alternative fuels, including electricity. This Act directed the Secretary of Energy to ensure that the maximum practicable number of federal passenger automobiles and light duty trucks be alcohol-powered vehicles, dual energy vehicles, natural gas-powered vehicles or natural gas dual energy vehicles. This Act also directed the Secretary of Energy to conduct a study regarding such vehicles' performance, fuel economy, safety, and maintenance costs and report to Congress the results of a feasibility study concerning the disposal of such alternative-fueled federal vehicles.

Energy Policy Act of 1992. The Energy Policy Act reduces dependence on imported petroleum and improves air quality by addressing all aspects of energy supply and demand, including alternative fuels, renewable energy and energy efficiency. This Act encourages the use of alternative fuels through both regulatory and voluntary activities and through the approaches carried out by the U.S. Department of Energy. It requires federal, state, and alternative fuel provider fleets to acquire alternative fuel vehicles. The Department of Energy's Clean Cities Initiative was established in response to the Energy Policy Act of 1992 to implement voluntary alternative fuel vehicle deployment activities.

Energy Policy Act of 2005. On August 8, 2005, President George W. Bush signed the Energy Policy Act of 2005 into law. The Energy Policy Act necessitates the development of grant programs, demonstration and testing initiatives, and tax incentives that promote alternative fuels and advanced vehicles production and use. This Act also amends existing regulations, including fuel economy testing procedures and Energy Policy Act of 1992 requirements for federal, state, and alternative fuel provider fleets. The Renewable Fuel Standard (RFS) program was created under the Energy Policy Act of 2005 and established the first renewable fuel volume mandate in the United States. As required under the Act, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012.

Energy Independence and Security Act of 2007 (EISA). On December 19, 2007, the EISA was signed into law. In addition to setting increased Corporate Average Fuel Economy standards for motor vehicles, the EISA includes the following provisions related to energy efficiency:

- Renewable Fuel Standard (RFS) (Section 202)
- Appliance and Lighting Efficiency Standards (Sections 301–325)
- Building Energy Efficiency (Sections 411–441)

This federal legislation requires ever-increasing levels of renewable fuels to replace petroleum. The U.S. Environmental Protection Agency (USEPA) is responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel. The RFS program regulations were developed in collaboration with refiners, renewable fuel producers, and many other stakeholders.

Under the EISA, the RFS program was expanded in several crucial ways that laid the foundation for achieving significant reductions in GHG emissions from the use of renewable fuels, reducing imported petroleum, and encouraging the development and expansion of the renewable fuels sector in the United States. The updated program is referred to as "RFS2" and includes the following:

- Expanded the RFS program to include diesel, in addition to gasoline.
- Increased the volume of renewable fuel required to be blended into transportation fuel.
- Established new categories of renewable fuel and set separate volume requirements for each one.
- Required the USEPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

Additional provisions of the EISA address energy savings in government and public institutions, research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green" jobs.

STATE

Warren-Alquist Act. The California Legislature passed the Warren-Alquist Act in 1974. The Warren-Alquist Act created the CEC. The CEC is the state's primary energy policy and planning agency. Created by legislature in 1974, the CEC has five major responsibilities: (1) forecasting future energy needs and keeping historical energy data, (2) licensing thermal power plants 50 megawatts (MW) or larger, (3) promoting energy efficiency through appliance and building standards, (4) developing energy technologies and supporting renewable energy, and (5) planning for and directing the state's response to energy emergencies. The legislation also incorporated the following three key provisions designed to address the demand side of the energy equation:

- Directed the CEC to formulate and adopt the nation's first energy conservation standards for buildings constructed and appliances sold in California.
- Removed the responsibility of electricity demand forecasting from the utilities, which had a financial interest in high-demand projections and transferred it to a more impartial CEC.
- Directed the CDC to implement a research and development program focused on alternative energy.

California Public Utilities Commission (CPUC). The CPUC regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. It regulates investor-owned electric and natural gas utilities operating in California, including Pacific Gas and Electric Company, Southern California Edison (SCE), San Diego Gas and Electric Company, and Southern California Gas Company. The CPUC also promotes programs to help consumers improve their energy efficiency and lower their energy bills.

State of California Energy Action Plan. The CEC and CPUC approved the first State of California Energy Action Plan in 2003. The plan established shared goals and specific actions to ensure that adequate, reliable, and reasonably priced electrical power and natural gas supplies are provided, and identified policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers. In

2005, a second Energy Action Plan was adopted by the CEC and CPUC to reflect various policy changes and actions of the prior two years.

Assembly Bill (AB) 2076. The CEC and the California Air Resources Board (CARB) are directed by AB 2076, Reducing Dependence on Petroleum (2000) to develop and adopt recommendations for reducing dependence on petroleum. A performance-based goal was to reduce petroleum demand to 15 percent less than 2003 demand by 2020.

Assembly Bill 1493. AB 1493 amended the Clean Car Standards (Chapter 200, Statutes of 2002) that require reductions in GHG emissions in new passenger vehicles from 2009 through 2016. The Advanced Clean Cars program extends AB 1493 for model years 2017 to 2025. This program promotes clean fuel technologies (i.e., plug-in hybrids, battery electric vehicles, compressed natural gas vehicles, hydrogen powered vehicles), reduces smog, and provides fuel saving costs.

Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002). The CEC is responsible for forecasting future energy needs for the state and developing renewable energy resources and alternative renewable energy technologies for buildings, industry, and transportation. SB 1389 requires the CEC to prepare a biennial integrated energy policy report assessing major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. The report is also intended to provide policy recommendations to conserve resources, protect the environment, and ensure reliable, secure, and diverse energy supplies. The *Final 2021 Integrated Energy Policy Report,* the most recent report required under SB 1389, was released to the public in February 2022.

California Renewables Portfolio Standard (RPS) Program. The California RPS Program, which was established in 2002 under SB 1078, accelerated in 2006 under SB 107, expanded in 2011 under SB 2 and further expanded in 2015 under SB 350, California's RPS is one of the most ambitious renewable energy standards in the country. The RPS Program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. On September 12, 2002, then-Governor Gray Davis signed SB 1078. SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then-Governor Arnold Schwarzenegger signed Executive Order S-14-08, which expands the RPS to 33 percent renewable power by 2020. In September 2009, Governor Schwarzenegger continued California's commitment to the RPS by signing Executive Order S-21-09, which directs the CARB under its AB 32 authority to enact regulations to help the state meet its RPS goal of 33 percent renewable energy by 2020.

Assembly Bill 1007. AB 1007 (2005) required the CEC to prepare a statewide plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the plan in partnership with the CARB and in consultation with other state agencies, plus federal and local agencies. The State Alternative Fuels Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing significant degradation of public health and environmental quality.

Assembly Bill 32 (2006) and Senate Bill 32 (2016). In 2006, the State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. In 2016, the Legislature enacted SB 32, which extended the horizon year of the state's codified GHG reduction planning targets from 2020 to 2030, requiring California to reduce its GHG emissions to 40 percent below 1990 levels by 2030. In accordance with AB 32 and SB 32, CARB prepares scoping plans to guide the development of statewide policies and regulations for the reduction of GHG emissions. Many of the policy and regulatory concepts identified in the scoping plans focus on increasing energy efficiencies, using renewable resources, and reducing the consumption of petroleum-based fuels (such as gasoline and diesel). As such, the state's GHG emissions reduction planning framework creates co-benefits for energy-related resources.

Alternative and Renewable Fuel and Vehicle Technology Program. In 2007, AB 118 created the Alternative and Renewable Fuel and Vehicle Technology Program, to be administered by the CEC. This Program authorizes the CEC to award grants, revolving loans, loan guarantees and other appropriate measures to qualified entities to develop and deploy innovative fuel and vehicle technologies that will help achieve California's petroleum reduction, air quality and climate change goals, without adopting or advocating any one preferred fuel or technology. In addition to funding alternative fuel and vehicle projects, this Program also funds workforce training to prepare the workforce required to design, construct, install, operate, produce, service and maintain new fuel vehicles. The statue was amended in 2008 and 2013, which authorized the Energy Commission to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies.

Senate Bill 375. SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required the CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035, and task regional metropolitan planning organizations with the preparation of sustainable communities strategies (SCS) within their regional transportation plans (RTP). The Southern California Association of Governments (SCAG) *Connect SoCal* 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) includes a commitment to reduce emissions from light duty vehicles to comply with SB 375. *Connect SoCal* outlines how the SCAG region will meet the SB 375 reduction targets—relative to 2005 emissions levels—established by the CARB: eight percent below by 2020 and 19 percent below by 2035.

Senate Bill X 1-2 and Senate Bill 250. SB X 1-2 (2011) requires all California utilities to generate 33 percent of their electricity from renewables by 2020. This RPS preempts the CARB 33 percent Renewable Electricity Standard and applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. These entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013 and 25 percent by the end of 2016, with the 33 percent requirement being met by the end of 2020. SB 250 requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030.

Senate Bill 100. SB 100 (2018), California Renewables Portfolio Standard Program: Emissions of Greenhouse Gases, also known as the 100 Percent Clean Energy Act, calls for the State Energy Resources Conservation and Development Commission, and State Air Resources Board to plan for 100 percent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045.

Executive Order N-79-20. Signed by Governor Gavin Newsom on September 23, 2020, this Executive Order set a 100 percent zero-emission vehicle (ZEV) sales goal for new passenger vehicles by 2035, a 100 percent ZEV operations goal for drayage and off-road vehicles by 2035, and a 100 percent ZEV operations goal for medium- and heavy-duty vehicles in the state by 2045, where feasible.

REGIONAL

The SCAG Regional Council formally adopted the *Connect SoCal* 2020–2045 RTP/SCS on September 3, 2020. Rooted in the 2008 and 2012 RTP/SCS plans, *Connect SoCal's* "Core Vision" focuses on maintaining and enhancing management of the transportation network while also expanding mobility choices by creating hubs that connect housing, jobs, and transit accessibility.[11] The "Core Vision" of *Connect SoCal* is organized into six key focus areas that expand upon progress made in the 2016 RTP/SCS: Sustainable Development, System Preservation and Resilience, Demand & System Management, Transit Backbone, Complete Streets, and Goods Movement. Connect SoCal incorporates a range of best practices for increasing transportation choices, reducing dependence on personal automobiles, further improving air quality and reducing GHG emissions, and encouraging growth in walkable, mixed-use communities with convenient access to transit infrastructure and employment. *Connect SoCal* outlines how the SCAG region will meet the SB 375 reduction targets—relative to 2005 emissions levels—established by the CARB: eight percent below by 2020 and 19 percent below by 2035. Although the SCAG Regional Council adopted the *Connect SoCal* 2024–2050 RTP/SCS on April 4, 2024, it has not yet received official approval from the CARB.

Existing Setting

PETROLEUM FUELS

According to the U.S. EIA, transportation accounts for nearly 40 percent of California's total energy demand, amounting to approximately 2,785 trillion BTU in 2021.[12] The CEC compiles statewide retail petroleum fuels sales data and produces the *California Annual Retail Fuel Outlet Report* (CEC A-15), which summarizes gasoline and diesel fuel retail sales by county.[13] According to the CEC retail sales dataset, fuel sales within Riverside County in 2022 comprised approximately 981 million gallons of gasoline and 173 million gallons of diesel fuel. The CEC estimates that approximately six percent of the State's retail fueling stations are located in Riverside County.

ELECTRICITY

According to CEC data, electricity consumption within Riverside County was approximately 17,781 gigawatt-hours (GWh) in 2022, comprised of approximately 9,061 GWh by residential end use (51 percent) and approximately 8,720 GWh of non-residential end use (49 percent). Electrical power at the proposed project site is provided by SCE, which reported that its industrial sector end users consumed approximately 17,353 GWh of electricity in 2022.[14] That year, SCE estimated that 43 percent of the power delivered to customers was derived from carbon-free sources, including RPS-eligible resources such as wind and solar, along with other carbon-free sources such as large hydroelectric facilities and nuclear power.[15] SCE has established ambitious goals to comply with statewide regulations mandating the expansion of renewably sourced power supply through the RPS Program, including, but not limited to:

- Net-Zero Commitment: Achieve net-zero greenhouse gas emissions across Scopes 1 (emissions from SCE's utility-owned electricity generation and transportation fleet, approximately eight percent of total emissions), Scope 2 (line loss emissions from power SCE purchases from third parties, approximately six percent of total emissions), and Scope 3 (emissions from power SCE purchases from third parties and sells to customers, approximately 87 percent of total) by 2045, in alignment with economy wide climate actions planned by the State of California.

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[11] SCAG, *Connect SoCal – The 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments*, adopted September 2020.

[12] U.S. EIA, *State Energy Data System Table C11. Total Energy Consumption Estimates by End-Use Sector*, 2022.

[13] CEC, *California Retail Fuel Outlet Annual Reporting (CEC-A15) Results and Analysis*, Updated 2024.

[14] CEC, *Electricity Consumption by Planning Area – 2022*, Accessed July 2024.

[15] Edison International, *2022 Sustainability Report*, June 2024.

- Clean Energy Transition: Deliver 100 percent carbon-free power in terms of retail sales to SCE customers by 2045.
- Electrification: By 2024 obtain customer commitments to deploy 8,490 medium- and heavy-duty electric vehicles at 870 sites through SCE's Charge Ready Transport Program; and, by 2025 obtain customer commitments to deploy at least 41,000 electric vehicle charge ports to serve at least 2,200 sites through SCE's Charge Ready light-duty vehicle charging programs.

As of 2022, approximately 43 percent of SCE retail sales were supplied by carbon-free power, and the RPS-qualifying compliance comprised 35.8 percent of the power mix delivered to customers. SCE is on track to meet the expanded renewable targets set forth in SB 350 and SB 100.

NATURAL GAS

According to CEC data, natural gas consumption within Riverside County was approximately 43,105,240 MMBTU in 2022, comprised of approximately 28,413,519 MMBTU by residential end use (66 percent) and approximately 14,691,721 MMBTU of non-residential end use (34 percent). Natural gas within Riverside County is provided by SoCalGas, which reported that its industrial sector end users consumed approximately 164,599,592 MMBTU of natural gas in 2022.[16]

Significance Thresholds

This Assessment was undertaken to determine whether construction or operation of the proposed project would have the potential to result in significant environmental impacts related to Energy in the context of the Appendix G Environmental Checklist criteria of the State CEQA Guidelines. The proposed project may result in a significant environmental impact related to Energy if its implementation would:

a) Result in potentially significant environment impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; and/or,

b) Conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

Additionally, Appendix F of the State CEQA Guidelines provides a goal of conserving energy. The appendix indicates the following methods to achieve this goal: (1) decreasing overall per capita energy consumption, (2) decreasing reliance on natural gas and oil, and (3) increasing reliance on renewable energy sources.

Methodology

In accordance with the codified CEQA Guidelines, assessments of potential environmental impacts related to energy should consider both direct and indirect expenditures of energy resources during construction and operation of projects. This Assessment evaluated the total energy consumption that would occur during the RNG facility construction activities and the incremental change in annual energy consumption relative to existing conditions resulting from operation of the RNG facillity.

CONSTRUCTION

The primary energy resource involved in construction of the proposed project would be petroleum fuels consumed by off-road equipment, on-road vehicles, and onsite trucks. Construction of the proposed project would employ off-road equipment and on-site vehicles with internal combustion engines predominately

[16] CEC, *Gas Consumption by Planning Area – 2022*, Accessed July 2024.

powered by either diesel fuel or motor gasoline. RNG facility construction would generally involve site grading activities, building construction, processing equipment installation, pipeline installation, and SoCalGas connection work. Toro provided an inventory of the off-road equipment activities that would be required to construct the proposed project, which can be found in the **Appendix.** Using CARB methodology, off-road equipment diesel fuel consumption was estimated using a fuel consumption factor of 0.0574 gal/hp-hr. for engines less than 100 hp and 0.0516 gal/hp-hr. for engines over 100 hp.

The incremental change in diesel fuel consumption associated with the additional on-site vehicle travel was estimated using a combination of carbon dioxide (CO_2) emissions produced using the California Emissions Estimator Model (CalEEMod, Version 2022.1) and the USEPA fuel-specific carbon intensity factors.[17] The USEPA estimates the carbon intensity of motor gasoline and diesel fuel to be 19.36 lbs. CO_2/gallon-gas and 22.51 lbs. CO_2/gallon-diesel, respectively. Daily CO_2 emissions from on-site truck travel were calculated in CalEEMod and divided by the corresponding diesel fuel carbon intensity factor to estimate fuel consumption.

OPERATIONS

Implementation of the proposed project would require electricity to power the RNG facility and the utility and maintenance building. Minor increases in petroleum fuels consumption at the ESL would also occur with the additional Toro employee vehicle trips to manage the RNG facility. CalEEMod was used to estimate the annual electricity consumption of the utility and service building, and Toro provided estimates of the annual electricity demand of the RNG facility. Detailed energy resource consumption estimates can be found in the **Appendix.**

Impacts Assessment

a) Would the proposed project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation? (Less-than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

The following analysis discusses short-term (construction) and long-term (operational) use of petroleum fuels and electricity that would result from implementation of the proposed project.

PETROLEUM

Construction

Petroleum fuels would be consumed during construction of the proposed project by heavy-duty equipment, on-site trucks, on-road truck trips delivering facility components and cement for foundations, and on-road vehicle trips by construction crews. **Table 2** presents a summary of the one-time expenditure of petroleum fuels that would be required during the 18-month RNG facility construction period. Construction activities would consume approximately 73,161 gallons of diesel fuel in total. The annual diesel fuel consumption would

[17] USEPA, *Emission Factors for Greenhouse Gas Inventories*, March 2023.

represent less than 0.05 percent of 2022 countywide retail sales. RNG facility construction crew vehicle trips would also consume approximately 14,258 gallons of gasoline over the 18-month construction period. This incremental increase in petroleum fuels demand to construct the proposed project would not place a disproportionate burden on available petroleum fuel supply.

TABLE 2: PROPOSED PROJECT CONSTRUCTION PETROLEUM DEMAND	
Fuel Type and End Use	**Fuel Consumption (Gallons)**
DIESEL	
RNG Facility Component Deliveries	24,810
RNG Facility Construction Off-Road Equipment	32,381
RNG Facility Construction Truck Trips	15,970
Total Diesel Consumption	**73,161**
GASOLINE	
Construction Crew – RNG Facility Construction (Total)	**14,258**
SOURCE: TAHA, 2024.	

The proposed project would adhere to best management practices to avoid the potential for the wasteful consumption of petroleum fuels, such as ensuring that equipment operates within optimum manufacturer specifications and enforcing the restriction on heavy-duty diesel vehicle idling time to five minutes in compliance with CARB's Airborne Toxics Control Measure 2485. Therefore, because petroleum use would be minimized to the extent feasible and represents a relatively small amount of regional fuel consumption, construction of the proposed project would result in a less than significant impact related to wasteful, inefficient, or unnecessary consumption of petroleum.

Operations

Operation of the proposed project would involve the consumption of petroleum fuels in Toro employee vehicles traveling to and from the ESL and occasional maintenance vehicle trips. As shown in **Table 3**, proposed project operations would require approximately 2,973 gallons of gasoline and 1,065 gallons of diesel fuel annually. Proposed project operations would not result in wasteful consumption of petroleum fuels; this impact would be less than significant.

TABLE 3: PROPOSED PROJECT OPERATIONS ANNUAL ENERGY DEMAND	
Energy Resource and End Use	**Energy Consumption**
GASOLINE	
Toro RNG Facility Employee Trips (Gallons)	2,973
DIESEL FUEL	
Onsite Maintenance Truck Trips (Gallons)	1,065
ELECTRICITY	
RNG Facility Power (MWh)	61,320
RNG Facility Utility Building Power (MWh)	31
Total Annual Electricity (MWh)	**61,351**
NATURAL GAS	
RNG Facility Natural Gas Production (MMBTU)	3,139,000
SOURCE: TAHA, 2024.	

Mitigation Measures

No mitigation measures are required.

ELECTRICITY

Construction

Construction of the proposed project may require electricity for operation of electrically powered hand tools. However, electricity to the site would be provided by diesel generators or connection to the existing SCE grid. Therefore, construction of the proposed project would result in a less than significant impact related to wasteful or inefficient consumption of electricity.

Operations

Implementation of the proposed project would require additional permanent electricity consumption associated with operation of the RNG facility and the utility and maintenance building, as summarized in **Table 3**. The increase in annual electricity demand would not place an undue burden on SCE power supply or grid reliability. Therefore, implementation of the proposed project would have a less than significant impact related to operational electricity consumption.

NATURAL GAS

Construction

Construction of the proposed project would not involve end uses of natural gas. Therefore, construction of the proposed project would result in a less than significant impact related to wasteful or inefficient consumption of natural gas.

Operations

Implementation of the proposed project would divert LFG through the RNG facility and produce up to 8,600 MMBTU of RNG daily. The proposed project would provide a new source of renewable energy and would contribute to regional efforts to reduce reliance on nonrenewable resources. Therefore, implementation of the proposed project would have a less than significant impact related to operational natural gas consumption.

Mitigation Measures

No mitigation measures are required.

b) Would the proposed project conflict with or obstruct a State or local plan for renewable energy or energy efficiency? (Less-than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Construction and Operations

Implementation of the proposed project would not conflict with or obstruct any State, regional, or local plan involving the expansion of renewable energy resources or improving energy efficiency. The proposed project would provide a net energy benefit by producing approximately 8,600 MMBTU of RNG on a daily basis. Toro is committed to responsible environmental stewardship and has embraced an evolving approach toward enhancing operational efficiency and monitoring and reducing its environmental impacts. **Table 4** below summarizes the most directly applicable plans and policies enacted for the purpose of managing energy resource consumption and conservation and provides a brief description of the proposed project's influence on implementation of the provisions therein. Implementation of the proposed project would not impede efforts to improve energy efficiency or expand renewable resources, and this impact would be less than significant.

TABLE 4: CONSISTENCY WITH ENERGY MANAGEMENT PLANS

Plan Goal, Objective, or Target	Project Evaluation
CARB Truck and Bus Regulation (2008, Amended 2014): By January 1, 2023, all drayage trucks must have 2010 model year or newer engines.	**Consistent.** Implementation of the proposed project would not generate new truck trips within the greater Riverside County area. All commercial heavy-duty trucks serving the RNG facility will be required to comply with the requirements set forth in the CARB Truck and Bus Regulation. Proposed project construction and operations would not impede the phasing out of trucks with older engines failing to comply with the regulation.
CARB Sustainable Freight Action Plan (2015): Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.	**Consistent.** The proposed project would not hinder the State's efforts to implement near-zero- and zero-emission technologies. The fleet of trucks and equipment used at the RNG facility would be turned over at similar rates consistent with the rest of Toro operations and the greater SCAG region.
SOURCE: TAHA, 2024.	

Mitigation Measures

No mitigation measures are required.

References

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Appendix

- California Emissions Estimator Model (Version 2022.1) Output Files
  - RNG Facility Construction and Operations Detailed Report
  - Pipeline Installation and SoCalGas Construction Activities Detailed Report
- Construction Activities Fuel Consumption Calculations

El Sobrante Landfill RNG Detailed Report

Table of Contents

1. Basic Project Information

   1.1. Basic Project Information

   1.2. Land Use Types

   1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

   2.1. Construction Emissions Compared Against Thresholds

   2.2. Construction Emissions by Year, Unmitigated

   2.3. Construction Emissions by Year, Mitigated

   2.4. Operations Emissions Compared Against Thresholds

   2.5. Operations Emissions by Sector, Unmitigated

   2.6. Operations Emissions by Sector, Mitigated

3. Construction Emissions Details

   3.1. Site Preparation (2024) - Unmitigated

   3.2. Site Preparation (2024) - Mitigated

   3.3. Grading-S (2024) - Unmitigated

3.4. Grading-S (2024) - Mitigated

3.5. Grading-N (2024) - Unmitigated

3.6. Grading-N (2024) - Mitigated

3.7. Grading-N (2025) - Unmitigated

3.8. Grading-N (2025) - Mitigated

3.9. Building Construction (2024) - Unmitigated

3.10. Building Construction (2024) - Mitigated

3.11. Building Construction (2025) - Unmitigated

3.12. Building Construction (2025) - Mitigated

3.13. EPC (2024) - Unmitigated

3.14. EPC (2024) - Mitigated

3.15. EPC (2025) - Unmitigated

3.16. EPC (2025) - Mitigated

3.17. Paving (2024) - Unmitigated

3.18. Paving (2024) - Mitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.1.2. Mitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.2. Electricity Emissions By Land Use - Mitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.2.4. Natural Gas Emissions By Land Use - Mitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.3.2. Mitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.4.2. Mitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.5.2. Mitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.6.2. Mitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.7.2. Mitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.8.2. Mitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.9.2. Mitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	El Sobrante Landfill RNG
Construction Start Date	8/5/2024
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	21.8
Location	33.79268209665507, -117.47540480799165
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5581
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Light Industry	3.20	1000sqft	2.80	3,200	0.00	0.00	—	Maintenance & Office Building

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads
Waste	S-4*	Recycle Demolished Construction Material
Refrigerants	R-7*	Reduce Disposal Emissions

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	9.34	25.4	38.4	0.06	1.08	2.07	3.14	0.99	0.39	1.38	—	7,614	7,614	0.31	0.17	6.39	7,678
Mit.	9.34	25.4	38.4	0.06	1.08	1.62	2.70	0.99	0.34	1.34	—	7,614	7,614	0.31	0.17	6.39	7,678
% Reduced	—	—	—	—	—	21%	14%	—	11%	3%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.41	35.0	49.3	0.08	1.38	2.83	4.21	1.27	0.54	1.81	—	10,032	10,032	0.41	0.24	0.24	10,114
Mit.	4.41	35.0	49.3	0.08	1.38	2.22	3.60	1.27	0.48	1.75	—	10,032	10,032	0.41	0.24	0.24	10,114
% Reduced	—	—	—	—	—	21%	14%	—	11%	3%	—	—	—	—	—	—	—

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.98	5.95	8.76	0.01	0.24	0.47	0.71	0.22	0.09	0.31	—	1,709	1,709	0.07	0.04	0.67	1,724
Mit.	0.98	5.95	8.76	0.01	0.24	0.37	0.61	0.22	0.08	0.30	—	1,709	1,709	0.07	0.04	0.67	1,724
% Reduced	—	—	—	—	—	20%	13%	—	11%	3%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.18	1.09	1.60	< 0.005	0.04	0.09	0.13	0.04	0.02	0.06	—	283	283	0.01	0.01	0.11	285
Mit.	0.18	1.09	1.60	< 0.005	0.04	0.07	0.11	0.04	0.01	0.06	—	283	283	0.01	0.01	0.11	285
% Reduced	—	—	—	—	—	20%	13%	—	11%	3%	—	—	—	—	—	—	—
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	9.34	25.4	38.4	0.06	1.08	2.07	3.14	0.99	0.39	1.38	—	7,614	7,614	0.31	0.17	6.39	7,678
2025	1.07	8.96	13.2	0.02	0.27	0.76	1.03	0.25	0.15	0.40	—	2,550	2,550	0.10	0.07	2.58	2,576
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	35.0	49.3	0.08	1.38	2.83	4.21	1.27	0.54	1.81	—	10,032	10,032	0.41	0.24	0.24	10,114
2025	2.20	17.7	26.6	0.04	0.64	1.51	2.16	0.59	0.30	0.89	—	5,553	5,553	0.23	0.13	0.12	5,597
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.98	5.95	8.76	0.01	0.24	0.47	0.71	0.22	0.09	0.31	—	1,709	1,709	0.07	0.04	0.67	1,724
2025	0.40	3.34	4.88	0.01	0.11	0.28	0.39	0.10	0.05	0.16	—	985	985	0.04	0.03	0.40	994
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.18	1.09	1.60	< 0.005	0.04	0.09	0.13	0.04	0.02	0.06	—	283	283	0.01	0.01	0.11	285
2025	0.07	0.61	0.89	< 0.005	0.02	0.05	0.07	0.02	0.01	0.03	—	163	163	0.01	< 0.005	0.07	165

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	9.34	25.4	38.4	0.06	1.08	1.62	2.70	0.99	0.34	1.34	—	7,614	7,614	0.31	0.17	6.39	7,678
2025	1.07	8.96	13.2	0.02	0.27	0.60	0.87	0.25	0.14	0.38	—	2,550	2,550	0.10	0.07	2.58	2,576
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	35.0	49.3	0.08	1.38	2.22	3.60	1.27	0.48	1.75	—	10,032	10,032	0.41	0.24	0.24	10,114
2025	2.20	17.7	26.6	0.04	0.64	1.24	1.88	0.59	0.27	0.86	—	5,553	5,553	0.23	0.13	0.12	5,597

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.98	5.95	8.76	0.01	0.24	0.37	0.61	0.22	0.08	0.30	—	1,709	1,709	0.07	0.04	0.67	1,724
2025	0.40	3.34	4.88	0.01	0.11	0.22	0.33	0.10	0.05	0.15	—	985	985	0.04	0.03	0.40	994
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.18	1.09	1.60	< 0.005	0.04	0.07	0.11	0.04	0.01	0.06	—	283	283	0.01	0.01	0.11	285
2025	0.07	0.61	0.89	< 0.005	0.02	0.04	0.06	0.02	0.01	0.03	—	163	163	0.01	< 0.005	0.07	165

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
Mit.	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
Mit.	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
Mit.	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280
Mit.	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Annual)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10,000
Unmit.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No
Mit.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Area	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Area	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.42	0.69	5.11	0.02	0.01	1.41	1.42	0.01	0.36	0.37	—	1,576	1,576	0.05	0.07	2.52	1,600
Area	0.09	< 0.005	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.39	0.39	< 0.005	< 0.005	—	0.39
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Area	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Energy	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.1	12.1	< 0.005	< 0.005	—	12.1
Water	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Waste	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Area	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.55	0.67	6.23	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,741	1,745	0.42	0.07	6.67	1,783
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Area	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.51	0.71	4.94	0.02	0.01	1.43	1.45	0.01	0.36	0.38	3.56	1,639	1,642	0.42	0.07	0.98	1,676
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.42	0.69	5.11	0.02	0.01	1.41	1.42	0.01	0.36	0.37	—	1,576	1,576	0.05	0.07	2.52	1,600
Area	0.09	< 0.005	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.39	0.39	< 0.005	< 0.005	—	0.39
Energy	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	73.1	73.1	0.01	< 0.005	—	73.4
Water	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Waste	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	0.52	0.73	5.24	0.02	0.01	1.41	1.43	0.01	0.36	0.37	3.56	1,654	1,657	0.42	0.07	3.35	1,693
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Area	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Energy	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.1	12.1	< 0.005	< 0.005	—	12.1
Water	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Waste	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	0.09	0.13	0.96	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	0.59	274	274	0.07	0.01	0.56	280

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	9.21	6.03	19.0	0.01	0.47	—	0.47	0.41	—	0.41	—	1,027	1,027	0.04	0.01	—	1,031
Dust From Material Movement	—	—	—	—	—	0.11	0.11	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25	0.17	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	28.1	28.1	< 0.005	< 0.005	—	28.2
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.28	0.28	< 0.005	< 0.005	< 0.005	0.29
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.03	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.66	4.66	< 0.005	< 0.005	—	4.67
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.05	0.05	< 0.005	< 0.005	< 0.005	0.05
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130

Hauling	0.02	0.53	0.28	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	220	220	0.01	0.04	0.39	231
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.34	7.34	< 0.005	< 0.005	0.01	7.44
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.56
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.03	6.03	< 0.005	< 0.005	< 0.005	6.33
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.22	1.22	< 0.005	< 0.005	< 0.005	1.23
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.59
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.00	1.00	< 0.005	< 0.005	< 0.005	1.05

3.2. Site Preparation (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	9.21	6.03	19.0	0.01	0.47	—	0.47	0.41	—	0.41	—	1,027	1,027	0.04	0.01	—	1,031
Dust From Material Movement	—	—	—	—	—	0.11	0.11	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25	0.17	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	28.1	28.1	< 0.005	< 0.005	—	28.2
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.28	0.28	< 0.005	< 0.005	< 0.005	0.29
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.03	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.66	4.66	< 0.005	< 0.005	—	4.67
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.05	0.05	< 0.005	< 0.005	< 0.005	0.05
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130
Hauling	0.02	0.53	0.28	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	220	220	0.01	0.04	0.39	231
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.34	7.34	< 0.005	< 0.005	0.01	7.44
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.56
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.03	6.03	< 0.005	< 0.005	< 0.005	6.33

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.22	1.22	< 0.005	< 0.005	< 0.005	1.23
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.59
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.00	1.00	< 0.005	< 0.005	< 0.005	1.05

3.3. Grading-S (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.85	1.15	< 0.005	0.04	—	0.04	0.04	—	0.04	—	209	209	0.01	< 0.005	—	210
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	1.38	1.38	< 0.005	< 0.005	< 0.005	1.45
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.6	34.6	< 0.005	< 0.005	—	34.8
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.23	0.23	< 0.005	< 0.005	< 0.005	0.24
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	2.00	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	345	345	0.01	0.01	1.37	351
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130
Hauling	< 0.005	0.08	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.14	1.51	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	317	317	0.02	0.01	0.04	321
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	< 0.005	0.09	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.0	44.0	< 0.005	< 0.005	0.08	44.7
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	17.0	17.0	< 0.005	< 0.005	0.02	17.8

Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.64	4.64	< 0.005	< 0.005	< 0.005	4.87
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.29	7.29	< 0.005	< 0.005	0.01	7.39
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.82	2.82	< 0.005	< 0.005	< 0.005	2.95
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.81

3.4. Grading-S (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.22	8.43	0.01	0.28	—	0.28	0.26	—	0.26	—	1,527	1,527	0.06	0.01	—	1,533
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.85	1.15	< 0.005	0.04	—	0.04	0.04	—	0.04	—	209	209	0.01	< 0.005	—	210
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	1.38	1.38	< 0.005	< 0.005	< 0.005	1.45
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.6	34.6	< 0.005	< 0.005	—	34.8
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.23	0.23	< 0.005	< 0.005	< 0.005	0.24
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	2.00	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	345	345	0.01	0.01	1.37	351
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.35	130
Hauling	< 0.005	0.08	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.14	1.51	0.00	0.00	0.31	0.31	0.00	0.07	0.07	—	317	317	0.02	0.01	0.04	321
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	< 0.005	0.09	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.0	44.0	< 0.005	< 0.005	0.08	44.7
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	17.0	17.0	< 0.005	< 0.005	0.02	17.8

Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.64	4.64	< 0.005	< 0.005	< 0.005	4.87
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.29	7.29	< 0.005	< 0.005	0.01	7.39
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.82	2.82	< 0.005	< 0.005	< 0.005	2.95
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.81

3.5. Grading-N (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.21	1.81	2.34	< 0.005	0.08	—	0.08	0.08	—	0.08	—	481	481	0.02	< 0.005	—	482
Dust From Material Movement	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.33	0.43	< 0.005	0.02	—	0.02	0.01	—	0.01	—	79.6	79.6	< 0.005	< 0.005	—	79.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.34
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.17	3.01	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	518	518	0.02	0.02	2.06	526
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.9	60.9	< 0.005	0.01	0.17	63.8
Hauling	< 0.005	0.12	0.06	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.7	50.7	< 0.005	0.01	0.09	53.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.20	2.27	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	476	476	0.02	0.02	0.05	482
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.0	61.0	< 0.005	0.01	< 0.005	63.7
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.9	50.9	< 0.005	0.01	< 0.005	53.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.47	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	94.4	94.4	< 0.005	< 0.005	0.17	95.7
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.9	11.9	< 0.005	< 0.005	0.01	12.5

Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.94	9.94	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.6	15.6	< 0.005	< 0.005	0.03	15.8
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.65	1.65	< 0.005	< 0.005	< 0.005	1.73

3.6. Grading-N (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	0.01	10.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	9.23	12.0	0.02	0.43	—	0.43	0.39	—	0.39	—	2,456	2,456	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.21	1.81	2.34	< 0.005	0.08	—	0.08	0.08	—	0.08	—	481	481	0.02	< 0.005	—	482
Dust From Material Movement	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.33	0.43	< 0.005	0.02	—	0.02	0.01	—	0.01	—	79.6	79.6	< 0.005	< 0.005	—	79.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.33	0.33	< 0.005	< 0.005	< 0.005	0.34
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.17	3.01	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	518	518	0.02	0.02	2.06	526
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.9	60.9	< 0.005	0.01	0.17	63.8
Hauling	< 0.005	0.12	0.06	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.7	50.7	< 0.005	0.01	0.09	53.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.20	2.27	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	476	476	0.02	0.02	0.05	482
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.0	61.0	< 0.005	0.01	< 0.005	63.7
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.9	50.9	< 0.005	0.01	< 0.005	53.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.47	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	94.4	94.4	< 0.005	< 0.005	0.17	95.7
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.9	11.9	< 0.005	< 0.005	0.01	12.5

Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.94	9.94	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.6	15.6	< 0.005	< 0.005	0.03	15.8
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.97	1.97	< 0.005	< 0.005	< 0.005	2.07
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.65	1.65	< 0.005	< 0.005	< 0.005	1.73

3.7. Grading-N (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.35	11.9	0.02	0.37	—	0.37	0.34	—	0.34	—	2,457	2,457	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.73	1.05	< 0.005	0.03	—	0.03	0.03	—	0.03	—	216	216	0.01	< 0.005	—	217
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.92

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.13	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	35.8	35.8	< 0.005	< 0.005	—	35.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.17	2.10	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	466	466	0.02	0.02	0.05	472
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.1	60.1	< 0.005	0.01	< 0.005	62.8
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.1	50.1	< 0.005	0.01	< 0.005	52.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.20	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.6	41.6	< 0.005	< 0.005	0.07	42.2
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	0.01	5.54
Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.40	4.40	< 0.005	< 0.005	< 0.005	4.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.89	6.89	< 0.005	< 0.005	0.01	6.98
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.88	0.88	< 0.005	< 0.005	< 0.005	0.92
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.73	0.73	< 0.005	< 0.005	< 0.005	0.76

3.8. Grading-N (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.35	11.9	0.02	0.37	—	0.37	0.34	—	0.34	—	2,457	2,457	0.10	0.02	—	2,465
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.73	1.05	< 0.005	0.03	—	0.03	0.03	—	0.03	—	216	216	0.01	< 0.005	—	217
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.92
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.13	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	35.8	35.8	< 0.005	< 0.005	—	35.9
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.17	2.10	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	466	466	0.02	0.02	0.05	472
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.1	60.1	< 0.005	0.01	< 0.005	62.8
Hauling	< 0.005	0.13	0.07	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.1	50.1	< 0.005	0.01	< 0.005	52.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.20	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.6	41.6	< 0.005	< 0.005	0.07	42.2
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	0.01	5.54
Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.40	4.40	< 0.005	< 0.005	< 0.005	4.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.89	6.89	< 0.005	< 0.005	0.01	6.98
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.88	0.88	< 0.005	< 0.005	< 0.005	0.92
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.73	0.73	< 0.005	< 0.005	< 0.005	0.76

3.9. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	3.79	4.19	0.01	0.12	—	0.12	0.11	—	0.11	—	764	764	0.03	0.01	—	766

Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	5.06	5.06	< 0.005	< 0.005	< 0.005	5.32
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.64	0.70	< 0.005	0.02	—	0.02	0.02	—	0.02	—	129	129	0.01	< 0.005	—	129
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.89
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.12	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.3	21.3	< 0.005	< 0.005	—	21.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.01	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	212	212	0.01	0.01	0.02	214
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	36.1	36.1	< 0.005	< 0.005	0.07	36.6
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.9	20.9	< 0.005	< 0.005	0.03	21.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.97	5.97	< 0.005	< 0.005	0.01	6.06
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.62
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	3.79	4.19	0.01	0.12	—	0.12	0.11	—	0.11	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.06	5.06	< 0.005	< 0.005	< 0.005	5.32
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.64	0.70	< 0.005	0.02	—	0.02	0.02	—	0.02	—	129	129	0.01	< 0.005	—	129
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.89
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.12	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.3	21.3	< 0.005	< 0.005	—	21.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.01	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	212	212	0.01	0.01	0.02	214

Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	36.1	36.1	< 0.005	< 0.005	0.07	36.6
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.9	20.9	< 0.005	< 0.005	0.03	21.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.97	5.97	< 0.005	< 0.005	0.01	6.06
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.46	3.46	< 0.005	< 0.005	< 0.005	3.62
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	4.95	4.95	< 0.005	< 0.005	0.01	5.20
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	4.98	4.98	< 0.005	< 0.005	< 0.005	5.23
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.09	0.87	0.99	< 0.005	0.03	—	0.03	0.02	—	0.02	—	182	182	0.01	< 0.005	—	183
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	1.18	1.18	< 0.005	< 0.005	< 0.005	1.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.18	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	30.2	30.2	< 0.005	< 0.005	—	30.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.20	0.20	< 0.005	< 0.005	< 0.005	0.21
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	1.24	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	226	226	0.01	0.01	0.83	229
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.08	0.93	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	207	207	0.01	0.01	0.02	210
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.24	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	50.1	50.1	< 0.005	< 0.005	0.09	50.8
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.2	29.2	< 0.005	< 0.005	0.04	30.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.30	8.30	< 0.005	< 0.005	0.01	8.42
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.84	4.84	< 0.005	< 0.005	0.01	5.07
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	4.95	4.95	< 0.005	< 0.005	0.01	5.20
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	3.63	4.16	0.01	0.11	—	0.11	0.10	—	0.10	—	764	764	0.03	0.01	—	766
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	4.98	4.98	< 0.005	< 0.005	< 0.005	5.23
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.87	0.99	< 0.005	0.03	—	0.03	0.02	—	0.02	—	182	182	0.01	< 0.005	—	183
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.18	1.18	< 0.005	< 0.005	< 0.005	1.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.18	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	30.2	30.2	< 0.005	< 0.005	—	30.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.20	0.20	< 0.005	< 0.005	< 0.005	0.21
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.07	1.24	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	226	226	0.01	0.01	0.83	229
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.08	0.93	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	207	207	0.01	0.01	0.02	210
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.24	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	50.1	50.1	< 0.005	< 0.005	0.09	50.8
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.2	29.2	< 0.005	< 0.005	0.04	30.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.30	8.30	< 0.005	< 0.005	0.01	8.42
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.84	4.84	< 0.005	< 0.005	0.01	5.07
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. EPC (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.09	6.15	0.01	0.18	—	0.18	0.17	—	0.17	—	1,019	1,019	0.04	0.01	—	1,023

Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.72	0.87	< 0.005	0.03	—	0.03	0.02	—	0.02	—	144	144	0.01	< 0.005	—	144
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	1.42	1.42	< 0.005	< 0.005	< 0.005	1.49
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.13	0.16	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.8	23.8	< 0.005	< 0.005	—	23.9
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.8	37.8	< 0.005	< 0.005	0.07	38.3
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	17.5	17.5	< 0.005	< 0.005	0.02	18.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.25	6.25	< 0.005	< 0.005	0.01	6.34
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.90	2.90	< 0.005	< 0.005	< 0.005	3.03
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. EPC (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.09	6.15	0.01	0.18	—	0.18	0.17	—	0.17	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	10.1	10.1	< 0.005	< 0.005	< 0.005	10.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.72	0.87	< 0.005	0.03	—	0.03	0.02	—	0.02	—	144	144	0.01	< 0.005	—	144
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.42	1.42	< 0.005	< 0.005	< 0.005	1.49
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.13	0.16	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.8	23.8	< 0.005	< 0.005	—	23.9
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268

Vendor	< 0.005	0.15	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	124	124	< 0.005	0.02	0.01	130
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.8	37.8	< 0.005	< 0.005	0.07	38.3
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	17.5	17.5	< 0.005	< 0.005	0.02	18.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.25	6.25	< 0.005	< 0.005	0.01	6.34
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.90	2.90	< 0.005	< 0.005	< 0.005	3.03
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. EPC (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	9.89	9.89	< 0.005	< 0.005	0.01	10.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.17	1.56	1.96	< 0.005	0.05	—	0.05	0.05	—	0.05	—	327	327	0.01	< 0.005	—	328
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.04	0.05	< 0.005	< 0.005	< 0.005	—	3.19	3.19	< 0.005	< 0.005	< 0.005	3.35
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.28	0.36	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.2	54.2	< 0.005	< 0.005	—	54.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.40	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	84.2	84.2	< 0.005	< 0.005	0.14	85.4
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.3	39.3	< 0.005	0.01	0.05	41.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	13.9	13.9	< 0.005	< 0.005	0.02	14.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.50	6.50	< 0.005	< 0.005	0.01	6.81
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.16. EPC (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.89	9.89	< 0.005	< 0.005	0.01	10.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	4.85	6.12	0.01	0.16	—	0.16	0.15	—	0.15	—	1,019	1,019	0.04	0.01	—	1,023
Onsite truck	< 0.005	0.04	0.02	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.97	9.97	< 0.005	< 0.005	< 0.005	10.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.56	1.96	< 0.005	0.05	—	0.05	0.05	—	0.05	—	327	327	0.01	< 0.005	—	328
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	3.19	3.19	< 0.005	< 0.005	< 0.005	3.35
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.28	0.36	< 0.005	0.01	—	0.01	0.01	—	0.01	—	54.2	54.2	< 0.005	< 0.005	—	54.3
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	< 0.005	0.13	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.35	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.14	0.04	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	122	122	< 0.005	0.02	0.01	128
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.40	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	84.2	84.2	< 0.005	< 0.005	0.14	85.4
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.3	39.3	< 0.005	0.01	0.05	41.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	13.9	13.9	< 0.005	< 0.005	0.02	14.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.50	6.50	< 0.005	< 0.005	0.01	6.81
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Paving (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	20.1	20.1	< 0.005	< 0.005	0.03	21.2

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	20.3	20.3	< 0.005	< 0.005	< 0.005	21.3
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.44	1.68	< 0.005	0.06	—	0.06	0.05	—	0.05	—	302	302	0.01	< 0.005	—	303
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	—	3.32	3.32	< 0.005	< 0.005	< 0.005	3.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.26	0.31	< 0.005	0.01	—	0.01	0.01	—	0.01	—	50.0	50.0	< 0.005	< 0.005	—	50.2
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.58
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.14	2.50	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	432	432	0.02	0.01	1.71	438
Vendor	0.01	0.21	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.52	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.17	1.89	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	397	397	0.02	0.01	0.04	402
Vendor	0.01	0.22	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.01	195

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.33	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	66.1	66.1	< 0.005	< 0.005	0.12	67.0
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.6	30.6	< 0.005	< 0.005	0.04	32.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.07	5.07	< 0.005	< 0.005	0.01	5.31
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.18. Paving (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	20.1	20.1	< 0.005	< 0.005	0.03	21.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05	8.78	10.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,838	1,838	0.07	0.01	—	1,845
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.07	0.04	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	20.3	20.3	< 0.005	< 0.005	< 0.005	21.3

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.44	1.68	< 0.005	0.06	—	0.06	0.05	—	0.05	—	302	302	0.01	< 0.005	—	303
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	3.32	3.32	< 0.005	< 0.005	< 0.005	3.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.26	0.31	< 0.005	0.01	—	0.01	0.01	—	0.01	—	50.0	50.0	< 0.005	< 0.005	—	50.2
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.58
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.14	2.50	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	432	432	0.02	0.01	1.71	438
Vendor	0.01	0.21	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.52	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.17	1.89	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	397	397	0.02	0.01	0.04	402
Vendor	0.01	0.22	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.01	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.33	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	66.1	66.1	< 0.005	< 0.005	0.12	67.0
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.6	30.6	< 0.005	< 0.005	0.04	32.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.07	5.07	< 0.005	< 0.005	0.01	5.31
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Total	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Total	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Total	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Total	0.45	0.63	6.06	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,663	1,663	0.05	0.07	5.84	1,690
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Total	0.43	0.68	4.91	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,561	1,561	0.05	0.07	0.15	1,583
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265
Total	0.08	0.13	0.93	< 0.005	< 0.005	0.26	0.26	< 0.005	0.07	0.07	—	261	261	0.01	0.01	0.42	265

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84
Total	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2

Total	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	—	29.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84
Total	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81	< 0.005	< 0.005	—	4.84

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31
Total	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Total	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.0	44.0	< 0.005	< 0.005	—	44.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31
Total	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.29	7.29	< 0.005	< 0.005	—	7.31

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Total	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	< 0.005	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Total	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Total	0.10	< 0.005	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.57	0.57	< 0.005	< 0.005	—	0.57
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	< 0.005	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07
Total	0.02	< 0.005	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.07

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Total	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Total	—	—	—	—	—	—	—	—	—	—	1.42	4.78	6.20	0.15	< 0.005	—	10.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80
Total	—	—	—	—	—	—	—	—	—	—	0.23	0.79	1.03	0.02	< 0.005	—	1.80

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Total	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Total	—	—	—	—	—	—	—	—	—	—	2.14	0.00	2.14	0.21	0.00	—	7.48
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24
Total	—	—	—	—	—	—	—	—	—	—	0.35	0.00	0.35	0.04	0.00	—	1.24

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	0.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	8/19/2024	8/30/2024	5.00	10.0	POR Metering Site Clearing
Grading-S	Grading	9/2/2024	11/8/2024	5.00	50.0	South Plant Site
Grading-N	Grading	9/23/2024	2/14/2025	5.00	105	North Plant Site
Building Construction	Building Construction	10/7/2024	5/2/2025	5.00	150	Office/Maintenance Building
EPC	Building Construction	10/21/2024	6/13/2025	5.00	170	EPC - Plant Equipment & Install
Paving	Paving	9/2/2024	11/22/2024	5.00	60.0	Electrical Installation

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Site Preparation	Concrete/Industrial Saws	Diesel	Average	1.00	4.00	33.0	0.73
Site Preparation	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36
Site Preparation	Crawler Tractors	Diesel	Average	1.00	6.00	87.0	0.43
Site Preparation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Site Preparation	Crushing/Proc. Equipment	Gasoline	Average	1.00	2.00	12.0	0.85
Grading-S	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-S	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-S	Excavators	Diesel	Average	1.00	4.00	180	0.38

Grading-S	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-S	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-S	Plate Compactors	Diesel	Average	1.00	4.00	8.00	0.43
Grading-S	Rollers	Diesel	Average	1.00	2.00	36.0	0.38
Grading-N	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-N	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-N	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-N	Excavators	Diesel	Average	1.00	4.00	300	0.38
Grading-N	Excavators	Diesel	Average	1.00	2.00	180	0.38
Grading-N	Cranes	Diesel	Average	1.00	2.00	367	0.29
Grading-N	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-N	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Grading-N	Crawler Tractors	Diesel	Average	1.00	2.00	87.0	0.43
Grading-N	Plate Compactors	Diesel	Average	1.00	2.00	8.00	0.43
Grading-N	Rollers	Diesel	Average	1.00	3.00	36.0	0.38
Building Construction	Cranes	Diesel	Average	1.00	2.00	367	0.29
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	25.0	0.74
Building Construction	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Building Construction	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Building Construction	Aerial Lifts	Diesel	Average	1.00	4.00	46.0	0.31
Building Construction	Sweepers/Scrubbers	Diesel	Average	1.00	2.00	10.0	0.46
Building Construction	Air Compressors	Diesel	Average	1.00	4.00	37.0	0.48
EPC	Cranes	Diesel	Average	1.00	2.00	367	0.29
EPC	Generator Sets	Diesel	Average	1.00	4.00	25.0	0.74

EPC	Welders	Diesel	Average	2.00	4.00	46.0	0.45
EPC	Rough Terrain Forklifts	Diesel	Average	1.00	4.00	96.0	0.40
EPC	Forklifts	Diesel	Average	1.00	6.00	82.0	0.20
EPC	Aerial Lifts	Diesel	Average	1.00	2.00	46.0	0.31
EPC	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
EPC	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
EPC	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	2.00	300	0.56
Paving	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	4.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Paving	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74
Paving	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Paving	Rubber Tired Loaders	Diesel	Average	1.00	4.00	150	0.36
Paving	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Paving	Excavators	Diesel	Average	1.00	4.00	180	0.38
Paving	Plate Compactors	Diesel	Average	1.00	6.00	8.00	0.43

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Site Preparation	Concrete/Industrial Saws	Diesel	Average	1.00	4.00	33.0	0.73
Site Preparation	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36

Site Preparation	Crawler Tractors	Diesel	Average	1.00	6.00	87.0	0.43
Site Preparation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Site Preparation	Crushing/Proc. Equipment	Gasoline	Average	1.00	2.00	12.0	0.85
Grading-S	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-S	Tractors/Loaders/Back hoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-S	Excavators	Diesel	Average	1.00	4.00	180	0.38
Grading-S	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-S	Rubber Tired Loaders	Diesel	Average	1.00	6.00	150	0.36
Grading-S	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-S	Plate Compactors	Diesel	Average	1.00	4.00	8.00	0.43
Grading-S	Rollers	Diesel	Average	1.00	2.00	36.0	0.38
Grading-N	Graders	Diesel	Average	1.00	4.00	148	0.41
Grading-N	Tractors/Loaders/Back hoes	Diesel	Average	1.00	4.00	84.0	0.37
Grading-N	Excavators	Diesel	Average	1.00	6.00	36.0	0.38
Grading-N	Excavators	Diesel	Average	1.00	4.00	300	0.38
Grading-N	Excavators	Diesel	Average	1.00	2.00	180	0.38
Grading-N	Cranes	Diesel	Average	1.00	2.00	367	0.29
Grading-N	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Grading-N	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Grading-N	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Grading-N	Crawler Tractors	Diesel	Average	1.00	2.00	87.0	0.43
Grading-N	Plate Compactors	Diesel	Average	1.00	2.00	8.00	0.43
Grading-N	Rollers	Diesel	Average	1.00	3.00	36.0	0.38
Building Construction	Cranes	Diesel	Average	1.00	2.00	367	0.29

Building Construction	Generator Sets	Diesel	Average	1.00	8.00	25.0	0.74
Building Construction	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Building Construction	Rough Terrain Forklifts	Diesel	Average	1.00	2.00	96.0	0.40
Building Construction	Aerial Lifts	Diesel	Average	1.00	4.00	46.0	0.31
Building Construction	Sweepers/Scrubbers	Diesel	Average	1.00	2.00	10.0	0.46
Building Construction	Air Compressors	Diesel	Average	1.00	4.00	37.0	0.48
EPC	Cranes	Diesel	Average	1.00	2.00	367	0.29
EPC	Generator Sets	Diesel	Average	1.00	4.00	25.0	0.74
EPC	Welders	Diesel	Average	2.00	4.00	46.0	0.45
EPC	Rough Terrain Forklifts	Diesel	Average	1.00	4.00	96.0	0.40
EPC	Forklifts	Diesel	Average	1.00	6.00	82.0	0.20
EPC	Aerial Lifts	Diesel	Average	1.00	2.00	46.0	0.31
EPC	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
EPC	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
EPC	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	2.00	300	0.56
Paving	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	4.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Paving	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74
Paving	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Paving	Rubber Tired Loaders	Diesel	Average	1.00	4.00	150	0.36
Paving	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Paving	Excavators	Diesel	Average	1.00	4.00	180	0.38

Paving	Plate Compactors	Diesel	Average	1.00	6.00	8.00	0.43

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	4.00	10.2	HHDT,MHDT
Site Preparation	Hauling	26.0	2.00	HHDT
Site Preparation	Onsite truck	2.00	1.00	HHDT
Grading-S	—	—	—	—
Grading-S	Worker	24.0	18.5	LDA,LDT1,LDT2
Grading-S	Vendor	4.00	10.2	HHDT,MHDT
Grading-S	Hauling	4.00	2.00	HHDT
Grading-S	Onsite truck	2.00	1.00	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	16.0	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	4.00	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	1.00	1.00	HHDT
Paving	—	—	—	—
Paving	Worker	30.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	0.00	HHDT
Paving	Onsite truck	4.00	1.00	HHDT
Grading-N	—	—	—	—
Grading-N	Worker	36.0	18.5	LDA,LDT1,LDT2

Grading-N	Vendor	2.00	10.0	HHDT,MHDT
Grading-N	Hauling	6.00	2.00	HHDT
Grading-N	Onsite truck	2.00	1.00	HHDT
EPC	—	—	—	—
EPC	Worker	20.0	18.5	LDA,LDT1,LDT2
EPC	Vendor	4.00	10.2	HHDT,MHDT
EPC	Hauling	0.00	20.0	HHDT
EPC	Onsite truck	2.00	1.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	20.0	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	4.00	10.2	HHDT,MHDT
Site Preparation	Hauling	26.0	2.00	HHDT
Site Preparation	Onsite truck	2.00	1.00	HHDT
Grading-S	—	—	—	—
Grading-S	Worker	24.0	18.5	LDA,LDT1,LDT2
Grading-S	Vendor	4.00	10.2	HHDT,MHDT
Grading-S	Hauling	4.00	2.00	HHDT
Grading-S	Onsite truck	2.00	1.00	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	16.0	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	4.00	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	1.00	1.00	HHDT
Paving	—	—	—	—
Paving	Worker	30.0	18.5	LDA,LDT1,LDT2

Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	0.00	HHDT
Paving	Onsite truck	4.00	1.00	HHDT
Grading-N	—	—	—	—
Grading-N	Worker	36.0	18.5	LDA,LDT1,LDT2
Grading-N	Vendor	2.00	10.0	HHDT,MHDT
Grading-N	Hauling	6.00	2.00	HHDT
Grading-N	Onsite truck	2.00	1.00	HHDT
EPC	—	—	—	—
EPC	Worker	20.0	18.5	LDA,LDT1,LDT2
EPC	Vendor	4.00	10.2	HHDT,MHDT
EPC	Hauling	0.00	20.0	HHDT
EPC	Onsite truck	2.00	1.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	2,080	3.75	0.00	—

Grading-S	0.00	960	12.5	0.00	—
Grading-N	0.00	4,000	39.4	0.00	—
Paving	0.00	0.00	0.00	0.00	0.00

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Light Industry	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	349	0.03	< 0.005
2025	0.00	349	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Light Industry	89.6	89.6	89.6	32,704	2,019	2,019	2,019	737,092

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year

General Light Industry	89.6	89.6	89.6	32,704	2,019	2,019	2,019	737,092

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	4,800	1,600	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	30,621	346	0.0330	0.0040	137,441

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	30,621	346	0.0330	0.0040	137,441

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	740,000	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	740,000	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Light Industry	3.97	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

General Light Industry	3.97	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	24.7	annual days of extreme heat
Extreme Precipitation	2.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	36.5	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	5	0	0	N/A

Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	1	1	4
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	5	1	1	4
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	1	1	4

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	84.6
AQ-PM	57.9
AQ-DPM	4.38
Drinking Water	79.0
Lead Risk Housing	3.18
Pesticides	65.5
Toxic Releases	49.4
Traffic	83.0
Effect Indicators	—
CleanUp Sites	74.9
Groundwater	32.4
Haz Waste Facilities/Generators	70.9
Impaired Water Bodies	0.00
Solid Waste	92.8
Sensitive Population	—
Asthma	44.2
Cardio-vascular	70.5
Low Birth Weights	54.1
Socioeconomic Factor Indicators	—
Education	42.3
Housing	16.3
Linguistic	26.4
Poverty	38.6
Unemployment	37.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	56.46092647
Employed	16.72013345
Median HI	50.14756833
Education	—
Bachelor's or higher	40.75452329
High school enrollment	100
Preschool enrollment	28.89772873
Transportation	—
Auto Access	98.98626973
Active commuting	13.82009496
Social	—
2-parent households	44.25766714
Voting	55.22905171
Neighborhood	—
Alcohol availability	92.31361478
Park access	12.72937251
Retail density	6.236365969
Supermarket access	11.88245862
Tree canopy	7.96868985
Housing	—
Homeownership	88.31002181
Housing habitability	84.12678044
Low-inc homeowner severe housing cost burden	30.54022841
Low-inc renter severe housing cost burden	77.98023868

Uncrowded housing	88.2586937
Health Outcomes	—
Insured adults	51.58475555
Arthritis	0.0
Asthma ER Admissions	58.5
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	53.7
Cognitively Disabled	56.3
Physically Disabled	65.4
Heart Attack ER Admissions	31.7
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	74.1
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	89.7
SLR Inundation Area	0.0

Children	89.4
Elderly	28.2
English Speaking	69.3
Foreign-born	8.9
Outdoor Workers	15.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	95.8
Traffic Density	73.0
Traffic Access	23.0
Other Indices	—
Hardship	47.0
Other Decision Support	—
2016 Voting	72.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	59.0
Healthy Places Index Score for Project Location (b)	42.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Total temporary disturbance area for all three sites and interconnecting piping installation is approximately 1 acre. Total permanent RNG site area for all three sites is approximately 1.7 acres. Support facility building structure is 3,200 square feet located on South RNG Site.
Construction: Construction Phases	Construction activity duration provided by Waste Management.
Construction: Off-Road Equipment	Equipment inventories provided by Waste Management. Adjusted for conservative emissions scenario.
Construction: Trips and VMT	Vehicle activity forecasts provided by Waste Management
Construction: On-Road Fugitive Dust	On-site roads are paved ~ minimal vehicle travel on unpaved areas.
Operations: Vehicle Data	Up to 10 additional employees and 4 additional private disposal trips per day.

El Sobrante Landfill RNG - Pipe Install & SoCalGas Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.3. Construction Emissions by Year, Mitigated

3. Construction Emissions Details

3.1. SCG Connection (2024) - Unmitigated

3.2. SCG Connection (2024) - Mitigated

3.3. SCG Connection (2025) - Unmitigated

3.4. SCG Connection (2025) - Mitigated

3.5. Pipe Installation (2024) - Unmitigated

3.6. Pipe Installation (2024) - Mitigated

3.7. Pipe Installation (2025) - Unmitigated

3.8. Pipe Installation (2025) - Mitigated

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	El Sobrante Landfill RNG - Pipe Install & SoCalGas
Construction Start Date	8/5/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	21.8
Location	33.7905451419209, -117.4765010743213
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5581
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Linear	2.00	Mile	1.50	0.00	0.00	—	—	POR Site + Pipeline

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
Mit.	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
Mit.	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
Mit.	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272
Mit.	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	—	—	150	—	—	55.0	—	—	—	—	—	—	—
Unmit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Mit.	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.44	3.55	5.45	0.01	0.11	0.66	0.77	0.10	0.15	0.25	—	1,872	1,872	0.06	0.16	3.54	1,924
2025	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
2025	1.54	12.7	18.6	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,191	5,191	0.19	0.25	0.14	5,270
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.34	2.77	3.67	0.01	0.12	0.27	0.38	0.11	0.06	0.17	—	1,062	1,062	0.04	0.06	0.59	1,082
2025	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.06	0.50	0.67	< 0.005	0.02	0.05	0.07	0.02	0.01	0.03	—	176	176	0.01	0.01	0.10	179
2025	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.44	3.55	5.45	0.01	0.11	0.66	0.77	0.10	0.15	0.25	—	1,872	1,872	0.06	0.16	3.54	1,924
2025	1.55	12.6	19.4	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,235	5,235	0.19	0.25	5.44	5,319
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.79	14.7	19.1	0.04	0.67	1.17	1.85	0.62	0.25	0.87	—	5,222	5,222	0.19	0.25	0.15	5,302
2025	1.54	12.7	18.6	0.04	0.50	1.17	1.67	0.46	0.25	0.71	—	5,191	5,191	0.19	0.25	0.14	5,270
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.34	2.77	3.67	0.01	0.12	0.27	0.38	0.11	0.06	0.17	—	1,062	1,062	0.04	0.06	0.59	1,082
2025	0.45	3.77	5.55	0.01	0.14	0.39	0.54	0.13	0.09	0.22	—	1,613	1,613	0.06	0.09	0.84	1,642
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.06	0.50	0.67	< 0.005	0.02	0.05	0.07	0.02	0.01	0.03	—	176	176	0.01	0.01	0.10	179
2025	0.08	0.69	1.01	< 0.005	0.03	0.07	0.10	0.02	0.02	0.04	—	267	267	0.01	0.01	0.14	272

3. Construction Emissions Details

3.1. SCG Connection (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.68	1.00	< 0.005	0.03	—	0.03	0.03	—	0.03	—	189	189	0.01	< 0.005	—	190

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.87	9.87	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.12	0.18	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	31.3	31.3	< 0.005	< 0.005	—	31.4
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.72
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	0.02	0.70	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	1.75	651
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.59	294
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.02	0.74	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	0.05	650
Hauling	< 0.005	0.33	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.02	294
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.39	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	78.1	78.1	< 0.005	< 0.005	0.14	79.2
Vendor	0.01	0.21	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	181	181	< 0.005	0.03	0.22	190
Hauling	< 0.005	0.10	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	81.7	81.7	< 0.005	0.01	0.07	85.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.0	30.0	< 0.005	< 0.005	0.04	31.4
Hauling	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	13.5	13.5	< 0.005	< 0.005	0.01	14.2

3.2. SCG Connection (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.8	33.8	< 0.005	0.01	0.06	35.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	2.35	3.44	0.01	0.10	—	0.10	0.09	—	0.09	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.68	1.00	< 0.005	0.03	—	0.03	0.03	—	0.03	—	189	189	0.01	< 0.005	—	190

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	9.87	9.87	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.12	0.18	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	31.3	31.3	< 0.005	< 0.005	—	31.4
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.72
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
Vendor	0.02	0.70	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	1.75	651
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.59	294
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.02	0.74	0.22	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	621	621	0.01	0.09	0.05	650
Hauling	< 0.005	0.33	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	280	280	0.01	0.05	0.02	294
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.39	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	78.1	78.1	< 0.005	< 0.005	0.14	79.2
Vendor	0.01	0.21	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	181	181	< 0.005	0.03	0.22	190
Hauling	< 0.005	0.10	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	81.7	81.7	< 0.005	0.01	0.07	85.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.0	30.0	< 0.005	< 0.005	0.04	31.4
Hauling	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	13.5	13.5	< 0.005	< 0.005	0.01	14.2

3.3. SCG Connection (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.93	1.43	< 0.005	0.03	—	0.03	0.03	—	0.03	—	270	270	0.01	< 0.005	—	271

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	13.9	13.9	< 0.005	< 0.005	0.01	14.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.17	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	44.8	44.8	< 0.005	< 0.005	—	44.9
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	2.30	2.30	< 0.005	< 0.005	< 0.005	2.41
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.67	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	1.74	642
Hauling	< 0.005	0.31	0.07	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.59	289
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	0.01	0.70	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	0.05	640
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.02	289
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.51	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	109	109	0.01	< 0.005	0.19	111
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	255	255	0.01	0.04	0.31	267
Hauling	< 0.005	0.13	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	115	115	< 0.005	0.02	0.11	120
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.1	18.1	< 0.005	< 0.005	0.03	18.4
Vendor	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.2	42.2	< 0.005	0.01	0.05	44.2
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.0	19.0	< 0.005	< 0.005	0.02	19.9

3.4. SCG Connection (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	2.23	3.42	0.01	0.08	—	0.08	0.07	—	0.07	—	649	649	0.03	0.01	—	651
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.93	1.43	< 0.005	0.03	—	0.03	0.03	—	0.03	—	270	270	0.01	< 0.005	—	271

Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.03	0.02	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	13.9	13.9	< 0.005	< 0.005	0.01	14.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.17	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	44.8	44.8	< 0.005	< 0.005	—	44.9
Dust From Material Movement	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	2.30	2.30	< 0.005	< 0.005	< 0.005	2.41
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.67	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	1.74	642
Hauling	< 0.005	0.31	0.07	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.59	289
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	0.01	0.70	0.21	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	612	612	0.01	0.09	0.05	640
Hauling	< 0.005	0.32	0.08	< 0.005	0.01	0.07	0.08	0.01	0.02	0.03	—	276	276	0.01	0.04	0.02	289
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.04	0.51	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	109	109	0.01	< 0.005	0.19	111
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	255	255	0.01	0.04	0.31	267
Hauling	< 0.005	0.13	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	115	115	< 0.005	0.02	0.11	120
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.1	18.1	< 0.005	< 0.005	0.03	18.4
Vendor	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.2	42.2	< 0.005	0.01	0.05	44.2
Hauling	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.0	19.0	< 0.005	< 0.005	0.02	19.9

3.5. Pipe Installation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.24	10.4	12.6	0.03	0.55	—	0.55	0.51	—	0.51	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	1.60	1.94	< 0.005	0.09	—	0.09	0.08	—	0.08	—	418	418	0.02	< 0.005	—	419
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.23	5.23	< 0.005	< 0.005	< 0.005	5.50
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.29	0.35	< 0.005	0.02	—	0.02	0.01	—	0.01	—	69.2	69.2	< 0.005	< 0.005	—	69.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.91
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	249	249	0.01	0.04	0.02	260
Hauling	0.01	0.23	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	123	123	< 0.005	0.02	0.01	129
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.4	41.4	< 0.005	< 0.005	0.08	42.0
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.4	38.4	< 0.005	0.01	0.05	40.2
Hauling	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	18.9	18.9	< 0.005	< 0.005	0.02	19.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.86	6.86	< 0.005	< 0.005	0.01	6.95
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.36	6.36	< 0.005	< 0.005	0.01	6.65
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.13	3.13	< 0.005	< 0.005	< 0.005	3.29

3.6. Pipe Installation (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.24	10.4	12.6	0.03	0.55	—	0.55	0.51	—	0.51	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.09	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.9	33.9	< 0.005	0.01	< 0.005	35.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.19	1.60	1.94	< 0.005	0.09	—	0.09	0.08	—	0.08	—	418	418	0.02	< 0.005	—	419
Onsite truck	< 0.005	0.01	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.23	5.23	< 0.005	< 0.005	< 0.005	5.50
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.29	0.35	< 0.005	0.02	—	0.02	0.01	—	0.01	—	69.2	69.2	< 0.005	< 0.005	—	69.4
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.91
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
Vendor	0.01	0.29	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	249	249	0.01	0.04	0.02	260
Hauling	0.01	0.23	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	123	123	< 0.005	0.02	0.01	129
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.4	41.4	< 0.005	< 0.005	0.08	42.0
Vendor	< 0.005	0.05	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.4	38.4	< 0.005	0.01	0.05	40.2
Hauling	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	18.9	18.9	< 0.005	< 0.005	0.02	19.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.86	6.86	< 0.005	< 0.005	0.01	6.95
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.36	6.36	< 0.005	< 0.005	0.01	6.65
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.13	3.13	< 0.005	< 0.005	< 0.005	3.29

3.7. Pipe Installation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	2.16	3.11	0.01	0.10	—	0.10	0.09	—	0.09	—	682	682	0.03	0.01	—	685
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	8.41	8.41	< 0.005	< 0.005	0.01	8.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.39	0.57	< 0.005	0.02	—	0.02	0.02	—	0.02	—	113	113	< 0.005	< 0.005	—	113
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.39	1.39	< 0.005	< 0.005	< 0.005	1.46
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.27	0.08	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.69	257
Hauling	0.01	0.21	0.09	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	120	120	< 0.005	0.02	0.24	126

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.28	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.02	256
Hauling	0.01	0.22	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	121	121	< 0.005	0.02	0.01	126
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.31	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	66.2	66.2	< 0.005	< 0.005	0.11	67.2
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.8	61.8	< 0.005	0.01	0.08	64.7
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.4	30.4	< 0.005	< 0.005	0.03	31.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.0	11.0	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.01	10.7
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.04	5.04	< 0.005	< 0.005	< 0.005	5.28

3.8. Pipe Installation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712
Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.3	33.3	< 0.005	0.01	0.06	34.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04	8.56	12.3	0.03	0.39	—	0.39	0.36	—	0.36	—	2,703	2,703	0.11	0.02	—	2,712

Onsite truck	< 0.005	0.08	0.04	< 0.005	< 0.005	0.15	0.16	< 0.005	0.02	0.02	—	33.4	33.4	< 0.005	0.01	< 0.005	35.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	2.16	3.11	0.01	0.10	—	0.10	0.09	—	0.09	—	682	682	0.03	0.01	—	685
Onsite truck	< 0.005	0.02	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	8.41	8.41	< 0.005	< 0.005	0.01	8.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.39	0.57	< 0.005	0.02	—	0.02	0.02	—	0.02	—	113	113	< 0.005	< 0.005	—	113
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	1.39	1.39	< 0.005	< 0.005	< 0.005	1.46
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	282	282	0.01	0.01	1.04	286
Vendor	0.01	0.27	0.08	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.69	257
Hauling	0.01	0.21	0.09	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	120	120	< 0.005	0.02	0.24	126
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.17	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	259	259	0.01	0.01	0.03	262
Vendor	< 0.005	0.28	0.09	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	245	245	0.01	0.04	0.02	256
Hauling	0.01	0.22	0.10	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	121	121	< 0.005	0.02	0.01	126
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.31	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	66.2	66.2	< 0.005	< 0.005	0.11	67.2
Vendor	< 0.005	0.07	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	61.8	61.8	< 0.005	0.01	0.08	64.7
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.4	30.4	< 0.005	< 0.005	0.03	31.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.0	11.0	< 0.005	< 0.005	0.02	11.1
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.01	10.7
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.04	5.04	< 0.005	< 0.005	< 0.005	5.28

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
SCG Connection	Linear, Drainage, Utilities, & Sub-Grade	8/5/2024	8/1/2025	5.00	260	SoCalGas POR Site
Pipe Installation	Linear, Paving	10/14/2024	5/9/2025	5.00	150	Pipe Installation

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37
SCG Connection	Aerial Lifts	Diesel	Average	1.00	2.00	320	0.31
SCG Connection	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
SCG Connection	Trenchers	Diesel	Average	1.00	2.00	40.0	0.50
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
SCG Connection	Welders	Diesel	Average	2.00	2.00	46.0	0.45
Pipe Installation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
Pipe Installation	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Pipe Installation	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Pipe Installation	Bore/Drill Rigs	Diesel	Average	1.00	2.00	83.0	0.50
Pipe Installation	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	72.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	180	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	6.00	320	0.38
Pipe Installation	Crawler Tractors	Diesel	Average	1.00	4.00	87.0	0.43
Pipe Installation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Pipe Installation	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Pipe Installation	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Pipe Installation	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Pipe Installation	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.00	84.0	0.37

SCG Connection	Aerial Lifts	Diesel	Average	1.00	2.00	320	0.31
SCG Connection	Air Compressors	Diesel	Average	1.00	2.00	37.0	0.48
SCG Connection	Trenchers	Diesel	Average	1.00	2.00	40.0	0.50
SCG Connection	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
SCG Connection	Welders	Diesel	Average	2.00	2.00	46.0	0.45
Pipe Installation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
Pipe Installation	Skid Steer Loaders	Diesel	Average	1.00	6.00	71.0	0.37
Pipe Installation	Rubber Tired Loaders	Diesel	Average	2.00	4.00	150	0.36
Pipe Installation	Bore/Drill Rigs	Diesel	Average	1.00	2.00	83.0	0.50
Pipe Installation	Excavators	Diesel	Average	1.00	2.00	36.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	72.0	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	4.00	180	0.38
Pipe Installation	Excavators	Diesel	Average	1.00	6.00	320	0.38
Pipe Installation	Crawler Tractors	Diesel	Average	1.00	4.00	87.0	0.43
Pipe Installation	Rollers	Diesel	Average	1.00	6.00	36.0	0.38
Pipe Installation	Pavers	Diesel	Average	1.00	2.00	81.0	0.42
Pipe Installation	Paving Equipment	Diesel	Average	1.00	2.00	89.0	0.36
Pipe Installation	Concrete/Industrial Saws	Diesel	Average	1.00	2.00	33.0	0.73
Pipe Installation	Generator Sets	Diesel	Average	1.00	2.00	14.0	0.74

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Pipe Installation	—	—	—	—
Pipe Installation	Worker	20.0	18.5	LDA,LDT1,LDT2

Pipe Installation	Vendor	8.00	10.2	HHDT,MHDT
Pipe Installation	Hauling	8.00	4.00	HHDT
Pipe Installation	Onsite truck	4.00	2.00	HHDT
SCG Connection	—	—	—	—
SCG Connection	Worker	20.0	18.5	LDA,LDT1,LDT2
SCG Connection	Vendor	20.0	10.2	HHDT,MHDT
SCG Connection	Hauling	4.00	20.0	HHDT
SCG Connection	Onsite truck	4.00	2.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Pipe Installation	—	—	—	—
Pipe Installation	Worker	20.0	18.5	LDA,LDT1,LDT2
Pipe Installation	Vendor	8.00	10.2	HHDT,MHDT
Pipe Installation	Hauling	8.00	4.00	HHDT
Pipe Installation	Onsite truck	4.00	2.00	HHDT
SCG Connection	—	—	—	—
SCG Connection	Worker	20.0	18.5	LDA,LDT1,LDT2
SCG Connection	Vendor	20.0	10.2	HHDT,MHDT
SCG Connection	Hauling	4.00	20.0	HHDT
SCG Connection	Onsite truck	4.00	2.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
SCG Connection	0.00	0.00	1.50	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
User Defined Linear	1.25	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	532	0.03	< 0.005
2025	0.00	532	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	24.7	annual days of extreme heat
Extreme Precipitation	2.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	36.5	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	84.6

AQ-PM	57.9
AQ-DPM	4.38
Drinking Water	79.0
Lead Risk Housing	3.18
Pesticides	65.5
Toxic Releases	49.4
Traffic	83.0
Effect Indicators	—
CleanUp Sites	74.9
Groundwater	32.4
Haz Waste Facilities/Generators	70.9
Impaired Water Bodies	0.00
Solid Waste	92.8
Sensitive Population	—
Asthma	44.2
Cardio-vascular	70.5
Low Birth Weights	54.1
Socioeconomic Factor Indicators	—
Education	42.3
Housing	16.3
Linguistic	26.4
Poverty	38.6
Unemployment	37.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—

Above Poverty	56.46092647
Employed	16.72013345
Median HI	50.14756833
Education	—
Bachelor's or higher	40.75452329
High school enrollment	100
Preschool enrollment	28.89772873
Transportation	—
Auto Access	98.98626973
Active commuting	13.82009496
Social	—
2-parent households	44.25766714
Voting	55.22905171
Neighborhood	—
Alcohol availability	92.31361478
Park access	12.72937251
Retail density	6.236365969
Supermarket access	11.88245862
Tree canopy	7.96868985
Housing	—
Homeownership	88.31002181
Housing habitability	84.12678044
Low-inc homeowner severe housing cost burden	30.54022841
Low-inc renter severe housing cost burden	77.98023868
Uncrowded housing	88.2586937
Health Outcomes	—
Insured adults	51.58475555
Arthritis	0.0

Asthma ER Admissions	58.5
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	53.7
Cognitively Disabled	56.3
Physically Disabled	65.4
Heart Attack ER Admissions	31.7
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	74.1
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	89.7
SLR Inundation Area	0.0
Children	89.4
Elderly	28.2
English Speaking	69.3
Foreign-born	8.9

Outdoor Workers	15.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	95.8
Traffic Density	73.0
Traffic Access	23.0
Other Indices	—
Hardship	47.0
Other Decision Support	—
2016 Voting	72.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	59.0
Healthy Places Index Score for Project Location (b)	42.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Preliminary schedule provided by Waste Management.
Construction: Off-Road Equipment	Equipment inventories provided by Waste Management.
Construction: Trips and VMT	Vehicle inventory provided by WM.
Construction: On-Road Fugitive Dust	Nearly all vehicle travel on-site will occur on existing paved roads.
Construction: Paving	Approximately 2 miles of 5 ft width.

Construction Fuel Consumption Calculations

2.2. Construction Emissions by Year, Unmitigated

Year		BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual								
	2024		283	283	0.01	0.01	0.11	285
	2025		163	163	0.01	0.005	0.07	165

2.5. Operations Emissions by Sector, Unmitigated

	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Mobile		261	261	0.01	0.01	0.42	265
Area		0.06	0.06	0.005	0.005		0.07
Energy		12.1	12.1	0.005	0.005		12.1
Water	0.23	0.79	1.03	0.02	0.005		1.8
Waste	0.35	0	0.35	0.04	0		1.24
Refrig.						0.14	0.14
Total	0.59	274	274	0.07	0.01	0.56	280

USEPA 2023 Fuel Carbon Intensity	
kgCO2/gal-D	10.21
kgCO2/gal-G	8.78
lbCO2/gal-D	22.51
lbCO2/gal-G	19.36

Source: Federal Register USEPA; 40 CFR Part 98: e-CFR, https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98

CO2T MT/year
261
29,727

	Gallons	
Gasoline	14,258	
Diesel	15,970	1064.643
Diesel-M	24,810	
Diesel-E	32,381	
	73,161	

Net Annual GHG
-42806

3.1. Site Preparation (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		4.66	4.66	0.005	0.005		4.67
Annual							
Worker		1.22	1.22	0.005	0.005	0.005	1.23
Vendor		0.56	0.56	0.005	0.005	0.005	0.59
Hauling		1	1	0.005	0.005	0.005	1.05

3.3. Grading-S (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		34.6	34.6	0.005	0.005		34.8
Dust From Material Movement							
Onsite truck		0.23	0.23	0.005	0.005	0.005	0.24
Annual							
Worker		7.29	7.29	0.005	0.005	0.01	7.39
Vendor		2.82	2.82	0.005	0.005	0.005	2.95
Hauling		0.77	0.77	0.005	0.005	0.005	0.81

Construction Fuel Consumption Calculations

3.5. Grading-N (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		79.6	79.6	0.005	0.005		79.9
Annual							
Worker		15.6	15.6	0.005	0.005	0.03	15.8
Vendor		1.97	1.97	0.005	0.005	0.005	2.07
Hauling		1.65	1.65	0.005	0.005	0.005	1.73

3.7. Grading-N (2025) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		35.8	35.8	0.005	0.005		35.9
Annual							
Worker		6.89	6.89	0.005	0.005	0.01	6.98
Vendor		0.88	0.88	0.005	0.005	0.005	0.92
Hauling		0.73	0.73	0.005	0.005	0.005	0.76

3.9. Building Construction (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		21.3	21.3	0.005	0.005		21.4
Annual							
Worker		5.97	5.97	0.005	0.005	0.01	6.06
Vendor		3.46	3.46	0.005	0.005	0.005	3.62
Hauling		0	0	0	0	0	0

3.11. Building Construction (2025) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		30.2	30.2	0.005	0.005		30.3
Annual							
Worker		8.3	8.3	0.005	0.005	0.01	8.42
Vendor		4.84	4.84	0.005	0.005	0.01	5.07
Hauling		0	0	0	0	0	0

3.13. EPC (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		23.8	23.8	0.005	0.005		23.9
Onsite truck		0.24	0.24	0.005	0.005	0.005	0.25
Annual							
Worker		6.25	6.25	0.005	0.005	0.01	6.34
Vendor		2.9	2.9	0.005	0.005	0.005	3.03
Hauling		0	0	0	0	0	0

Construction Fuel Consumption Calculations

3.15. EPC (2025) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		54.2	54.2	0.005	0.005		54.3
Annual							
Worker		13.9	13.9	0.005	0.005	0.02	14.1
Vendor		6.5	6.5	0.005	0.005	0.01	6.81
Hauling		0	0	0	0	0	0

3.17. Paving (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		50	50	0.005	0.005		50.2
Annual							
Worker		10.9	10.9	0.005	0.005	0.02	11.1
Vendor		5.07	5.07	0.005	0.005	0.01	5.31
Hauling		0	0	0	0	0	0

2.2. Construction Emissions by Year, Unmitigated

Year	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
2024		176	176	0.01	0.01	0.1	179
2025		267	267	0.01	0.01	0.14	272

3.1. SCG Connection (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		31.3	31.3	0.005	0.005		31.4
Annual							
Worker		12.9	12.9	0.005	0.005	0.02	13.1
Vendor		30	30	0.005	0.005	0.04	31.4
Hauling		13.5	13.5	0.005	0.005	0.01	14.2

3.3. SCG Connection (2025) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		44.8	44.8	0.005	0.005		44.9
Annual							
Worker		18.1	18.1	0.005	0.005	0.03	18.4
Vendor		42.2	42.2	0.005	0.01	0.05	44.2
Hauling		19	19	0.005	0.005	0.02	19.9

Construction Fuel Consumption Calculations

3.5. Pipe Installation (2024) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		69.2	69.2	0.005	0.005		69.4
Annual							
Worker		6.86	6.86	0.005	0.005	0.01	6.95
Vendor		6.36	6.36	0.005	0.005	0.01	6.65
Hauling		3.13	3.13	0.005	0.005	0.005	3.29

3.7. Pipe Installation (2025) - Unmitigated

Location	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Annual							
Off-Road Equipment		113	113	0.005	0.005		113
Annual							
Worker		11	11	0.005	0.005	0.02	11.1
Vendor		10.2	10.2	0.005	0.005	0.01	10.7
Hauling		5.04	5.04	0.005	0.005	0.005	5.28

South RNG Site	46
North RNG Site	394
Gas POR Site	225
Pipe Install	226
Total Con	892
	29.729

Appendix F1
Geotechnical Investigation Report

GEOTECHNICAL INVESTIGATION REPORT
EL SOBRANTE LANDFILL, SOCALGAS WASTE TO ENERGY FACILITY
CORONA, RIVERSIDE COUNTY, CALIFORNIA

Prepared for

Toro Energy, LLC
5900 Southwest Parkway
Building 2, Suite 220
Austin, TX 78735

Prepared by

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers
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October 2023

HUSHMAND ASSOCIATES, INC.
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10/30/2023

Toro Energy, LLC
5900 Southwest Parkway
Building 2, Suite 220
Austin, TX 78735

Attn: Randy Glad, Operation Manager

SUBJECT: Geotechnical Investigation Report
El Sobrante Landfill, SoCalGas Waste to Energy Facility
Corona, Riverside County, California
HAI Project No. TE-22-001

Dear Mr. Glad:

Hushmand Associates, Inc. (HAI) is pleased to submit this Geotechnical Investigation Report for design and construction of SoCalGas Waste to Energy Facility project located at Corona, Riverside County, California. This report has been prepared in accordance with the proposed scope of work of HAI's Proposal No. P22-1019 dated October 19, 2022.

HAI appreciates the opportunity of being of service to Toro Energy, LLC. Should you need additional information or any clarifications please call the undersigned.

Sincerely yours,

HUSHMAND ASSOCIATES, INC.

LICENSED PROFESSIONAL ENGINEER ASHKAAN HUSHMAND GE 3187 GEOTECHNICAL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER BIDJAN GHAHREMAN GE3111 GEOTECHNICAL STATE OF CALIFORNIA

Ashkaan Hushmand

Ashkaan Hushmand, PhD, PE, GE
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REGISTERED PROFESSIONAL ENGINEER BEHNAM HUSHMAND No. C 044777 CIVIL STATE OF CALIFORNIA

Ben Hushmand

Ben Hushmand, PhD, PE
President, Principal Engineer

TABLE OF CONTENTS

			Page
1.0	INTRODUCTION		1
	1.1	Project Description	1
	1.2	Scope of Work	1
2.0	FIELD EXPLORATION AND LABORATORY TESTING		1
	2.1	Pre-Mobilization Preparation	1
	2.2	Subsurface Soil Exploration	1
	2.3	Geotechnical and Chemical Laboratory Testing	2
3.0	SUBSURFACE CONDITIONS		2
	3.1	Geologic Setting	2
	3.2	Site Subsurface Soil and Groundwater Conditions	3
		3.2.1 Subsurface Soil Conditions	3
		3.2.2 Groundwater Conditions	3
4.0	GEOLOGIC AND SEISMIC HAZARDS		3
	4.1	Seismic Setting – Regional Faults and Historical Seismicity	3
	4.2	Surface Fault Rupture Potential	4
	4.3	Seismic Hazard Zones	4
	4.4	Expansive/Collapsible Soils	4
	4.5	Corrosion Potential	5
5.0	GROUND MOTION AND SEISMIC DEFORMATION ANALYSIS		6
	5.1	2019 CBC Seismic Design Coefficients	6
	5.2	Liquefaction and Seismic Settlement	7
		5.2.1 SPT-Based Liquefaction and Seismic Settlement Analysis	7
		5.2.2 SPT-Based Lateral Spreading Analysis	7
6.0	CONCLUSIONS AND RECOMMENDATIONS		7
	6.1	General	7
	6.2	Site Preparation and Earthwork	8
		6.2.1 Cleaning and Grubbing	8
		6.2.2 Ground Preparation	8
		6.2.3 Temporary Excavations	9
	6.3	Shallow Foundations	9
		6.3.1 Bearing and Lateral Capacity	9
		6.3.2 Footing and slabs on Grade	10
		6.3.3 Foundation Observations	10
	6.4	Lateral Earth Pressures for Design of Retaining Walls	10
	6.5	Design Percolation Rate	11
	6.6	Preliminary Pavement Design Recommendations	11
	6.7	Exterior Flatwork	13
	6.8	Concrete Mix Design	13
	6.9	Corrosion	13
	6.10	Earthquake Hazards Mitigation Measures	14
		6.10.1 Deep Foundations	14
		6.10.2 Lateral Spreading Stabilization	14
	6.11	Post-Grading Considerations	15
		6.11.1 Site Drainage and Irrigation	15
		6.11.2 Utility Trench Backfill	15
7.0	ADDITIONAL SERVICES		16

8.0 LIMITATIONS 16
9.0 REFERENCES 17

LIST OF TABLES

Table 1 Summary of Soil Borings
Table 2 Summary of Nearby Active Faults
Table 3 Results of Corrosivity Testing
Table 4 Site Categorization and Site Coefficients
Table 5 Recommended Lateral Earth Pressure, Level Backfill
Table 6 Summary of Test Boring Soil Classification and Design Infiltration Rates
Table 7 Preliminary Pavement Sections
Table 8 Traffic Index

LIST OF FIGURES

Figure 1 Site Vicinity Map
Figure 2 Site Location Map
Figure 3 Geotechnical Exploration Map
Figure 4a Regional Geological Map
Figure 4b Local Geological Map
Figure 4c Historical Highest Groundwater Contour Map
Figure 5a Fault Activity Map
Figure 5b Earthquake & Liquefaction Zones of Required Investigation Map

LIST OF APPENDICES

Appendix A Exploratory Boring Logs
Appendix B Laboratory Test Results
Appendix C Print outs of Liquefaction Analyses Using LiqSV.2.0.2.1
Appendix D Calculation of Design Infiltration Rate

GEOTECHNICAL INVESTIGATION REPORT
SOCALGAS WASTE TO ENERGY FACILITY
CORONA, RIVERSIDE COUNTY, CALIFORNIA

1.0 INTRODUCTION

1.1 Project Description

According to the information provided by Toro Energy (client), the project includes development of a renewable natural gas facility to refine the methane gas collected from the El Sobrante Landfill for distribution to Southern California Gas Company (SoCalGas) for use as local natural gas fuel. The project site is located at intersection of Dawson Canyon Road and Park Canyon Drive, adjacent to Indian Pictographs Historical Marker, and about 0.1 mile northeast of intersection of Temescal Canyon Road and Dawson Canyon Road in the City of Corona, Riverside County, California. **Figures 1 & 2** show the site vicinity and location maps, respectively.

1.2 Scope of Work

The primary purpose of this investigation is to evaluate the site geologic and subsurface soil conditions, investigate potential site liquefaction hazard, estimate liquefaction-induced settlement & lateral spreading, provide foundation & seismic design parameters for the proposed facility, and provide earthwork & foundation preparation recommendations.

2.0 FIELD EXPLORATION AND LABORATORY TESTING

2.1 Pre-Mobilization Preparation

Figure 3 shows the approximate locations of HAI Borings B-1 through B-5 performed at the project site for the foundation system design. Boring B-5 was also used to perform a percolation test to the depth of about 8 feet.

Prior to the start of this field exploration, underground utility clearance was carried out by contacting Underground Service Alert (USA or DigAlert). For additional safety and to minimize liabilities, Ground Penetration Radar (GPR) survey was also performed by a private utility search company.

2.2 Subsurface Soil Exploration

The field investigation consisted of drilling three (3) Hollow Stem Auger (HSA), one (1) Rotary Wash (RW), and one (1) Hand Auger (HA) borings to a maximum depth of 38 feet. **Table 1** provides the information on date, drilling method, and depth of the boreholes performed at the site.

Table 1. Summary of Soil Borings

Boring ID	Date	Drilling Method	Final Depth (feet)
B-1	11/3/2022	HSA	38.0
B-2	11/2/2022	RW	37.0
B-3	11/3/2022	HSA	37.3
B-4	11/3/2022	HSA	31.5
B-5	11/2/2022	Hand Auger	8.0

Soil borings were performed by a hand auger and two drill rigs (an 8-inch diameter hollow-stem auger (HSA) drill rig, and a 4.3-inch diameter rotary wash (RW) drill rig). BC2 Environmental LLC of Orange, CA was subcontracted to drill the borings under the field supervision of HAI personnel. Soil penetration resistance data, by way of measuring Modified California (MC) and Standard Penetration Test (SPT) samplers blow counts, were recorded and soil samples were logged and collected for further physical inspection and testing at HAI's geotechnical testing laboratory.

After samplers were withdrawn from the borings, soil samples were carefully removed, visually inspected and classified according to the Unified Soil Classification System (USCS), sealed to reduce moisture loss, and delivered to our laboratory for further inspection, soil classification, and testing. Logs of exploratory borings, as well as a key to these logs, are presented in **Appendix A**. Upon completion of drilling and sampling, borings were backfilled using soil cuttings.

2.3 Geotechnical and Chemical Laboratory Testing

Soil samples collected during the field investigation were examined in our laboratory and selected samples were tested to evaluate their physical characteristics, in-situ conditions, classification, index, and engineering properties. Laboratory tests performed included:

- In-Situ Moisture Content (ASTM D2216) and Dry Density (ASTM D2937);
- Atterberg Limits (ASTM D4318);
- Particle Size Analysis (Gradation) (ASTM D6913);
- Percent Passing # 200 Sieve (ASTM D1140);
- Direct Shear (ASTM D3080);
- Compaction (Maximum Dry Density & Optimum Moisture Content) (ASTM D1557);
- Soil Expansion Index (ASTM D4829);
- Consolidation (ASTM D2435);
- R-value (CTM301); and
- Corrosion Set 1 (ASTM G187, D516, D512B, G51).

Visual classifications performed in the field were modified as required based on the laboratory test results. These modifications and the type of tests performed on the selected soil samples are reflected in boring logs (**Appendix A)**. Laboratory test results are presented in **Appendix B.**

3.0 SUBSURFACE CONDITIONS

3.1 Geologic Setting

The site is located within the Peninsular Ranges geomorphic province. It is located near the western margin of the Perris Block, which is an internally unfaulted, structurally stable eroded mass of Cretaceous and older granitic and metasedimentary basement rocks located between the Elsinore and San Jacinto Fault Zones. **Figure 4**, Regional Geological Map, shows location of the project site on the State of California Geological Survey (CGS) Official Seismic Hazard Map for Lake Mathews Quadrangle dated January 1, 1980. All but the southeast corner of the Lake Mathews quadrangle is in the Perris Block in the northern Peninsular Ranges Province. In the southwest corner of the quadrangle including the proposed project site, a small triangular-shaped area that is part of the Santa Ana Mountains structural block is separated from the Perris Block by a short segment of the Elsinore fault zone. The active Elsinore fault zone, a major component of the San Andreas Fault system, consists of a series of en echelon northwest-striking right lateral faults located in a graben-like structure.

Mountainous terrain is present in north and south of site. The site is located in an alluvial valley flood plain associated with Temescal Wash. Based on the Geologic Map of the Lake Mathews 7.5' Quadrangle, the site is mostly underlain at the surface by Holocene-age and late Pleistocene young axial channel deposits (Qya). Near surface soils at the site within the recently active Temescal Wash consist of unconsolidated alluvium consisting of fine-grained sand and silt.

3.2 Site Subsurface Soil and Groundwater Conditions

3.2.1 Subsurface Soil Conditions

Based on the data from field exploration and laboratory testing, soil samples collected from exploratory borings generally consisted of clayey sands with gravel (SC) in the upper 5 to 10 ft. This layer is underlain mainly by layers of silty sand (SM) and interbedded sequence of well graded and poorly graded sands (SW and SP) with gravel. Boring B-4 consists of silty clay (CL-ML) from the depth of 20 ft to the bottom of the boring at depth 31.5 ft.

3.2.2 Groundwater Conditions

During the subsurface exploration, groundwater was encountered at roughly 29 ft below ground surface (bgs) at borings B-1 and B-2. This groundwater measurement was taken at the time of drilling and may not reflect the actual groundwater or may not be indicative of other times, or at other locations along the project site. Based on data from nearby groundwater monitoring wells located in a 0.7- to 0.9- mile radius around the site, the minimum depth to groundwater during the last 10 years was measured at approximately 8.7 ft bgs as shown in **Figure 5**.

This data was obtained from the California Department of Water Resources map (http://wdl.water.ca.gov/waterdatalibrary/). Groundwater levels will likely fluctuate due to seasonal variation, nearby construction, irrigation, and numerous other anthropogenic and natural influences.

4.0 GEOLOGIC AND SEISMIC HAZARDS

4.1 Seismic Setting – Regional Faults and Historical Seismicity

Southern California region is known to be seismically active. Earthquakes occurring within approximately 100 km (62 miles) of the site are generally capable of generating ground shaking of engineering significance to the proposed construction.

Active faults are defined as those that have experienced surface displacement within the Holocene period (approximately the last 11,000 years). As shown in **Figure 6a**, there are known active surface faults in the immediate vicinity of the site in the region that could produce significant ground shaking. **Table 2** shows a summary of the faulting characteristics nearby the site.

Table 2 - Summary of Nearby Active Faults

Fault Name	Fault Type	Maximum Earthquake (Mw_{max})	Distance from Site (km)
Elsinore (Glen Ivy) rev, Subsection 0 and Elsinore (Glen Ivy) rev, Subsection 2	Strike-Slip	6.50	2.11
Elsinore (Glen Ivy) rev, Subsection 1 and Elsinore (Stepovers Combined), Subsection 1	Strike-Slip	7.75	2.11
Elsinore (Glen Ivy) rev, Subsection 0 and Elsinore (Coyote Mountains), Subsection 0	Strike-Slip	7.65	2.11
Elsinore (Glen Ivy) rev, Subsection 0 and Elsinore (Temecula) rev, Subsection 5	Strike-Slip	7.70	2.11
Elsinore (Glen Ivy) rev, Subsection 0 and Elsinore (Julian), Subsection 5	Strike-Slip	7.75	2.11
Elsinore (Glen Ivy) rev, Subsection 0 and Elsinore (Glen Ivy) rev, Subsection 3	Strike-Slip	6.50	3.18
Chino alt 2	Strike-Slip	6.90	8.88

4.2 Surface Fault Rupture Potential

Earthquake Fault Zones (known as Special Studies Zones prior to 1994) have been established in accordance with the Alquist-Priolo Special Studies Zones Act enacted in 1972. The Act directs the State Geologist to delineate the regulatory zones that encompass surface traces of active faults that have a potential for future surface fault rupture. The purpose of the Alquist-Priolo Act is to regulate development near active faults in order to mitigate the hazard of surface fault rupture.

According to CGS Special Publication 42 (revised 2018), the proposed project site is not located within an Alquist-Priolo Earthquake Fault Zone.

4.3 Seismic Hazard Zones

Maps of seismic hazard zones are issued by the California Geological Survey (CGS, formerly California Department of Conservation, Division of Mines and Geology [CDMG]) in accordance with the Seismic Hazards Mapping Act enacted in April 1997. The intent of the Seismic Hazards Mapping Act is to provide for a statewide seismic hazard mapping and technical advisory program to assist cities and counties in developing compliance requirements to protect the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failures.

The CGS "Earthquake Zones of Required Investigation" official maps do not include any hazard evaluations regarding the project site, therefore, detailed liquefaction hazard evaluations are required for the project site.

No known landslides have been mapped along or adjacent to the proposed facility in the available study area.

4.4 Expansive/Collapsible Soils

Expansive soils change in volume with changes in moisture. They can shrink or swell and cause heaving and cracking of slabs-on-grade, pavements, and lightly loaded structures founded on shallow foundations. Because expansive soils change in volume with changes in moisture, it is important to limit potential volume change and reduce uplift pressures or settlement by embedding footings below the active zone; the active zone refers to the depth over which soil moisture content variations are likely to cause significant shrink or swell.

According to the 2019 California Building Code (CBC) Chapter 18: Soils and Foundations, soils shall be considered expansive if they are in compliance with all of the following Items, except that tests to show compliance with Items 1, 2, and 3 shall not be required if the test prescribed in Item 4 is conducted:

1) Plasticity index (PI) greater than 15 (ASTM D4318),
2) More than 10 percent of the soil particles pass a No. 200 sieve (ASTM D1140),
3) More than 10 percent of the soil particles are less than 5 micrometers in size (ASTM D422), and
4) Expansion Index greater than 20, determined in accordance with ASTM D4829.

Based on lab tests including Expansion Index test, No. 200 sieve and Gradation test performed on samples collected from upper layers, the soil is considered to be non-expansive.

4.5 Corrosion Potential

Samples from Borings B-2 and B-3 were submitted to Project X Corrosion Testing Laboratory for pH, minimum resistivity, soluble sulfates, and soluble chlorides content testing. Details of the test results are presented in **Appendix B**.

Table 3 shows the soluble sulfate content and the corresponding exposure class of soil sample from each boring in accordance with Table 19.3.1.1 of ACI 318-19. The saturated (minimum) electrical resistivity of onsite soils and pH value at each representative boring are also provided in **Table 3** with the soil classification according to ASTM's special technical publication STP1013/ASME EB.12072, "Effects of Soil Characteristic on Corrosion" (page 86).

Table 3 - Results of Corrosion Testing

Boring	Sample ID	Depth (feet)	pH	Soluble Sulfate Content in Soil (%)	Resistivity (ohm-cm)	Corrosion Potential to Ferrous Metals	Chlorides (%)
B-2	Bulk	3.5-4	8.3	0.0558 ***Category S0*** per ACI 318-19	1,005	***Severely Corrosive*** based on ASTM_STP1013-EB.12072	0.0224
B-2	Bulk	20-21	7.5	0.0052 ***Category S0*** per ACI 318-19	5,250	***Moderately Corrosive*** based on ASTM_STP1013-EB.12072	0.0038
B-3	Bulk	6-6.5	8.2	0.0195 ***Category S0*** per ACI 318-19	871	***Very Severely Corrosive*** based on ASTM_STP1013-EB.12072	0.0176

The corrosion test was performed for screening purposes only. HAI does not practice corrosion engineering; therefore, we recommend that a corrosion engineer be retained to evaluate the corrosion potential of the onsite soils and any impact on the proposed project developments. The corrosion potential of the on-site soils should be verified during construction for each encountered soil type. Imported fill materials should be tested prior to placement to confirm that their corrosion potential is proper for the project.

5.0 GROUND MOTION AND SEISMIC DEFORMATION ANALYSIS

5.1 2019 CBC Seismic Design Coefficients

The seismic design coefficients based on Chapter 11 and 21 of the American Society of Civil Engineers (ASCE) Standard 7-16 (ASCE 7-16) cited by 2019 CBC are provided in **Table 4**. Site Class for the project site was considered "D" due to the average blow counts (e.g., between 15 and 50 blows/foot) across the investigated depth, assumed applicable to the upper 100 feet depths.

The approach taken in this study was to conduct site-specific probabilistic analysis for Maximum Considered Earthquake probability level and deterministic ground motion analysis using OpenSHA (USGS/SCEC, 2019) computer code and NGA-West2 GMPE worksheet to estimate the site ground motion parameters, respectively. The code and the worksheet use the Phase 2 of the Next Generation Attenuation (NGA) relationships proposed by Abrahamson et al. (2014), Campbell and Bozorgnia (2014), Boore et al. (2014), and Chiou and Youngs (2014).

The Phase 2 relationships (NGA-West2) are an enhancement for the initial NGA relationships developed for the Western US. However, OpenSHA also uses an updated fault database (Peterson et al. 2014) which is also employed in development of the updated seismic hazard maps by United States Geological Survey (USGS, 2014).

The site-specific MCE_G peak ground acceleration, PGA_M, shall be taken as the lesser of the probabilistic geometric mean peak ground acceleration of Section 21.5.1 and the deterministic geometric mean peak ground acceleration of Section 21.5.2. The site-specific MCEG peak ground acceleration shall not be taken as less than 80% of PGA_M determined from Eq. (11.8-1).

Table 4 - Site Categorization and Site Coefficients

Categorization/Coefficient	Design Value
Site Soil Classification	D
Site Seismic Design Category	D
Short Period Spectral Acceleration S_S (g)	2.342
1-sec. Period Spectral Acceleration S_1 (g)	0.934
Short-Period Site Coefficient, F_a	1.0
Long-Period Site Coefficient, F_v	2.5
Short Period (MCE_R) Spectral Acceleration S_{MS} (g)	2.417
1-sec. Period (MCE_R) Spectral Acceleration S_{M1} (g)	1.868
Short Period Design Spectral Acceleration S_{DS} (g)	1.611
1-sec. Period Design Spectral Acceleration S_{D1} (g)	1.245
Site-Specific MCE_G Peak Ground Acceleration, PGA_M (g)	0.864

Notes:

- MCE_R stands for Risk-Targeted Maximum Considered Earthquake.

5.2 Liquefaction and Seismic Settlement

Riverside County's liquefaction zones Map (**Figure 6b**) indicates that the liquefaction susceptibility of the project site is low and this susceptibility rank refers to historical ground water of greater than 30 feet, susceptible general sediment type, and study required for critical facilities.

Liquefaction potential and seismically-induced settlement at the site were evaluated using HAI borings logs **B-1**, **B-2**, **B-3**, and **B-4** (available in **Appendix A**), by employing the commercially available software LiqSVs 2.0 (developed by GeoLogismiki, 2020), through Boulanger and Idriss (2014) method. For input, this software accepts the in-situ sampler penetration resistance represented by Standard Penetration Test (SPT) blow count (N), or Shear Wave Velocity (Vs) data.

Seismic ground motion parameters estimated for the project site reported above, namely earthquake magnitude M = 6.55, and site-modified peak horizontal ground acceleration PGA_M = 0.864g, were used in these analyses. Groundwater depth of 8.7 feet bgs, discussed earlier in this report was used.

The liquefaction analyses include estimates of seismically induced (re-consolidation) settlements of saturated granular soils, as well as estimates of liquefaction-triggered lateral spread.

5.2.1 SPT-Based Liquefaction and Seismic Settlement Analysis

The printouts included in **Appendix C** indicate that some of the soil layers experience a computed factor of safety against liquefaction (FS) smaller than 1.0, and thus are considered to be susceptible to liquefaction. Total seismically-induced settlement of approximately in the order of 3.5 inches is estimated at the highest level of seismic demand. The differential seismic settlement is estimated to be 2.3 inches (2/3 of the estimated total seismic settlement). The estimated differential seismic settlement should be expected to occur over distances ranging from 20 to 40-feet.

5.2.2 SPT-Based Lateral Spreading Analysis

The same commercially available software LiqSVs 2.0 was utilized to roughly estimate order of magnitude of Lateral Displacement Index (LDI) as shown in **Appendix C** for HAI borings. To calculate Lateral Displacement (LD) at different distances from free-surface (L), the following equation proposed by Zhang et al. (2004) may be used:

$$\mathrm{LD} = 6\ \mathrm{LDI}\left(\frac{\mathrm{L}}{\mathrm{H}}\right)^{-0.8} \quad \text{for}\ \ 4 < \frac{\mathrm{L}}{\mathrm{H}} < 40$$

The height of the free face (H) was estimated of 10 feet through USGS Topographic Map (https://apps.nationalmap.gov/downloader/). For the area at least 40 feet from the free surface, maximum LD was calculated roughly on the order of 2.0 feet, which corresponds to the area encompassing HAI borings **B-1 & B-2**.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 General

From a geotechnical point of view, the proposed site development is considered feasible provided the recommendations presented in this report are incorporated into design and construction of the project. It is also our opinion that the proposed development will not adversely impact the stability of adjoining facilities and properties if the recommendations presented in this report are incorporated into site construction.

6.2 Site Preparation and Earthwork

The following earthwork recommendations are based on the assumptions contained herein, and will be subject to the conditions exposed during site grading. Modifications to these recommendations may be required during grading as determined by the geotechnical consultant.

All earthwork and grading should be performed in accordance with all applicable requirements of the Grading Code of the City of Corona, Riverside County, in addition to recommendations presented herein.

6.2.1 Cleaning and Grubbing

Any portions of the existing site improvements that are in conflict with the proposed construction, such as structures and associated foundations, utility conduits, landscape elements, concrete curbs and pavements, should be removed from the project area. Removal of trees should include root balls and major roots. Any loose soils associated with site clearing should be removed to expose undisturbed soils. Areas of demolition should remain open until the project geotechnical consultant has observed the exposed subgrade soil conditions. Should any unusual soil conditions or subsurface structures be encountered during site clearing operations or grading that are not described or anticipated herein, they should be brought to the immediate attention of the project geotechnical consultant for appropriate recommendations.

6.2.2 Ground Preparation

In general the upper 5 feet of the existing on-site soils at the site is considered unsuitable and undocumented for support of site improvements that are to be founded on shallow footings. The ground preparation operation should plan for minimum 3 to 5 feet of removal. However, the actual depth of removal should be determined by the geotechnical consultant during grading. These materials should be removed from proposed building sites, tanks, retaining walls, screen walls, pavement, and any other “structural” areas, and replaced as engineered compacted fill.

Removals should extend laterally beyond the limits of the proposed footings a distance equal to the depth of removal (i.e. 1:1 projection) but not less than 5 feet. Where removals are limited by existing structures or property lines, special grading techniques, such as slot cuttings, underpinning, or other acceptable criteria may be required for construction of affected foundations. Under such conditions, specific recommendations should be provided by this firm.

All removals and over-excavations should be evaluated by the geotechnical consultant during grading to confirm the exposed conditions are as anticipated and to provide supplemental recommendations if required.

Exposed bottom (subgrade soil) surfaces in each removal area, including demolition and tree removal areas, should be observed and approved by the project geotechnical consultant prior to processing and placement of fill. Prior to placement of compacted fill, the exposed ground should be scarified to a depth of 6 inches, moisture conditioned to approximately 2% to 3% above the optimum moisture content, then compacted to at least 90 percent of the laboratory standard per ASTM D 1557.

Materials excavated from the site may be processed and re-used as engineered fill provided they are free of deleterious materials and particles greater than 3 inches in maximum dimension and have an expansion index (EI) less than 21. This material should also be moisture-conditioned to 2% to 3% above the optimum moisture content, then compacted to at least 90 percent of maximum dry density per ASTM D1557. All fill should be placed in lifts no greater than

8 inches in loose thickness. Each lift should be treated in a similar manner. Subsequent soil lifts should not be placed until the project geotechnical consultant has approved the preceding lift.

Within limits of exterior non-structural concrete flatwork, soils should be scarified to a depth of 12 inches, moisture conditioned to 2% to 3% above the optimum moisture content, then compacted to at least 90% of ASTM D1557.

The project geotechnical consultant should also be on site during grading and backfill operations to verify proper placement and compaction of all fill, as well as to verify compliance with the other recommendations presented herein.

6.2.3 Temporary Excavations

Temporary excavations may be cut vertically to a maximum height of 4 feet. Excavations greater than 4 feet in height should be laid back at a maximum gradient of 1 to 1 (H:V) for depths up to 10 feet. Where friable soils are exposed, the excavations should be laid back to a maximum gradient of 1.5 to 1 (H:V). For excavations deeper than 10 feet, our office should be contacted.

6.3 Shallow Foundations

Design of shallow footings should take into consideration tolerable total and differential settlement and tilting of the related structure. Shallow foundations are subjected to both static and seismic settlements. The total and differential static settlements are in order of 1 and ½ inches, respectively. The seismic settlement is evaluated in the discussion of earthquake-induced soil liquefaction in this report.

6.3.1 Bearing and Lateral Capacity

Provided site grading is performed in compliance with the recommendations outlined in this report, allowable net bearing capacity of 2,500 pounds per square foot (psf) may be used for strip (continuous) and isolated footings having a minimum width of 12 inches and 24 inches, respectively, and founded at a minimum embedment depth of 12 inches below the lowest adjacent grade. The bearing value may be increased by 400 psf and 800 psf for each additional foot in width and depth, respectively, up to the maximum value of 3,500 psf.

The recommended allowable bearing values include both dead and live loads, and may be increased by one-third for wind and seismic forces (per 2019 CBC, Section 1806.1).

Allowable lateral bearing pressure of 240 pounds per square foot per foot of depth (pcf) up to maximum value of 1,200 psf may be used to determine lateral capacity of the footings facing compacted fill. Passive capacity across the upper 1 foot below grade should be ignored. A coefficient of friction of 0.39 times the dead load may also be used between footing (concrete) and the supporting soils to determine lateral sliding resistance. The above recommended allowable lateral bearing pressure and coefficient of friction may be combined together for design purposes, but none should be increased for transient loading condition (e.g., seismic and wind).

A structural mat foundation system is recommended to limit the effect of static and seismic differential settlements. The outer 12 inches of the mat should be thickened to provide minimum embedment of 8 inches below the lowest adjacent grade. An average allowable net bearing pressure of up to 2,000 pounds per square foot (psf) under static conditions may be used to design mat foundations not exceeding 20' by 20' in dimension. Depending on the mat dimensions and stiffness, and type of applied load, structural analysis of the mat foundation may indicate local bearing pressures (i.e., in limited area of the mat contact area) in excess of the allowable average value, above. Local bearing pressures under static and seismic conditions should be limited to 3,600 psf and 4,800 psf, respectively.

Design of the structural mat may be based on a modulus of subgrade reaction k_{v1} =60 pci (pounds per cubic inch). The modulus is based on an effective loading area of 1 foot by 1 foot. The modulus may be adjusted for other effective loading areas using the equation provided below.

$k_b = k_{v1} \left(\frac{b+1}{2b}\right)^2$ Where “b” is the effective width of loading area (minimum dimension) in feet.

Lateral resistance of the structural mat may be based on the recommended values provided above.

6.3.2 Footing and slabs on Grade

All continuous footings should be reinforced with a minimum of two No. 4 bars, one top and one bottom. The structural engineer may require different reinforcement and should dictate if greater than the recommendations provided herein.

Interior concrete slabs constructed on grade should be a nominal 4 inches thick and should be reinforced with 6-inch by 6-inch, W4 X W4 (No. 6 by No. 6) reinforcing wire mesh or No. 3 bars spaced 18 inches on center, each way. Care should be taken to ensure the placement of reinforcement at mid-slab height. The structural engineer may recommend a greater slab thickness and reinforcement based on proposed use and loading conditions and such recommendations should govern if greater than the recommendations presented herein.

Concrete floor slabs in areas to receive carpet, tile, or other moisture sensitive coverings should be underlain with a moisture vapor retarder such as 10-mil Visqueen, or equivalent. The membrane should be properly lapped, sealed, and protected with at least 2 inches of sand having a sand equivalent (SE) of 30 or greater. This vapor retarder system is anticipated to be suitable for most flooring finishes that can accommodate some vapor emissions. However, this system may emit more than 4 pounds of water per 1000 sq. ft. and therefore, may not be suitable for all flooring finishes. Additional steps should be taken if such vapor emission levels are too high for anticipated flooring finishes.

Special consideration should be given to slabs in areas to receive ceramic tile or other rigid, crack-sensitive floor coverings. Design and construction of such areas should mitigate hairline cracking as recommended by the structural engineer.

Block-outs should be provided around interior columns to permit relative movement and mitigate distress to the floor slabs due to differential settlement that will occur between column footings and adjacent floor subgrade soils as loads are applied.

6.3.3 Foundation Observations

Foundation excavations should be observed by the project geotechnical consultant to verify that they have been excavated into competent bearing soils and to the minimum embedment recommended above. These observations should be performed prior to placement of forms or reinforcement. The excavations should be trimmed neat, level and square. Loose, sloughed or moisture-softened materials and debris should be removed prior to placing concrete.

6.4 Lateral Earth Pressures for Design of Retaining Walls

The recommended lateral earth pressures (static and seismic increment) for backfilled retaining walls are shown in **Table 5**. In this table, “H” is the retained height in feet, and the lateral pressure is in pounds per square foot (psf). These values are for level backfill and should not be used for sloped backfill. Seismic load need not be considered for design of retaining walls with retaining heights shorter than 6 ft. In addition to the recommended earth pressures, retaining wall should be designed to resist lateral earth pressures from surcharge (from additional soil, equipment, etc., as applicable) with a lateral earth pressure coefficient of 0.25. The incremental static and seismic earth pressures should be included as an upright triangular pressure distribution.

Table 5 - Recommended Lateral Earth Pressures, Level Backfill

Condition	Static Earth Pressure	Seismic Increment of Lateral Earth Pressure
Level Backfill	33H	26H

The values provided in the above table do not include hydrostatic pressures. As such, the back of the wall should be fully drained.

6.5 Design Percolation Rate

Percolation tests along with soil classification shall provide the in-situ infiltration characteristics of the soils at the location tested, needed for evaluation of suitability and design of the stormwater facility at the site.

One *Shallow Percolation Test* was performed in accordance with the *Technical Guidance Manual for Onsite Wastewater Treatment Systems provided by County of Riverside Environmental Health Department (Rev. 03/15)*. This test was performed at an 8- inch-diameter hand auger boring (B-5, Shown in **Figure 3**) reaching depth 8 feet bgs to evaluate the infiltration characteristics of onsite soils for stormwater control and groundwater recharging. Bulk samples from the excavated materials were collected for soil classification and physical index properties testing.

Detail of the percolation testing procedures, calculations, as well as spreadsheets relevant to each testing location are presented in **Appendix D** of this report. A summary of the field measured, calculated reduction factors, and suggested design infiltration rates, as well as soil classification is presented in **Table 6**.

Table 6 - Summary of Test Boring Soil Classification and Design Infiltration Rates

Boring	Soil Classification at the Invert Depth (USCS)	Invert depth below ground surface (ft)	Field-Measured Infiltration Rate (in/hr)	Reduction Factor (RF)	"Design" Infiltration Rate (in/hr)
B-5	Brown, Silty Sand with Gravel (SM)	8	7.39	3	2.46

6.6 Preliminary Pavement Design Recommendations

Based on the lab test results of Appendix B, and description of the near-surface soil at the site during the present geotechnical investigation, R-value of 35 is assigned to the project site for preliminary design of pavement section. The preliminary pavement section design is presented in **Table 7** for a range of traffic index (TI). The sections provided in this table are for planning purposes only and should be re-evaluated subsequent to site rough grading. Final pavement sections should be based on actual R-value testing of in-place soils and analysis of anticipated traffic.

Table 7 - Preliminary Pavement Sections

Traffic Index	Asphalt Concrete, AC (in)	Aggregate Base, AB (in)	Portland Cement Concrete, PCC[1] (in)
6	4	6	6.0
7	5	7	7.0
8	6	8	8.0
Parking Stalls	3	4	---
Note 1: No Aggregate Base needed for Portland Cement Concrete (PCC) pavement.			

Truck traffic loading and repetition should be carefully considered before choosing Traffic Indices and corresponding pavement sections. For truck traffic areas, **Table 8** may be used for correlating the average daily truck traffic to Traffic Index, using “5-Axle” truck load. These Traffic Indices should be considered as a guideline and the value of Traffic Index should be evaluated by the project civil engineer. For comparison, the loading induced by one “5-Axle” truck is approximately equivalent to the loading induced by 2.3 “4-Axle” or 3.7 “3-Axle” or 10.0 "2-Axle" trucks.

Table 8 - Traffic Index

Average Daily Traffic (5-Axle Trucks)	Traffic Index
3	6
9	7
27	8

Prior to placement of pavement elements, the upper 12 inches of subgrade soils should be moisture-conditioned to slightly above the optimum moisture content and compacted to at least 90 percent of relative compaction as determined per ASTM D1557 standard. Areas observed to pump or yield under vehicle traffic should be removed and replaced with firm and unyielding compacted soil or aggregate base materials.

Aggregate base (AB) should be moisture conditioned to slightly over the optimum moisture content, placed in lifts no greater than 6 inches in loose thickness, then compacted to at least 95 percent of the laboratory standard per ASTM D1557. Aggregate base materials should be Class II Aggregate Base conforming to Section 26-1 of the 2018 Edition of the Caltrans Standard Specifications, Crushed Aggregate Base conforming to Section 200-2.2 of the 2021 Edition of the Standard Specifications for Public Works Construction (Greenbook) or Crushed Miscellaneous Base conforming to Section 200-2.4 of the Greenbook.

Paving asphalt should be PG 64-10 conforming to the requirements of Section 203-1 of the Greenbook. Asphalt concrete materials should conform to Section 203-6 and construction should conform to Section 302 of the Greenbook, and should be compacted to at least 95% relative compaction (ASTM D1557). A representative of HAI should observe all pavement construction and test all materials including subgrade, base, and asphalt.

Portland cement concrete (PCC) used to construct concrete paving should conform to Section 201-1 of the Greenbook and should have a minimum compressive strength of 3,000 pounds per square inch (psi) at 28 days. Reinforcement and jointing of concrete pavement sections should be designed according to the minimum recommendations provided by the

Portland Cement Association (PCA). For rigid pavement, transverse and longitudinal contraction joints should be provided at spacing no greater than 15 feet. Score joints may be constructed by saw cutting to a depth of ¼ of the slab thickness. Expansion/cold joints may be used in lieu of score joints. Such joints should be properly sealed. Where traffic will traverse over cold joints or edges of concrete paving, the edges should be thickened by 20% of the design thickness toward the edge over a horizontal distance of 5 feet.

It is recommended to construct rigid pavements at the areas with frequent heavy truck stops such as loading docks, trash truck loading pads, etc. These rigid pavement structural sections should be reinforced with a minimum of No. 3 bars spaced at 18 inches on center each way.

6.7 Exterior Flatwork

Exterior flatwork should be a nominal 4 inches thick. Cold joints or saw cuts should be provided at least every 10 feet in each direction. Special jointing detail should be provided in areas of block-outs, notches, or other irregularities to avoid cracking at points of high stress.

Within limits of exterior non-structural concrete flatwork, soils should be scarified to a depth of 12 inches, moisture conditioned to 2% to 3% above the optimum moisture content, then compacted to at least 90% of ASTM D1557.

Before pouring concrete for exterior flatwork, subgrade soils below flatwork should be thoroughly moistened to 2% to 3% above the optimum moisture content to a depth of 12 inches. Moistening should be accomplished by lightly spraying the area over a period of a few days just prior to pouring concrete. The geotechnical consultant should observe and verify the density and moisture content of subgrade soils prior to pouring concrete to ensure that the required compaction and pre-moistening recommendations have been met.

Drainage from flatwork areas should be directed to local area drains or other appropriate collection devices designed to carry runoff water to the street or other approved drainage structures. The concrete flatwork should also be sloped at a minimum gradient of ½% away from building foundations and masonry walls.

6.8 Concrete Mix Design

The chemical test results provided in **Appendix B** of this report and summarized in **Table 3** indicate maximum soluble sulfate concentration of 0.0195%. We recommend following the procedures provided in ACI 318, Section 4.3, Table 4.3.1, for Low sulfate exposure. Upon completion of rough grading, an evaluation of as-graded conditions and further laboratory testing should be completed for the site to confirm or modify the recommendations provided in this section.

6.9 Corrosion

Per the results of chemical tests reported in **Appendix B** and summarized in **Table 3**, soil pH is near neutral, chloride content less than 500 ppm, but the minimum resistivity is between 1,005 to 871 ohm-cm, the latter suggesting severely corrosive to very severely corrosive soil. As such, structural elements fabricated from metals should have appropriate corrosion protection if they will be in contact with site soils. Under such conditions, a corrosion specialist should provide specific recommendations. Metals that are embedded in concrete per ACI requirements should not require any special consideration of corrosion due to soil conditions.

6.10 Earthquake Hazards Mitigation Measures

As discussed in Section 5.0 of this report, because of the project location in a seismically active region (i.e., southern California), the site is subject to ground shaking due to earthquakes, with all its consequences, such as liquefaction-induced settlements and lateral spreading.

This section briefly discusses a number of recommendations to potentially mitigate the effects of liquefaction at the site. These recommendations are for general considerations only. More specific and design-level recommendations will be provided upon request. In case any method is used to improve foundation condition, the potential differential settlements between the treated area and the untreated area of the site should be taken into account. The utility connections between these two areas should be capable of withstanding the potential differential settlements.

6.10.1 Deep Foundations

Piles used to support structures can reduce or eliminate both static and seismic settlements. Shallow piles embedded to a depth of greater than 20 feet bgs can eliminate seismic settlements from the dry soils above groundwater and from the shallower liquefiable layers (estimated within depth 12.5 to 20 feet bgs). These piles will still experience settlement from liquefaction of the deeper liquefiable layers (estimated within depth 25 to 35 feet bgs). Deeper piles reaching depth 50 and greater, eliminate the seismic settlement altogether. Piles should be designed for downdrag loads from soil settlement.

Various types of piles may be used, including driven (steel and concrete) piles, Cast-In-Drilled-Holes (CIDH) piles, and Auger-Cast-in-Place (ACIP) piles. Selection of the appropriate type of pile depends on a number of parameters, including but not limited to the tolerable vibration level, rig size, available room, and availability of the construction material.

6.10.2 Lateral Spreading Stabilization

One or more row of CIDH piles installed approximately along the shoreline (North and Northeast of the site) can reduce or eliminate the risk of liquefaction-triggered lateral spreading of the site soils toward the slope. These piles should be spaced tightly enough to arrest the flow of soil materials between them. Geotechnical and structural design of the stabilization piles should provide lateral capacity with acceptable factors of safety to counter lateral load from the moving soil mass.

The pile-stabilized sites with lateral spreading potential have been analyzed based on the approach presented by Law and Lam (2000). This method has been used by the California Department of Transportation (Caltrans) to design or retrofit foundations of several bridges including the Vincent Thomas Bridge near Port of Los Angeles in southern California.

Additionally, various ground improvement methods such as stone columns and deep soil mixing for installation of soil cement columns or walls may be used to create a massive stabilizing buttress in front of the liquefied soils along the shoreline to mitigate lateral spreading effects.

Besides, more suitable subsurface investigation methods for evaluation of liquefaction and lateral spreading in gravelly materials along the shoreline such as Dynamic Cone Penetration Test (DPT) and/or Becker Penetration Testing (BPT) are required prior to providing more specific and design-level recommendations for mitigation of lateral spreading effects.

6.11 Post-Grading Considerations

6.11.1 Site Drainage and Irrigation

The ground immediately adjacent to foundations should be provided with positive drainage away from the structures in accordance with 2019 CBC, Section 1804.4. However, the slope of ground away from the foundations may be reduced from 5% to 2% minimum based on climatic and soil conditions present at the site. No rain or excess water should be allowed to pond against structures such as walls, foundations, flatwork, etc.

Excessive irrigation water can be detrimental to the performance of the proposed site development. Water applied in excess of the needs of vegetation will tend to percolate into the ground. Such percolation can lead to nuisance seepage and shallow perched groundwater. Seepage can form on slope faces, on the faces of retaining walls, in streets, or other low-lying areas. These conditions could lead to adverse effects such as formation of stagnant water that breeds insects, distress or damage to trees, surface erosion, slope instability, discoloration and salt buildup on wall faces, and premature failure of pavement. Excessive watering can also lead to elevated vapor emissions within building that can damage flooring finishes or lead to mold growth inside the building.

Key factors that can help mitigate the potential for adverse effects of overwatering include the judicious use of water for irrigation, use of irrigation systems that are appropriate for the type of vegetation and geometric configuration of the planted area, the use of soil amendments to enhance moisture retention, use of low-water demand vegetation, regular use of appropriate fertilizers, and seasonal adjustments of irrigation systems to match vegetation needs for water. Specific recommendations should be provided by a landscape architect or other knowledgeable professional.

6.11.2 Utility Trench Backfill

Trench excavations should be constructed in accordance with the recommendations contained in Section 6.2.3 of this report. Trench excavations must also conform to the requirements of Cal/OSHA.

Utility trench backfill within the property should be compacted to at least 90 percent of the maximum dry density per Modified Proctor compaction test (ASTM D1557). Soils placed within the pipe zone (6 inches below and 12 inches above the pipe) should consist of particles no greater than ¾ inches and have a SE of at least 30. The materials within the pipe zone should be consolidated with some vibratory compaction without damaging the pipe. Jetting and flooding is not recommended. Above the pipe zone (>1 foot above pipe), the backfill may consist of general fill materials. Trench backfill should be brought to slightly over optimum moisture content, placed in lifts no greater than 8 inches in thickness, and then mechanically compacted with appropriate equipment to at least 90 percent of the Modified Proctor maximum dry density (per ASTM D1557 standard). For trenches with sloped walls, backfill material should be placed in lifts no greater than 6 inches in loose thickness, and then compacted by a sheep-foot roller or similar equipment. The project geotechnical consultant should perform density testing along with probing to verify that adequate compaction has been achieved.

Within shallow trenches (less than 18 inches deep) where pipes may be damaged by heavy compaction equipment, imported clean sand having a SE of 30 or greater may be utilized. For utility trenches located below a 1:1 (H:V) plane projecting downward from the outside edge of the adjacent footing base or crossing footing trenches, concrete or slurry should be used as trench backfill.

7.0 ADDITIONAL SERVICES

We recommend that Hushmand Associates, Inc. (HAI) be engaged to review the grading plans and foundation plans prior to construction. The purpose of this is to provide any additional comments and specific recommendations for site grading and development, as well as to verify that the recommendations contained in this report have been properly interpreted and incorporated into the project specifications. If we are not provided the opportunity to review these documents and perform the necessary engineering analyses, we take no responsibility for misinterpretation of our recommendations.

HAI recommends that the project Geotechnical Engineer of Record be retained to provide soil engineering services during the grading and construction phases of the work. This is to observe compliance with the design, specifications or recommendations, and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

8.0 LIMITATIONS

This report has been prepared for the sole use of Toro Energy, LLC, specifically for design of the proposed improvements at the subject landfill site. The opinions presented in this report have been formulated in accordance with existing accepted geotechnical engineering practices in southern California at the time this report was written. No other warranty, expressed or implied, is made or should be inferred.

The opinions, conclusions, and recommendations contained in this report are based upon the information obtained from our investigation, which includes data from widely separated discrete sampling locations, visual observations from our site reconnaissance, along with local experience and engineering judgment. The recommendations presented in this report are based on the assumption that soil and geologic conditions at or between borings do not deviate substantially from those encountered during our investigation. We are not responsible for the data presented by others. We should be retained to review the geotechnical aspects of the final plans and specifications for conformance with our recommendations. The recommendations provided in this report are based on the assumption that we will be retained to provide observation and testing services during construction to confirm that conditions are similar to that assumed for design and to form an opinion as to whether the work has been performed in accordance with the project plans and specifications.

If we are not retained for these services, HAI cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of HAI's report by others. Furthermore, HAI will cease to be the Geotechnical Engineer of Record, if we are not retained for these services and/or at the time another consultant is retained for follow up service to this report.

The opinions presented in this report are valid as of the present date for the site evaluated. Changes in the condition of the site will likely occur with the passage of time due to natural processes and/or the works of man. In addition, changes in applicable standards of practice can occur as a result of legislation and/or the broadening of knowledge. Furthermore, geotechnical issues may arise that were not apparent at the time of our investigation. Accordingly, the opinions presented in this report may be invalidated, wholly or partially, by changes outside of our control. Therefore, this report is subject to review and should not be relied upon after a period of three years, nor should it be used, or is it applicable, for any other properties.

9.0 REFERENCES

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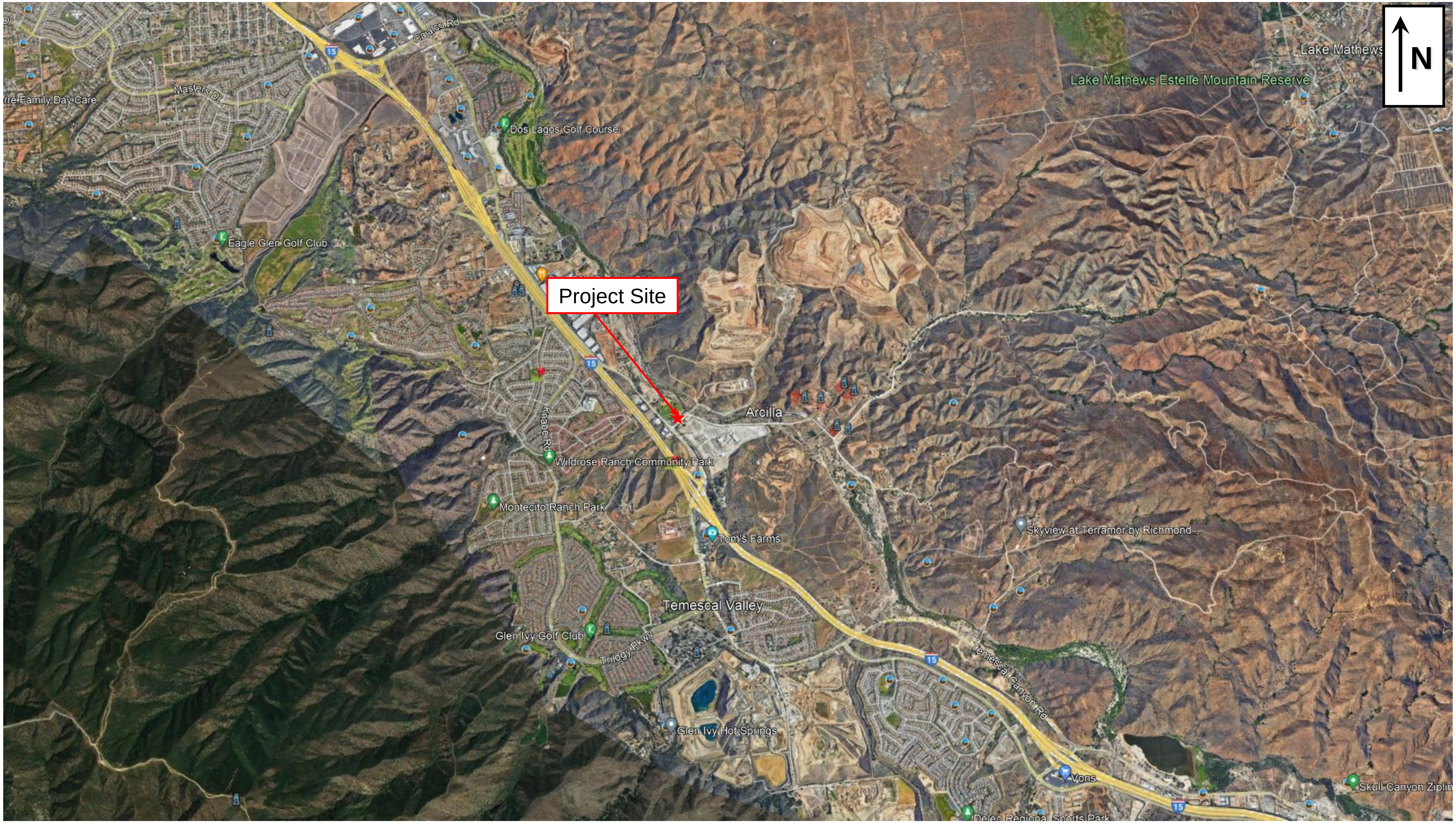
Figures



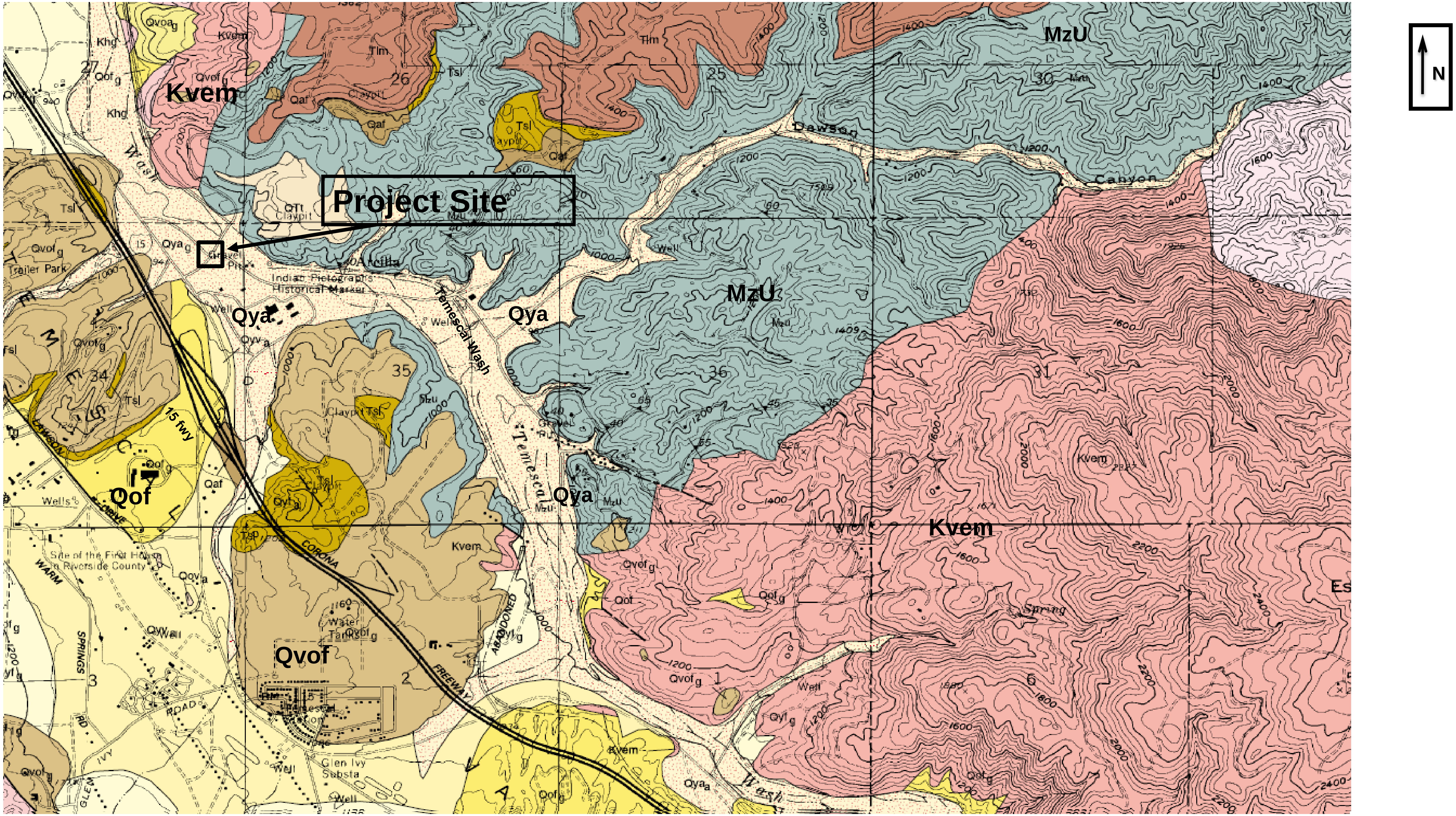
Source: Google Earth

HUSHMAND ASSOCIATES, INC. Geotechnical and Earthquake Engineers	Proposed SoCalGas Waste to Energy Facility Corona, Riverside County, CA Project No. TE-22-001	Site Vicinity Map	Figure 1

Source: Google Earth

HAI HUSHMAND ASSOCIATES, INC. Geotechnical and Earthquake Engineers	**Proposed SoCalGas Waste to Energy Facility Corona, Riverside County, CA**	**Site Location Map**	**Figure 2**
	Project No. TE-22-001		

HAI HUSHMAND ASSOCIATES, INC. Geotechnical and Earthquake Engineers	**Proposed SoCalGas Waste to Energy Facility Corona, Riverside County, CA** Project No. TE-22-001	**Soil Exploration Location Map**	**Figure 3**

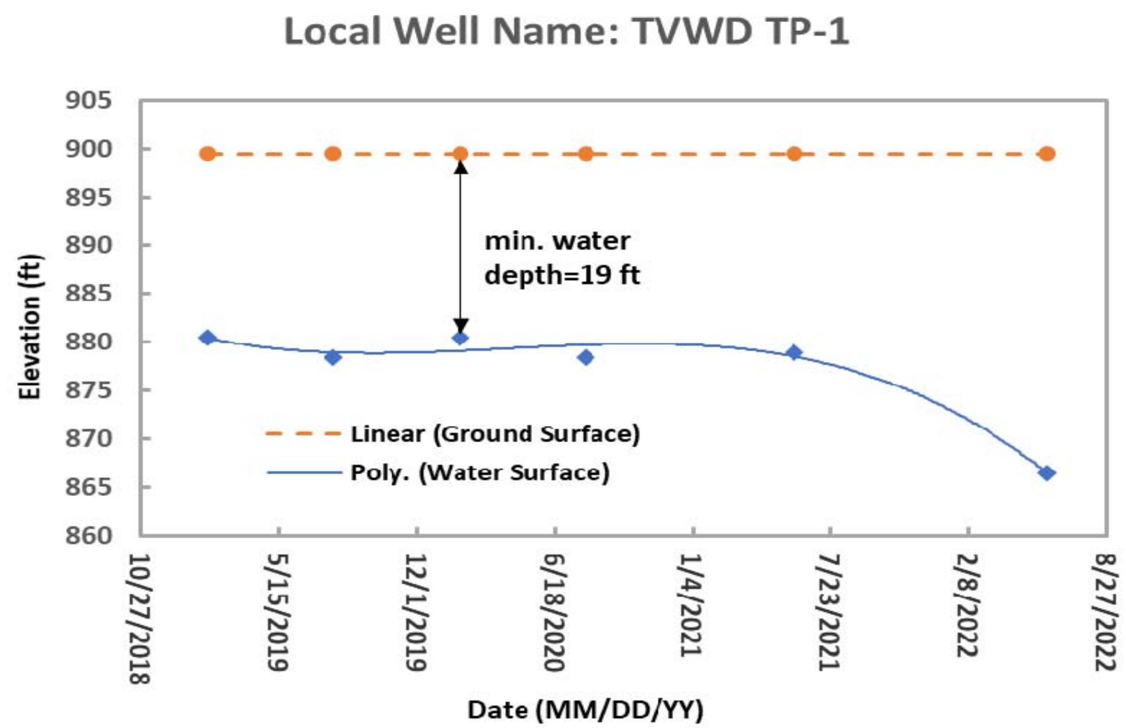


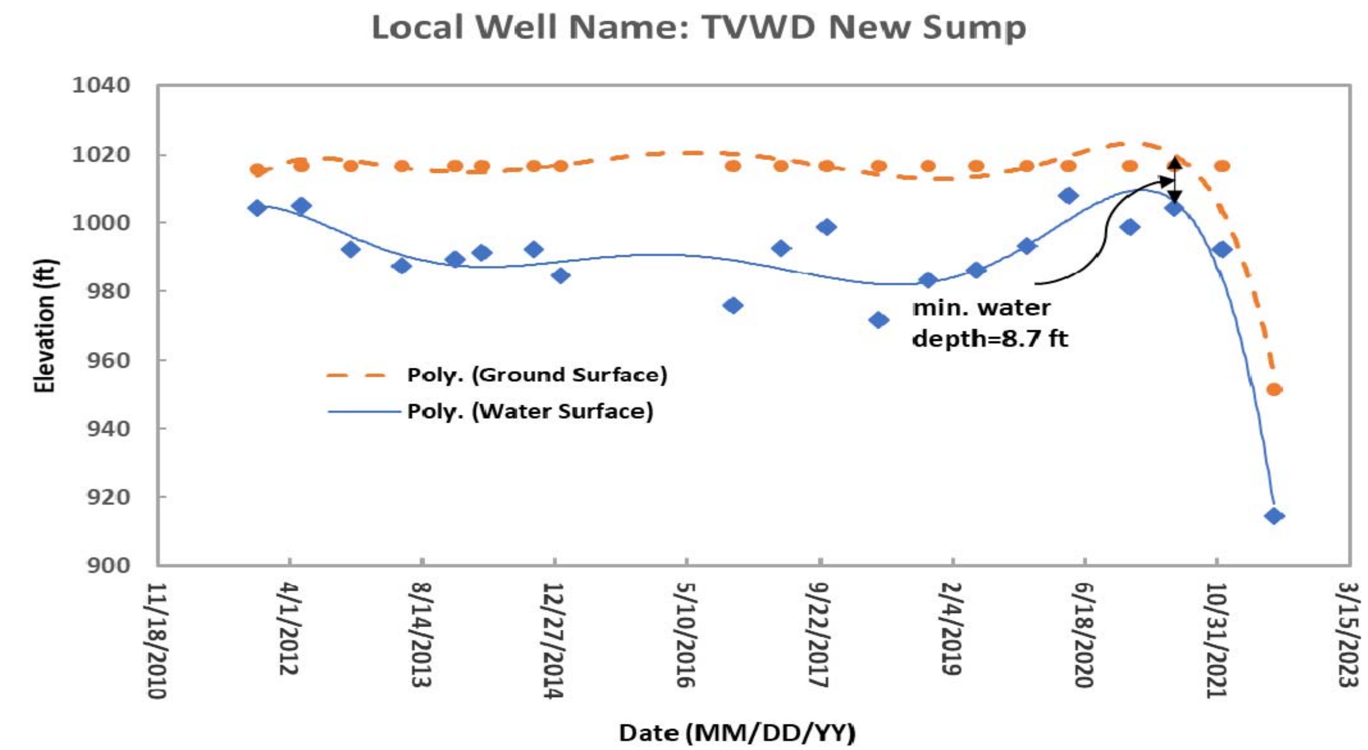
Source: *Geologic Map of the Lake Mathews 7.5' Quadrangle, Riverside County, CA.: U.S. Geological Survey*

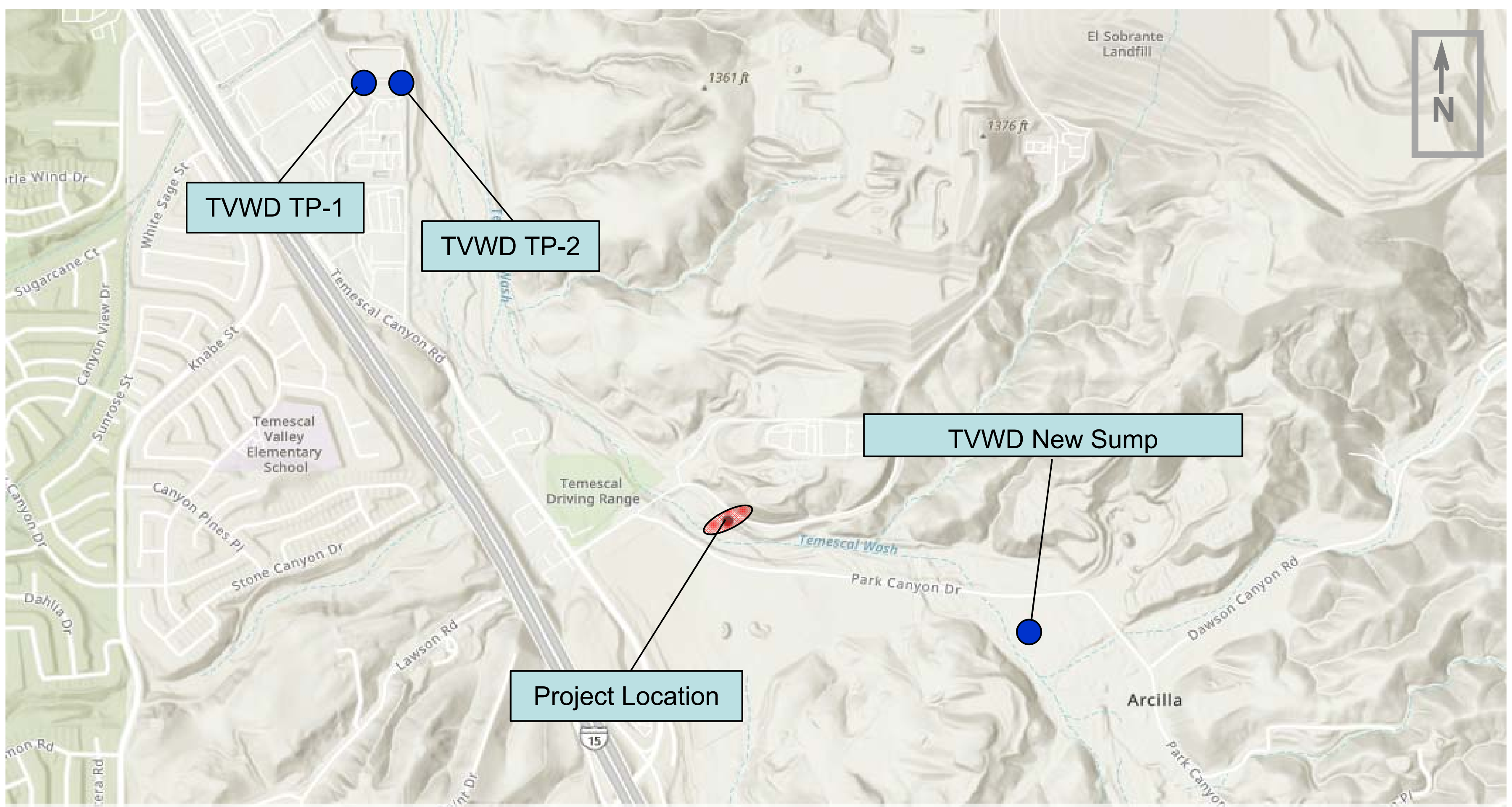
Description of Map Units

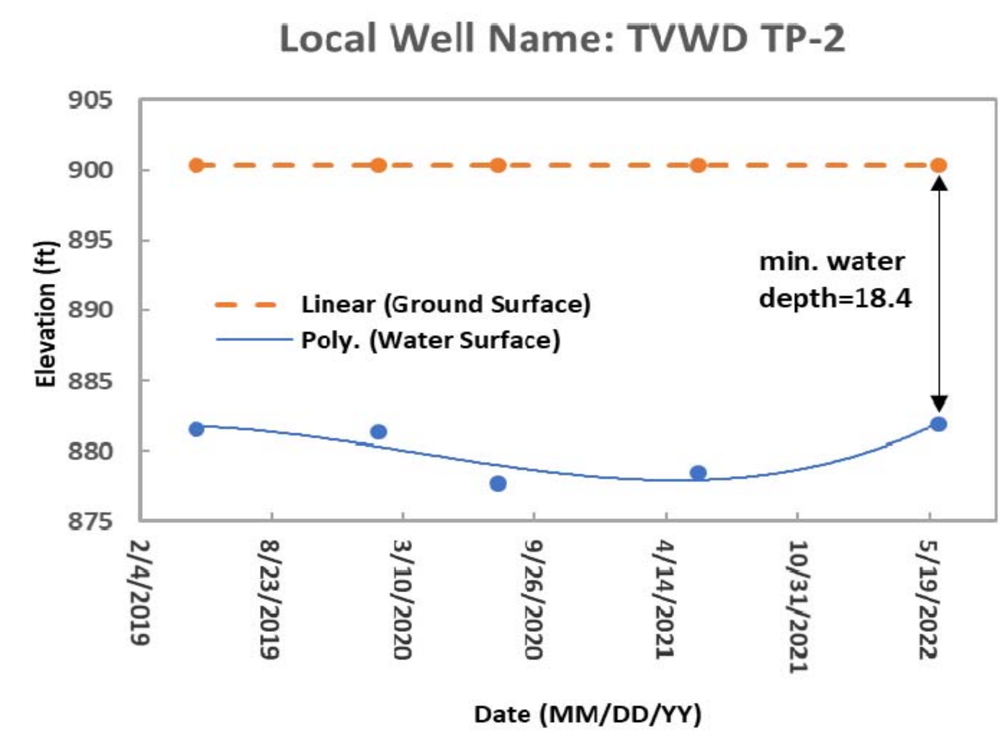
Qya: Young axial channel deposits (Holocene and late Pleistocene)
Qof: Old alluvial fan deposits (late to middle Pleistocene)
Qvof: Very old alluvial fan deposits (early Pleistocene)
Mzu: Mesozoic metasedimentary rocks (Mesozoic)
Kvem: Estelle Mountain volcanics of Herzig (Cretaceous)

HAI HUSHMAND ASSOCIATES, INC. Geotechnical and Earthquake Engineers	Proposed SoCalGas Waste to Energy Facility Corona, Riverside County, CA Project No. TE-22-001	Regional Geological Map	Figure 4

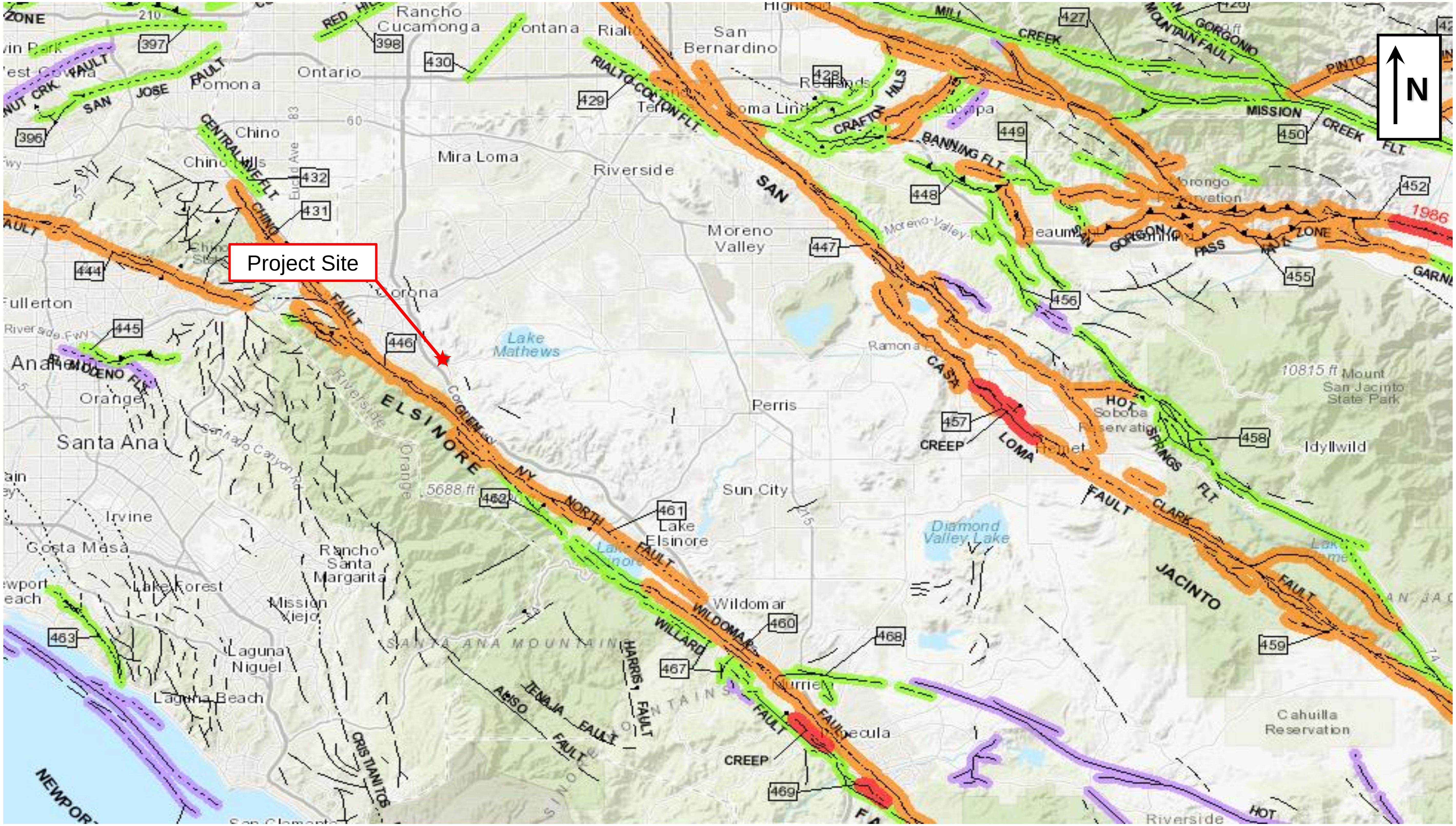






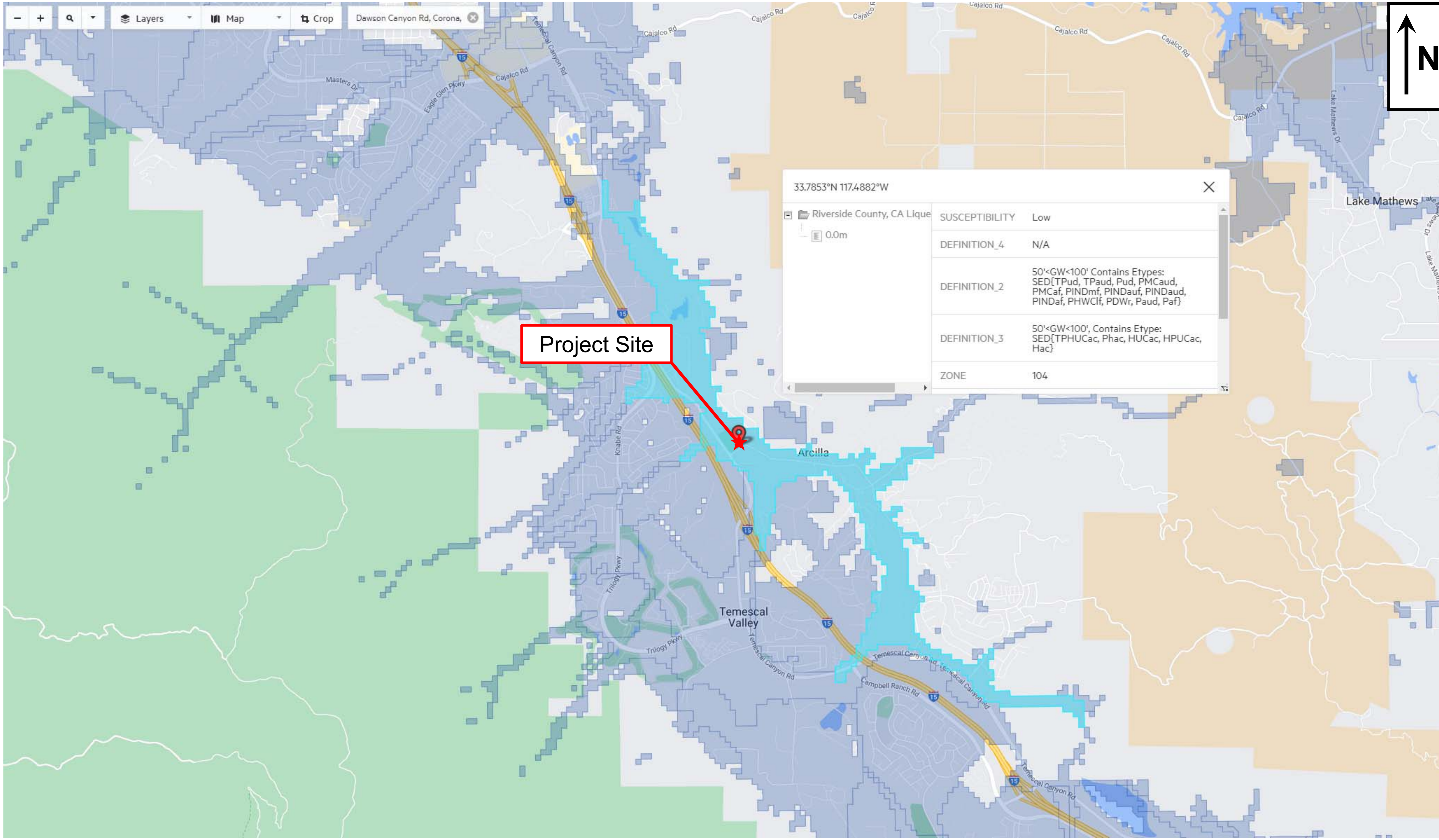


HAI HUSHMAND ASSOCIATES, INC. Geotechnical and Earthquake Engineers	Proposed SoCalGas Waste to Energy Facility Corona, Riverside County, CA Project No. TE-22-001	Ground Water Elevation at Nearby Monitoring Wells	Figure 5



Source: Fault Activity Map (CGS, 2010). California Geological Survey, Geologic Data Map No. 6. Compilation and Interpretation by: Charles W. Jennings and William A. Bryant; Graphics by: Milind Patel, Ellen Sander, Jim Thompson, Barbara Wanish and Milton Fonseca [https://maps.conservation.ca.gov/cgs/fam/].

HUSHMAND ASSOCIATES, INC. Geotechnical and Earthquake Engineers	**Proposed SoCalGas Waste to Energy Facility Corona, Riverside County, CA**	**Fault Activity Map**	**Figure 6a**
	Project No. TE-22-001		



Source: https://koordinates.com/layer/96846-riverside-county-ca-liquefaction/

HAI HUSHMAND ASSOCIATES, INC. Geotechnical and Earthquake Engineers	Proposed SoCalGas Waste to Energy Facility Corona, Riverside County, CA Project No. TE-22-001	Riverside County's Liquefaction Zones	Figure 6b

Appendix A
Exploratory Boring Logs

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
AH/AH	**11-3-22**	**11-3-22**	**33° 47' 4.1" / -117° 29' 12.95"**	**B-1**

DRILLING CONTRACTOR **BC2 Enviromental**	Client **Toro Energy, LLC**	SURFACE ELEVATION **930.53 NAVD88**
DRILLING METHOD **Hollow-Stem Auger**	DRILL RIG **CME 95**	BOREHOLE DIAMETER **8 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **Bulk, Mod Cal (2"), SPT (1.4")**	Location **El Sobrante Landfill, Riverside County, CA**	HAMMER EFFICIENCY, ERi **83%**
BOREHOLE BACKFILL AND COMPLETION **Backfilled with soil cuttings**	GROUNDWATER READINGS DURING DRILLING **29.0 ft** AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING **38.0 ft**

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	CLAYEY SAND with GRAVEL (SC); grayish brown; dry; mostly coarse to fine SAND; some medium plasticity fines.		BULK					3					% Passing # 200 Sieve= 17.5
	5	Becomes very dense.		MC-1	50/6"	REF	33							
	7.5	Well-graded SAND with SILT and GRAVEL (SW-SM); medium dense; grayish brown; dry; mostly coarse to fine SAND; few medium plasticity fines; few fine GRAVEL.		MC-2	6 9 6	15	0		2					SA
	10	Same as above.		SPT-1	18 14 7	21	100							
	12.5	Becomes loose.		MC-3	5 7 5	12	100							
	15	Well-graded SAND with SILT (SW-SM); medium dense; grayish brown; dry; mostly coarse to fine SAND; little nonplastic fines.		MC-4	7 6 15	21	100		2					SA
	20	SILTY SAND (SM); medium dense; light brown; moist; mostly coarse to fine SAND; some nonplastic fines.		SPT-2	5 8 10	18	100							
	25													

(continued)

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Poorly graded SAND with SILT and GRAVEL (SP-SM) very dense; brown; moist; mostly medium to fine SAND; few nonplastic fines; few fine GRAVEL.		MC-5	11 50/3"	50/3	44							
	30		Poorly graded SAND (SP); medium dense; brown; moist; mostly medium to fine SAND.		SPT-3	6 9 11	20	100							
	35		Well-graded SAND (SW); very dense; light brown; wet; mostly coarse to fine SAND.		SPT-4	24 30 14	44	100							
	36.5		Same as above.		SPT-5	6 12 50	62	100							Terminated due to hard drilling
	38		Bottom of borehole at 38.0 ft bgs												

Depth scale (ft): 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
AH/AH	**11-2-22**	**11-2-22**	**33° 47' 3.48" / -117° 29' 13.82"**	**B-2**

DRILLING CONTRACTOR	Client	SURFACE ELEVATION
BC2 Enviromental	**Toro Energy, LLC**	**929.53 NAVD88**
DRILLING METHOD	DRILL RIG	BOREHOLE DIAMETER
Rotary Wash	**CME 75**	**4.3 in**
SAMPLER TYPE(S) AND SIZE(S) (ID)	Location	HAMMER EFFICIENCY, ERi
Bulk, Mod Cal (2"), SPT (1.4")	**El Sobrante Landfill, Riverside County, CA**	**81.1%**
BOREHOLE BACKFILL AND COMPLETION	GROUNDWATER READINGS DURING DRILLING AFTER DRILLING (DATE)	TOTAL DEPTH OF BORING
Backfilled with mix of cement & bentonite	**Not Measured**	**37.0 ft**

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Remarks
	0	CLAYEY SAND with GRAVEL (SC); light brown; dry; mostly coarse to fine SAND; some medium plasticity fines; little fine GRAVEL.	BULK								
	2.5	SILTY GRAVEL with SAND (GM); medium dense; grayish brown; dry; mostly fine GRAVEL; little nonplastic fines; some fine to coarse SAND.	MC-1	9 10 11	21	100		2			SA
	5	Well-graded SAND with SILT (SW-SM); dense; light brown; moist; mostly coarse to fine SAND; few nonplastic fines; few fine GRAVEL.	MC-2	10 28 35	63	100		9	116		SA Peak: C= 300 psf Phi= 40.0 deg
	7.5	SILTY SAND (SM); medium dense; brown; moist; mostly coarse to fine SAND; some nonplastic fines.	MC-3	7 9 10	19	100					
	10	Same as above.	SPT-1	1 3 5	8	100					
	12.5		SPT-2	50/5"	REF	28		6			
	13.5	SILTY SAND with GRAVEL (SM); very dense; gray; moist; mostly coarse to fine SAND; some nonplastic fines; little fine Gravel.									
	15	SILTY CLAY (CL-ML); very stiff; brown; moist; mostly medium plasticity fines.	MC-4	5 13 14	27	100					
	20	Poorly graded GRAVEL (GP); very dense; brown; moist; mostly fine SAND.	SPT-3	10 15 23	38	100		5			SA
	25										

(continued)

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Well-graded SAND with SILT (SW-SM); very dense brown; moist; mostly coarse to fine SAND; few nonplastic fines.		MC-5	17 33 40	73	100		11	108				SA Peak: C= 200 psf Phi= 38.5 deg
	30		Poorly graded SAND (SP); very dense; brown; moist; mostly medium to fine SAND.		SPT-4	5 13 50/6"	63/12	100							
	35		Poorly graded GRAVEL with SAND (GP); medium dense; grayish brown; wet; mostly fine GRAVEL; little fine SAND.		MC-6	11 18 19	37	100		13					SA Terminated due to hard drilling.
	37		Bottom of borehole at 37.0 ft bgs												

Depth scale: 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55

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Geotechnical and Earthquake Engineers

Hushmand Associates, Inc.
250 Goddard
Irvine, CA 92618

EL Sobrante Landfill, SoCalGas Waste to Energy Facility
Corona, Riverside County, CA

LOG OF BORING B-2

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
AH/AH	**11-2-22**	**11-2-22**	**33° 47' 2.59" / -117° 29' 15.01"**	**B-3**
DRILLING CONTRACTOR			Client	SURFACE ELEVATION
BC2 Enviromental			**Toro Energy, LLC**	**928.71 NAVD88**
DRILLING METHOD			DRILL RIG	BOREHOLE DIAMETER
Hollow-Stem Auger			**CME 95**	**8 in**
SAMPLER TYPE(S) AND SIZE(S) (ID)			Location	HAMMER EFFICIENCY, ERi
Bulk, Mod Cal (2"), SPT (1.4")			**El Sobrante Landfill, Riverside County, CA**	**83%**
BOREHOLE BACKFILL AND COMPLETION			GROUNDWATER READINGS — DURING DRILLING **29.0 ft** — AFTER 40 MINITUES **31.5 ft**	TOTAL DEPTH OF BORING
Backfilled with soil cuttings				**37.3 ft**

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Remarks
	0	SILTY SAND with GRAVEL (SM); light brown; dry; mostly coarse to fine SAND; little low plasticity fines; some fine GRAVEL.	BULK					3			SA Peak: C= 200 psf Phi= 36.5 deg
	5	Becomes medium dense, grayish brown.	MC-1	42 20 12	32	100		7	114		SA
	10	Well-graded SAND (SW); medium dense; light brown; dry to moist; mostly coarse to fine SAND.	SPT-1	2 4 8	12	100		3			SA
	12.5	Poorly graded SAND with SILT and GRAVEL (SP-SM); medium dense; brown; dry to moist; mostly medium to fine SAND; few nonplastic fines; some fine GRAVEL.	MC-2	4 14 19	33	100		2			SA
	15	SILTY SAND (SM); medium dense; brown; moist; mostly medium to fine SAND; some nonplastic fines.	SPT-2	2 7 8	15	100					
	20	SILTY SAND with GRAVEL (SM); dense; light brown; moist; mostly medium to fine SAND; some nonplastic fines; little fine GRAVEL.	MC-3	18 25 14	39	100					
	25										

(continued)

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Well-graded SAND with SILT (SW-SM); medium dense light brown; moist; mostly coarse to fine SAND; some nonplastic fines.		SPT-3	7 9 10	19	100		3					SA
	30		SILTY SAND (SM); dense; brown; wet; mostly coarse SAND; some nonplastic fines.		MC-4	9 16 21	37	100							
	35		Same as above.		SPT-4	3 8 18	26	100		11	120				
	37		Well-graded SAND with SILT and GRAVEL (SW-SM); very dense; light brown; wet; mostly coarse to fine SAND; few nonplastic fines; little fine GRAVEL.		MC-5	6 50/4"	50/4	100							SA Terminated due to hard drilling.
			Bottom of borehole at 37.3 ft bgs												

Depth scale: 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
AH/AH	11-3-22	11-3-22	33° 46' 59.97" / -117° 29' 19.34"	B-4

DRILLING CONTRACTOR **BC2 Enviromental**	Client **Toro Energy, LLC**	SURFACE ELEVATION **933.43 NAVD88**
DRILLING METHOD **Hollow-Stem Auger**	DRILL RIG **CME 95**	BOREHOLE DIAMETER **8 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **Bulk, Mod Cal (2"), SPT (1.4")**	Location **El Sobrante Landfill, Riverside County, CA**	HAMMER EFFICIENCY, ERi **83%**
BOREHOLE BACKFILL AND COMPLETION **Backfilled with soil cuttings**	GROUNDWATER READINGS DURING DRILLING AFTER DRILLING (DATE) **Not Encountered**	TOTAL DEPTH OF BORING **31.5 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		SILTY, CLAYEY SAND (SC-SM); brown; dry; mostly coarse to fine SAND; some low plasticity fines.		BULK										
	5		SILTY SAND with GRAVEL (SM); dense; brown; dry; mostly coarse to fine SAND; some nonplastic fines; few fine GRAVEL.		MC-1	14 18 44	62	100							SA
	10		SILTY SAND (SM); loose; brown; moist; mostly coarse to fine SAND; some nonplastic fines.		SPT-1	2 2 3	5	100							% Passing # 200 Sieve= 40.1
	15		Poorly graded SAND (SP); medium dense; brown; dry; mostly medium to fine SAND.		MC-2	4 10 14	24	100							SA
	20		Lean CLAY with SAND (CL); medium stiff; brown; moist; mostly medium plasticity fines; little fine SAND.		SPT-2	2 2 3	5	100							% Passing # 200 Sieve= 70.2 LL= 28% pi= 8%
	25														

(continued)

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Hushmand Associates, Inc.
250 Goddard
Irvine, CA 92618

EL Sobrante Landfill, SoCalGas Waste to Energy Facility
Corona, Riverside County, CA

LOG OF BORING B-4

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	25		Becomes stiff.		MC-3	4 5 7	12	100							Cons.
	30		Becomes medium stiff.		SPT-3	2 2 2	4	100							% Passing # 200 Sieve= 83.2
	31.5		Bottom of borehole at 31.5 ft bgs												

Depth scale (ft): 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
AH/AH	**11-3-22**	**11-3-22**	**33° 47' 3.93" / -117° 29' 12.89"**	**B-5**
DRILLING CONTRACTOR **BC2 Enviromental**			Client **Toro Energy, LLC**	SURFACE ELEVATION **930.53 NAVD88**
DRILLING METHOD **Hand Auger**			DRILL RIG **Hand Augered**	BOREHOLE DIAMETER **8 in**
SAMPLER TYPE(S) AND SIZE(S) (ID) **Bulk**			Location **El Sobrante Landfill, Riverside County, CA**	HAMMER EFFICIENCY, ERi **-**
BOREHOLE BACKFILL AND COMPLETION **Backfilled with soil cuttings**			GROUNDWATER READINGS — DURING DRILLING: **Not Encountered**; AFTER DRILLING (DATE):	TOTAL DEPTH OF BORING **8.0 ft**

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		Poorly graded GRAVEL with SILT and SAND (GP-GM); brown; moist; mostly fine GRAVEL; little coarse to medium SAND; few nonplastic fines.		BULK-1					4					SA
	3		SILTY SAND with GRAVEL (SM); brown; moist; mostly coarse to fine SAND; little nonplastic fines; little fine GRAVEL.		BULK-2					5					SA
	8		Bottom of borehole at 8.0 ft bgs												

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

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Irvine, CA 92618

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

EL Sobrante Landfill, SoCalGas Waste to Energy Facility
Corona, Riverside County, CA

LOG OF BORING B-5

SHEET 1 of 1

Appendix B

Laboratory Test Results

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

MOISTURE CONTENT AND DRY DENSITY OF RING SAMPLES

ASTM D2216 & ASTM D2937

Client: Toro Energy, LLC
Project Name: SoCalGas Waste to Energy Facility
Project No.: -

HAI Proj No.: TE-22-001
Performed by: GA
Checked by: KL
Date: 11/9/2022

No.	**Boring No.**	**Sample No.**	**Depth**	Wt of Ring + Soil	Height of Sample	Dia. of Sample	Volume of Sample	Wt of Rings	Wt of Soil	Wet Density	Wt of Cont. + Wet Soil	Wt of Cont. + Dry Soil	Wt of Container	**Moisture Content**	**Dry Density**
			ft	gr	in	in	cu.ft	gr	gr	pcf	gr	gr	gr	**%**	**pcf**
1	**B-1**	**Bulk**	**0-5**	-	-	-	-	-	-	-	1311.25	1277.09	222.4	**3.2**	**-**
2	**B-1**	**MC-2B**	**8.5-9.0**	-	-	-	-	-	-	-	894.97	880.21	220.26	**2.2**	**-**
3	**B-1**	**MC-4B**	**16.0-16.5**	-	-	-	-	-	-	-	936.16	923.6	221.11	**1.8**	**-**
4	**B-2**	**MC-1B**	**3.5-4.0**	-	-	-	-	-	-	-	723.05	712.41	221.24	**2.2**	**-**
5	**B-2**	**MC-2B**	**6.0-6.5**	594.17	3.00	2.416	0.0080	138.10	456.07	126.3	513.16	488.29	221.12	**9.3**	**115.6**
6	**B-2**	**SPT-2**	**12.5-13.5**	-	-	-	-	-	-	-	356.7	348.91	222.55	**6.2**	**-**
7	**B-2**	**SPT-3**	**20-21.0**	-	-	-	-	-	-	-	717.68	692.46	220.92	**5.3**	**-**
8	**B-2**	**MC-5B**	**26.0-26.5**	1144.95	6.00	2.416	0.0159	276.20	868.75	120.3	485.08	459.18	223.42	**11.0**	**108.4**
9	**B-2**	**MC-6B**	**36.0-36.5**	-	-	-	-	-	-	-	846.03	772.73	220.74	**13.3**	**-**
10	**B-3**	**Bulk**	**0-5**	-	-	-	-	-	-	-	272.81	265.85	11.88	**2.7**	**-**
11	**B-3**	**MC-1B**	**6-6.5**	387.78	2.00	2.416	0.0053	92.07	295.71	122.9	595.29	568.89	213.57	**7.4**	**114.4**
12	**B-3**	**SPT-1**	**10-11.0**	-	-	-	-	-	-	-	671.39	660.47	220.1	**2.5**	**-**
13	**B-3**	**MC-2B**	**13.5-14.0**	-	-	-	-	-	-	-	690.26	680.64	221.21	**2.1**	**-**
14	**B-3**	**SPT-3**	**25-25.5**	-	-	-	-	-	-	-	648.57	634.96	222.9	**3.3**	**-**
15	**B-3**	**MC-5A**	**36.0-36.5**	622.64	3.00	2.416	0.0080	138.10	484.54	134.2	844.19	780.26	221.24	**11.4**	**120.4**

MOISTURE CONTENT AND DRY DENSITY OF RING SAMPLES

ASTM D2216 & ASTM D2937

Client: Toro Energy, LLC
Project Name: SoCalGas Waste to Energy Facility
Project No.: -

HAI Proj No.: TE-22-001
Performed by: GA
Checked by: KL
Date: 11/9/2022

No.	Boring No.	Sample No.	Depth	Wt of Ring + Soil	Height of Sample	Dia. of Sample	Volume of Sample	Wt of Rings	Wt of Soil	Wet Density	Wt of Cont. + Wet Soil	Wt of Cont. + Dry Soil	Wt of Container	Moisture Content	Dry Density
			ft	gr	in	in	cu.ft	gr	gr	pcf	gr	gr	gr	%	pcf
1	**B-4**	**MC-1B**	**6-6.5**	915.03	5.00	2.416	0.0133	230.17	684.86	113.8	683.35	665.31	220.41	**4.1**	**109.4**
2	**B-4**	**SPT-1**	**10-11.0**	-	-	-	-	-	-	-	562.52	536.99	221.69	**8.1**	**-**
3	**B-4**	**MC-2B**	**16-16.5**	-	-	-	-	-	-	-	630.16	622.92	226.97	**1.8**	**-**
4	**B-4**	**SPT-2**	**20-21.0**	-	-	-	-	-	-	-	625.04	564.37	220.61	**17.6**	**-**
5	**B-4**	**MC-3B**	**26-26.5**	955.40	5.00	2.416	0.0133	230.17	725.23	120.5	176.24	156.11	11.64	**13.9**	**105.8**
6	**B-4**	**SPT-3**	**30.0-31.5**	-	-	-	-	-	-	-	727.86	614.29	219.61	**28.8**	**-**
7	**B-5**	**Bulk-1**	**0-2.5**	-	-	-	-	-	-	-	272.95	263.53	11.91	**3.7**	**-**
8	**B-5**	**Bulk-2**	**3.0-6.0**	-	-	-	-	-	-	-	257.07	245.79	24.06	**5.1**	**-**

MATERIALS FINER THAN 75-µm (No. 200) SIEVE by WASHING

ASTM D1140

Client: Toro Energy, LLC
Project: SoCalGas Waste to Energy Facility
Project No.: -

HAI Project No.: TE-22-001
Performed by: GA
Checked by: KL
Date: 11/9/2022

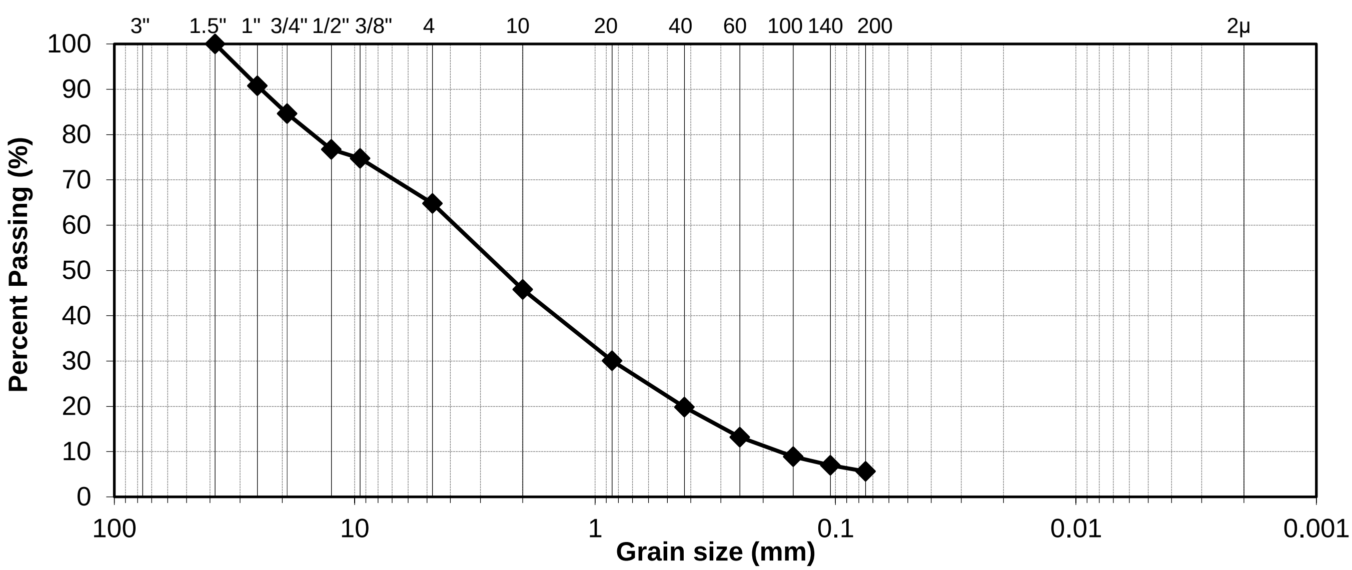
Boring No.	Sample No.	Depth (ft)	Sample Description (USCS)	Dry Soil before Wash + $W_{Container}$	Dry Soil after #200 Wash + $W_{Container}$	$W_{Container}$	Wt of soil retained on # 200 sieve	Initial wt of dry soil	**Soil % passing 200 sieve**
				g	g	g	g	g	%
B-1	Bulk	0-5	Grayish Brown, Clayey Sand with Gravel (SM)	1277.09	1092.78	222.40	870.38	1054.69	**17.5**
B-4	SP-1	10-11.0	Brown, Silty Sand (SM)	536.99	410.48	221.69	188.79	315.30	**40.1**
B-4	SP-2	20-21.0	Brown, Lean Clay with Sand (CL)	564.37	323.02	220.61	102.41	343.76	**70.2**
B-4	SP-3	30.0-31.5	Brown, Lean Clay with Sand (CL)	614.29	285.79	219.61	66.18	394.68	**83.2**

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	01/00/00
Project No.:	-	*Checked by:*	KL
Boring No.:	B-1	*Date:*	11/09/22
Sample No.:	MC-1B		
Depth (ft):	8.5-9		
Sample Description:	Grayish Brown, Well Graded Sand with Silt and Gravel (SW-SM)		

Dry Weight (g) **660.0**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	61.07	9.3	**90.7**	**-**
3/4 "	19.1	40.34	6.1	**84.6**	**-**
1/2 "	12.5	52.37	7.9	**76.7**	**-**
3/8 "	9.5	12.94	2.0	**74.7**	**-**
# 4	4.75	65.44	9.9	**64.8**	**-**
# 10	2.00	125.44	19.0	**45.8**	**-**
# 20	0.85	103.89	15.7	**30.1**	**-**
# 40	0.425	67.57	10.2	**19.8**	**-**
# 60	0.250	43.98	6.7	**13.2**	**-**
# 100	0.150	28.20	4.3	**8.9**	**-**
# 140	0.105	12.71	1.9	**7.0**	**-**
# 200	0.075	8.96	1.4	**5.6**	**-**
Soil % passing 200 sieve (%)		37.04	5.6	**0.0**	**-**



Particle-Size Analysis					
	D_{10}	0.18	% Gravel	% Sand	% Fines
	D_{30}	0.85	35.2	59.2	5.6
	D_{60}	4.05	Sample Description / USCS Classification		
	C_u	23.05	Grayish Brown, Well Graded Sand with Silt and Gravel (SW-SM)		
	C_c	1.01			

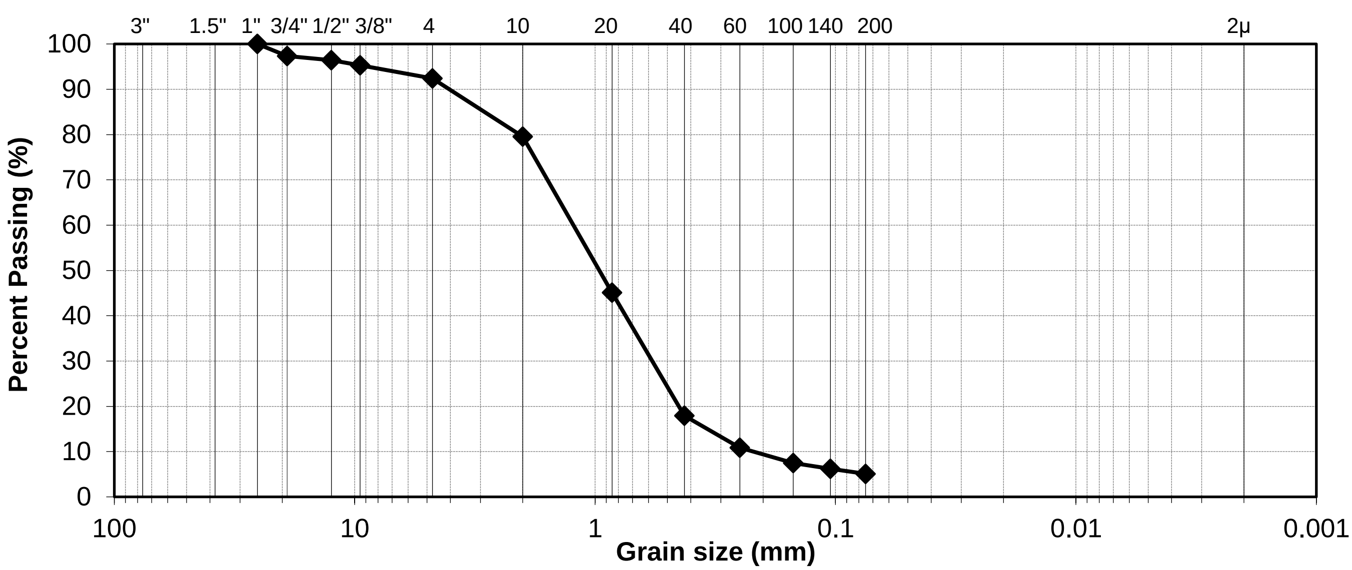
PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-1	*Date:*	11/09/22
Sample No.:	MC-4B		
Depth (ft):	16-16.5		
Sample Description:	Grayish Brown, Well Graded Sand with Silt (SW-SM)		

Dry Weight (g) **702.5**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	0.00	0.0	**100.0**	-
3/4 "	19.1	18.76	2.7	**97.3**	-
1/2 "	12.5	6.63	0.9	**96.4**	-
3/8 "	9.5	7.66	1.1	**95.3**	-
# 4	4.75	20.53	2.9	**92.4**	-
# 10	2.00	89.96	12.8	**79.6**	-
# 20	0.85	242.26	34.5	**45.1**	-
# 40	0.425	190.94	27.2	**17.9**	-
# 60	0.250	49.46	7.0	**10.9**	-
# 100	0.150	23.74	3.4	**7.5**	-
# 140	0.105	9.07	1.3	**6.2**	-
# 200	0.075	7.73	1.1	**5.1**	-
Soil % passing 200 sieve (%)		35.75	5.1	**0.0**	-



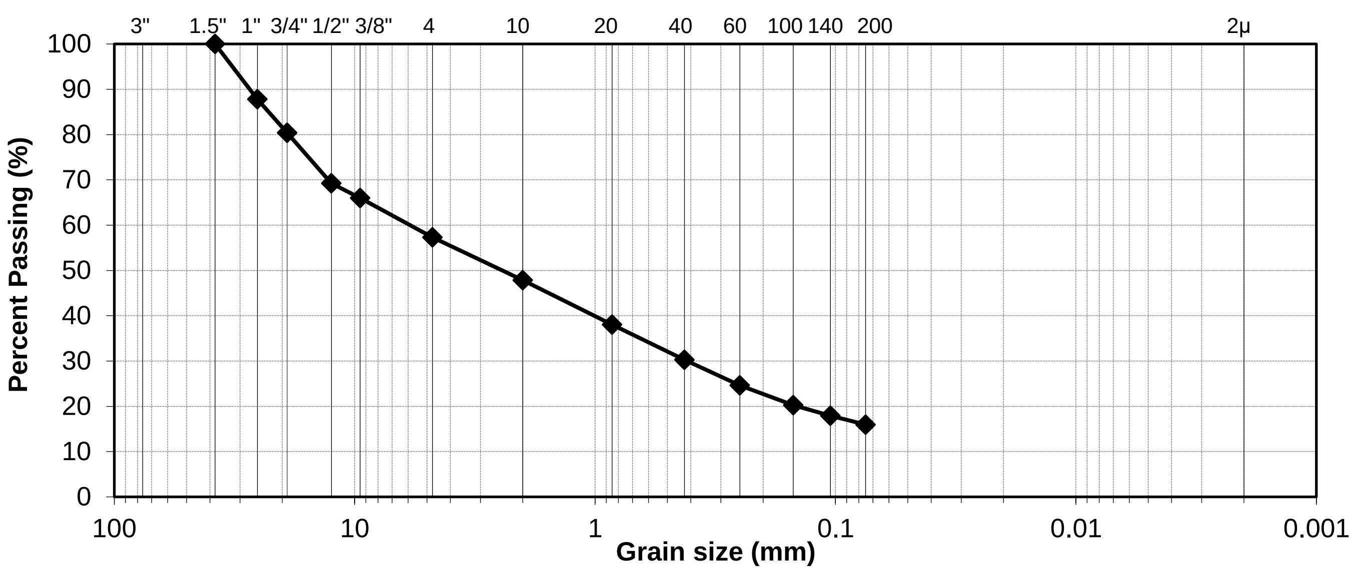
Particle-Size Analysis	D_{10}	0.22	% Gravel	% Sand	% Fines
	D_{30}	0.61	7.6	87.3	5.1
	D_{60}	1.35	Sample Description / USCS Classification		
	C_u	6.00	Grayish Brown, Well Graded Sand with Silt (SW-SM)		
	C_c	1.25			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-2	*Date:*	11/09/22
Sample No.:	MC-1B		
Depth (ft):	3.5-4		
Sample Description:	Grayish Brown, Silty Gravel with Sand (GM)		

Dry Weight (g) **491.2**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	59.74	12.2	**87.8**	-
3/4 "	19.1	36.72	7.5	**80.4**	-
1/2 "	12.5	54.57	11.1	**69.3**	-
3/8 "	9.5	15.91	3.2	**66.0**	-
# 4	4.75	42.64	8.7	**57.3**	-
# 10	2.00	46.73	9.5	**47.8**	-
# 20	0.85	47.93	9.8	**38.1**	-
# 40	0.425	38.35	7.8	**30.2**	-
# 60	0.250	27.74	5.6	**24.6**	-
# 100	0.150	21.27	4.3	**20.3**	-
# 140	0.105	11.62	2.4	**17.9**	-
# 200	0.075	9.58	2.0	**16.0**	-
Soil % passing 200 sieve (%)		78.37	16.0	**0.0**	-



Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	42.7	41.4	16.0
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Grayish Brown, Silty Gravel with Sand (GM)		
	C_c	-			

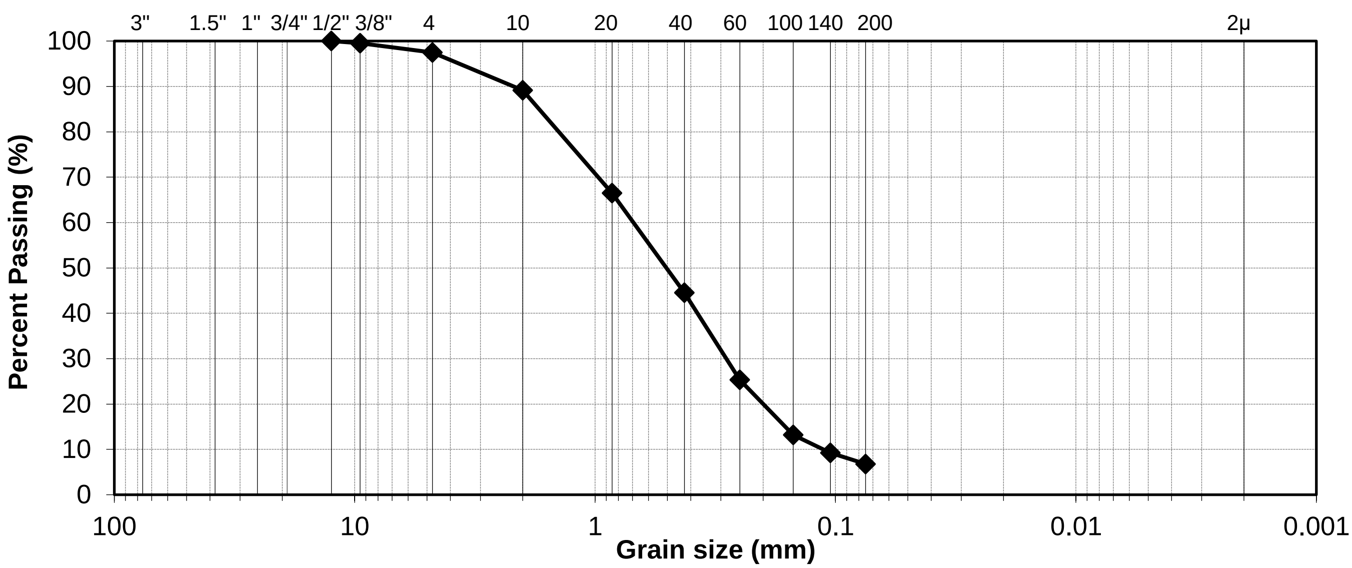
PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client: Toro Energy, LLC
Project Name: SoCalGas Waste to Energy Facility
Project No.: -
Boring No.: B-2
Sample No.: MC-2B
Depth (ft): 6-6.5
Sample Description: Light Brown, Well Graded Sand with Silt (SW-SM)

HAI Project No.: TE-22-001
Tested by: GA
Checked by: KL
Date: 11/09/22

Dry Weight (g) **267.2**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	0.00	0.0	**100.0**	**-**
3/4 "	19.1	0.00	0.0	**100.0**	**-**
1/2 "	12.5	0.00	0.0	**100.0**	**-**
3/8 "	9.5	1.22	0.5	**99.5**	**-**
# 4	4.75	5.49	2.1	**97.5**	**-**
# 10	2.00	22.35	8.4	**89.1**	**-**
# 20	0.85	60.51	22.6	**66.5**	**-**
# 40	0.425	58.67	22.0	**44.5**	**-**
# 60	0.250	51.32	19.2	**25.3**	**-**
# 100	0.150	32.34	12.1	**13.2**	**-**
# 140	0.105	10.59	4.0	**9.2**	**-**
# 200	0.075	6.56	2.5	**6.8**	**-**
Soil % passing 200 sieve (%)		18.12	6.8	**0.0**	**-**



Particle-Size Analysis					
	D_{10}	0.11	% Gravel	% Sand	% Fines
	D_{30}	0.29	2.5	90.7	6.8
	D_{60}	0.72	Sample Description / USCS Classification		
	C_u	6.38	Light Brown, Well Graded Sand with Silt (SW-SM)		
	C_c	1.04			

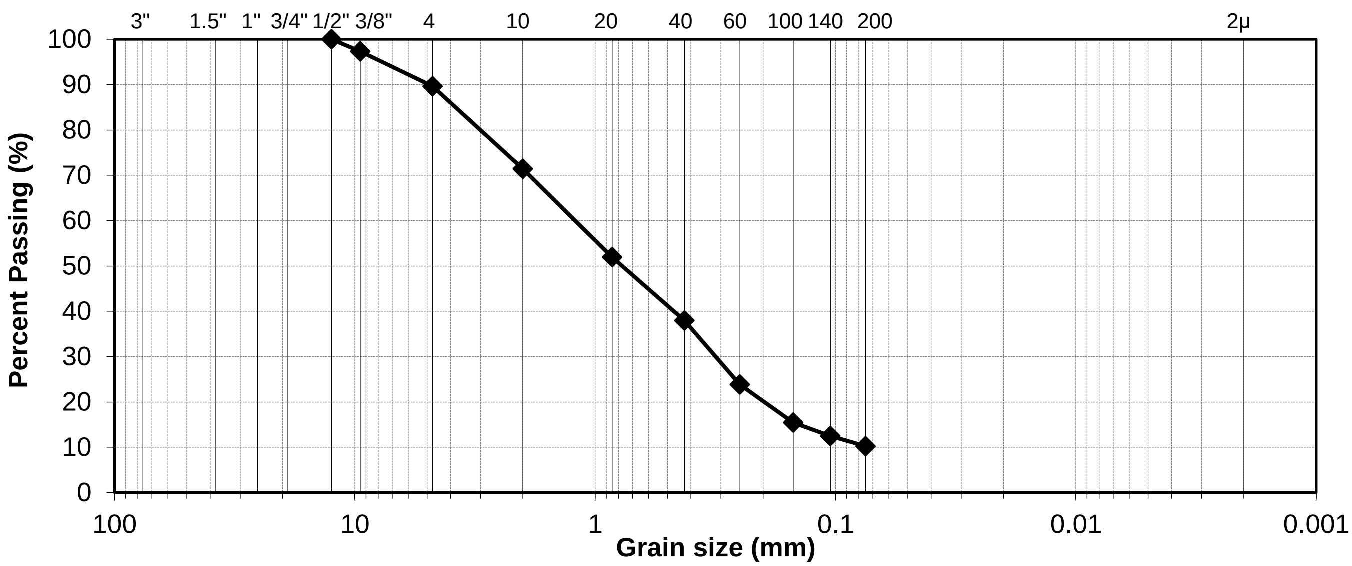
PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-2	*Date:*	11/09/22
Sample No.:	MC-5B		
Depth (ft):	26-26.5		
Sample Description:	Brown, Well Graded Sand with Silt (SW-SM)		

Dry Weight (g) **235.8**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	0.00	0.0	**100.0**	-
3/4 "	19.1	0.00	0.0	**100.0**	-
1/2 "	12.5	0.00	0.0	**100.0**	-
3/8 "	9.5	6.20	2.6	**97.4**	-
# 4	4.75	18.20	7.7	**89.7**	-
# 10	2.00	43.04	18.3	**71.4**	-
# 20	0.85	45.86	19.5	**51.9**	-
# 40	0.425	32.98	14.0	**38.0**	-
# 60	0.250	33.25	14.1	**23.9**	-
# 100	0.150	19.79	8.4	**15.5**	-
# 140	0.105	7.02	3.0	**12.5**	-
# 200	0.075	5.26	2.2	**10.2**	-
Soil % passing 200 sieve (%)		24.16	10.2	**0.0**	-



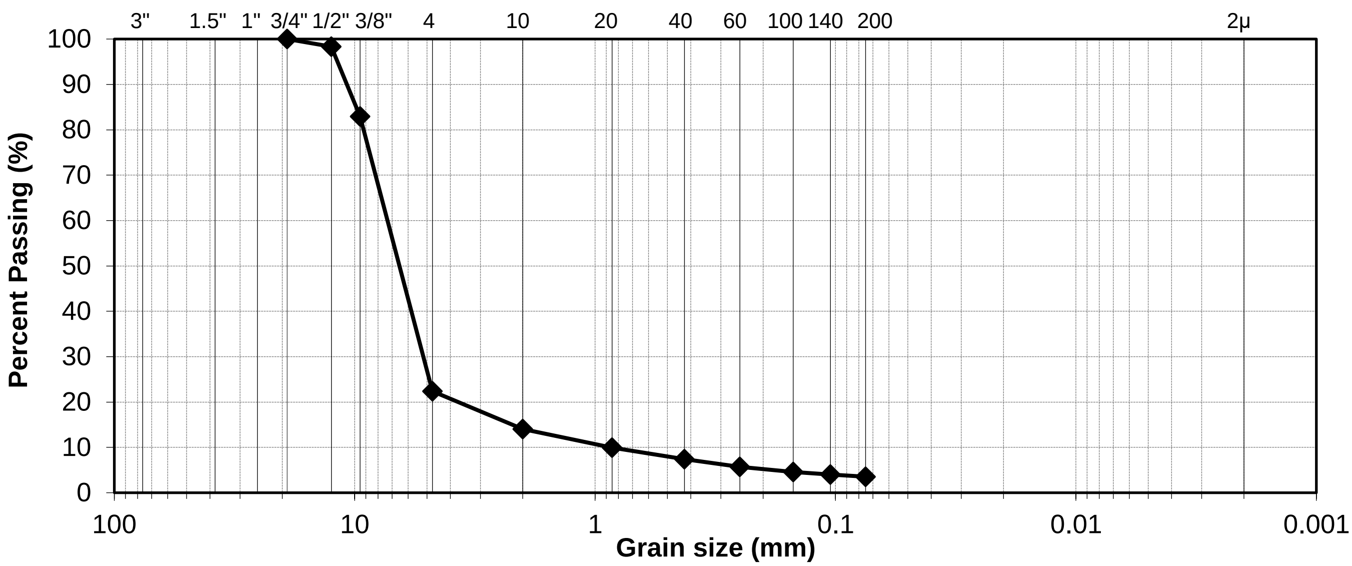
Particle-Size Analysis					
	D_{10}	0.07	% Gravel	% Sand	% Fines
	D_{30}	0.33	10.3	79.4	10.2
	D_{60}	1.33	Sample Description / USCS Classification		
	C_u	18.95	Brown, Well Graded Sand with Silt (SW-SM)		
	C_c	1.15			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-2	*Date:*	11/09/22
Sample No.:	MC-6B		
Depth (ft):	36-36.5		
Sample Description:	Grayish Brown, Poorly Graded Gravel with Sand (GP)		

Dry Weight (g) **552.0**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	0.00	0.0	**100.0**	-
3/4 "	19.1	0.00	0.0	**100.0**	-
1/2 "	12.5	9.43	1.7	**98.3**	-
3/8 "	9.5	84.80	15.4	**82.9**	-
# 4	4.75	334.12	60.5	**22.4**	-
# 10	2.00	46.19	8.4	**14.0**	-
# 20	0.85	22.47	4.1	**10.0**	-
# 40	0.425	14.10	2.6	**7.4**	-
# 60	0.250	9.43	1.7	**5.7**	-
# 100	0.150	6.27	1.1	**4.6**	-
# 140	0.105	2.95	0.5	**4.0**	-
# 200	0.075	2.71	0.5	**3.5**	-
Soil % passing 200 sieve (%)		19.52	3.5	**0.0**	-



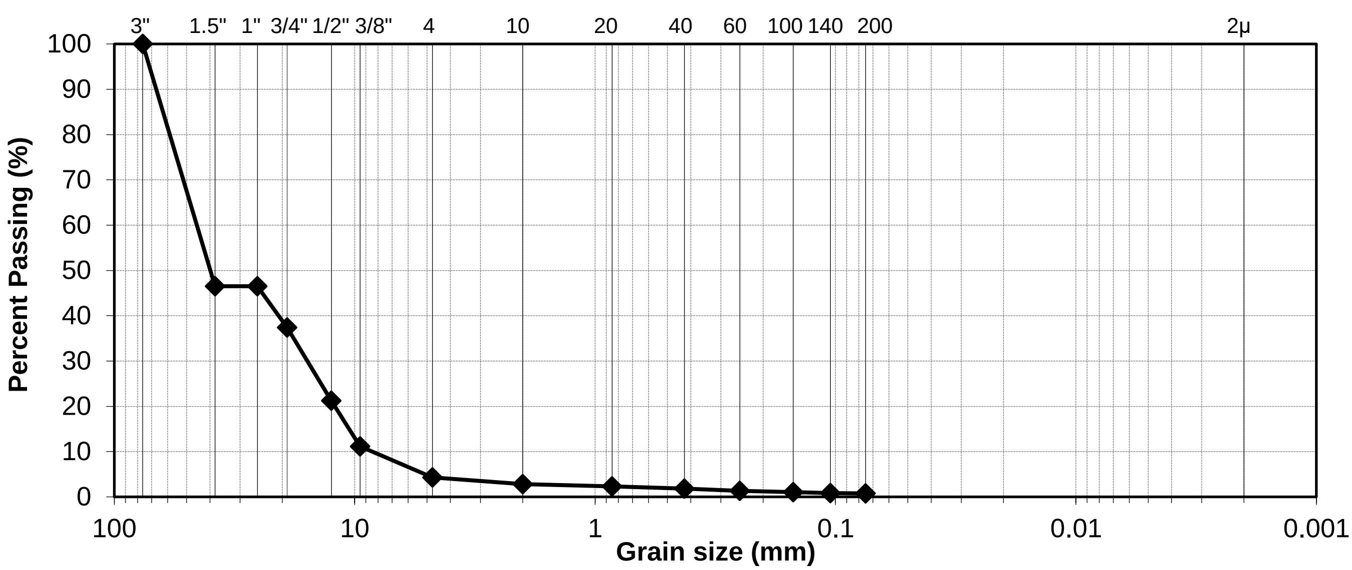
Particle-Size Analysis	D_{10}	0.86	% Gravel	% Sand	% Fines
	D_{30}	5.35	77.6	18.9	3.5
	D_{60}	7.70	Sample Description / USCS Classification		
	C_u	8.94	Grayish Brown, Poorly Graded Gravel with Sand (GP)		
	C_c	4.31			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-2	*Date:*	11/09/22
Sample No.:	SPT-3		
Depth (ft):	20-21		
Sample Description:	Grayish Brown, Poorly-graded Gravel (GP)		

Dry Weight (g) **471.5**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	252.20	53.5	**46.5**	**-**
1"	25.4	0.00	0.0	**46.5**	**-**
3/4 "	19.1	43.10	9.1	**37.4**	**-**
1/2 "	12.5	76.07	16.1	**21.2**	**-**
3/8 "	9.5	47.54	10.1	**11.2**	**-**
# 4	4.75	32.21	6.8	**4.3**	**-**
# 10	2.00	7.12	1.5	**2.8**	**-**
# 20	0.85	2.20	0.5	**2.4**	**-**
# 40	0.425	2.52	0.5	**1.8**	**-**
# 60	0.250	2.22	0.5	**1.3**	**-**
# 100	0.150	1.57	0.3	**1.0**	**-**
# 140	0.105	0.69	0.1	**0.9**	**-**
# 200	0.075	0.52	0.1	**0.8**	**-**
Soil % passing 200 sieve (%)		3.58	0.8	**0.0**	**-**



Particle-Size Analysis					
	D_{10}	8.69	% Gravel	% Sand	% Fines
	D_{30}	16.08	95.7	3.6	0.8
	D_{60}	47.71	Sample Description / USCS Classification		
	C_u	5.49	Grayish Brown, Poorly-graded Gravel (GP)		
	C_c	0.62			

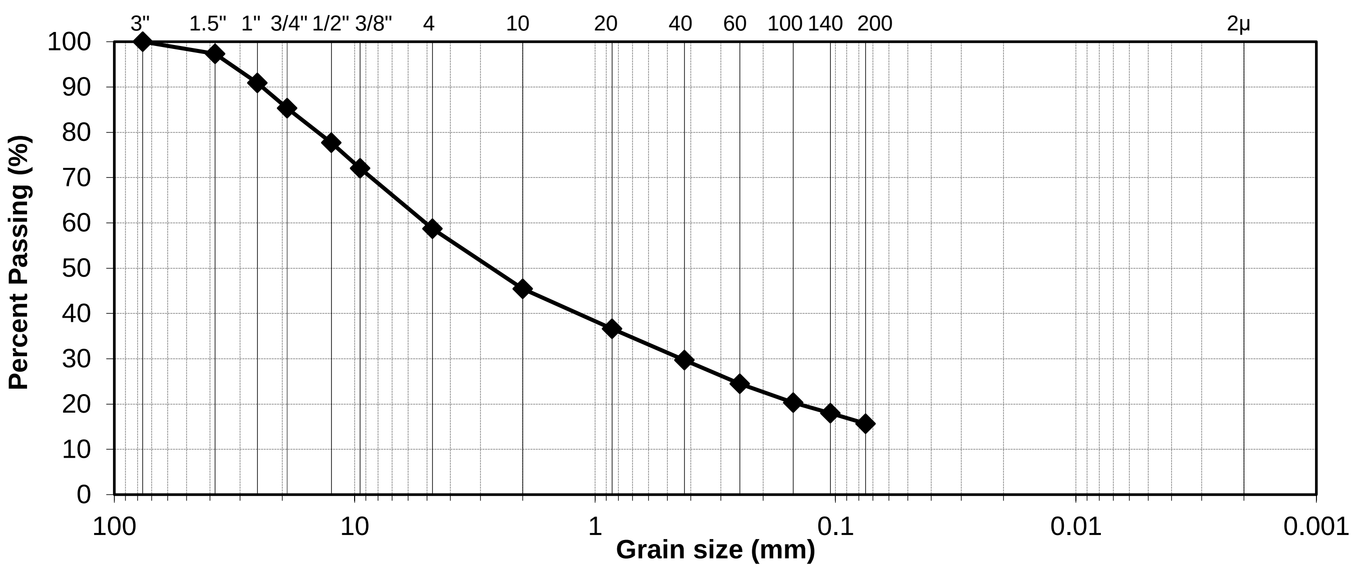
PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-3	*Date:*	11/09/22
Sample No.:	Bulk		
Depth (ft):	0-5		
Sample Description:	Light Brown, Silty Sand with Gravel (SM)		

Dry Weight (g) **8763.1**

Sieve Size	Aperture	Weight Retained	% Retained	**(Accumulative) % Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	236.15	2.7	**97.3**	**-**
1"	25.4	562.91	6.4	**90.9**	**-**
3/4 "	19.1	486.68	5.6	**85.3**	**-**
1/2 "	12.5	668.93	7.6	**77.7**	**-**
3/8 "	9.5	492.15	5.6	**72.1**	**-**
# 4	4.75	1168.92	13.3	**58.7**	**-**
Dry Weight (g)	**612.7**				
# 10	2.00	138.30	22.6	**45.5**	**-**
# 20	0.85	92.51	15.1	**36.6**	**-**
# 40	0.425	72.36	11.8	**29.7**	**-**
# 60	0.250	53.81	8.8	**24.5**	**-**
# 100	0.150	43.79	7.1	**20.3**	**-**
# 140	0.105	24.20	3.9	**18.0**	**-**
# 200	0.075	24.13	3.9	**15.7**	**-**
Soil % passing 200 sieve (%)		163.59	26.7	**15.68**	**-**



Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	41.3	43.1	15.7
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Light Brown, Silty Sand with Gravel (SM)		
	C_c	-			

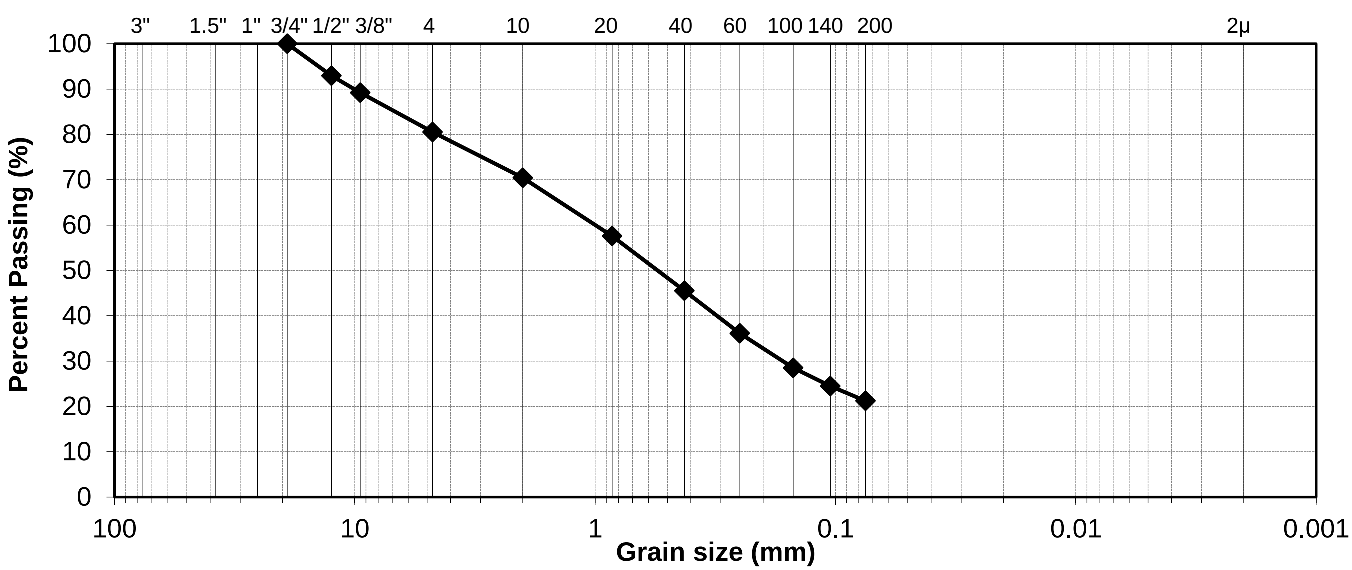
PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client: Toro Energy, LLC
Project Name: SoCalGas Waste to Energy Facility
Project No.: -
Boring No.: B-3
Sample No.: MC-1B
Depth (ft): 6-6.5
Sample Description: Grayish Brown, Silty Sand with Gravel (SM)

HAI Project No.: TE-22-001
Tested by: GA
Checked by: KL
Date: 11/09/22

Dry Weight (g) **355.3**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	0.00	0.0	**100.0**	-
3/4 "	19.1	0.00	0.0	**100.0**	-
1/2 "	12.5	25.06	7.1	**92.9**	-
3/8 "	9.5	13.35	3.8	**89.2**	-
# 4	4.75	30.65	8.6	**80.6**	-
# 10	2.00	36.02	10.1	**70.4**	-
# 20	0.85	45.58	12.8	**57.6**	-
# 40	0.425	43.01	12.1	**45.5**	-
# 60	0.250	33.35	9.4	**36.1**	-
# 100	0.150	26.88	7.6	**28.5**	-
# 140	0.105	14.35	4.0	**24.5**	-
# 200	0.075	11.70	3.3	**21.2**	-
Soil % passing 200 sieve (%)		75.37	21.2	**0.0**	-



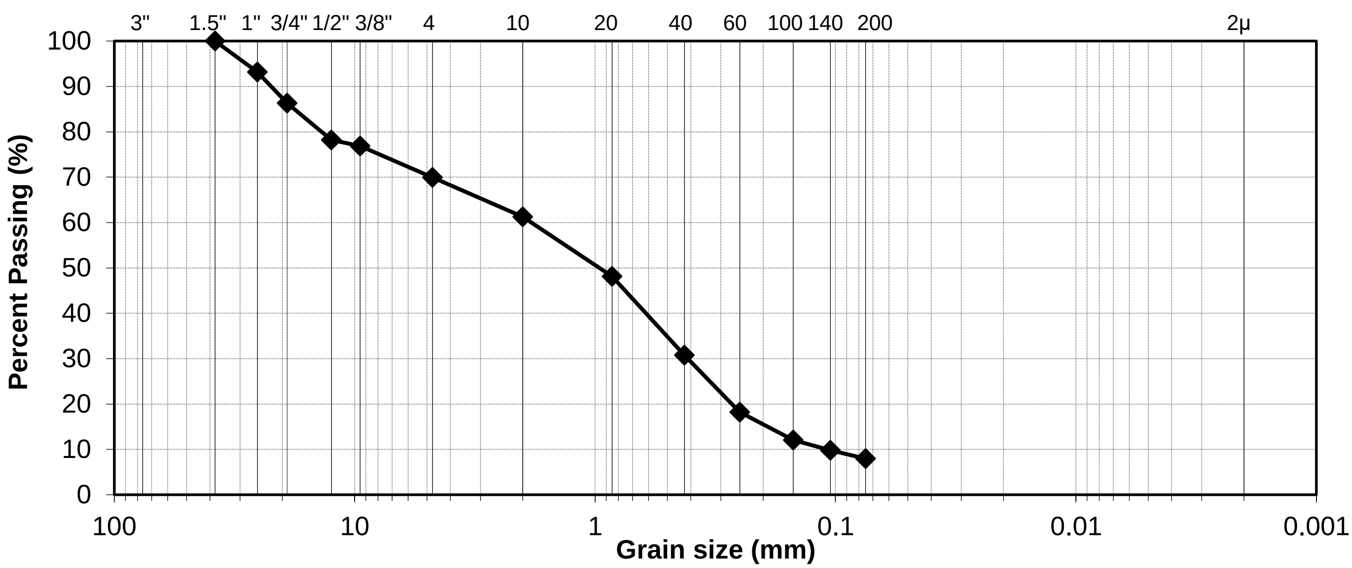
Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	19.4	59.4	21.2
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Grayish Brown, Silty Sand with Gravel (SM)		
	C_c	-			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-3	*Date:*	11/09/22
Sample No.:	MC-2B		
Depth (ft):	13.5-14		
Sample Description:	Grayish Brown, Poorly Graded Sand with Silt and Gravel (SP-SM)		

Dry Weight (g) **459.4**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	31.42	6.8	**93.2**	**-**
3/4 "	19.1	31.40	6.8	**86.3**	**-**
1/2 "	12.5	37.23	8.1	**78.2**	**-**
3/8 "	9.5	6.30	1.4	**76.9**	**-**
# 4	4.75	31.74	6.9	**69.9**	**-**
# 10	2.00	39.78	8.7	**61.3**	**-**
# 20	0.85	60.47	13.2	**48.1**	**-**
# 40	0.425	79.83	17.4	**30.7**	**-**
# 60	0.250	57.69	12.6	**18.2**	**-**
# 100	0.150	28.01	6.1	**12.1**	**-**
# 140	0.105	10.63	2.3	**9.8**	**-**
# 200	0.075	8.39	1.8	**8.0**	**-**
Soil % passing 200 sieve (%)		36.54	8.0	**0.0**	**-**



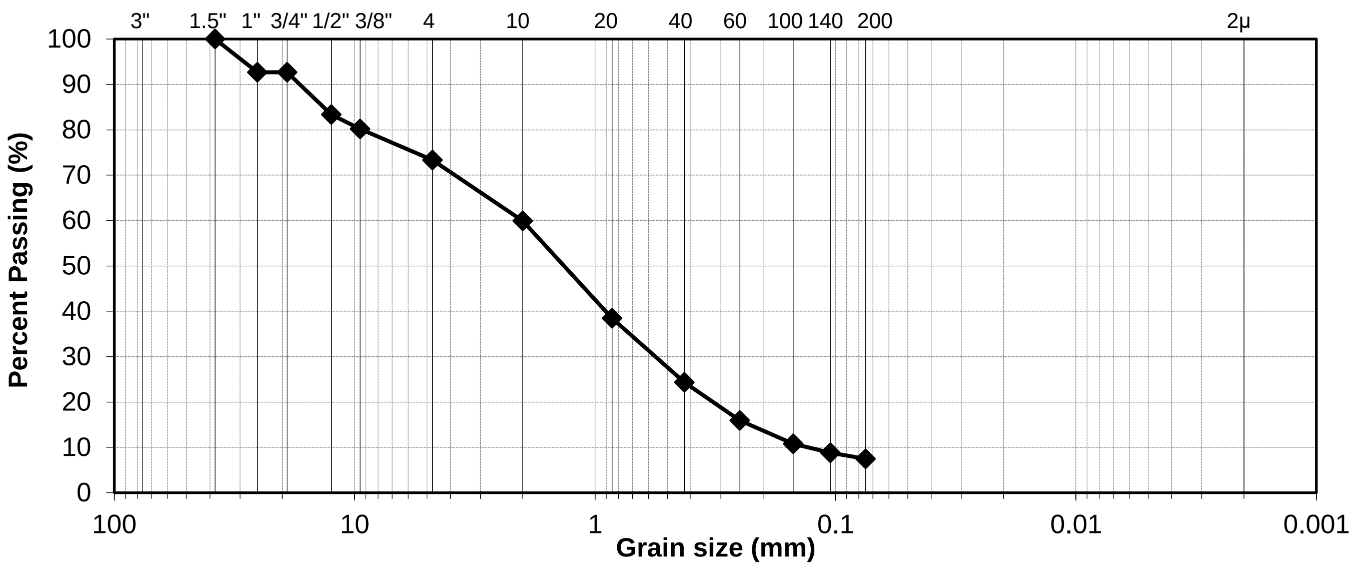
Particle-Size Analysis					
	D_{10}	0.11	% Gravel	% Sand	% Fines
	D_{30}	0.41	30.1	62.0	8.0
	D_{60}	1.89	Sample Description / USCS Classification		
	C_u	17.27	Grayish Brown, Poorly Graded Sand with Silt and Gravel (SP-SM)		
	C_c	0.83			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-3	*Date:*	11/09/22
Sample No.:	MC-5A		
Depth (ft):	36-36.5		
Sample Description:	Light Brown, Well Graded Sand with Silt and Gravel (SW-SM)		

Dry Weight (g) **559.0**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	41.07	7.3	**92.7**	**-**
3/4 "	19.1	0.00	0.0	**92.7**	**-**
1/2 "	12.5	51.97	9.3	**83.4**	**-**
3/8 "	9.5	17.69	3.2	**80.2**	**-**
# 4	4.75	38.46	6.9	**73.3**	**-**
# 10	2.00	74.83	13.4	**59.9**	**-**
# 20	0.85	119.82	21.4	**38.5**	**-**
# 40	0.425	79.25	14.2	**24.3**	**-**
# 60	0.250	46.63	8.3	**16.0**	**-**
# 100	0.150	28.87	5.2	**10.8**	**-**
# 140	0.105	10.99	2.0	**8.8**	**-**
# 200	0.075	7.65	1.4	**7.5**	**-**
Soil % passing 200 sieve (%)		41.79	7.5	**0.0**	**-**



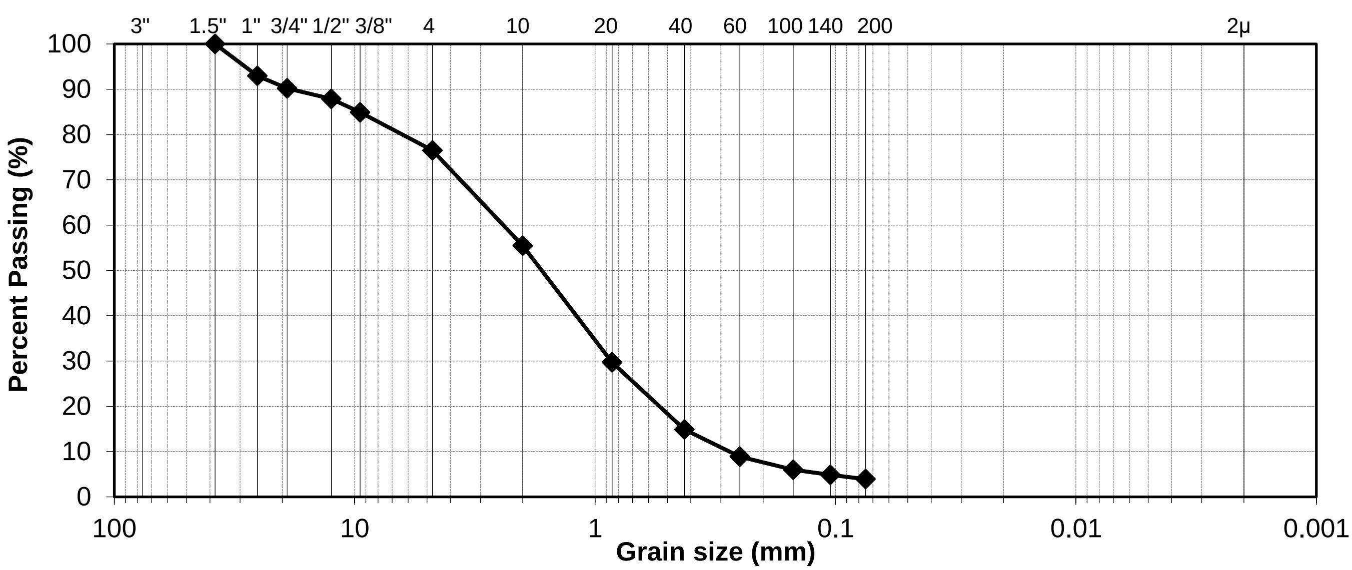
Particle-Size Analysis					
	D_{10}	0.13	% Gravel	% Sand	% Fines
	D_{30}	0.60	26.7	65.8	7.5
	D_{60}	2.02	Sample Description / USCS Classification		
	C_u	15.33	Grayish Brown, Well Graded Sand with Silt and Gravel (SW-SM)		
	C_c	1.34			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-3	*Date:*	11/09/22
Sample No.:	SPT-1		
Depth (ft):	10-11		
Sample Description:	Grayish Brown, Well Graded Sand with Gravel (SW)		

Dry Weight (g) **440.4**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	30.98	7.0	**93.0**	**-**
3/4 "	19.1	12.24	2.8	**90.2**	**-**
1/2 "	12.5	10.21	2.3	**87.9**	**-**
3/8 "	9.5	12.88	2.9	**84.9**	**-**
# 4	4.75	37.19	8.4	**76.5**	**-**
# 10	2.00	92.50	21.0	**55.5**	**-**
# 20	0.85	113.43	25.8	**29.7**	**-**
# 40	0.425	65.37	14.8	**14.9**	**-**
# 60	0.250	26.44	6.0	**8.9**	**-**
# 100	0.150	12.69	2.9	**6.0**	**-**
# 140	0.105	5.01	1.1	**4.9**	**-**
# 200	0.075	4.20	1.0	**3.9**	**-**
Soil % passing 200 sieve (%)		17.23	3.9	**0.0**	**-**



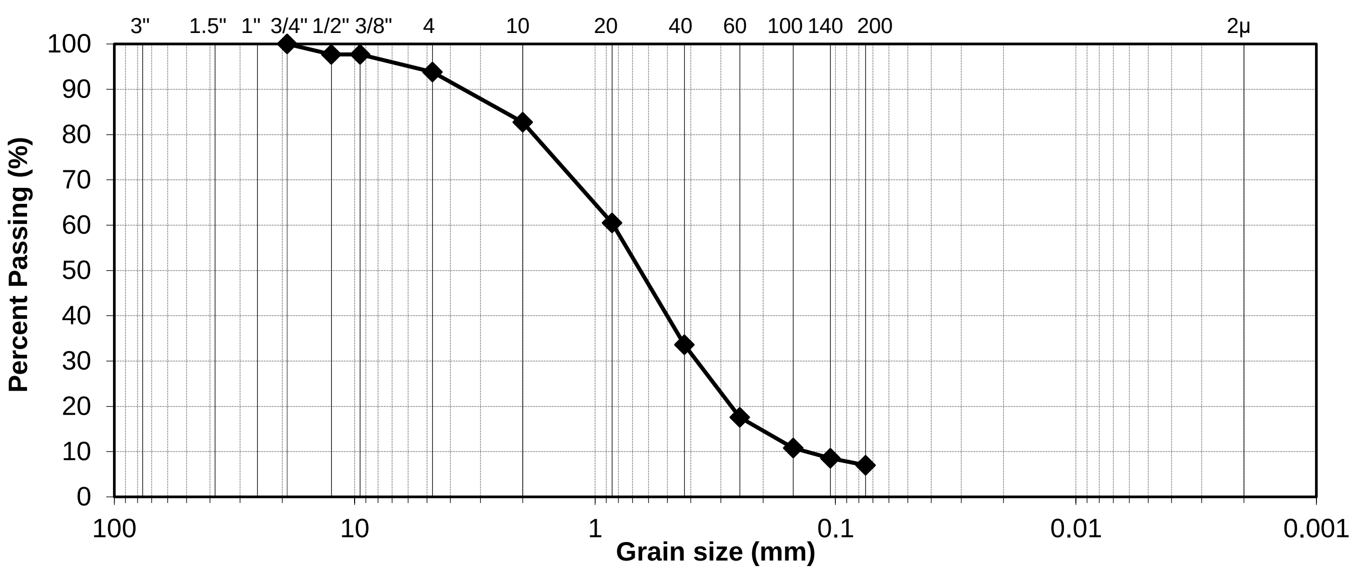
Particle-Size Analysis					
	D_{10}	0.28	% Gravel	% Sand	% Fines
	D_{30}	0.86	23.5	72.6	3.9
	D_{60}	2.59	Sample Description / USCS Classification		
	C_u	9.17	Grayish Brown, Well Graded Sand with Gravel (SW)		
	C_c	1.02			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-3	*Date:*	11/09/22
Sample No.:	SPT-3		
Depth (ft):	25-25.5		
Sample Description:	Light Brown, Well Graded Sand with Silt (SW-SM)		

Dry Weight (g) **412.1**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	0.00	0.0	**100.0**	**-**
3/4 "	19.1	0.00	0.0	**100.0**	**-**
1/2 "	12.5	9.45	2.3	**97.7**	**-**
3/8 "	9.5	0.00	0.0	**97.7**	**-**
# 4	4.75	16.19	3.9	**93.8**	**-**
# 10	2.00	45.62	11.1	**82.7**	**-**
# 20	0.85	91.66	22.2	**60.5**	**-**
# 40	0.425	110.68	26.9	**33.6**	**-**
# 60	0.250	66.18	16.1	**17.5**	**-**
# 100	0.150	27.84	6.8	**10.8**	**-**
# 140	0.105	9.16	2.2	**8.6**	**-**
# 200	0.075	6.48	1.6	**7.0**	**-**
Soil % passing 200 sieve (%)		28.80	7.0	**0.0**	**-**



Particle-Size Analysis					
	D_{10}	0.13	% Gravel	% Sand	% Fines
	D_{30}	0.39	6.2	86.8	7.0
	D_{60}	0.84	Sample Description / USCS Classification		
	C_u	6.28	Light Brown, Well Graded Sand with Silt (SW-SM)		
	C_c	1.32			

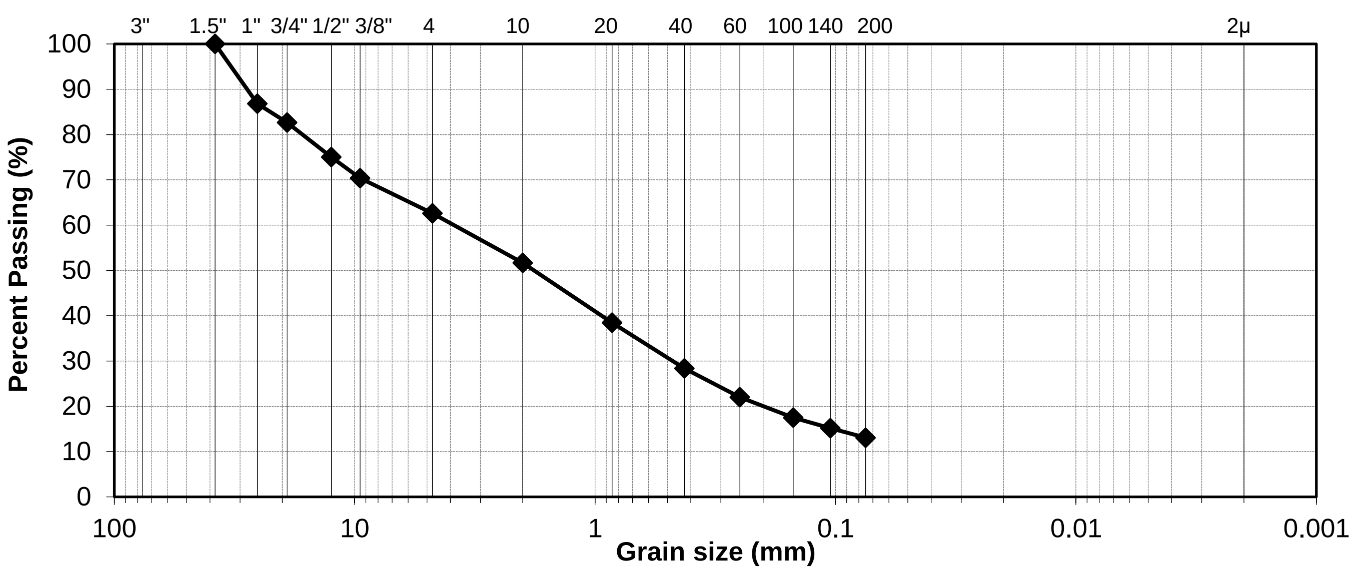
PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-4	*Date:*	11/09/22
Sample No.:	MC-1B		
Depth (ft):	6-6.5		
Sample Description:	Grayish Brown, Silty Sand with Gravel (SM)		

Dry Weight (g) **444.9**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	58.73	13.2	**86.8**	-
3/4 "	19.1	18.35	4.1	**82.7**	-
1/2 "	12.5	34.02	7.6	**75.0**	-
3/8 "	9.5	20.77	4.7	**70.4**	-
# 4	4.75	34.51	7.8	**62.6**	-
# 10	2.00	48.78	11.0	**51.6**	-
# 20	0.85	58.55	13.2	**38.5**	-
# 40	0.425	44.87	10.1	**28.4**	-
# 60	0.250	28.52	6.4	**22.0**	-
# 100	0.150	20.05	4.5	**17.5**	-
# 140	0.105	10.14	2.3	**15.2**	-
# 200	0.075	9.44	2.1	**13.1**	-
Soil % passing 200 sieve (%)		58.17	13.1	**0.0**	-



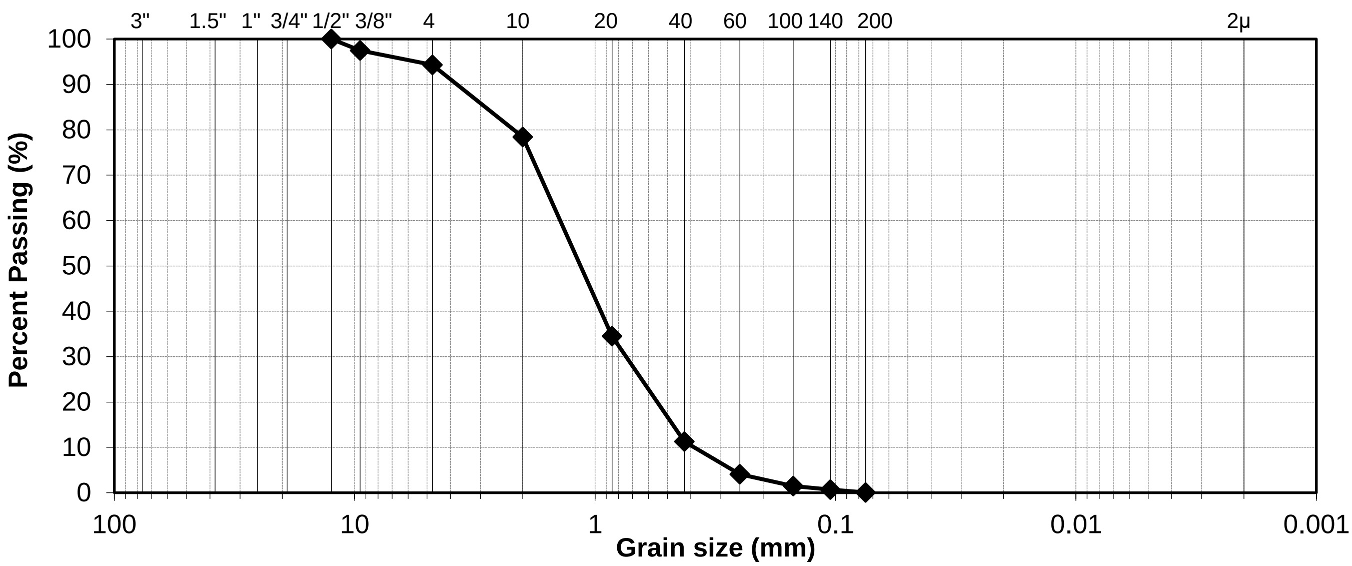
Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	37.4	49.5	13.1
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Grayish Brown, Silty Sand with Gravel (SM)		
	C_c	-			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-4	*Date:*	11/09/22
Sample No.:	MC-2B		
Depth (ft):	16-16.5		
Sample Description:	Brown, Poorly Graded Sand (SP)		

Dry Weight (g) **396.0**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	0.00	0.0	**100.0**	-
3/4 "	19.1	0.00	0.0	**100.0**	-
1/2 "	12.5	0.00	0.0	**100.0**	-
3/8 "	9.5	10.03	2.5	**97.5**	-
# 4	4.75	12.42	3.1	**94.3**	-
# 10	2.00	63.07	15.9	**78.4**	-
# 20	0.85	173.66	43.9	**34.5**	-
# 40	0.425	92.22	23.3	**11.3**	-
# 60	0.250	28.50	7.2	**4.1**	-
# 100	0.150	10.19	2.6	**1.5**	-
# 140	0.105	3.21	0.8	**0.7**	-
# 200	0.075	2.38	0.6	**0.1**	-
Soil % passing 200 sieve (%)		0.27	0.1	**0.0**	-



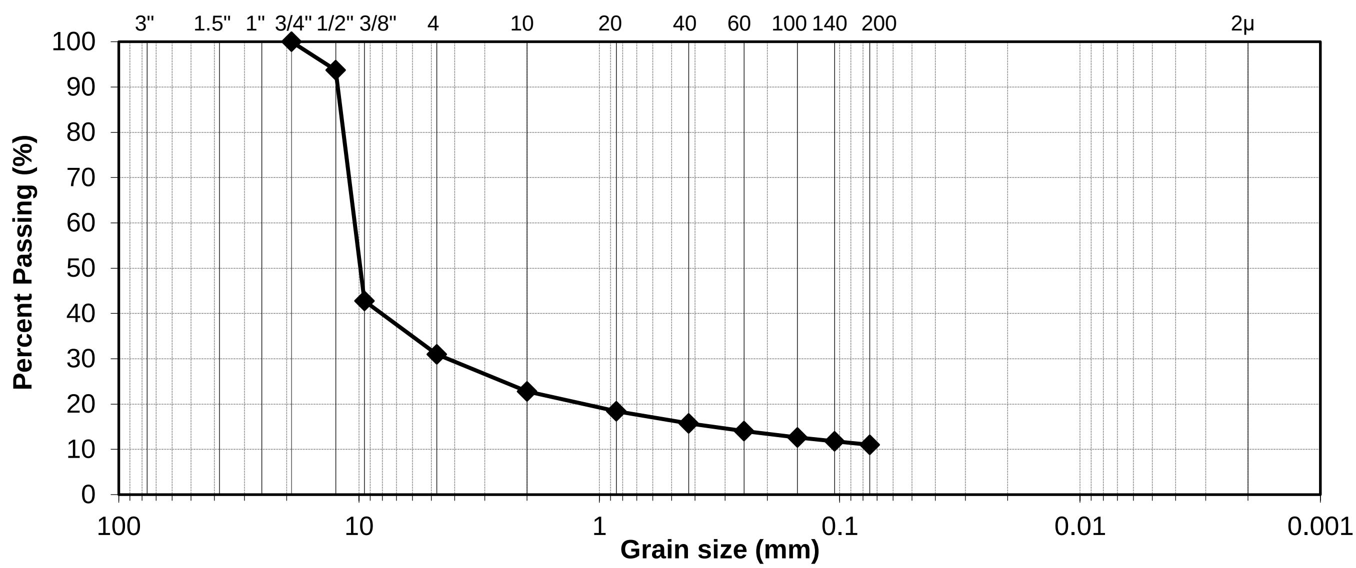
Particle-Size Analysis	D_{10}	0.39	% Gravel	% Sand	% Fines
	D_{30}	0.77	5.7	94.3	0.1
	D_{60}	1.52	Sample Description / USCS Classification		
	C_u	3.85	Brown, Poorly Graded Sand (SP)		
	C_c	0.98			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-5	*Date:*	11/09/22
Sample No.:	Bulk		
Depth (ft):	0-2.5		
Sample Description:	Brown, Poorly Graded Gravel with Silt and Sand (GP-GM)		

Dry Weight (g) **13624.4**

Sieve Size	Aperture	Weight Retained	% Retained	**(Accumulative) % Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	0.00	0.0	**100.0**	**-**
3/4 "	19.1	0.00	0.0	**100.0**	**-**
1/2 "	12.5	852.27	6.3	**93.7**	**-**
3/8 "	9.5	6941.07	50.9	**42.8**	**-**
# 4	4.75	1610.47	11.8	**31.0**	**-**
Dry Weight (g)	**579.0**				
# 10	2.00	152.95	26.4	**22.8**	**-**
# 20	0.85	82.53	14.3	**18.4**	**-**
# 40	0.425	49.16	8.5	**15.8**	**-**
# 60	0.250	32.27	5.6	**14.0**	**-**
# 100	0.150	25.96	4.5	**12.6**	**-**
# 140	0.105	15.41	2.7	**11.8**	**-**
# 200	0.075	15.04	2.6	**11.0**	**-**
Soil % passing 200 sieve (%)		205.72	35.5	**11.01**	**-**



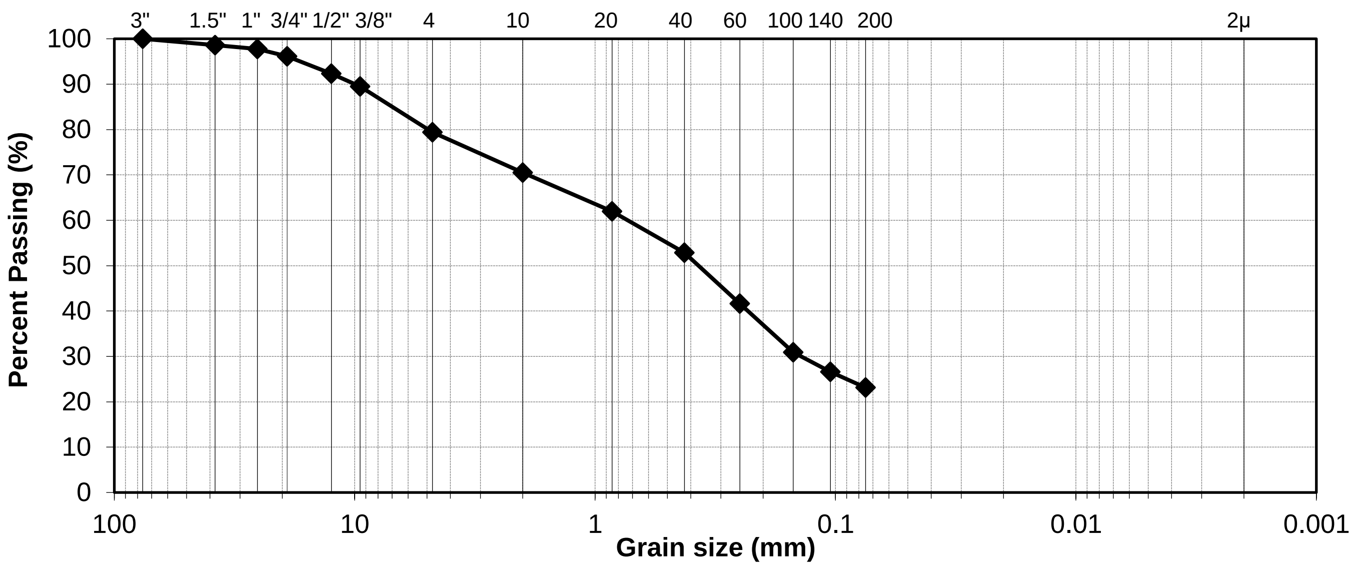
Particle-Size Analysis	D_{10}	0.05	% Gravel	% Sand	% Fines
	D_{30}	4.42	69.0	20.0	11.0
	D_{60}	10.51	Sample Description / USCS Classification		
	C_u	210.26	Brown, Poorly Graded Gravel with Silt and Sand (GP-GM)		
	C_c	37.19			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-5	*Date:*	11/09/22
Sample No.:	Bulk		
Depth (ft):	3-6		
Sample Description:	Brown, Silty Sand with Gravel (SM)		

Dry Weight (g) **12590.5**

Sieve Size	Aperture	Weight Retained	% Retained	**(Accumulative) % Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	171.80	1.4	**98.6**	**-**
1"	25.4	108.99	0.9	**97.8**	**-**
3/4 "	19.1	206.52	1.6	**96.1**	**-**
1/2 "	12.5	482.38	3.8	**92.3**	**-**
3/8 "	9.5	353.97	2.8	**89.5**	**-**
# 4	4.75	1269.40	10.1	**79.4**	**-**
Dry Weight (g)	**574.1**				
# 10	2.00	64.19	11.2	**70.5**	**-**
# 20	0.85	61.92	10.8	**62.0**	**-**
# 40	0.425	65.75	11.5	**52.9**	**-**
# 60	0.250	81.18	14.1	**41.6**	**-**
# 100	0.150	77.40	13.5	**30.9**	**-**
# 140	0.105	31.32	5.5	**26.6**	**-**
# 200	0.075	25.25	4.4	**23.1**	**-**
Soil % passing 200 sieve (%)		167.12	29.1	**23.11**	**-**



Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	20.6	56.3	23.1
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Brown, Silty Sand with Gravel (SM)		
	C_c	-			

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

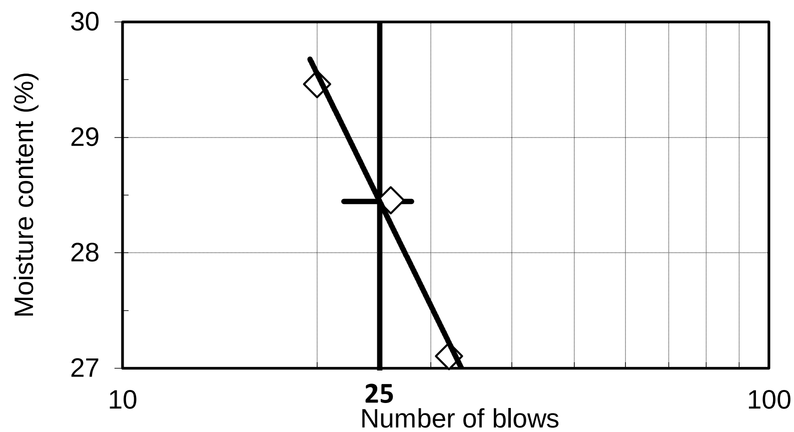
ASTM D4318

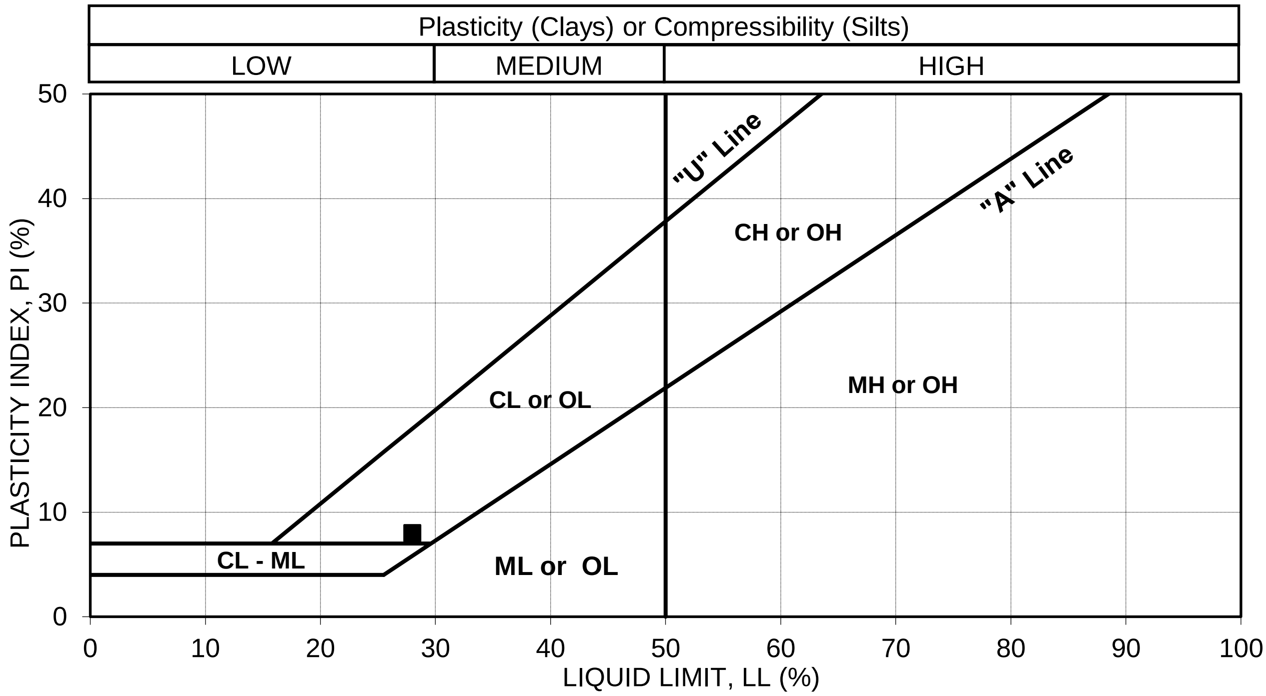
Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	GA
Project No.:	-	*Checked by:*	KL
Boring No.:	B-4	*Date:*	11/09/22
Sample No.:	MC-3B		
Depth (ft):	26-26.5		
Soil Description:	Brown, Lean Clay with Sand (CL)		

Test		LL	LL	LL	PL	PL
No. of blows	**-**	**32**	**26**	**20**	**-**	**-**
Wt. of Wet Soil + Container	(g)	26.2	26.8	26.7	9.7	9.3
Wt. of Dry soil + Container	(g)	23.0	23.3	23.2	8.3	7.9
Wt. of Container	(g)	11.0	11.0	11.3	1.1	1.1
Water content	**(%)**	**27.1**	**28.5**	**29.5**	**19.6**	**19.8**

Liquid Limit (LL)	**28**
Plastic Limit (PL)	**20**
Plasticity Index (PI)	**8**
USCS	**CL**

Remarks:





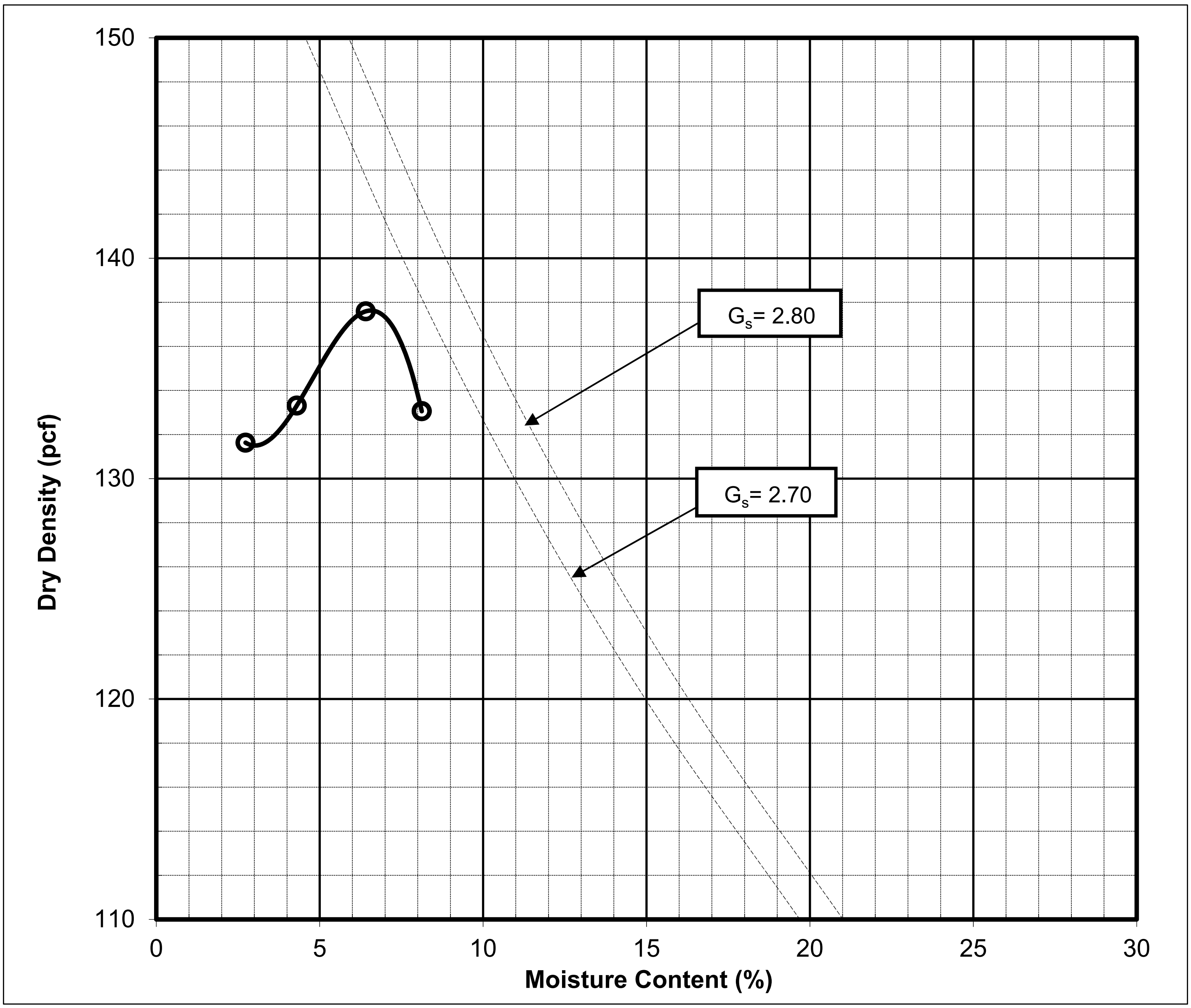
Compaction Characteristics of Soils Using Modified Effort

ASTM D1557

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project:	SoCalGas Waste to Energy Facility	*Tested by:*	WA
Project No.:	-	*Checked by:*	KL
Boring Number:	B-3	*Date:*	11/09/22
Sample Number:	Bulk		
Depth (ft) :	0-5		
Soil Description:	Light Brown, Silty Sand with Gravel (SM)		

Mold size (in)	6"
Procedure	C
Weight Retained on:	14.9
Remarks:	

Maximum Dry Density (pcf)	**137.6**
Optimum Moisture Content (%)	**6.6**
Corrected Maximum Dry Density (pcf)	**140.1**
Corrected Optimum Moisture Content (%)	**5.7**



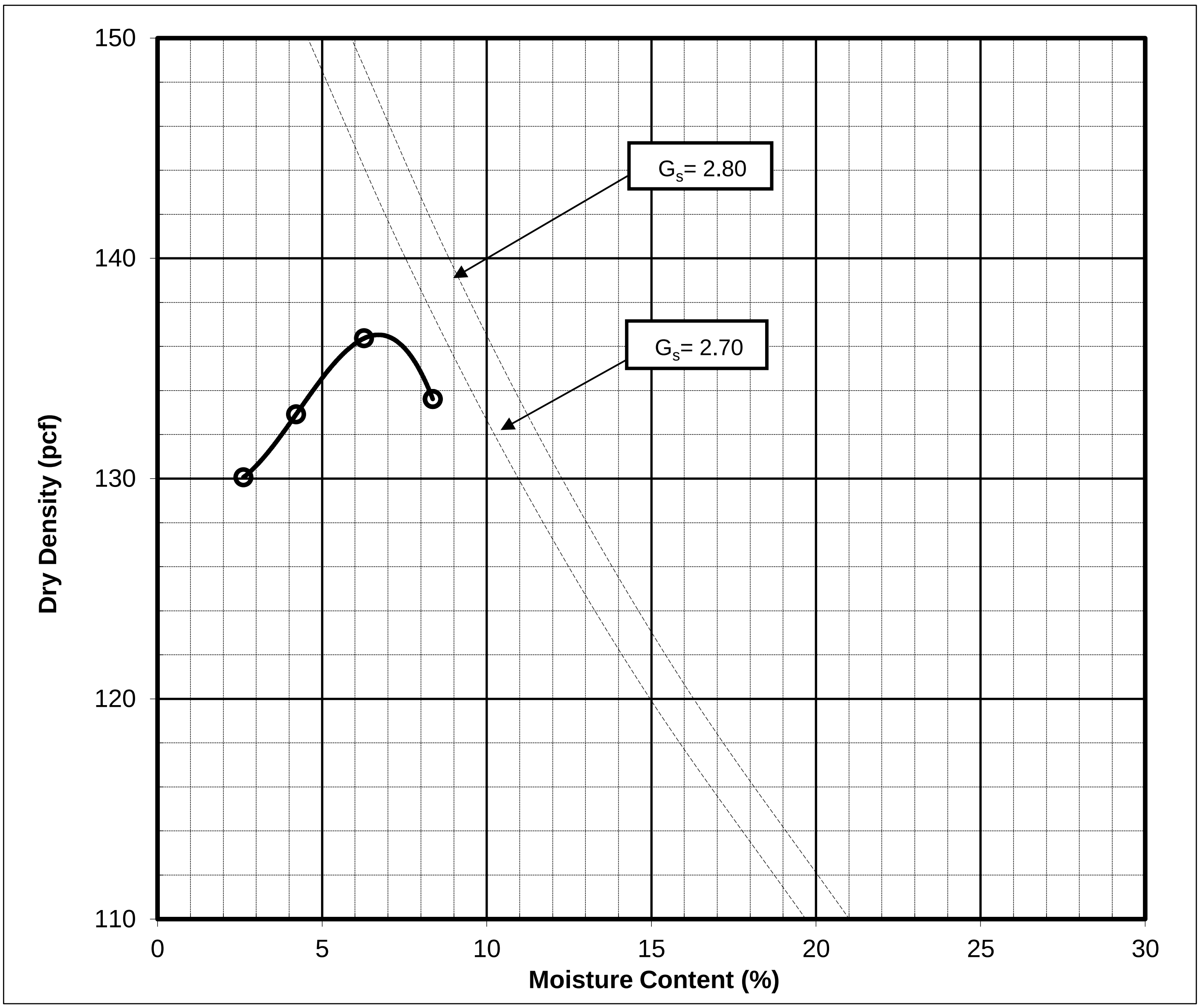
Compaction Characteristics of Soils Using Modified Effort

ASTM D1557

Client:	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project:	SoCalGas Waste to Energy Facility	*Tested by:*	WA
Project No.:	-	*Checked by:*	KL
Boring Number:	B-5	*Date:*	11/09/22
Sample Number:	Bulk		
Depth (ft) :	0-5		
Soil Description:	Brown, Poorly Graded Gravel with Silt and Sand (GP-GM)		

Mold size (in)	6"
Procedure	C
Weight Retained on:	9.0
Remarks:	

Maximum Dry Density (pcf)	**136.5**
Optimum Moisture Content (%)	**6.7**
Corrected Maximum Dry Density (pcf)	**138.1**
Corrected Optimum Moisture Content (%)	**6.1**



EXPANSION INDEX

ASTM D4829

Client: Toro Energy, LLC — *HAI Project No.:* TE-22-001

Project Name: SoCalGas Waste to Energy Facility — *Tested by:* GA

Project No.: - — *Checked by:* KL

Boring No.: B-2 — *Date:* 11/9/2022

Sample No.: Bulk

Depth (ft): 0-5 — *Apparatus No.:* 3

Soil Description: Light Brown, Clayey Sand with Gravel (SC)

Initial Specimen Info		
Wt. of wet soil + cont.	235.66	g
Wt. of dry soil + cont.	221.90	g
Wt. of container	11.74	g
Wt. of water	13.76	g
Wt. of dry soil	210.16	g
Moisture Content	**6.5**	**%**

Final Specimen Info		
Wt. of wet soil + cont.	646.70	g
Wt. of dry soil + cont.	592.97	g
Wt. of container	197.36	g
Wt. of water	53.73	g
Wt. of dry soil	395.61	g
Moisture Content	**13.6**	**%**

Wt. of wet soil + ring	625.88	g
Wt. of ring	197.36	g
Wt. of wet soil	428.52	g
Wet density of soil	130.6	pcf
Dry density of soil	122.6	pcf
Specific gravity of soil	2.68	-
Saturation	**48.2**	**%**

Date & Time	Elapsed Time (min)	Dial Reading	Δh, Expansion
11/16/2022 13:35	0	0	0
11/16/2022 13:45	10	0.0000	0
Add Distilled Water to Sample			
11/17/2022 13:35	1440	0.0000	0.0000

Expansion Index = **0** **Very Low**

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

SAND EQUIVALENT TEST
CTM 217

Client: Toro Energy, LLC
Project Name: SoCalGas Waste to Energy Facility
Project No.: -
Boring No.: B-2
Sample No.: MC-1A
Soil Description: Light Brown, Clayey Sand with Gravel (SC)

HAI Project No.: TE-22-001
Tested by: KL
Checked by: SD
Date: 11/21/22

T1	T2	T3	T4	R1	R2	SE	Average SE
13:40	13:50	13:51	14:11	12.40	3.00	25	**25**
13:43	13:53	13:54	14:14	12.70	3.10	25	
13:46	13:56	13:56	14:16	12.20	2.90	24	

T1 = Starting Time
T2 = (T1 + 10 min) Begin Agitation
(100 cycles in 30 sec)

T3 = Settlement Starting Time
T4 = (T3 + 20 min) Take Clay Reading (R1)
and Sand Reading (R2)

Sand Equivalent = R2 / R1 * 100
Record SE as Next Higher Integer

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

SAND EQUIVALENT TEST
CTM 217

Client:	Toro Energy, LLC	***HAI Project No.:***	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	***Tested by:***	KL
Project No.:	-	***Checked by:***	SD
Boring No.:	B-4	***Date:***	11/21/22
Sample No.:	MC-1A		
Soil Description:	Brown, Silty Sand with Gravel (SM)		

T1	T2	T3	T4	R1	R2	SE	Average SE
13:49	13:59	13:59	14:19	12.9	3.0	24	**24**
13:52	14:02	14:02	14:22	13.0	3.0	24	
13:55	14:05	14:05	14:25	13.0	3.0	24	

T1 = Starting Time
T2 = (T1 + 10 min) Begin Agitation
(100 cycles in 30 sec)

T3 = Settlement Starting Time
T4 = (T3 + 20 min) Take Clay Reading (R1)
and Sand Reading (R2)

Sand Equivalent = R2 / R1 * 100
Record SE as Next Higher Integer

DIRECT SHEAR TEST

ASTM D3080

HAI Project No.: TE-22-001

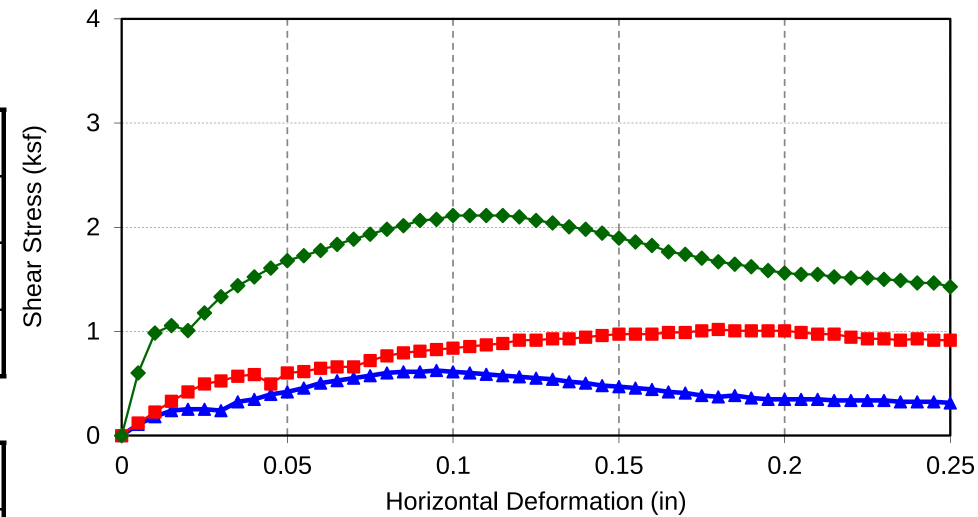
Client:	Toro Energy, LLC
Project Name:	SoCalGas Waste to Energy Facility
Project Number:	-
Boring No.:	B-2
Sample No.:	MC-2B
Sample Type:	Undisturbed Ring
Depth (ft):	6-6.5
Soil Description:	Light Brown, Well Graded Sand with Silt (SW-SM)
Type of test:	**Consolidated, Drained**

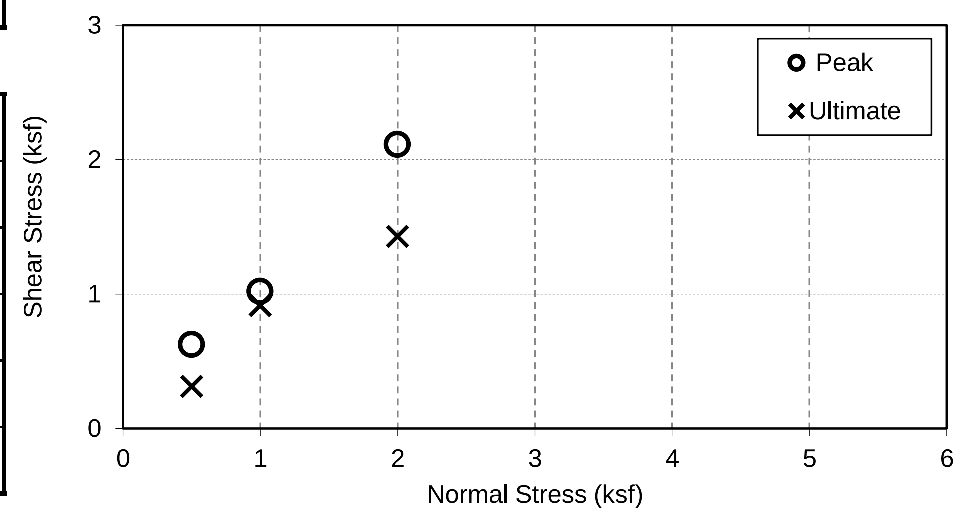
Tested by: GA
Checked by: KL
Date: 11/9/2022

Test No.	1	2	3
Symbol	▲	■	◆
Normal Stress (ksf)	**0.5**	**1**	**2**
Deformation Rate (in/min)	**0.002**	**0.002**	**0.002**

Peak Shear Stress (ksf)	**O**	**0.62**	**1.02**	**2.11**
Shear Stress @ End of Test (ksf)	**X**	**0.31**	**0.92**	**1.43**

Initial Height of Sample (in)	1.000	1.000	1.000
Height of Sample before Shear (in)	0.9848	0.9813	0.9770
Diameter of Sample (in)	2.416	2.416	2.416
Initial Moisture Content (%)	**9.3**	**9.3**	**9.3**
Final Moisture Content (%)	**19.1**	**18.1**	**17.8**
Dry Density (pcf)	**109.4**	**111.8**	**110.5**





HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST
ASTM D3080

HAI Project No.: TE-22-001
Tested by: GA
Checked by: KL
Date: 11/9/2022

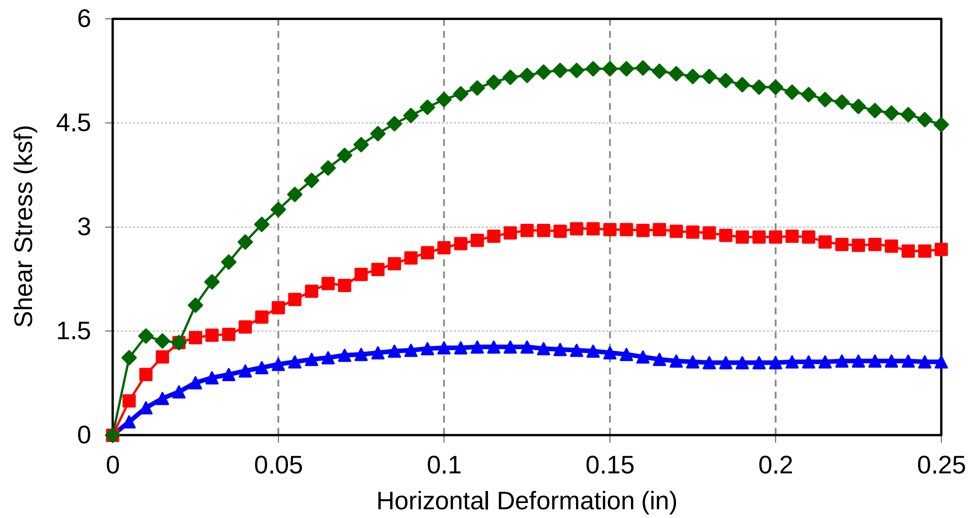
Client: Toro Energy, LLC
Project Name: SoCalGas Waste to Energy Facility
Project Number: -
Boring No.: B-2
Sample No.: MC-5B
Sample Type: Undisturbed Ring
Depth (ft): 26-26.5
Soil Description: Brown, Well Graded Sand with Silt (SW-SM)

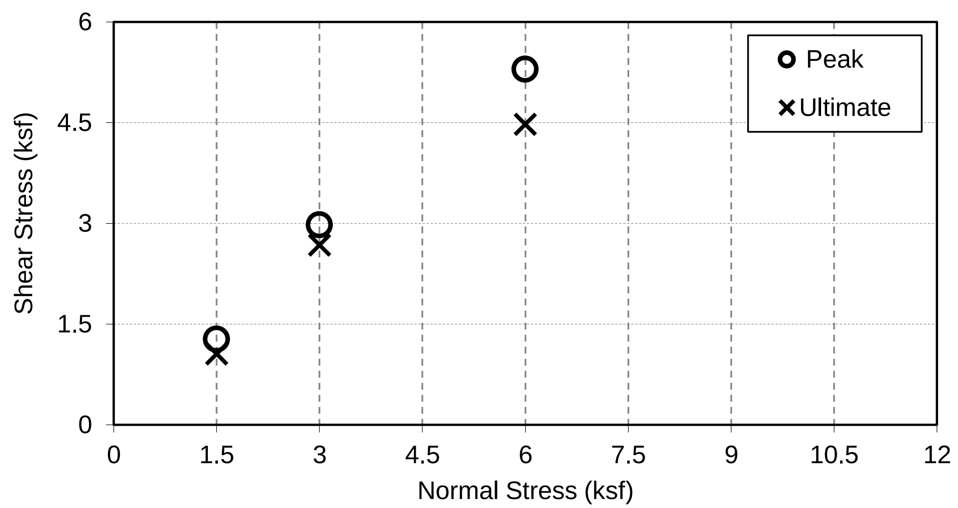
Type of test: **Consolidated, Drained**

Test No.	1	2	3
Symbol	▲	■	◆
Normal Stress (ksf)	**1.5**	**3**	**6**
Deformation Rate (in/min)	**0.002**	**0.002**	**0.002**

Peak Shear Stress (ksf)	**O**	**1.27**	**2.98**	**5.29**
Shear Stress @ End of Test (ksf)	**X**	**1.06**	**2.68**	**4.48**

Initial Height of Sample (in)	1.000	1.000	1.000
Height of Sample before Shear (in)	0.9699	0.9690	0.9684
Diameter of Sample (in)	2.416	2.416	2.416
Initial Moisture Content (%)	**11.0**	**11.0**	**11.0**
Final Moisture Content (%)	**18.4**	**15.3**	**16.4**
Dry Density (pcf)	**112.7**	**114.4**	**115.1**





HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

DIRECT SHEAR TEST

ASTM D3080

HAI Project No.: TE-22-001

Client:	Toro Energy, LLC
Project Name:	SoCalGas Waste to Energy Facility
Project Number:	-
Boring No.:	B-3
Sample No.:	Bulk
Sample Type:	Sample Remold
Depth (ft):	0-5
Soil Description:	Light Brown, Silty Sand with Gravel (SM)

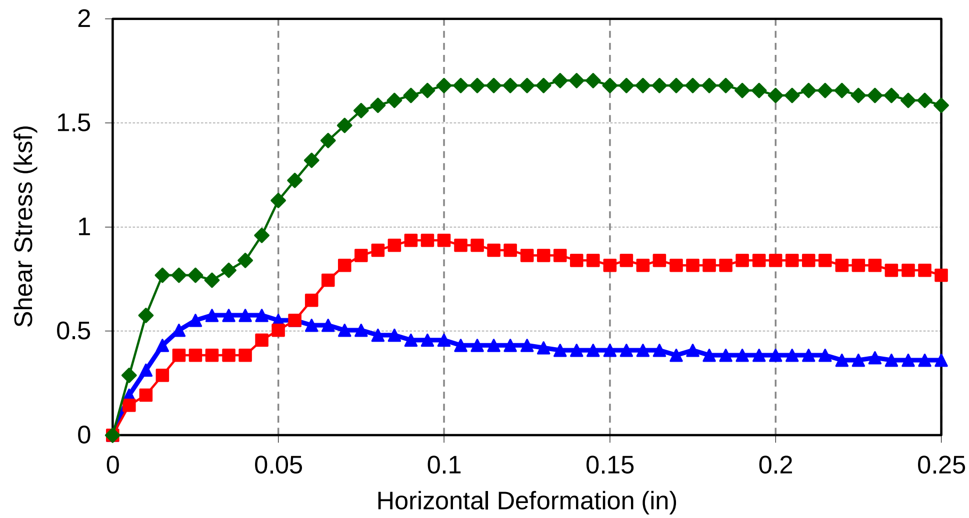
Tested by: GA
Checked by: KL
Date: 11/9/2022

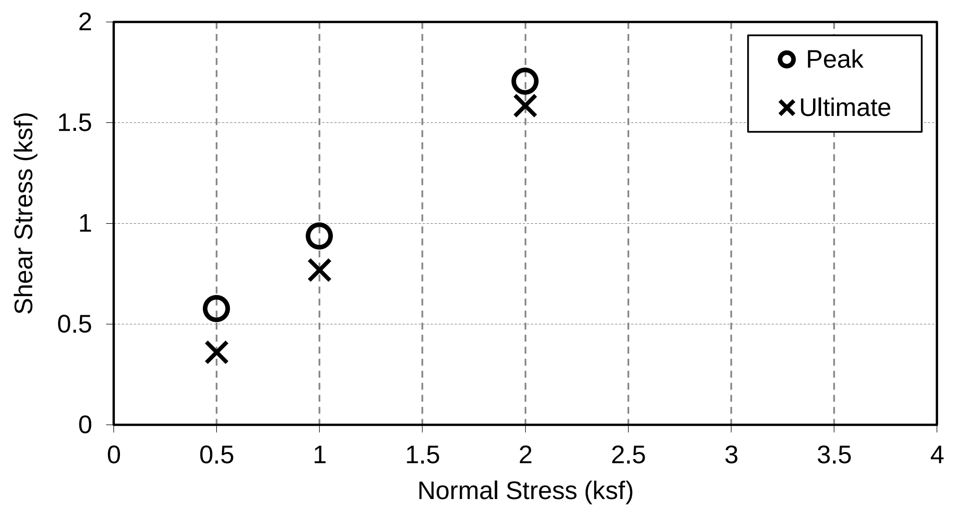
Type of test: **Consolidated, Drained**

Test No.	1	2	3
Symbol	▲	■	◆
Normal Stress (ksf)	**0.5**	**1**	**2**
Deformation Rate (in/min)	**0.002**	**0.002**	**0.002**

Peak Shear Stress (ksf)	**O**	**0.58**	**0.94**	**1.70**
Shear Stress @ End of Test (ksf)	**X**	**0.36**	**0.77**	**1.58**

Initial Height of Sample (in)	1.000	1.000	1.000
Height of Sample before Shear (in)	0.9930	0.9942	0.9867
Diameter of Sample (in)	2.416	2.416	2.416
Initial Moisture Content (%)	**7.6**	**7.6**	**7.6**
Final Moisture Content (%)	**12.8**	**12.2**	**12.4**
Dry Density (pcf)	**123.9**	**123.9**	**123.9**

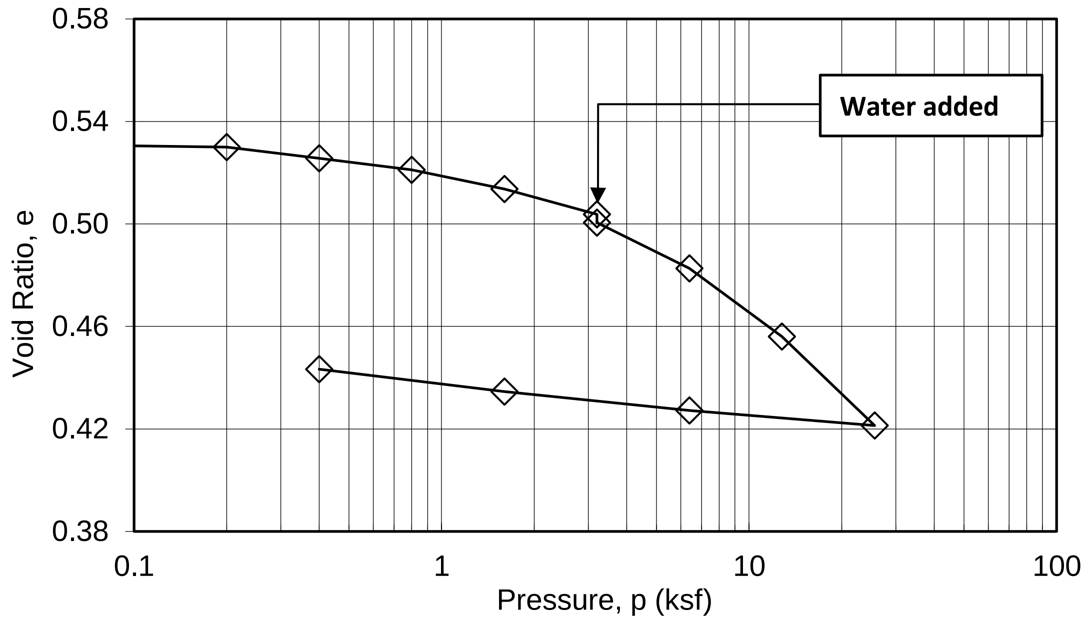


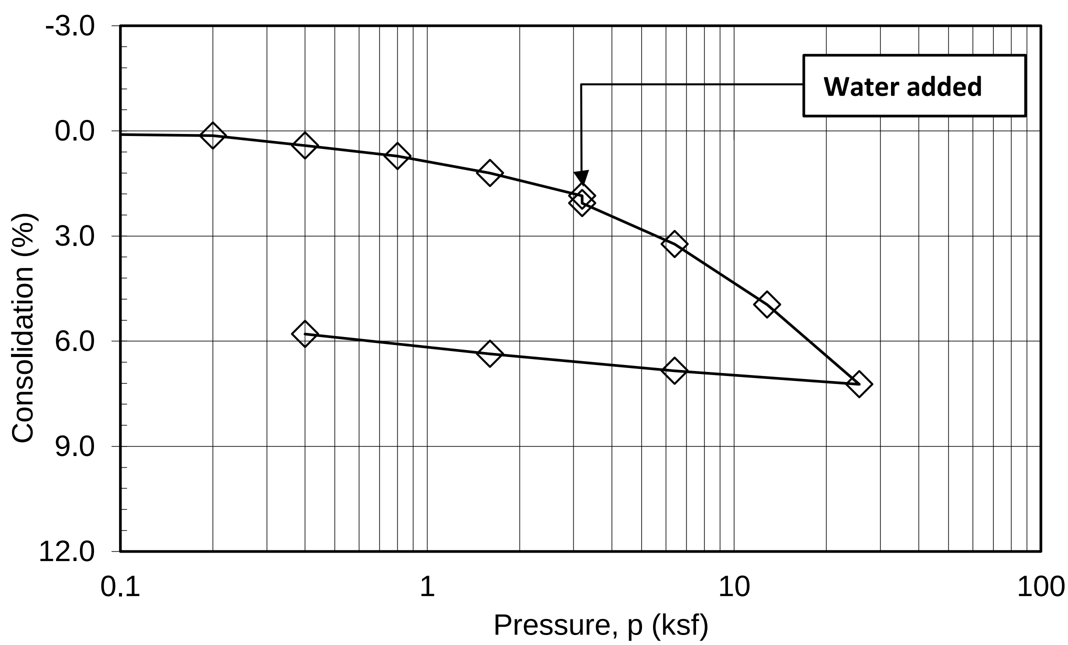


CONSOLIDATION TEST

ASTM D2435

Client :	Toro Energy, LLC	*HAI Project No.:*	TE-22-001
Project Name:	SoCalGas Waste to Energy Facility	*Tested by:*	KL
Project Number:	-	*Checked by:*	SD
Boring No.:	B-4	*Date:*	11/09/22
Sample No.:	MC-3B		
Type of Sample:	Undisturbed Ring		
Depth (ft):	26-26.5		
Soil Description:	Brown, Lean Clay with Sand (CL)		





Results Only Soil Testing for SoCalGas Waste to Energy Facility

November 16, 2022

Prepared for:

Kang Lin
HAI
250 Goddard
Irvine, CA 92618
kang@haieng.com

Project X Job#: S221114P
Client Job or PO#: TE-22-001

Respectfully Submitted,

Eduardo Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

REGISTERED PROFESSIONAL ENGINEER
EDUARDO HERNANDEZ
No. M37102
MECHANICAL
STATE OF CALIFORNIA

Soil Analysis Lab Results

Client: HAI
Job Name: SoCalGas Waste to Energy Facility
Client Job Number: TE-22-001
Project X Job Number: S221114P
November 16, 2022

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** **As Rec'd**	**Minimum**	**pH**
	(ft)	**(mg/kg)**	**(wt%)**	**(mg/kg)**	**(wt%)**	**(Ohm-cm)**	**(Ohm-cm)**	
B-2 MC-1A	3.5-4	558.0	0.0558	223.9	0.0224	134,000	1,005	8.3
B-2 SPT-3	20-21	52.4	0.0052	38.1	0.0038	>737,000	5,250	7.5
B-3 MC-1B	6-6.5	195.0	0.0195	176.2	0.0176	2,814	871	8.2

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

● ANALYSIS
● DESIGN

LaBelle • Marvin

PROFESSIONAL PAVEMENT ENGINEERING

A CALIFORNIA CORPORATION

● SOILS, ASPHALT TECHNOLOGY

November 18, 2022

Kang Chieh Lin
Hushmand Associates, Inc.
250 Goddard
Irvine, California 92618

Project No. 48854

Attention: Kang Chieh Lin
Testing of the bulk soil sample delivered to our laboratory on 11/17/2022 has been completed.

P.N.: **TE-22-001**
Reference: **SoCalGas Waste to Energy Facility**
Sample: **B-5 Bulk @ 0'-5'**

Data sheets are attached for your use and file. Any untested portion of the sample will be retained for a period of 60 days prior to disposal. The opportunity to be of service is sincerely appreciated and should you have any questions, kindly call.

Very truly yours,

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. MARVIN
NO. 30659
CIVIL
STATE OF CALIFORNIA

Steven R. Marvin
RCE 30659

SRM:tw
Enclosure

2700 S. GRAND AVENUE • SANTA ANA, CA 92705-5404 • (714) 546-3468 • FAX (714) 546-5841
INFO@LABELLEMARVIN.COM

LaBelle Marvin

R - VALUE DATA SHEET

PROJECT No. 48854

DATE: 11/18/2022

BORING NO. B-5 Bulk @ 0'-5'

SoCalGas Waste to Energy Facility

P.N. TE-22-001

SAMPLE DESCRIPTION: Brown Gravelly Sandy Silt

R-VALUE TESTING DATA | CA TEST 301

	SPECIMEN ID		
	a	b	c
Mold ID Number	10	11	12
Water added, grams	41	30	23
Initial Test Water, %	9.0	7.9	7.3
Compact Gage Pressure,psi	45	100	150
Exudation Pressure, psi	242	429	735
Height Sample, Inches	2.42	2.33	2.33
Gross Weight Mold, grams	3078	3076	3063
Tare Weight Mold, grams	1943	1949	1944
Sample Wet Weight, grams	1135	1127	1119
Expansion, Inches x 10exp-4	0	1	5
Stability 2,000 lbs (160psi)	30 / 81	24 / 52	17 / 32
Turns Displacement	4.62	4.09	4.02
R-Value Uncorrected	35	56	71
R-Value Corrected	33	52	68
Dry Density, pcf	130.4	135.8	135.7

DESIGN CALCULATION DATA

Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.69	0.49	0.33
G. E. by Expansion	0.00	0.03	0.17

Equilibrium R-Value	**40** by EXUDATION	Examined & Checked: 11 /18/ 22

REMARKS:

Gf = 1.25

10.3% Retained on the 3/4" Sieve.

Partial Free Drainage.

REGISTERED PROFESSIONAL ENGINEER STEVEN R. MARVIN NO. 30659 CIVIL STATE OF CALIFORNIA

Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle Marvin

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 48854

DATE: 11 /18/ 2022

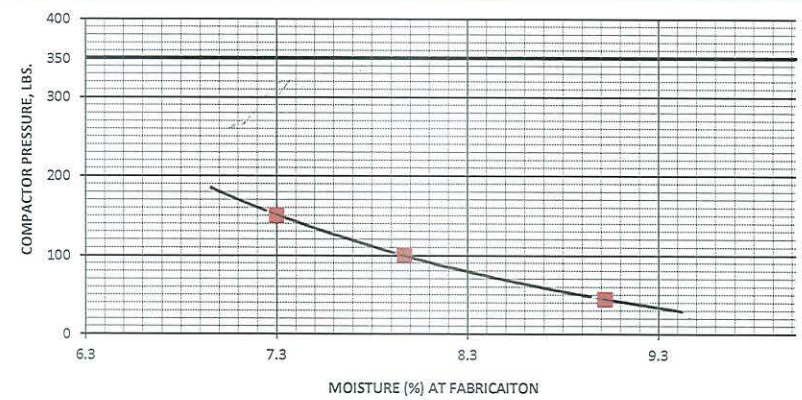
REMARKS:

BORING NO. B-5 Bulk @ 0'-5'

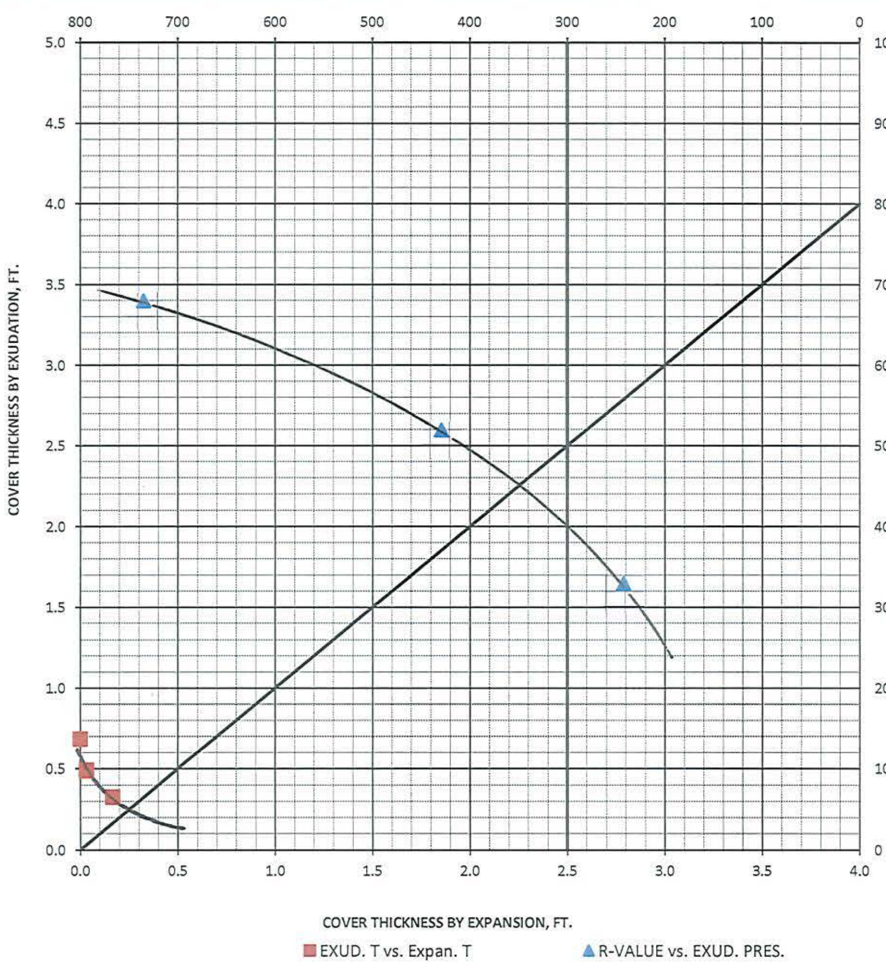
SoCalGas Waste to Energy Facility

P.N. TE-22-001

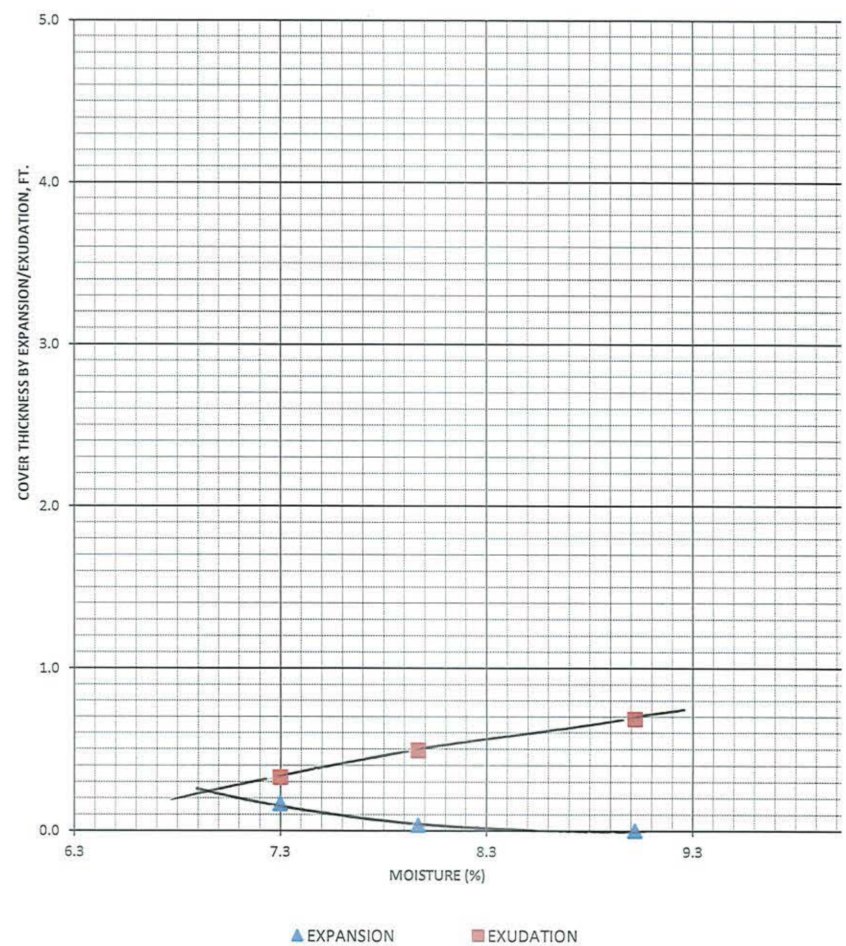
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



Appendix C

Print outs of Liquefaction Analyses Using LiqSV.2.0.2.1

GEOLOGISMIKI Geotechnical Software

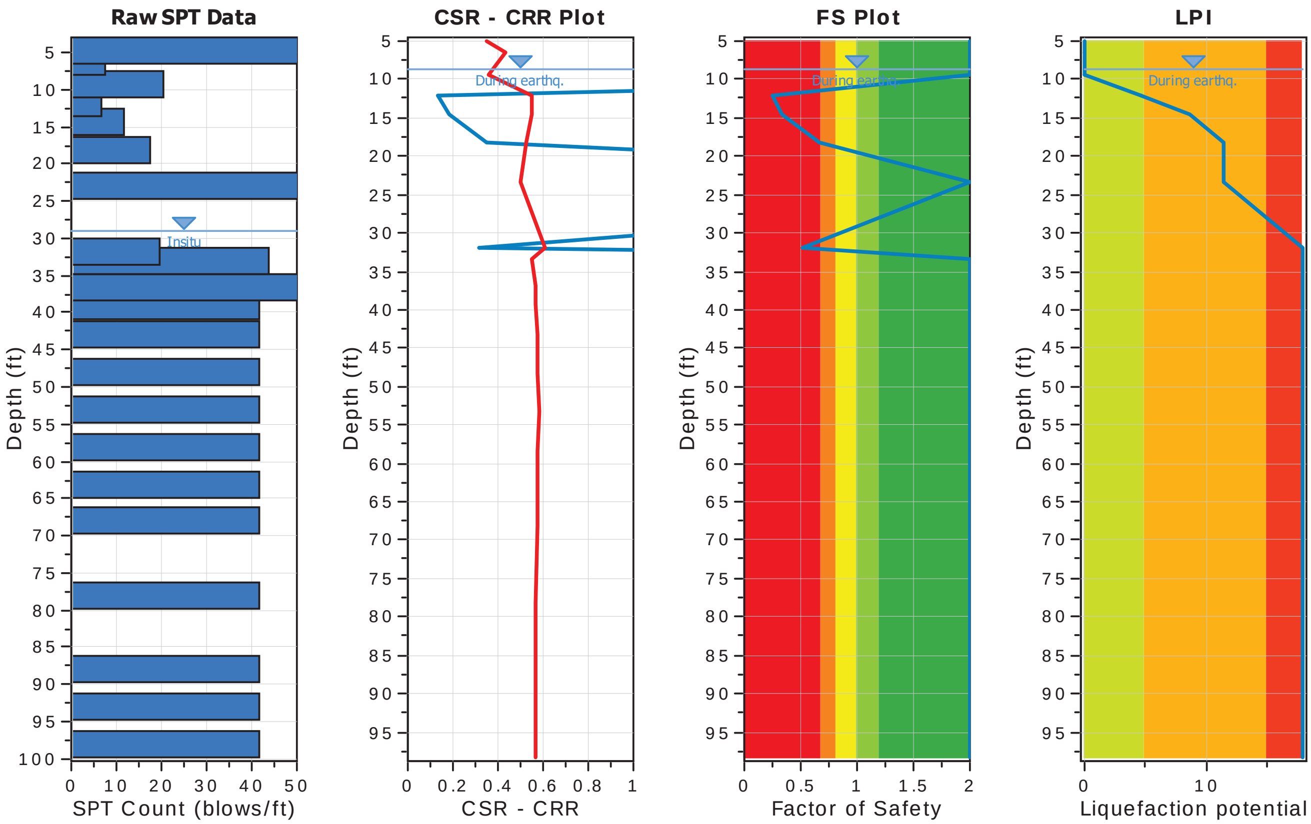
SPT BASED LIQUEFACTION ANALYSIS REPORT

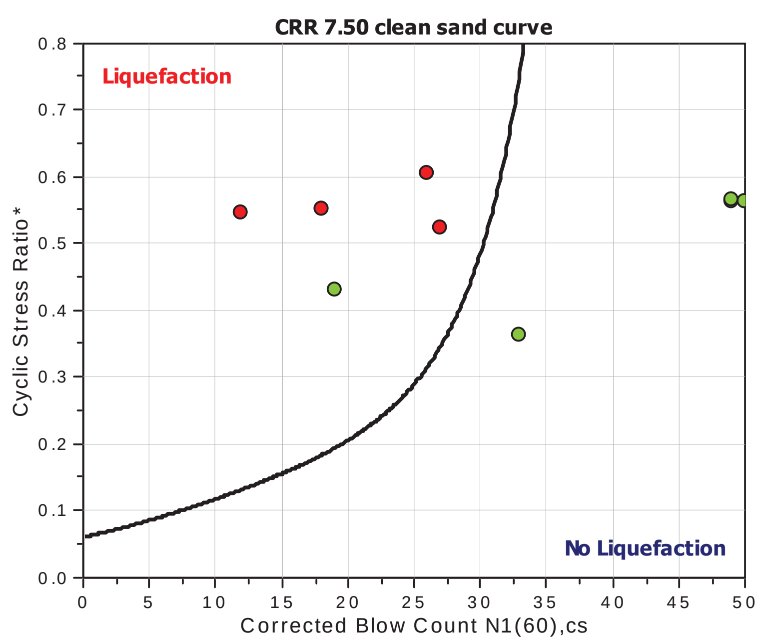
Project title : TE-22-001 **SPT Name: B-1**

Location : El Sobrante Landfill, SoCalGas Waste to Energy Facility, Corona, Riverside County, CA

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	29.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	8.70 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.55
Borehole diameter:	200mm	Peak ground acceleration:	0.86 g
Rod length:	3.00 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.38		





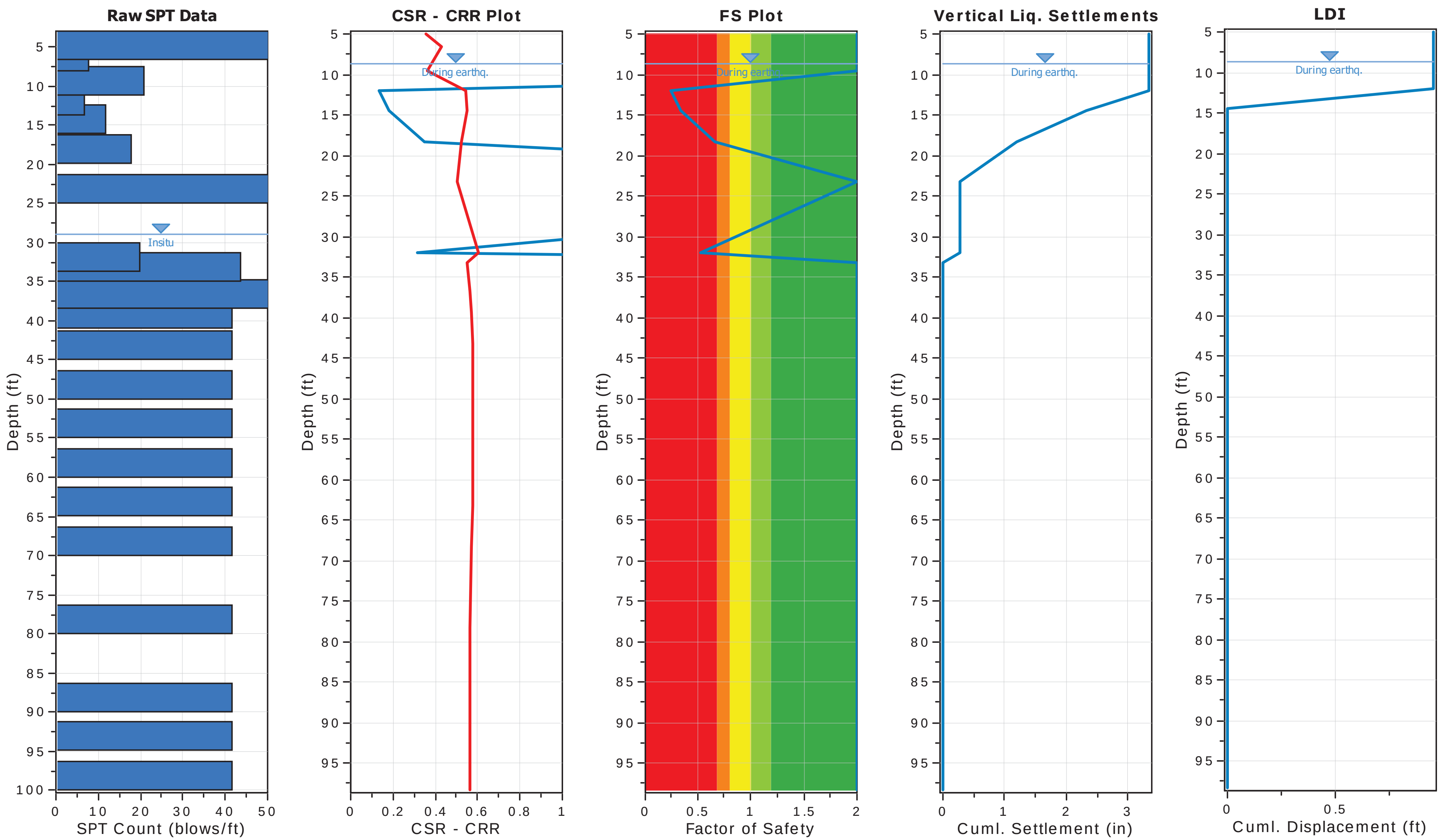
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



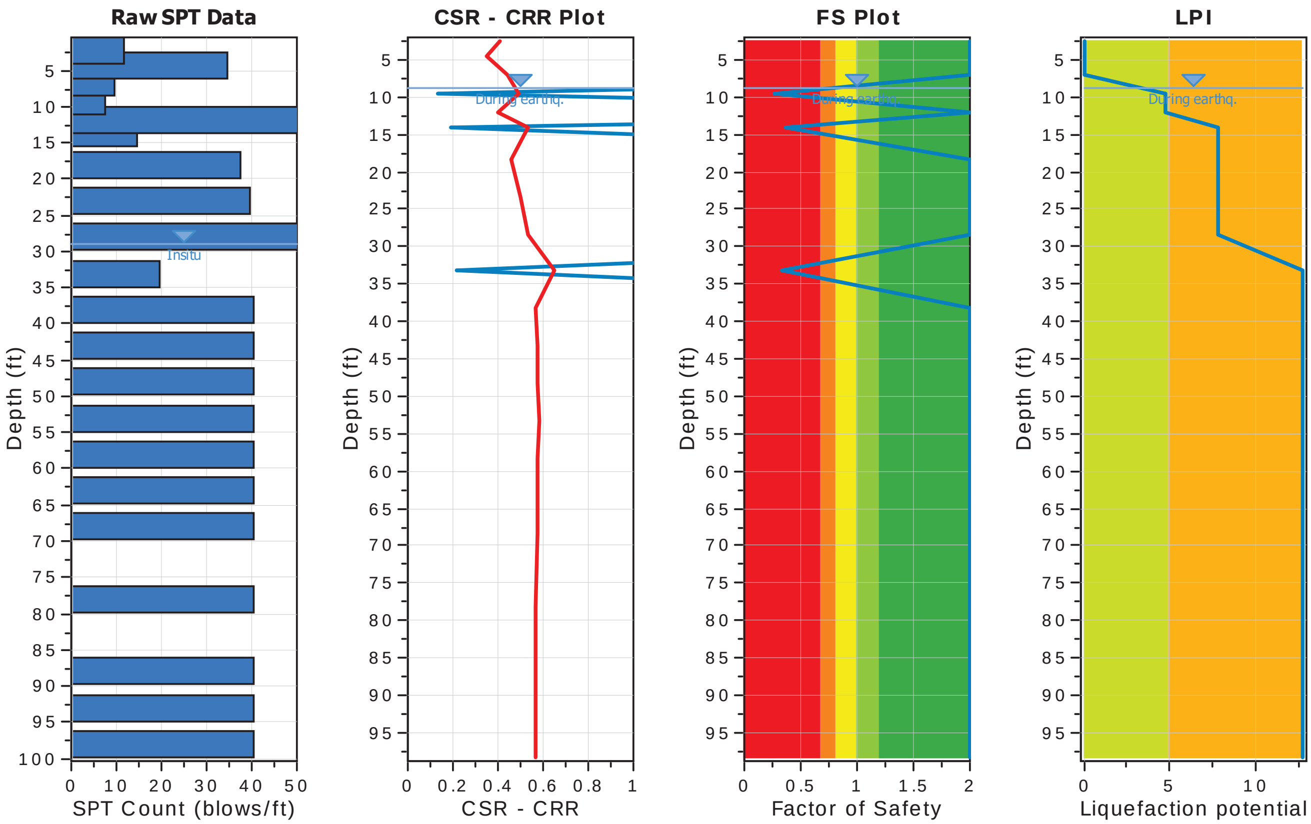
SPT BASED LIQUEFACTION ANALYSIS REPORT

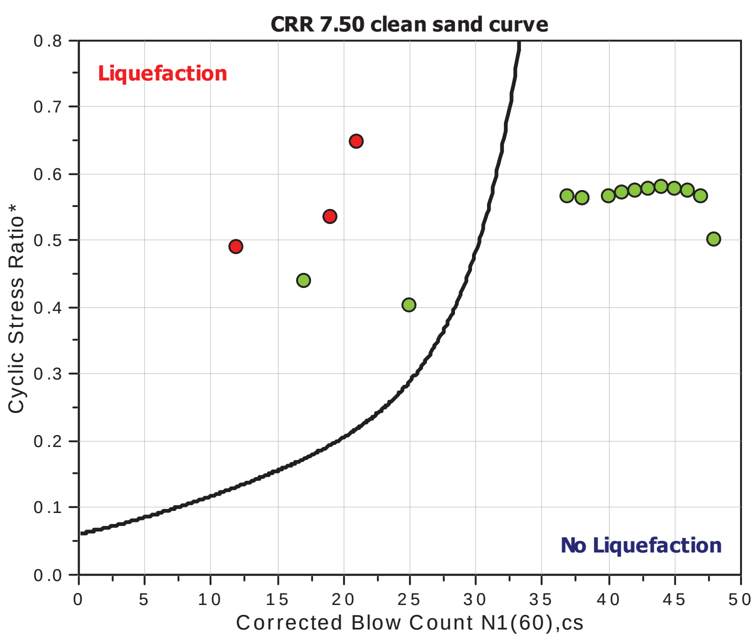
Project title : TE-22-001 **SPT Name: B-2**

Location : El Sobrante Landfill, SoCalGas Waste to Energy Facility, Corona, Riverside County, CA

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	29.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	8.70 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.55
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.86 g
Rod length:	3.00 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.35		





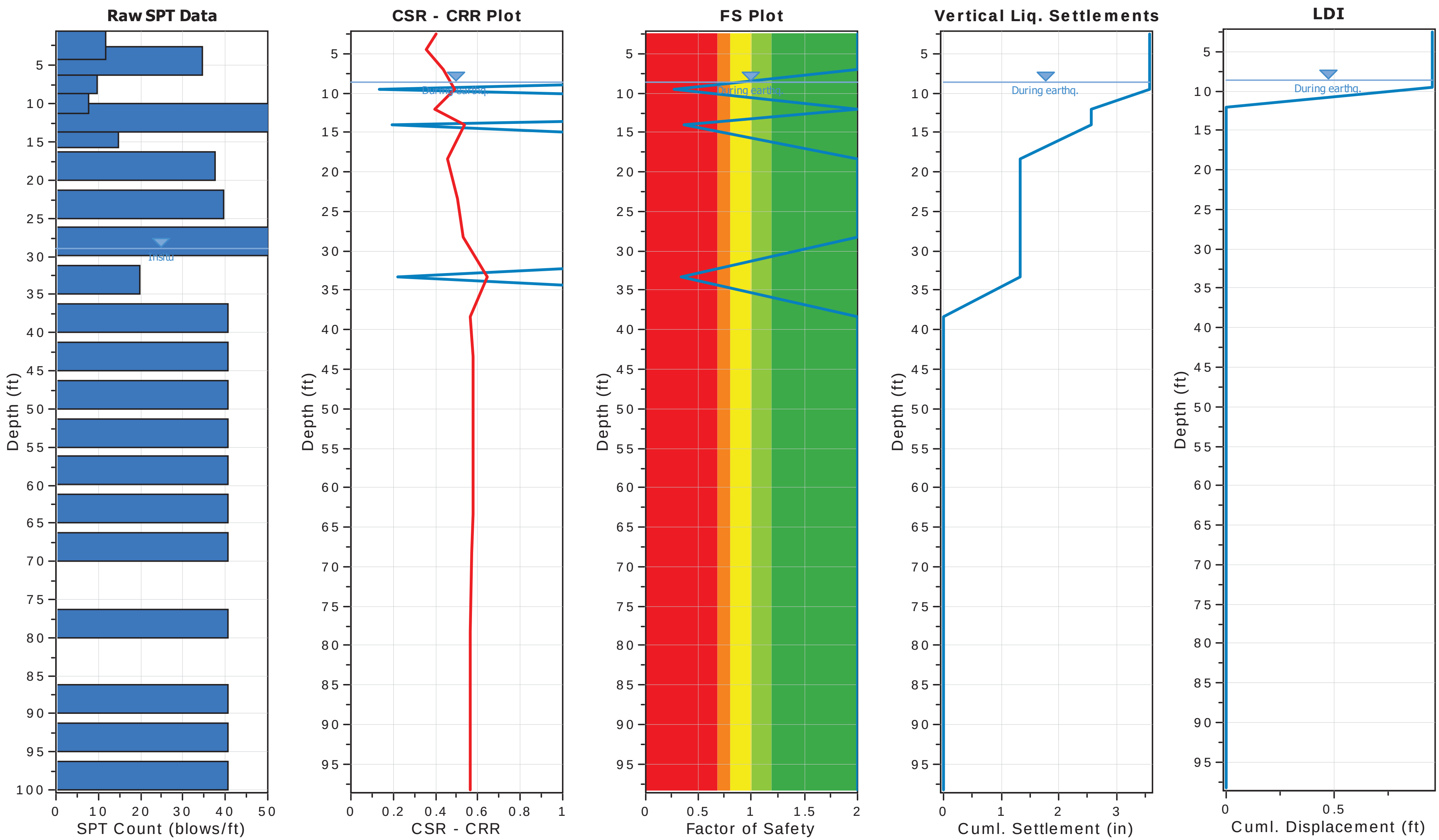
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



SPT BASED LIQUEFACTION ANALYSIS REPORT

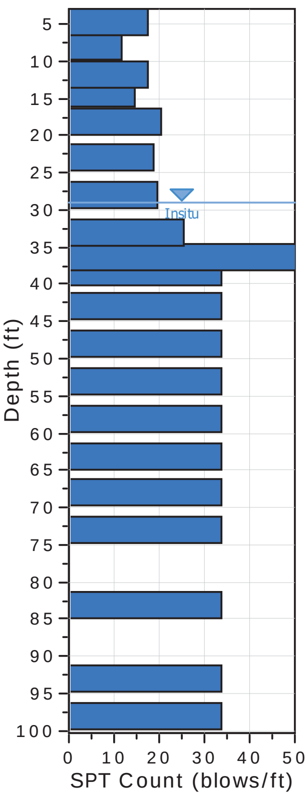
Project title : TE-22-001 **SPT Name: B-3**

Location : El Sobrante Landfill, SoCalGas Waste to Energy Facility, Corona, Riverside County, CA

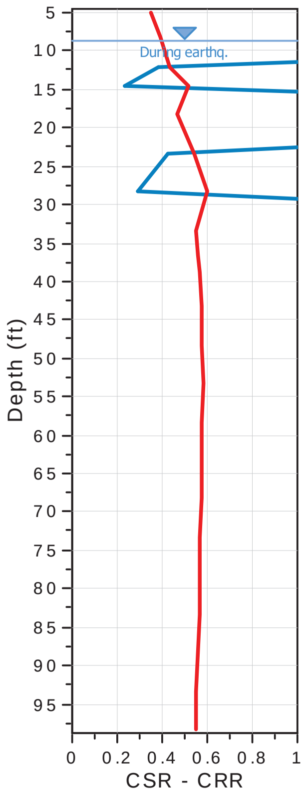
:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	29.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	8.70 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.55
Borehole diameter:	200mm	Peak ground acceleration:	0.86 g
Rod length:	3.00 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.38		

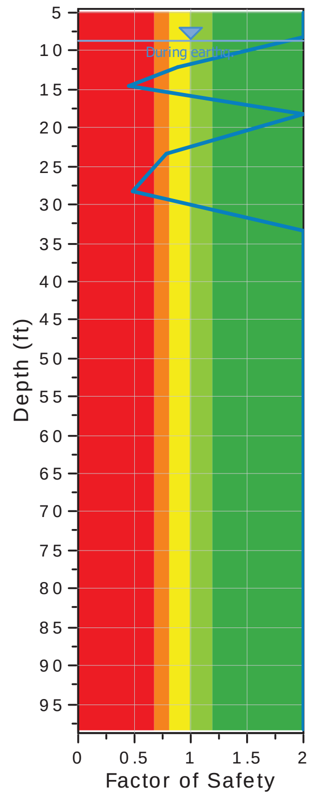
Raw SPT Data



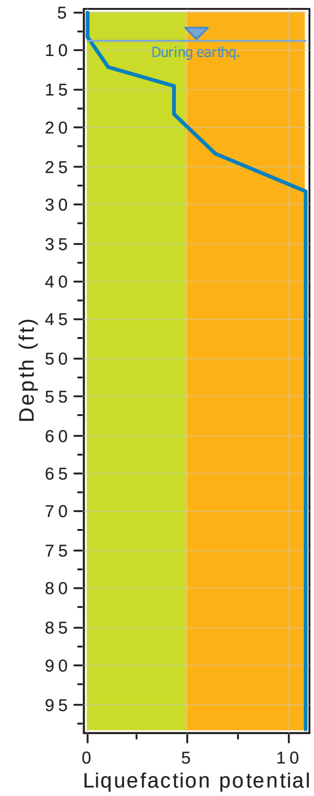
CSR - CRR Plot



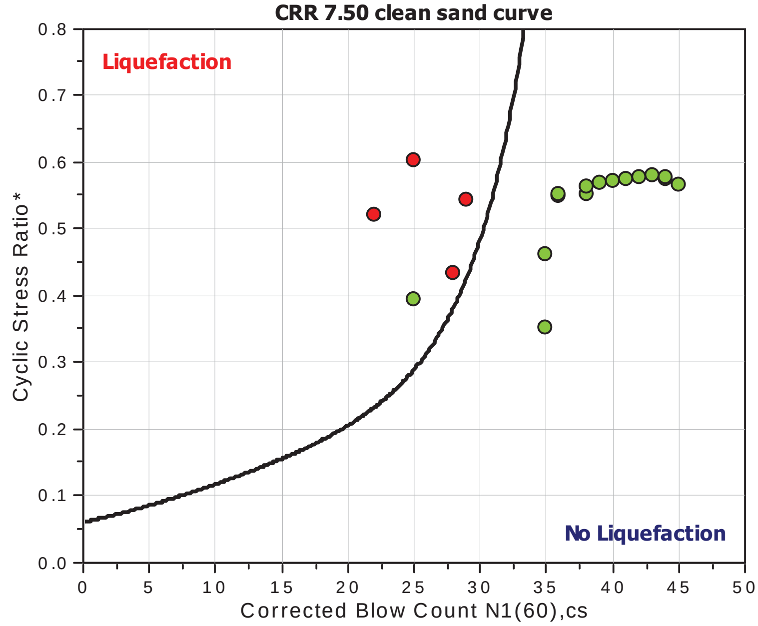
FS Plot



LPI



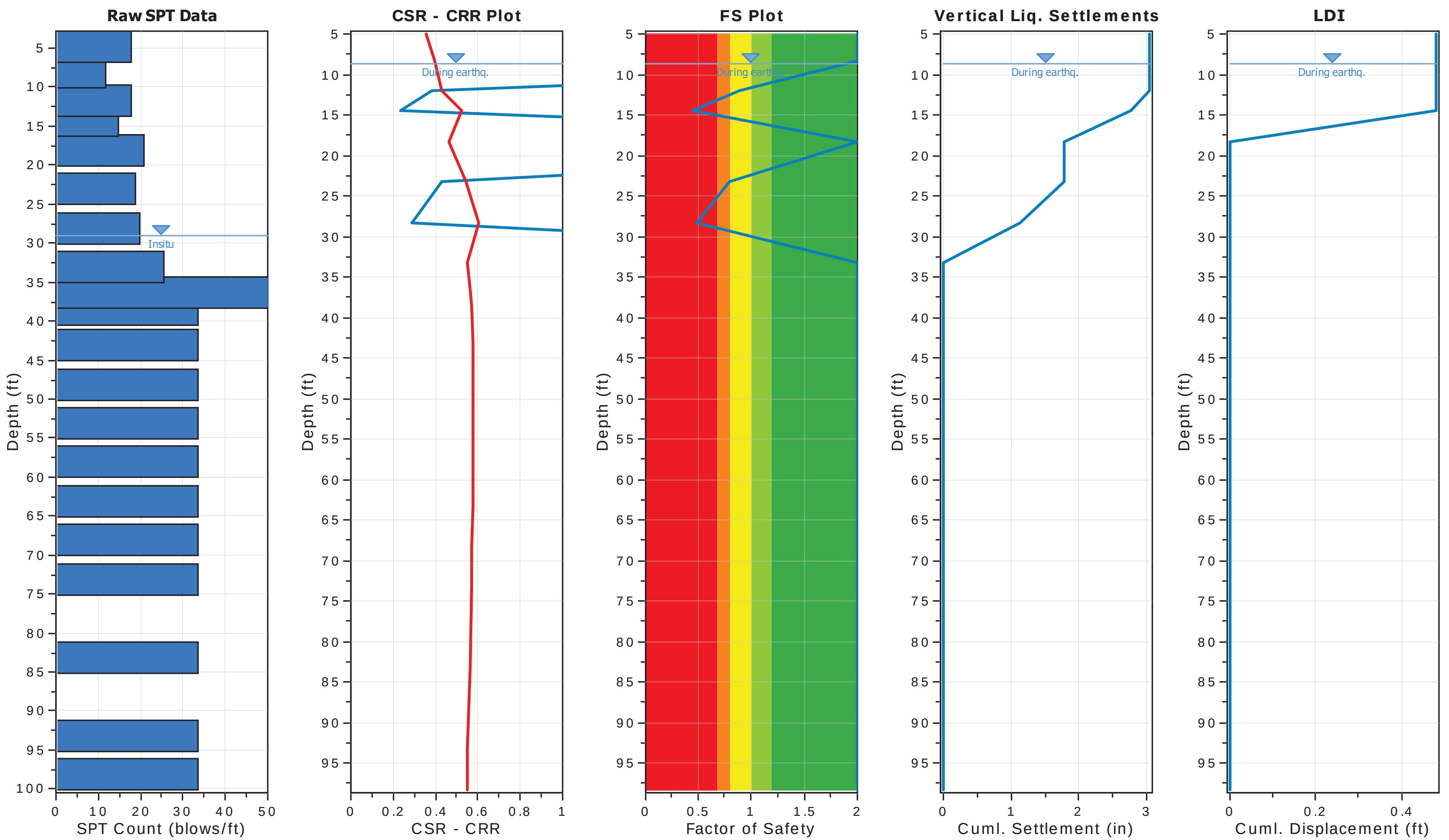
CRR 7.50 clean sand curve



F.S. color scheme
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme
- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



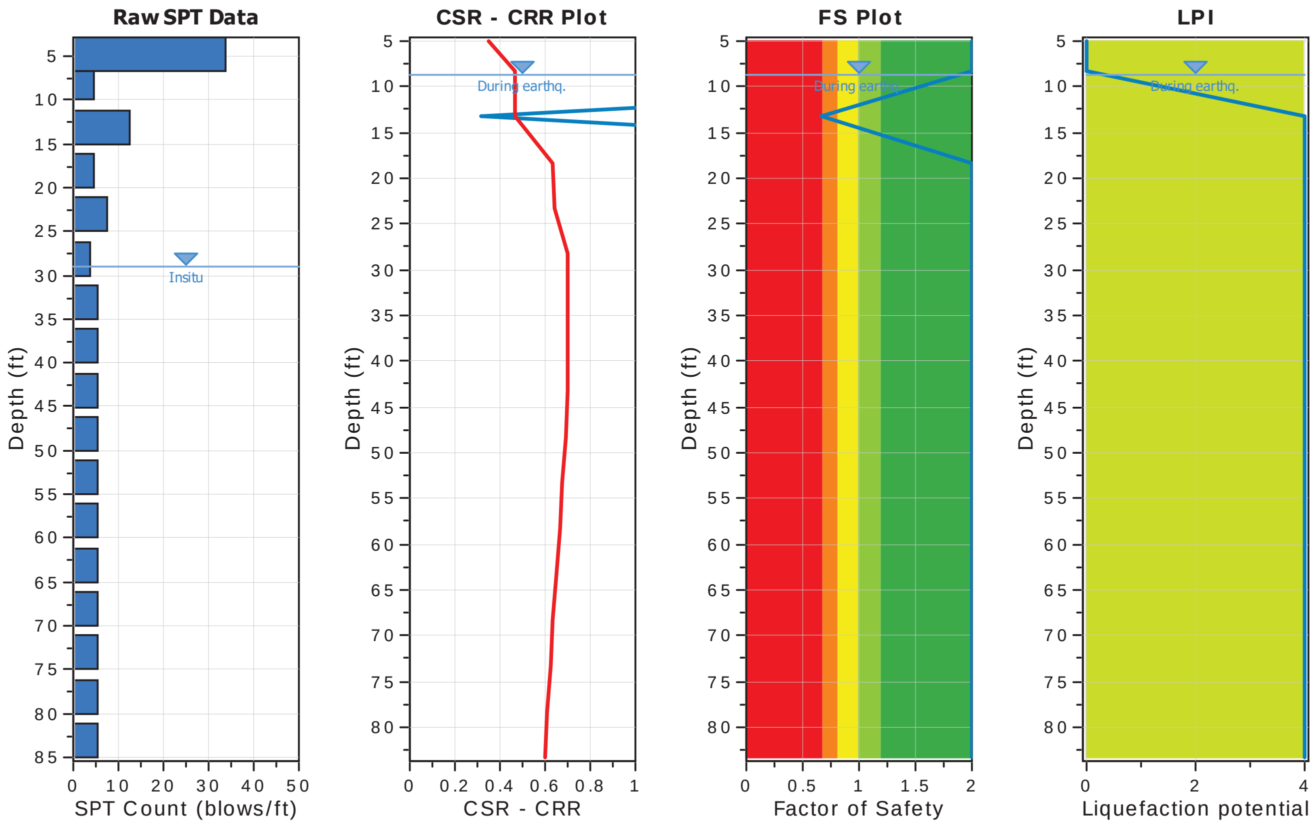
SPT BASED LIQUEFACTION ANALYSIS REPORT

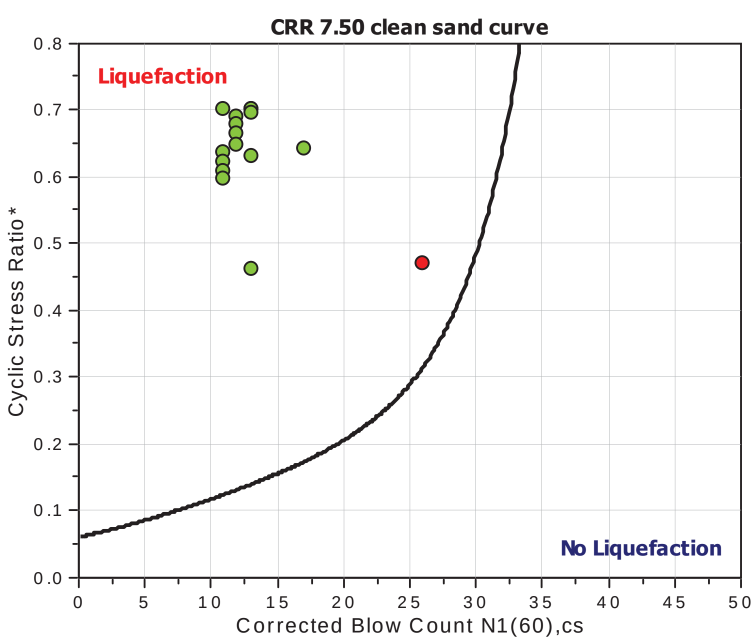
Project title : TE-22-001 **SPT Name: B-4**

Location : El Sobrante Landfill, SoCalGas Waste to Energy Facility, Corona, Riverside County, CA

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	29.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	8.70 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.55
Borehole diameter:	200mm	Peak ground acceleration:	0.86 g
Rod length:	3.00 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.38		

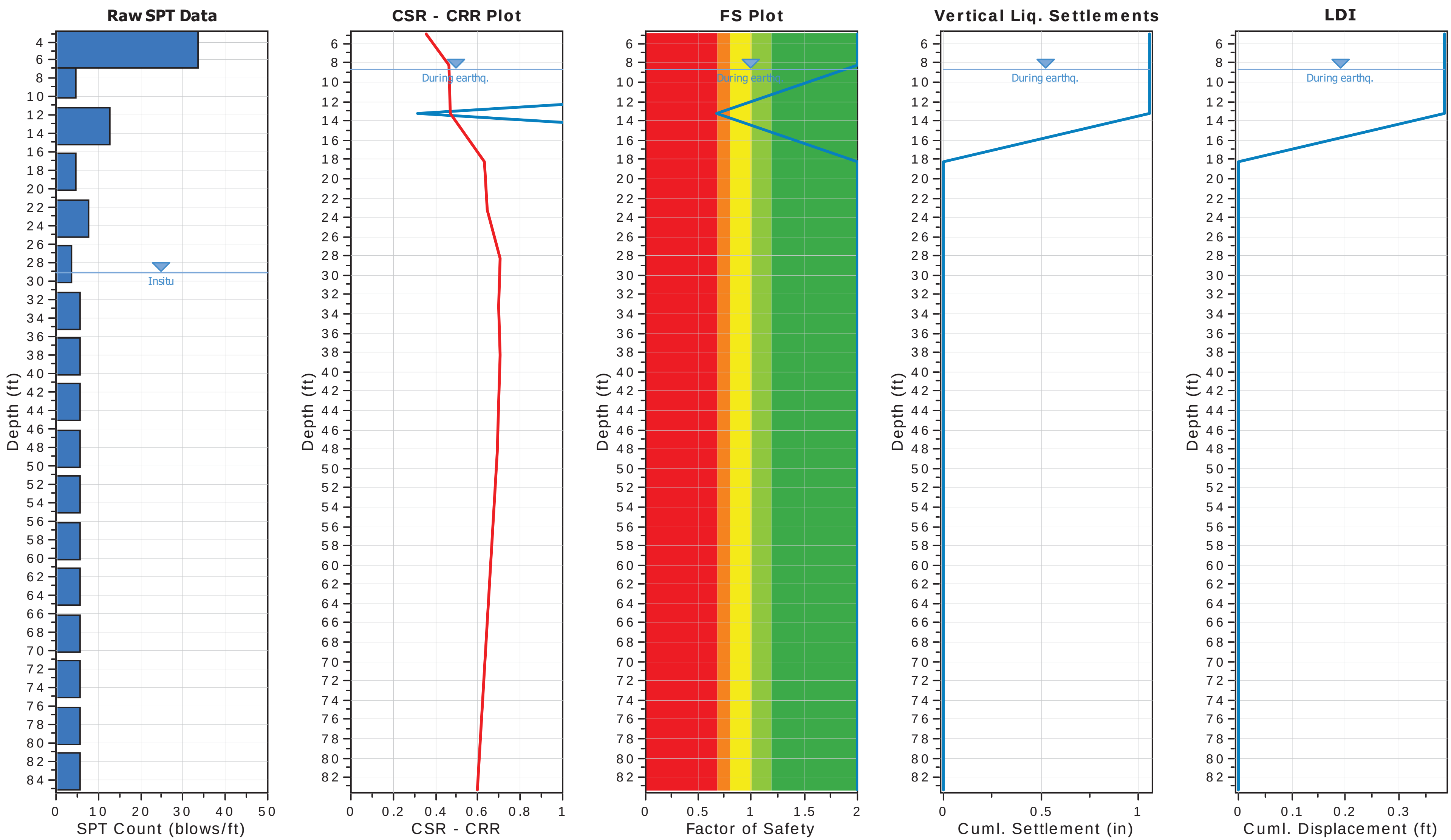




F.S. color scheme
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme
- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



Appendix D

Calculation of Design Infiltration Rate

Percolation Test Data Sheet*

Project:	SoCalGas Waste to Energy Facility					Project No:	TE-22-001
Client:	Toro Energy, LLC					Test Date:	11/2/2022
Test Hole No: B-5		Tested By:	AH			Checked By:	BH
Field Soil Classification:		Silty Sand with Gravel (SM)					
Test Hole Dimensions (in)							
Diameter (if round) (in):		8	Length (in):		Width (in):		
Depth of Test Hole (in):	96	Diameter of Perforated Pipe (in)	4.00		Type of Gravel	1/4-inch pea gravel	

Time Interval Measurement:

Trial No.	Start Time	Stop Time	Time Interval (min)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (Y/N)
1	3:18:00 PM	3:19:00 PM	1.00	93.60	102	8.40	Y
2	3:22:00 PM	3:23:00 PM	1.00	88.80	96	7.20	Y

In sandy soils, when 2 consecutive measurements show that 6 inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Measurements shall be taken with a precision of 0.25 inches or better. The drop that occurs during the final 10 minutes is used to calculate the percolation rate. Field data must show the two 25 minute readings and the six 10 minute readings.

In non-sandy soils, obtain at least twelve measurements per hole over at least six hours with a precision of 0.25 inches or better. From a fixed reference point, measure the drop in water level over a 30 minute period for at least 6 hours, refilling after every 30 minute reading. The total depth of the hole must be measured at every reading to verify that collapse of the borehole has not occurred. The drop that occurs during the final reading is used to calculate the percolation rate.

Reading No.	Start Time	Stop Time	Δt Time Interval (min)	Do Initial Depth to Water (in)	Df Final Depth to Water (in)	ΔH Drop in Water Level (in)	Percolation Rate (min/in.)
1	3:26:00 PM	3:36:00 PM	10.00	84.00	119.40	35.40	0.28
2	3:40:00 PM	3:50:00 PM	10.00	81.60	117.60	36.00	0.28
3	3:57:00 PM	4:07:00 PM	10.00	81.60	105.60	24.00	0.42
4	4:12:00 PM	4:22:00 PM	10.00	81.60	105.60	24.00	0.42
5	4:24:00 PM	4:34:00 PM	10.00	82.80	105.00	22.20	0.45
6	4:35:00 PM	4:45:00 PM	10.00	81.60	104.40	22.80	0.44
7							
8							
9							
10							
11							
12							

*Riverside County - Low Impact Development BMP Design Handbook- 9/2011

Comments:

$$I_t = \frac{\Delta H \times 60 \times r}{\Delta t\ (r + 2H_{avg})}$$

H_{avg} =The average head height over the time interval (inches)

Δt = Time interval (min)

r=hole radius (inches)

Infiltration Rate Tested (in/hr)	**7.39**
Design Infiltration Rate (in/hr)	**2.46**

Appendix F2
Geotechnical Exploration and Recommendations Report

Geotechnical Exploration and Recommendations Report for Proposed RNG Facility

El Sobrante Landfill - Riverside County, California

Submitted to:

Toro Energy, LLC

5900 Southwest Parkway
Building 2, Suite 220
Austin, TX 78735

Submitted by:

WSP USA Inc.

7 Corporate Park, Suite 260
Irvine, CA 92606

31405562.000

November 14, 2022

November 14, 2022 Project No.: 31405562.000

Randy Glad
Operations Manager
Toro Energy, LLC
5900 Southwest Parkway
Building 2, Suite 220
Austin, TX 78735

RE: GEOTECHNICAL EXPLORATION AND RECOMMENDATIONS REPORT FOR THE PROPOSED RNG FACILITY
EL SOBRANTE LANDFILL – RIVERSIDE COUNTY, CALIFORNIA

Dear Mr. Glad:

WSP USA Inc. (WSP) presents this report containing the results of our geotechnical study to support the design of the proposed renewable natural gas (RNG) facility at the El Sobrante Landfill in Riverside County, California. This report has been prepared in accordance with our approved proposal dated July 25, 2022.

WSP's opinion, based on the geotechnical analysis of field and laboratory results, is that development of the proposed RNG facility is feasible from a geotechnical standpoint. Our opinion is conditional upon incorporation of this report's recommendations into the design and construction of the facility. Please refer to Section 1.2 and Appendix F for important information regarding the proper use and interpretation of this report.

WSP appreciates the opportunity to be of service on this important project. If you have any questions, please contact the undersigned.

Sincerely,

WSP USA Inc.

Ryan Hillman, PE
Senior Consultant

Donald Lowry, PG, CEG
Senior Engineering Geologist

Table of Contents

1.0 INTRODUCTION 1

1.1 General 1

1.2 Use of This Report 1

1.3 Project Understanding 1

1.4 Existing Site Conditions 2

1.5 Objective and Scope 2

2.0 GEOTECHNICAL EXPLORATION PROGRAM 4

2.1 General 4

2.2 Site Reconnaissance 4

2.3 Borings 4

2.4 Percolation Testing 5

2.5 Laboratory Testing 6

2.6 Previous 2017 Geotechnical Study 6

3.0 GEOLOGIC AND SUBSURFACE CONDITIONS 7

3.1 Regional Geologic Setting 7

3.2 Site Geology 7

3.3 Generalized Subsurface Conditions 7

3.4 Groundwater 8

3.5 Historical Seismicity and Active Faults 8

3.6 Landslide Hazards 9

4.0 GEOTECHNICAL DESIGN RECOMMENDATIONS 9

4.1 Geotechnical Feasibility 9

4.2 Seismic Design 9

4.2.1 General 9

4.2.2 Seismic Design Criteria 9

4.2.3 Liquefaction Potential and Seismic Settlement 10

4.2.4 Surface Fault Rupture 10

4.2.5 Tsunamis and Seiches 10

4.3 Foundation Design 10

4.3.1 General 10

4.3.2 General Shallow Foundation Recommendations 10

4.3.3 Recommended Design Criteria for Shallow Footing Foundations 11

4.3.4 Recommended Design Criteria for Shallow Mat Foundations 12

4.4 Slab-on-Grade Floors 13

4.5 Expansion and Collapse Potential 13

4.6 Subsurface Stormwater Infiltration 14

4.6.1 General 14

4.6.2 Design Infiltration Rates 14

4.6.3 Recommendations 14

4.7 Soil Corrosivity 15

5.0 CONSTRUCTION CONSIDERATIONS 16

5.1 General 16

5.2 Site Preparation 16

5.3 Surface Drainage 16

5.4 Excavation Characteristics 17

5.5 Engineered Fill 17

5.6 Temporary Excavations 18

5.7 Pipe Bedding and Trench Backfill 18

6.0 ADDITIONAL SERVICES 19

7.0 LIMITATIONS 19

8.0 REFERENCES 20

TABLES

Table 1: 2022 California Building Code Seismic Design Parameters

Table 2: Design Infiltration Rates

FIGURES

Figure 1: Site Location Map

Figure 2: Boring Location Map (South Site)

Figure 3: Boring Location Map (North Site)

APPENDICES

APPENDIX A
Boring Logs for Current Study

APPENDIX B
Boring Logs for 2017 Study

APPENDIX C
Geotechnical Laboratory Test Results

APPENDIX D
Infiltration Test Results for Current Study

APPENDIX E
Infiltration Test Results for 2017 StudyImportant Information About This Geotechnical Engineering Report (by GBA)

1.0 INTRODUCTION

1.1 General

This report presents the results of the geotechnical study performed by WSP USA Inc. (WSP) for the proposed renewable natural gas (RNG) facility at the El Sobrante Landfill (ESL) in Riverside County, California (the site). The ESL is owned and operated by USA Waste of California, Inc. (USA Waste) and is located in an unincorporated area of western Riverside County near Corona, as shown on Figure 1.

1.2 Use of This Report

This report pertains only to the proposed RNG facility at the ESL. The proposed RNG facility is described in Section 1.3. See Appendix F for further information regarding the proper use and interpretation of this geotechnical report.

1.3 Project Understanding

Toro Energy, LLC (Toro Energy) is proposing to develop a new RNG facility on two noncontiguous lease sites that are both within the ESL property boundary. One of the lease sites, herein referred to as the "South Site," is located immediately west of the site's entrance between the existing flare station and cutslope. The other site, herein referred to as the "North Site," is located on the graded pad in the northwestern corner of the landfill property that is the location of the landfill's former maintenance facility. The locations of the South Site and North Site are shown on Figure 1. The existing ground surfaces at both the South Site and North Site are relatively level and WSP understands that only minor earthworks (i.e., cuts and fills of no more than 5 feet) will be required to develop the project.

WSP has been provided with preliminary figures that show the proposed conceptual layout of the RNG facility. Per these figures and Toro Energy, the RNG facility will generally consist of the following primary components:

- South Site: This location will be completely covered with a concrete slab-on-grade and will contain several pieces of equipment supported on reinforced concrete pad foundations and an approximately 2,400 square foot RNG office building. An underground stormwater infiltration device is planned for this location, assuming the soil infiltration rates are sufficient to support such a device.
- North Site: This location will contain several pieces of equipment supported on reinforced concrete pad foundations. An underground stormwater infiltration device is planned for this location, assuming the soil percolation rates are sufficient.

WSP understands that the equipment pad foundations will generally be on the order of 10 feet by 20 feet in plan and will be subjected to static structural loads of approximately 20 to 25 kips. According to the project's civil engineer, ThirdGen Civil Engineering (ThirdGen), underground stormwater infiltration devices are proposed and would likely infiltrate into existing soils at a depths of approximately 5 to 15 feet below finished grade, depending on the design infiltration rates of the surrounding soils. The proposed underground stormwater storage/infiltration devices are anticipated to consist of buried perforated pipes in a gravel bed that will allow for the temporary storage and infiltration of collected stormwater. WSP also understands that no retaining walls or pavements are proposed. Installation of underground utilities is anticipated for both the South Site and North Site.

The geotechnical recommendations provided herein are based on the above-described proposed development. If the design of the proposed RNG facility is modified, then WSP should be provided with updated plans for review.

Depending on the nature of the design modifications, the recommendations of this report may need to be changed to reflect the modified design.

1.4 Existing Site Conditions

The ESL is an active Class III municipal solid waste (i.e., non-hazardous) disposal facility that encompasses a total area of approximately 1,322 acres, of which approximately 485 acres comprise the permitted waste disposal footprint. The remaining approximately 837 acres of the landfill property consist primarily of buffer areas (i.e., open space) and site infrastructure (e.g., roads, embankments, stormwater basins, administration facilities, etc.). The proposed RNG facility is located along the western edge of the landfill property in previously disturbed areas that were graded level for past infrastructure development at the site.

At the time of Golder's geotechnical exploration program at the site on July 28 and 29, 2022, the locations of both the proposed South Site and North Site were observed to be developed areas with some existing infrastructure (e.g., concrete pads, fencing, buildings, utilities, etc.). The existing ground surfaces at both the South Site and North Site are relatively level and generally surfaced with an aggregate base-type material to support traffic. There is no significant vegetation within the proposed RNG facility footprint. The existing ground surface elevations within the South Site range between approximately 1,198 and 1,202 feet above mean sea level (amsl) while those within the North Site range between approximately 1,368 and 1,370 feet amsl. The ground surface slopes gently toward the south at both the South Site and North Site.

No bedrock outcrops were observed within the footprint areas of the proposed RNG facility, but some outcrops were noted in the immediate vicinity, namely in the tall slope immediately west of the South Site and in the natural ridgeline to the west of the North Site. The geology of these bedrock outcrops was consistent with the geology of the bedrock encountered in the borings, as discussed herein.

No groundwater seeps or wet zones were observed in the areas of the proposed RNG facility. Similarly, no obvious evidence of landsliding, large-scale ground subsidence, or surface fault rupture was observed in these areas.

1.5 Objective and Scope

The objective of WSP's current study was to provide the necessary geotechnical recommendations to support the design of foundations, slabs-on-grade, stormwater controls, and earthworks for the proposed RNG facility. WSP explored, sampled, evaluated, and tested the subsurface conditions at points within and surrounding the limits of the proposed development. A summary of the work undertaken is provided below.

Task 1: Pre-Field Activities

WSP reviewed readily-available geotechnical and geologic reports for the site and surrounding areas as well as the preliminary site plan provided by Toro Energy. WSP prepared a site-specific health and safety environment plan for use by field staff during the field work and notified Underground Service Alert (USA) to identify existing underground utilities in the area of the geotechnical field exploration. In addition, WSP coordinated with USA Waste to clear the geotechnical field exploration locations of existing underground utilities. A subsurface drilling permit was not required for the field exploration.

Task 2: Geotechnical Field Exploration

WSP performed a geotechnical field exploration program at the site on July 28 and 29, 2022. The field exploration consisted of drilling six borings at the South Site, at the locations shown on Figure 2, and drilling five borings at the North Site, at the locations shown on Figure 3. In addition, percolation tests were conducted in four of the borings, one at the South Site and three at the North Site. The boring logs for the current study are presented in Appendix A and the geotechnical field exploration program is described in detail in Section 2.

Task 3: Geotechnical Laboratory Testing

Representative soil samples collected during the field exploration program were transported to a geotechnical laboratory for particle size, Atterberg limits, modified Proctor compaction, expansion index, swell/collapse potential, and soil chemistry (pH, resistivity, chloride content, and sulfate content) testing. The results of the geotechnical laboratory testing are presented in Appendix C.

Task 4: Geotechnical Analyses and Report Preparation

Field data, field observations, field test results, and laboratory test results were analyzed after reviewing the preliminary site plan and other project information provided by Toro Energy. This report was prepared to present the following findings, conclusions, and recommendations of WSP's geotechnical study:

- Regional geology, potential geologic hazards, and seismicity of the site.
- Assessment of foundation types and foundation design recommendations for the proposed project, including:
  - Selection of foundation systems.
  - Allowable vertical bearing pressures and lateral earth pressures for shallow foundations.
  - Coefficient of friction for lateral sliding resistance.
  - Estimated total and differential settlements under static and seismic conditions for the recommended foundations.
- Seismic design criteria and parameters as defined by the 2022 California Building Code.
- Liquefaction potential assessment.
- Assessment and recommendations regarding the presence of unsuitable or adverse soil conditions such as expansive, collapsible, and/or organic soils.
- Assessment of soil infiltration rates for stormwater infiltration design.
- Excavation and grading methods, including temporary slope inclinations of the various soils for cut and fill operations.
- Soil types, properties, and compaction requirements for backfill to support structure loads.
- Subgrade preparation requirements.
- Soil corrosivity potential.
- General recommendations for stormwater drainage.

- Recommendations for underground utility installation including subgrade preparation, trench excavations, bedding materials, and backfill operations.

2.0 GEOTECHNICAL EXPLORATION PROGRAM

2.1 General

As part of the current study, WSP performed a geotechnical exploration program at the site to support the design of the proposed RNG facility. The geotechnical exploration program consisted of the following four components:

1) Site Reconnaissance.

2) Borings.

3) Percolation Testing.

4) Laboratory Testing.

The above-listed components of the geotechnical exploration program are discussed in Sections 2.2 through 2.5, respectively.

2.2 Site Reconnaissance

On July 28, 2022, WSP's field engineer performed visual reconnaissance of the site prior to the commencement of drilling activities. The primary purposes of the site reconnaissance were to become familiar with the existing surficial conditions of the site as well as to look for any surficial signs of abnormal or unexpected conditions such as groundwater seeps, evidence of landsliding, surface fault rupture, etc. The primary findings of WSP's site reconnaissance are summarized in Section 1.4.

2.3 Borings

WSP advanced geotechnical borings at the site on July 28 and 29, 2022, to evaluate the stratigraphy and characteristics of the existing subsurface materials. A total of six (6) borings (SS-B1 through SS-B6) were drilled at the South Site and a total of five (5) borings (NS-B1 through NS-B5) were drilled at the North Site. The borings were drilled using a truck-mounted CME-75 hollow stem auger rig to final depths ranging from approximately 5 to 51 feet below the existing ground surface (bgs). Borings SS-B5, NS-B1, NS-B3, and NS-B4 were selected for in-situ percolation testing, as described further in Section 2.4. The locations of the borings for the South Site are shown on Figure 2 and the locations of the borings for the North Site are shown on Figure 3.

Prior to drilling, the boring locations were cleared of existing underground utilities by Underground Service Alert (i.e., the 811 call center). In addition, WSP subcontracted Ground Penetrating Radar Systems Inc. (GPRS) to use portable ground penetrating radar equipment to locate any existing underground utilities near each boring location. Prior to the start of drilling on July 28, 2022, and under the direct observation of WSP, GPRS verified that the area within a 10-foot radius of each boring location was clear of underground utilities. A subsurface drilling permit was not required for the current study.

Soil/rock samples were primarily obtained using a standard penetration test (SPT) split spoon sampler. This sampler consists of a 2.0-inch outside diameter (O.D.), 1.4-inch inside diameter (I.D.) split barrel driven a total of 18 inches (or to refusal) into the soil/rock at the bottom of the boring. Soil/rock collected inside the split barrel sampler was visually classified in the field, placed in sealed plastic bags, and stored for future reference and potential laboratory testing.

A Modified California (MC) sampler was also used on occasion to obtain samples of the soils encountered. This sampler consists of a 3.0-inch O.D., 2.4-inch I.D. split barrel driven a total of 18 inches (or to refusal) into the soil at the bottom of the boring. Three 2.4-inch diameter, 6-inch long brass rings were located inside the split barrel sampler and were used to retain soil for visual classification in the field and potential laboratory testing.

Bulk disturbed samples of the near-surface soils (i.e., within the upper 10 feet) were collected from the auger cuttings of borings NS-B2, NS-B5, SS-B4, and SS-B5. These samples were placed in sealed 5-gallon buckets.

Both the MC and SPT samplers were driven into the soil using an automatic 140-pound hammer free-falling a vertical distance of 30 inches. The total number of hammer blows required to drive the sampler the final 12 inches is termed the "blow count." The procedures employed in the field were generally consistent with those described in ASTM D1586 for the SPT and ASTM D3550 for the MC. Refusal of the sampler was considered to be achieved when it took 50 hammer blows to advance the sampler 6 inches or less.

The logs of the borings for the current study are presented in Appendix A. The logs (Report of Borehole) describe the earth materials encountered and the samples obtained. The logs also show the boring number, drilling date, and the name of the WSP engineer that logged the boring. The soils were described in general accordance with ASTM D2487 (i.e., the Unified Soil Classification System). The boundaries between different soil/rock types shown on the logs are approximate because the actual transition between layers may be gradual.

Upon reaching its termination depth and after percolation testing was completed (if applicable), each boring was completely backfilled with the excavated soil cuttings. The borings were drilled by ABC Liovin Drilling of Signal Hill, California, under subcontract to WSP.

2.4 Percolation Testing

Percolation testing was performed in borings SS-B5, NS-B1, NS-B3, and NS-B4 for the purpose of evaluating design soil infiltration rates for potential subsurface stormwater infiltration at these locations. Upon reaching its termination depth, each of these borings was prepared for percolation testing.

Percolation testing for the proposed stormwater infiltration system was conducted in general conformance with the guidelines set forth by Riverside County (2011). Approximately 2 inches of pea gravel was placed at the bottom of the boring followed by the insertion of a 2-inch diameter PVC casing down the center of the boring. The PVC casing consisted of 5-foot long flush-threaded PVC pipe sections with the bottom 5-foot section having 0.02-inch slots (the remaining length of the casing was solid). After setting the casing, additional pea gravel was poured into the boring to fill the annular space between the PVC casing and the boring walls to approximately 5 feet above the bottom of the casing. Both the pea gravel and the casing were installed in the boring through the hollow stem auger as the auger was being slowly withdrawn from the boring.

After the hollow stem auger was completely removed from the boring, clean water was poured down the casing until the water level in the boring was at least five times the borehole radius (i.e., at least 20 inches) above the bottom of the boring. The water was allowed to seep out of the boring for a period of 25 minutes. After the initial 25-minute period, the water level was measured and then, if needed, clean water was poured down the casing to replenish the water level in the boring to approximately its initial level. After the second 25-minute period, the water level in the boring was measured and if the water level dropped more than 6 inches after both 25-minute pre-soak time intervals then the percolation testing commenced. If the water level drop during either of the 25-minute pre-soak periods did not drop by at least 6 inches, then the boring was allowed to soak overnight and the percolation test was performed the following day. Of the four borings that were tested, only boring NS-B1 achieved water level drops of at least 6 inches for the two 25-minute periods.

Upon completion of the required pre-soak period, the percolation test in each boring was performed by pouring clean water down the PVC casing and then measuring the rate at which the water level in the boring dropped. The water level in the boring was measured using an electronic water level indicator along with a fixed reference point (i.e., the top of the PVC casing) from which to measure the depth to water. At the start of the percolation test, the height of the water column in the boring was at least 5 times the boring radius (i.e., at least 20 inches) above the bottom of the boring. The water level in the boring was measured every 10 minutes for a total period of 1 hour for tests that did not require pre-soaking overnight and was measured every 30 minutes for a total period of 6 hours for tests that required pre-soaking overnight. At the end of each time interval, additional clean water was poured down the PVC casing as needed to raise the water level in the boring to approximately its original level.

The tested infiltration rate in each boring was calculated using the drop in water level that occurred during the final time interval. The tested infiltration rates, as well as the design infiltration rates, calculated for each boring of the current study are shown on the percolation test data sheets presented in Appendix D. The percolation test results are discussed further in Section 4.5.2.

2.5 Laboratory Testing

Representative soil samples retrieved during the field exploration program were selected by WSP and transported to a geotechnical laboratory for testing. The laboratory testing was performed by Hushmand Associates, Inc. (HAI) of Irvine, California, for the purposes of:

- Substantiating visual field classifications.
- Providing engineering parameters necessary for geotechnical design.

Laboratory testing consisted of grain size distribution (ASTM D6913), Atterberg limits (ASTM D4318), expansion index (ASTM D4829), modified Proctor compaction (ASTM D1557), swell/collapse potential (ASTM D4546), and chemical testing to evaluate soil corrosivity (CTM 417, 422, and 643). Results of the laboratory testing are presented in Appendix C.

2.6 Previous 2017 Geotechnical Study

In addition to the geotechnical exploration program performed by WSP as part of the current study, results of a previous geotechnical exploration program at the site were used in the analyses for the current scope. Golder Associates Inc. (Golder) advanced three geotechnical borings (B-143, B-144, and B-145) within the proposed footprint of the North Site in October 2017 at the locations shown on Figure 3. Percolation testing was performed in two of these borings (B-143 and B-145) using the same general methods as described in Section 2.4. Appendix B presents the logs of borings B-143, B-144, and B-145 while Appendix E presents the results of the previous percolation testing in borings B-143 and B-145. This previous study was performed to support the design of proposed stormwater basins at the site and is documented in Golder (2018). The results of borings B-143, B-144, and B-145 were used during the current study to supplement the data obtained from WSP's current scope.

3.0 GEOLOGIC AND SUBSURFACE CONDITIONS

3.1 Regional Geologic Setting

The site is located in the central portion of the Lake Mathews quadrangle and within the Peninsular Ranges geomorphic province of Southern California (CGS 2002). The Peninsular Ranges geomorphic province comprises a series of ranges separated by northwest trending valleys and faults branching from and subparallel to the San Andreas Fault. The Peninsular Ranges extend into lower California and are bound on the west by the Pacific Ocean and on the east by the Colorado Desert. The province also includes the Los Angeles Basin and the Channel Islands, together with the surrounding continental shelf.

The site is located within the Perris structural block that is bounded by the Elsinore Fault to the west and the San Jacinto Fault to the east. The Temescal Valley to the west of the site is a structural depression that is bound on the west side by the Glen Ivy north and south sections of the Elsinore Fault. These faults lie within the Elsinore Trough that includes Lake Elsinore.

The Perris block is composed of basement rocks consisting of metasedimentary rocks of the Bedford Canyon Formation and intrusive crystalline rocks of the Southern California batholith. The basement rocks are overlain by Tertiary and Quaternary sedimentary deposits that are in turn mantled by recent surficial deposits and soils.

3.2 Site Geology

Several previous geotechnical/geologic investigations have been performed at the ESL. HAI (2016) provides a summary of many of the previous investigations at the site, as well as the local geologic conditions at the landfill. HAI (2016) indicates that the majority of the ESL is underlain by the Jurassic-aged, weakly metamorphosed sediments of the Bedford Canyon Formation. The Jurassic rocks consist of interbedded mudstone, sandstone, shale, and conglomerate that have undergone low-grade metamorphism to form metasedimentary argillite, quartzite, meta-breccia, and meta-sandstone. In some portions of the ESL site, the Bedford Canyon Formation is capped by materials of the Lake Mathews Formation. However, these areas are south/southeast of the proposed location of the RNG facility.

The geologic map prepared by Morton et al. (2001) corroborates the geologic information presented by HAI (2016) and indicates that the entire area of the proposed RNG facility as well as the surrounding vicinity is underlain by units of the Bedford Canyon Formation.

3.3 Generalized Subsurface Conditions

Based on the results of WSP's current geotechnical exploration program and on the subsurface information contained in Golder (2018), the areas of the proposed RNG facility are underlain by the following geologic units:

- South Site: This location is underlain by a surficial layer of very stiff to hard lean clay with varying amounts of sand that is in turn underlain by fractured argillite bedrock of the Bedford Canyon Formation to the maximum depth explored (approximately 51 feet bgs). The thickness of the surficial lean clay layer was approximately 3 to 8 feet at the locations of the borings. The argillite bedrock was observed to be weakly metamorphosed, highly fractured, and moderately to slightly weathered. SPT blow counts in the argillite were all very high (i.e., greater than 50). In the unpaved areas of the South Site, the existing ground surface was generally observed to be covered with a surficial aggregate base layer.
- North Site: This location was previously graded to form a relatively level pad, and in doing so the central portion of the graded pad is underlain by bedrock while the northern and southern portions of the pad are

underlain by fill. The bedrock is comprised of fractured argillite of the Bedford Canyon Formation that is similar to that underlying the South Site. The fill appeared to consist of reworked native materials from the site and it generally consists of clayey sand/gravel that is medium dense. The fill thickness is very thin (less than 2 feet) at the locations of borings NS-B3, NS-B4, and NS-B5 and increases to approximately 20 to 25 feet thick at the location of boring NS-B2 in the northern portion of the pad and approximately 10 feet thick at the location of boring B-143 in the southern portion of the pad. In the unpaved areas of the North Site, the existing ground surface was generally observed to be covered with a surficial aggregate base layer.

Due to the developed nature of both the South Site and North Site, it is expected that localized zones of fill soils (in addition to the fill soils described already) will be encountered during grading in existing utility trenches, under foundations, or in other areas. Similarly, man-made obstructions such as the existing concrete pads, utilities, and other structures are present within the footprint of the proposed RNG facility.

3.4 Groundwater

Groundwater was not encountered in any of the borings drilled for the current study, which reached depths of 51 feet bgs. The argillite encountered in the borings was observed to be dry. In addition, groundwater was not encountered in borings B-143, B-144, and B-145 that were drilled by Golder up to depths of 25.8 feet bgs within the North Site in October 2017.

The ESL has several active groundwater monitoring wells that are routinely measured as part of the landfill's monitoring program stipulated by the regulators. Based on the results of the groundwater monitoring data, SCS Engineers (SCS 2022) presents groundwater elevation contour maps for the entire landfill property. The groundwater elevation contour maps prepared by SCS (2022) indicate the following:

- The groundwater level is located at a depth of approximately 90 to 100 feet bgs at the South Site.
- The groundwater level is located at a depth of approximately 150 feet bgs at the North Site.

Based on the reported groundwater level data in SCS (2022), it appears that the groundwater levels at the landfill can fluctuate seasonally by about 10 feet.

In light of the above, WSP considers the groundwater level within the proposed areas of the RNG facility to be at least 80 feet bgs. Therefore, groundwater is not anticipated to impact the construction of the proposed RNG facility.

3.5 Historical Seismicity and Active Faults

Instrumental and reported historical records from the early 20th Century through October 2022 reveal that at least 375 earthquakes of magnitude $M \geq 4.0$ have epicenters located within about 62 miles (100 kilometers) of the site. Earthquake magnitudes and epicenter locations were taken from the ANSS Comprehensive Earthquake Catalog (ComCat) maintained by the U.S. Geological Survey (USGS) (https://earthquake.usgs.gov/earthquakes/search). The large number of recorded earthquakes in the region and their magnitudes indicate that the proposed RNG facility is located in an area where future earthquake activity and strong ground shaking can be expected.

Active faults have not been mapped within the ESL property boundary (CDMG 1980). The nearest mapped active fault to the site is the Elsinore Fault, which is located approximately 3.1 miles to the southwest at its closest approach to the site.

3.6 Landslide Hazards

No landslides have been mapped in the vicinity of the proposed RNG facility and no evidence of landsliding has been observed in these areas. In addition, the subsurface conditions encountered at the site did not indicate any signs of potential landslide hazards (e.g., continuous bedding planes, weak layers, etc.). Given the subsurface conditions encountered, the field observations made during the geotechnical exploration program, and the lack of significant grading that is anticipated for the proposed RNG facility, the risk of landsliding in the native materials at and surrounding the proposed locations of the RNG facility is considered to be low.

4.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

4.1 Geotechnical Feasibility

Based on the results of the field exploration, laboratory testing, and geotechnical analyses performed, WSP considers that it is feasible from a geotechnical standpoint to construct the proposed RNG facility provided the recommendations presented in this report are incorporated into the facility's design and construction.

4.2 Seismic Design

4.2.1 General

The proposed RNG facility will be located in a seismically active region of Southern California. Therefore, the proposed RNG facility is expected to be subjected to seismic hazards during its design life. Potential seismic hazards include strong ground shaking, ground surface rupture due to faulting, liquefaction and seismic settlement, and tsunamis and/or seiches. The following sections discuss these potential seismic hazards with respect to the proposed RNG facility.

4.2.2 Seismic Design Criteria

The bases for the 2022 California Building Code (CBC) seismic design are 5%-damped spectral accelerations for 0.2 seconds (S_S) and 1 second (S_1) at a rock site (Site Class B). These 5%-damped spectral accelerations are established for a risk-targeted maximum considered earthquake (MCE_R). Typically, the MCE_R spectral accelerations have a mean return period of 2,475 years (i.e., 2% probability of being exceeded in 50 years). At some locations, the 2,475-year ground motions are capped by deterministic ground motions. The values for S_S and S_1 were evaluated using the U.S. Seismic Design Maps website (https://www.seismicmaps.org) provided by the Structural Engineers Association of California. Site coefficients (F_a and F_v) are used to scale the spectral accelerations as a function of site class to develop a site-specific, 5%-damped acceleration response spectrum. Table 1 provides the recommended 2022 CBC seismic design parameters for the site based on the results of WSP's geotechnical exploration program and on Section 1613 of the 2022 CBC.

Table 1: 2022 California Building Code (CBC) Seismic Design Parameters

2022 CBC Seismic Design Parameter	Value
Site Class	C
5%-damped, 0.2-sec spectral acceleration (S_S)	2.14 g
5%-damped, 1-sec spectral acceleration (S_1)	0.85 g

2022 CBC Seismic Design Parameter	Value
Site Coefficient, F_a	1.2
Site Coefficient, F_v	1.4

4.2.3 Liquefaction Potential and Seismic Settlement

The proposed locations of the RNG facility are underlain by bedrock at relatively shallow depths (generally within the upper 25 to 30 feet bgs). In addition, the groundwater table is considered to be at least 80 feet bgs within the proposed footprint of the RNG facility (see Section 3.4). Therefore, the liquefaction potential of the earthen materials underlying the proposed locations of the RNG facility is considered to be negligible.

Similarly, seismic compaction settlements of the unsaturated subsurface materials underlying the proposed RNG facility are anticipated to be insignificant due to the generally dense or stiff/hard nature of the surficial soils and the presence of relatively shallow bedrock underlying the surficial soils. It is anticipated that engineered fill used in the construction will be derived from the on-site surficial soils and compacted. Hence, seismic compaction settlements of engineered fill should also be insignificant.

4.2.4 Surface Fault Rupture

There have been no reported observations of potential scarps or other field indications of modern or Holocene faulting within the site. The nearest mapped active fault to the site is the Elsinore Fault, which is located approximately 3.1 miles to the southwest at its closest approach to the site (Section 3.5). The site is not located in an Alquist-Priolo Earthquake Fault Zone (CDMG 1980; Bryant et al. 2002) and no known active faults trend across or toward the site. Therefore, the probability of surface fault rupture occurring at the locations of the proposed RNG facility is considered very low.

4.2.5 Tsunamis and Seiches

Tsunamis are very large waves in the ocean caused by seismic events, landslides, or volcanic eruptions. Seiches are waves in lakes, bays, or gulfs that result from seismic events, landslides, or atmospheric disturbances. The distance of the proposed RNG facility from the Pacific Ocean and other large bodies of water and its elevation of greater than 1,190 feet amsl indicate that the probability of experiencing adverse effects from tsunamis and seiches is negligible at the site.

4.3 Foundation Design

4.3.1 General

WSP evaluated potential shallow foundation systems for the proposed RNG facility structures. Based on WSP's current understanding of the site's subsurface conditions and on information provided by Toro Energy (see Section 1.3), it is anticipated that the proposed RNG building, equipment, and other appurtenances can be supported on shallow foundations (i.e., footings and/or mats). The following sections present WSP's foundation recommendations.

4.3.2 General Shallow Foundation Recommendations

In order to mitigate against the collapse potential of the existing fill soils at the North Site (see Section 4.5) and to also provide a uniform bearing surface, the existing fill soils at the North Site should be removed to a minimum depth of 3 feet below the bottoms of all shallow foundations (both footings and mats) and then recompacted as engineered fill in accordance with the recommendations in Section 5.5. The overexcavation should extend beyond the limits of the foundations for a horizontal distance of at least 3 feet in all directions.

For the South Site, shallow foundations may bear directly on firm undisturbed native soils.

If a shallow foundation subgrade contains both fill/soil and bedrock, then the bedrock should be overexcavated to a depth of at least 1.5 feet below the bottom of the foundation and replaced with engineered fill in order to mitigate excessive differential settlements across the fill/soil-bedrock transition. The overexcavation of bedrock need not extend horizontally beyond the limits of the foundation. A foundation subgrade that is located entirely within bedrock need not be overexcavated.

It is essential that proper surface water drainage be provided to minimize the chance of water infiltrating into the earthen materials beneath and surrounding the foundations. Proper design measures must be taken to minimize changes in the moisture content of the earthen materials underlying and surrounding the proposed foundations. These measures include, but are not limited to, properly controlling surface water around the structures (e.g., sloping the ground surface away from the structures and their foundations) and minimizing the potential infiltration of water under and behind the structures (e.g., keeping sources of water away from the foundations, sealing planters that are located near buildings, etc.). Additional surface drainage recommendations are provided in Section 5.3.

The foundations for the proposed RNG facility structures should be set back from the crests of slopes that are inclined steeper than 20%. The offset distance, as measured horizontally from the outside edge of the foundation to the slope face, should be at least one-third of the vertical slope height or 40 feet, whichever is less.

4.3.3 Recommended Design Criteria for Shallow Footing Foundations

Shallow spread or continuous footing foundations may be used to support the proposed RNG facility structures. The depth of engineered fill below the bottom of the footings should be as described in Section 4.3.2. WSP recommends the following design criteria for footings:

- The bottom of each footing should be embedded at least 2 feet below the lowest adjacent grade.
- Shallow spread footings should have a minimum dimension of 2 feet.
- Shallow continuous footings should have a minimum width of 1.5 feet.
- Design footings using a maximum static vertical allowable bearing pressure of 2,000 psf for footings bearing on engineered fill or firm, undisturbed native soils. This recommended allowable bearing value is for total dead plus live loads and may be increased by one-third for wind, seismic, or other transient loading conditions.
- The allowable bearing pressure of 2,000 psf will result in an estimated total static settlement of one inch or less. Differential, post-construction settlements between adjacent supports with similar loading conditions are not expected to exceed 0.5 inches.

Footing foundations located below grade may derive lateral load resistance from passive resistance along the vertical sides of the foundations, friction acting on the bases of the foundations, or a combination of the two. An allowable passive resistance of 160 psf per foot of depth up to a maximum of 2,000 psf may be used for design. The allowable passive resistance is based on a static factor of safety of 2. The factor of safety may be reduced for seismic or other transient loading conditions. However, the selection of the appropriate factor of safety is left to the structural engineer. WSP recommends that the upper 1 foot of soil cover be neglected in the passive resistance calculations. An allowable friction factor of 0.20 between the bases of the concrete foundations and the engineered fill or native soils can be used for sliding resistance using the dead load forces. This frictional resistance has been reduced from its ultimate value using a factor of safety of 2. Friction and passive resistance may be combined without reduction. The passive resistance and friction factor are based on the native on-site soils. If other soils or borrow materials are used, then these values may vary.

4.3.4 Recommended Design Criteria for Shallow Mat Foundations

Mat (i.e., slab) foundations may be used to support the proposed structures. The depth of engineered fill below the bottom of the mat should be as described in Section 4.3.2. The bottom of the mat foundation should be embedded at least 2 feet below the lowest adjacent grade (a turned down slab edge may be used to meet this criterion).

A maximum allowable static vertical bearing pressure of 1,500 psf may be used to design mat foundations for total dead plus live loads and may be increased by one-third for wind, seismic, or other transient loading conditions. The allowable bearing pressure of the mat foundation is controlled by settlement, not bearing capacity. Under the allowable bearing pressure of 1,500 psf, the total estimated static settlement of the mat foundation is anticipated to be one inch or less. Differential, post-construction static settlements are not expected to exceed 0.5 inches over a horizontal distance of 30 feet.

Mat foundations located below grade may derive lateral load resistance from passive resistance along the vertical sides of the foundations, friction acting on the bases of the foundations, or a combination of the two. An allowable passive resistance of 160 psf per foot of depth up to a maximum of 2,000 psf may be used for design. The allowable passive resistance is based on a static factor of safety of 2. The factor of safety may be reduced or increased for seismic or other transient loading conditions. However, the selection of the appropriate factor of safety is left to the structural engineer. An allowable friction factor of 0.20 between the base of the concrete mat foundation and engineered fill subgrade can be used for sliding resistance using the dead load forces. This frictional resistance has been reduced from its ultimate value using a factor of safety of 2.

The modulus of subgrade reaction concept can be used in the design of the mat foundations. The modulus of subgrade reaction is not an intrinsic property of the soil since it also depends on the dimensions and stiffness of the mat foundation and the stress level. The modulus of subgrade reaction can be calculated as follows:

$$k = k_1 \left(\frac{B+1}{2B}\right)^2$$

where:

k = static, vertical modulus of subgrade reaction for the loaded mat foundation

k_1 = static, vertical modulus of subgrade reaction for a 1-foot diameter loaded area

B = effective diameter of the mat foundation's reaction area (in feet), given by the following equation:

$$B = \frac{4h}{\pi}\left(\frac{E}{E_S}\right)^{0.33}$$

where:

h = mat foundation thickness (in feet)

E = elastic modulus of the concrete mat

E_S = elastic modulus of subgrade soil

WSP recommends that a k_1 of 150 kips per cubic foot (kcf) and an E_S of 200 kips per square foot (ksf) be used to evaluate the modulus of subgrade reaction for mat foundations bearing on either engineered fill or native soils. For mat foundations bearing on bedrock, WSP recommends that a k_1 of 1,000 kcf and an E_S of 800 ksf be used to evaluate the modulus of subgrade reaction.

4.4 Slab-on-Grade Floors

Conventional concrete slab-on-grade floors may be used for the proposed RNG building. It is recommended that the uppermost 1 foot of the floor subgrade be scarified, moisture conditioned, and compacted as engineered fill per Section 5.5 in order to provide a uniform bearing surface.

A vapor barrier and capillary break can be constructed beneath slabs-on-grade to reduce moisture migration through the slabs, if this reduction in moisture migration is desired (e.g., in office areas). A vapor barrier is a layer of material used to inhibit or prevent the absorption of moisture into a structure. The vapor barrier should be covered with 2 inches of clean sand (i.e., no greater than 5% passing the U.S. No. 200 sieve) to protect the vapor barrier during construction. The vapor barrier should be underlain by 4 inches of clean sand or rounded/subrounded gravel. Areas adjacent to buildings, including any planters, should be designed to drain away from the buildings to avoid infiltration of water around and beneath the buildings.

4.5 Expansion and Collapse Potential

A soil sample from boring NS-B1 collected from a depth of approximately 2.5 to 4 feet bgs and a soil sample from boring SS-B1 collected from a depth of approximately 3 to 4 feet bgs were subjected to expansion index testing per ASTM D4829. The results of the laboratory expansion index testing on these samples, which are presented in Appendix C, yielded an expansion index value of 13 for the sample from boring NS-B1 and an expansion index value of 72 for the sample from boring SS-B1. An expansion index value of 13 is indicative of a “very low” potential for expansion while an expansion index value of 72 is indicative of a “medium” potential for expansion. Therefore, no special measures to address soil expansion potential are required for the North Site. However, the following features should be incorporated into the project’s design for the South Site:

- Provide hardscape (e.g., concrete apron) around each foundation for a minimum horizontal distance of 5 feet out from the edge of the foundation. WSP understands that the entire South Site is planned to be covered with a concrete slab-on-grade, which would satisfy this recommendation. The joint between the foundation and slab-on-grade should be sealed to prevent moisture infiltration through the joint and into the underlying soil.
- Provide positive surface water drainage away from all slabs-on-grade and foundations, as described in Section 4.3.2.
- Establish the bases of footings and mats at least 2 feet below the lowest adjacent grade, as described in Sections 4.3.3 and 4.3.4.

It is noted that the argillite bedrock materials at the site are not considered to be expansive due to their metamorphosed lithology.

A sample of the existing fill soil from boring NS-B2 collected from a depth of approximately 3.5 to 4 feet bgs and a soil sample from boring SS-B4 collected from a depth of approximately 3 to 4 feet bgs were subjected to swell/collapse testing per ASTM D4546. The results of these laboratory tests, which are presented in Appendix C, indicated that the fill at the North Site is susceptible to collapse when wetting while the native soil at the South Site has low susceptibility to collapse. Therefore, WSP recommends that the existing fill soils at the North Site be overexcavated and recompacted below foundations as described in Section 4.3.2 to mitigate the collapse potential.

4.6 Subsurface Stormwater Infiltration

4.6.1 General

This section presents recommendations pertaining to the design of potential subsurface stormwater infiltration structures for the proposed RNG facility. These structures are anticipated to consist of infiltration trenches, infiltration galleries, or other comparable systems that infiltrate stormwater into the subsurface earthen materials. It is WSP's understanding that all stormwater would be pretreated before being discharged into the subsurface infiltration structure(s).

4.6.2 Design Infiltration Rates

The percolation test data sheets presented in Appendices D and E present the results of the field percolation tests and the methods used to calculate the design infiltration rates. Specifically, WSP (and Golder for the 2017 tests) calculated the tested infiltration rate by using the Porchet equation in conjunction with the measured percolation rates and then divided the tested infiltration rate by a factor of safety of 3.0 to yield the design infiltration rate. The factor of safety of 3.0 is per Riverside County (2011) guidelines. The design infiltration rates for each boring are summarized in Table 2.

Table 2: Design Infiltration Rates

Boring No.	Depth of Percolation Test (feet bgs)	Design Infiltration Rate (inches/hour)
SS-B5	14	0.0
NS-B1	14	0.3
NS-B3	14	0.1
NS-B4	5	0.2
B-143	10	0.0
B-145	10	0.6

4.6.3 Recommendations

The proposed stormwater infiltration structures should be sized using the design infiltration rates presented in Table 2 and should have invert elevations that are within the layer tested. As can be seen in Table 2, the design infiltration rates for some of the borings are very low, and it is recommended that infiltration not be relied upon for structures having a design infiltration rate of less than 0.3 inches/hour. Based on the results of the borings, the materials in which the percolation tests were performed generally extend to sufficient depths below the proposed infiltration depths.

As discussed in Section 3.4, the groundwater level at the proposed location of the RNG facility is considered to be at least 80 feet bgs. Hence, there is anticipated to be sufficient separation between the stormwater infiltration depth and the highest groundwater level that would be expected to occur.

All stormwater infiltration structures shall be offset a minimum horizontal distance of 30 feet from the nearest edge of a structural foundation such that no stormwater is infiltrated within 30 feet of a foundation. In addition, the stormwater infiltration facilities shall be offset a minimum horizontal distance of:

- 40 feet from the toe or crest of any permanent cut or fill slopes.
- 50 feet from any groundwater monitoring well or perimeter landfill gas monitoring well.
- 30 feet from any existing on-site wastewater treatment system.

The proposed stormwater infiltration structures are not expected to significantly increase the risk of exposure to potential geotechnical hazards at the site, such as liquefaction, slope instability, and soil collapse/expansion. In addition, there are no known contaminated materials underlying the proposed location of the RNG facility. Therefore, pollutant mobilization due to subsurface stormwater infiltration is not expected.

During construction, it should be verified that the stormwater infiltration structures are established in the appropriate layers and that no unexpected impermeable layers are present at the infiltration depth(s).

Ongoing periodic maintenance of the stormwater structures will be of upmost importance. In particular, each stormwater structure should be cleaned of accumulated sediments and debris prior to each rainy season.

4.7 Soil Corrosivity

Two near-surface soil samples, one from boring NS-B2 and the other from boring SS-B4, were subjected to laboratory corrosivity testing (resistivity, pH, chloride content, and sulfate content). The results of this testing are as follows (see Appendix C):

- Minimum resistivity = 1,407 ohm-cm (NS-B2) and 1,675 ohm-cm (SS-B4)
- pH = 7.9 (NS-B2) and 3.8 (SS-B4)
- Chloride content = 171 ppm (NS-B2) and 101 ppm (SS-B4)
- Sulfate content = 318 ppm (NS-B2) and 1,798 ppm (SS-B4)

According to the 2021 Caltrans Corrosion Guidelines (Caltrans 2021), a minimum resistivity value for soil of less than 1,000 ohm-cm indicates a generally corrosive environment. For structural elements, Caltrans considers a site corrosive if one or more of the following conditions exists:

- Chloride concentration of 500 ppm or greater, or
- Sulfate concentration of 1,500 ppm or greater, or
- pH of 5.5 or less.

Based on the above criteria, WSP considers the existing native soils at the South Site to be corrosive to buried concrete and metallic structures and the existing soils at the North Site to be generally non-corrosive to concrete. Therefore, WSP recommends that Type V cement be used for concrete elements that will be in contact with earthen materials at the South Site and Type II cement be used for the North Site. WSP recommends that the soil corrosivity test results be reviewed by the structural engineer and/or a qualified corrosion engineer to determine if any additional measures should be taken to protect concrete and metallic elements that will be in contact with the earthen materials at the site.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 General

Site preparation and earthwork operations should be performed in accordance with all applicable codes and ordinances. In this report, all references to maximum dry density and optimum moisture content refer to those values obtained in accordance with ASTM D1557 (the “modified Proctor” compaction test).

All earthwork operations should be observed and tested by a WSP representative.

5.2 Site Preparation

Existing debris and obstructions should be removed from within the footprints of the proposed structures and all areas to be graded. Any existing underground structures (such as abandoned utilities) should be completely removed from areas underlying foundations and slabs-on-grade.

Exposed deleterious, vegetative, inert, and oversized materials (materials greater than 6 inches in maximum dimension) partially exposed at the subgrade elevation should be stripped and isolated prior to removal of reusable soils. The soil exposed in excavation subgrades should be observed by WSP to confirm that the soil has the desired engineering properties. Additional removals may be required as a result of observation and testing of the exposed subgrade soil.

If contaminated soils are encountered, the suspect soils should be stockpiled separately. The stockpiled soils should be placed on plastic and covered with plastic. These soils will have to be sampled and tested to identify the proper disposal method.

Prior to placement of the first lift of engineered fill on a soil subgrade, the upper 8 inches of the exposed soil subgrade should be brought to within 3% of its optimum moisture content and compacted to a minimum of 90% (95% under slabs-on-grade and foundations) of its maximum dry density as determined by ASTM D1557 to provide a uniform bearing surface.

If the subsurface conditions exposed during grading operations vary from those described in this report, WSP should be notified immediately as a revision of the recommendations contained herein may be necessary.

5.3 Surface Drainage

Proper surface drainage is critical to the acceptable performance of the project. Uncontrolled infiltration of stormwater runon/runoff, irrigation excess, and/or water from other sources into the soils can adversely affect the performance of the planned improvements. Saturation (or near saturation) of soil can cause it to lose internal shear strength, thereby increasing its compressibility and resulting in a detrimental and undesirable change in its engineering properties. Proper positive surface drainage should be maintained at all times both during and after the construction of the proposed development. During construction, the contractor(s) will be responsible for controlling surface drainage at the site. The contractor(s) should prepare the site in an acceptable manner prior to anticipated storm events such that surface water is not allowed to pond within the project's footprint, especially on or near building pads, pavement subgrades, and near walls or slopes. In addition, surface water should never be allowed to flow uncontrolled over the crests of slopes and down the slope faces.

5.4 Excavation Characteristics

The borings drilled at the site for the current study were advanced using a truck-mounted CME-75 hollow-stem auger drill rig. Drilling was generally completed with moderate to high effort through the existing native soils and fractured argillite bedrock. Therefore, conventional earth moving equipment should be capable of performing the vast majority of the excavations required for the development of the proposed RNG facility. While not encountered during the geotechnical exploration described herein, it is possible that localized hard, cemented, or other unrippable materials may be encountered during excavation activities. Appropriate contingencies should be made for the scenario of encountering unrippable materials at shallow depths, especially for the North Site.

5.5 Engineered Fill

WSP anticipates that the majority of the existing on-site native soils may be reusable as engineered fill. Particles greater than 6 inches in maximum dimension should be removed or crushed and any vegetative, expansive, and deleterious material and debris should be removed. Engineered fill should be well-graded material that is placed in lifts no greater than 8 inches thick (loose measurement) and compacted to:

- At least 95% of its ASTM D1557 maximum dry density in areas underlying foundations or slabs-on-grade.
- At least 90% of its ASTM D1557 maximum dry density elsewhere (e.g., for minor grading, trench backfill, etc.).

Existing on-site soil used as engineered fill should be placed at a water content that is within 3% of its optimum moisture content, as evaluated from ASTM D1557. In addition, the uppermost 2 feet of engineered fill material underlying foundations and slabs-on-grade, and all engineered fill placed above this level within the structure footprint, should have a maximum particle size of 2 inches. The maximum particle size of 2 inches also applies to engineered fill that will be excavated at a later time for the installation of underground utilities and/or structures.

In all areas in which engineered fill is to be placed on a surface having a slope greater than 20%, the fill should be benched a minimum horizontal distance of 5 feet into existing competent material. Where fill slopes daylight above cut slopes, the fill slope shall daylight on a minimum 10-foot wide horizontal bench.

No backfill should be placed around concrete until all forms and shoring have been removed, and the concrete has cured sufficiently to withstand the loading incurred due to backfill, including the backfill placement and compaction operations.

Imported materials to be used as engineered fill, if required, should have the following characteristics:

- Be non-expansive (i.e., have an expansion index value less than 20).
- Be well-graded with no less than 70% passing the ¾-inch sieve and no greater than 30% of the particles passing the U.S. No. 200 sieve.
- Have no particles greater than 2 inches in maximum dimension.

- The percent passing the U.S. No. 40 sieve should have a plasticity index less than 15.
- Be non-corrosive to buried concrete and metallic structures.

If the imported materials deviate from the above-listed properties, then special earthwork recommendations may be required.

A preliminary shrinkage factor of 5 to 10% could be used for the native materials assuming that excavated oversized material would be broken down into smaller materials that could be used as engineered fill. This recommended range is a rough estimate only and should be used accordingly. The actual shrinkage and/or bulking values will be affected by several factors including the oversized particle content of the native soils, the nature of any imported fills, the waste quantities during handling, the amount of debris and other unsuitable material in the existing soils, local in-situ densities, actual compactive effort used in the field, etc.

5.6 Temporary Excavations

Shallow, temporary utility trench excavations may be required for installation of new utility lines. If very steep or vertical-sided excavations deeper than 4 feet are necessary, WSP recommends that the sidewalls be braced and shored in accordance with Cal/OSHA standards and all other applicable safety ordinances and codes to provide temporary trench stability during construction. The contractor will be responsible for the structural design and safety of the temporary shoring system and it is recommended that this design be submitted to WSP for review. The design of the temporary shoring system should account for all surcharge loads. The contractor is ultimately responsible for site safety. All excavations should be evaluated for stability prior to occupation by construction personnel.

Due to the potential for local instability, WSP recommends that temporary cutslopes needed to achieve the proposed subgrade elevations be constructed at inclinations no steeper than 1.5H:1V (horizontal:vertical) in both the native materials and fills. Temporary fill slopes (e.g., for stockpiles) should be constructed at inclinations no steeper than 2H:1V.

Heavy construction loads, such as those resulting from material stockpiles or heavy machinery, should be set back from the top of all temporary excavations a minimum distance equal to the depth of the excavation unless the excavation is specifically designed by a qualified professional engineer to accommodate these additional surcharge loads. All surface water should be diverted away from excavations (see Section 5.3).

5.7 Pipe Bedding and Trench Backfill

Pipe bedding should consist of sand, gravel, or similar granular material that has 100% of its particles passing the 0.5-inch sieve and a minimum sand equivalent value of 30. The pipe bedding material should be placed in a zone that extends a minimum of 6 inches below and 12 inches above the pipe for the full trench width. If the bedding material is sand, it should be compacted to a minimum of 90% of its ASTM D1557 maximum dry density. If the bedding material is gravel, then it should be tamped to a firm condition.

Trench backfill above the pipe bedding may consist of approved on-site or import soils placed in lifts no greater than 8 inches loose thickness and compacted to at least 90% of its maximum dry density at a water content within 3% of its optimum moisture content, as evaluated per ASTM D1557. Jetting of pipe bedding or trench backfill materials shall not be permitted.

Where utility trenches enter under a building or structural foundation/slab, a minimum 5-foot long seepage plug should be installed in the trench to prevent water within the pipe bedding material from flowing under the building/structural foundation. The seepage plug can consist of clay, grout, or another approved low permeability material.

6.0 ADDITIONAL SERVICES

WSP should review the project's construction documents before they are finalized. This review is necessary to verify that the geotechnical recommendations contained in this report have been properly interpreted and implemented into the project's design. If WSP does not perform this review, then WSP will assume no responsibility for misinterpretation of the geotechnical recommendations provided herein.

The construction process is an integral design component with respect to the geotechnical aspects of a project. Geotechnical engineering is not an exact science because of the variability of natural processes. Only a very small portion of the subsurface materials that will affect the performance of the proposed project have been observed, sampled, and tested. Unanticipated or changed conditions can occur during grading and excavating (see Appendix F). Proper geotechnical observation and testing during construction is necessary to allow the geotechnical engineer the opportunity to verify design assumptions. Therefore, WSP should be retained during site grading and construction to observe compliance with the design concepts and geotechnical recommendations contained herein. WSP can recommend design changes if subsurface conditions or methods of construction differ from those assumed in this report.

7.0 LIMITATIONS

This report has been prepared for the exclusive use of Toro Energy for the proposed RNG facility at the El Sobrante Landfill in Riverside County, California. The findings, conclusions, and recommendations presented in this report were prepared in a manner consistent with that level of care and skill ordinarily exercised by other members of the geotechnical engineering profession currently practicing under similar conditions subject to the time limits and financial, physical, and other constraints applicable to the scope of work. No warranty, express or implied, is made.

WSP should review the project's final plans to verify that the geotechnical borings were properly located. Section 1.2 and Appendix F contain further information regarding the proper use and interpretation of this geotechnical report.

The project's owner has the responsibility to see that all parties to the project, including the designers, contractors, subcontractors, etc., are made aware of this report in its entirety. This report contains information that may be useful in the preparation of contract specifications and contractor cost estimates. However, this report is not written as a specification document and may not contain sufficient information for this use without proper modification.

8.0 REFERENCES

Bryant, W.A., Martin, R., Wong, P., Maldonado, D., Wampole, J., and Dixon, D., 2002, "GIS Files of Official Alquist-Priolo Earthquake Fault Zones, Southern Region," California Geological Survey, CD 2001-05.

California Department of Transportation (Caltrans), 2021, "Corrosion Guidelines, Version 3.2," February.

California Division of Mines and Geology (CDMG), 1980, "State of California, Special Studies Zones, Lake Mathews Quadrangle, Official Map," Effective January 1.

California Geological Survey (CGS), 2002, "California Geomorphic Provinces," California Geological Survey Note 36, 4 pp.

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Riverside County Flood Control and Water Conservation District (Riverside County), 2011, "Design Handbook for Low Impact Development Best Management Practices," September.

SCS Engineers (SCS), 2022, "Spring-Summer 2022 Semiannual Groundwater Monitoring Report, El Sobrante Landfill, Corona, California," October.

FIGURES

Path: ## | File Name: Figure 1.dwg

SCALE IN FEET

2,000 0 2,000 4,000

CLIENT
TORO ENERGY, LLC
5900 SOUTHWEST PARKWAY, BUILDING 2, SUITE 220
AUSTIN, TX 78735

CONSULTANT

YYYY-MM-DD	2022-11-14
PREPARED	K. KAVLI
DESIGN	--
REVIEW	R. HILLMAN
APPROVED	R. HILLMAN

PROJECT
GEOTECHNICAL EXPLORATION FOR PROPOSED RNG FACILITY
EL SOBRANTE LANDFILL - RIVERSIDE COUNTY, CALIFORNIA

TITLE

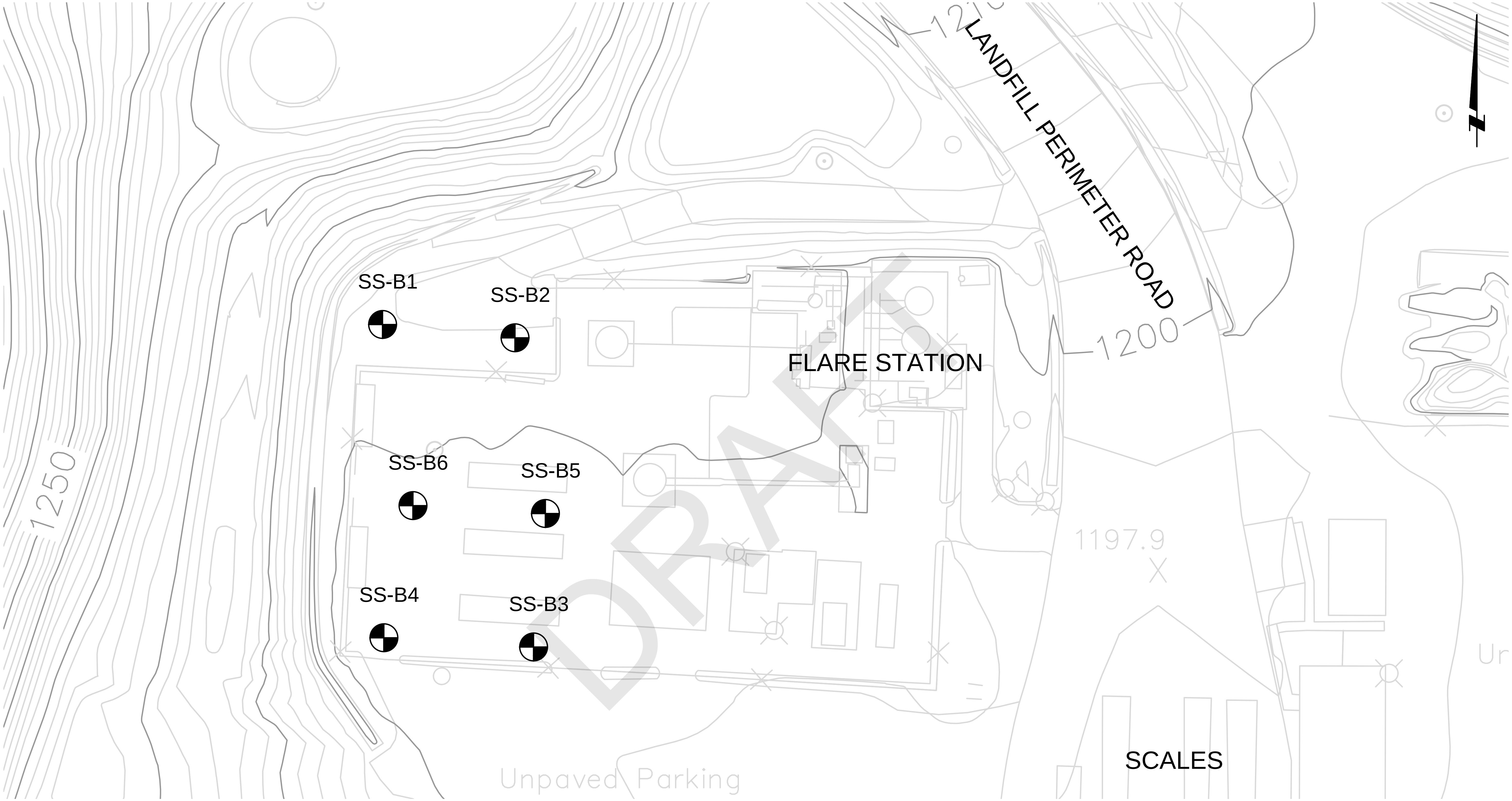
SITE LOCATION MAP

PROJECT No.	Rev.	FIGURE
31405562.000	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

1 in

0



Notes:
1. Background topography provided by Miller Creek Aerial Mapping, dated January 4, 2022.
2. Boring locations are approximate as the locations were not surveyed.

LEGEND

SS-B1 — DESIGNATION AND APPROXIMATE LOCATION OF BORING BY GOLDER (2022)

1330 — EXISTING GROUND SURFACE ELEVATION (10-FOOT AND 2-FOOT CONTOURS SCREENED BACK)

0 40 80

Scale in Feet

CLIENT
TORO ENERGY, LLC
5900 SOUTHWEST PARKWAY, BUILDING 2, SUITE 220
AUSTIN, TX 78735

CONSULTANT
wsp

YYYY-MM-DD	2022-11-14
PREPARED	K. KAVLI
DESIGN	--
REVIEW	R. HILLMAN
APPROVED	R. HILLMAN

PROJECT
GEOTECHNICAL EXPLORATION FOR PROPOSED RNG FACILITY
EL SOBRANTE LANDFILL - RIVERSIDE COUNTY, CALIFORNIA

TITLE
BORING LOCATION MAP (SOUTH SITE)

PROJECT No.	Rev.	FIGURE
31405562.000	0	2

Notes:
1. Background topography provided by Miller Creek Aerial Mapping, dated January 4, 2022.
2. Boring locations are approximate as the locations were not surveyed.

LEGEND

Symbol	Description
NS-B1 ◐	DESIGNATION AND APPROXIMATE LOCATION OF BORING BY GOLDER (2022)
B-143 ●	DESIGNATION AND APPROXIMATE LOCATION OF BORING BY GOLDER (2017)
——1330——	EXISTING GROUND SURFACE ELEVATION (10-FOOT AND 2-FOOT CONTOURS SCREENED BACK)

0 50 100
Scale in Feet

CLIENT
TORO ENERGY, LLC
5900 SOUTHWEST PARKWAY, BUILDING 2, SUITE 220
AUSTIN, TX 78735

CONSULTANT
wsp

YYYY-MM-DD	2022-11-14
PREPARED	K. KAVLI
DESIGN	--
REVIEW	R. HILLMAN
APPROVED	R. HILLMAN

PROJECT
GEOTECHNICAL EXPLORATION FOR PROPOSED RNG FACILITY
EL SOBRANTE LANDFILL - RIVERSIDE COUNTY, CALIFORNIA

TITLE
BORING LOCATION MAP (NORTH SITE)

PROJECT No.	Rev.	FIGURE
31405562.000	0	3

APPENDIX A

Boring Logs for Current Study

REPORT OF BOREHOLE: NS-B1

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.802 LON: -117.472
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/28/22
CHECKED: R. Hillman DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
Hollow Stem Auger			0							ML	SANDY SILT WITH GRAVEL, sand is fine to medium, mostly pea gravel up to 1 inch diameter, grayish-brown, medium dense			
											hard drilling			
					S-1		12 14 15				gravel at surface			
											appears we broke through rock			
			5		S-2		4 8 6				SANDY SILT WITH GRAVEL, fine to coarse sand, mostly fine sand, gravel up to 1 inch, brown to dark brown, dry, medium dense			
			10		S-3		6 11 11				medium dense to loose, low recovery			
				13.9							Bottom of borehole at approximately 13.9 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

DRAFT

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: NS-B2

Golder Associates

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.801 LON: -117.472
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/28/22
CHECKED: R. Hillman DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0		BS-1					SM	SILTY SAND WITH GRAVEL, fine to medium sand, gravel up to 1 inch diameter, sub-angular, tan/reddish-brown, dry, dense to very dense			
					S-1		39 27 23							
			5	4.0	S-2		6 6 9			GM	SILTY SANDY GRAVEL			
				6.5	S-3		15 16 24			SM	SILTY SAND WITH GRAVEL, fine to coarse sand, non plastic fines, angular gravel up to 1 inch, brown to dark brown, dense			
			10	10.0	S-4		6 6 7			SC	CLAYEY SAND WITH SOME GRAVEL, fine to course sand, plastic fines, dark brown to reddish-brown, moist, stiff			
			15	15.0	S-5		12 10 8			SM	SILTY CLAYEY SAND SOME GRAVEL, fine to medium sand, less clay than above, fine gravel up to 1/2 inch, moist, medium dense			
			20	20.0	S-6		6 19 30			ML	SANDY SILT WITH GRAVEL, fine to medium sand, mostly fine gravel, angular, oxidation present, mostly gray, dry, very dense			
			25	25.0	S-7		50/5"			22	possible contact with bedrock - ARGILLITE. half of sample is silty sand SAA half of sample is fractured angular gravel up to 1 inch, dark gray			
			30		S-8		50/5"				no recovery			
				30.4							Bottom of borehole at approximately 30.4 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: NS-B3

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.801 LON: -117.472
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/28/22
CHECKED: R. Hillman DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							SM	SILTY SAND WITH GRAVEL, fine to coarse sand, sub-angular to sub-rounded gravel up to 2 inches, brown-gray, dry, dense			
			5		S-1		26 50/6"				SILTY SAND TRACE GRAVEL, fine to coarse sand, gravel up to 1 inch, some geotextile in cuttings, brown, dry, dense, may have hit a rock (refusal)			
			10		S-2		7 24 32				increase in gravel			
					S-3		12 50/6"				medium dense to loose, may have hit rock			
				14.0							Bottom of borehole at approximately 14 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

DRAFT

Report of borehole must be read in conjunction with accompanying notes and abbreviations

GEOTECH WITH MATERIAL GRAPHICS AND USCS TORO ENERGY - WM- EL SOBRANTE LANDFILL.GPJ GINT STD US LAB.GDT 8/5/22

REPORT OF BOREHOLE: NS-B4

Golder Associates

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.801 LON: -117.472
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/28/22
CHECKED: R. Hillman DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							GW	SANDY GRAVEL SOME FINES, fine to coarse gravel, angular, fine to coarse sand, orange-brown, dry, very dense hard drilling, 1-5 feet, rufusal? possible bedrock was encountered, no SPT since we hit rock			
			5	5.0							Bottom of borehole approximately 5 feet due to auger refusal. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings. This is the second attempt at drilling NS-B4, about 3 feet away from previous boring.			

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: NS-B5

Golder Associates

CLIENT: Toro Energy, LLC	DRIVE WEIGHT: 140 lbs	SHEET: 1 OF 1	
PROJECT: El Sobrante LF RNG Geotech	DROP DISTANCE: 30 in	DRILLER: ABC Liovin Drilling, Inc	
LOCATION: El Sobrante Landfill	LAT: 33.801 LON: -117.472	DRILL RIG: CME-75	
PROJECT NO.:	ELEVATION: DATUM:	LOGGED: M. Gidula	DATE: 7/28/22
	BOREHOLE DIAMETER: 8 inches	CHECKED: R. Hillman	DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
			0		BS-1					SM	SILTY SAND WITH GRAVEL, fine to coarse sand, well graded, fine to coarse gravel, up to 1 inch, sub-angular to sub-rounded, mostly fine, brown, dry, dense to very dense			
					S-1		21 50/5"				increased silt, organic odor			
			5	5.0	S-2		41 50/6"			22	bedrock, possibly argillite, gray to dark gray rock			
				6.5							Bottom of borehole at approximately 6.5 feet due to auger rufusal. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

GEOTECH WITH MATERIAL GRAPHICS AND USCS TORO ENERGY - WM- EL SOBRANTE LANDFILL.GPJ GINT STD US LAB.GDT 8/5/22

REPORT OF BOREHOLE: SS-B1

CLIENT: Toro Energy, LLC	DRIVE WEIGHT: 140 lbs	SHEET: 1 OF 1	
PROJECT: El Sobrante LF RNG Geotech	DROP DISTANCE: 30 in	DRILLER: ABC Liovin Drilling, Inc	
LOCATION: El Sobrante Landfill	LAT: 33.794 LON: -117.475	DRILL RIG: CME-75	
PROJECT NO.:	ELEVATION: DATUM:	LOGGED: M. Gidula	DATE: 7/29/22
	BOREHOLE DIAMETER: 8 inches	CHECKED: R. Hillman	DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							ML	SILT WITH SAND TRACE GRAVEL, fine to medium sand, mostly fine, light to dark gray with reddish-brown oxidation, dry, very dense			
					S-1		14 21 45				initial cuttings consist of silty SAND, fine to medium sand, tan			
			5		S-2		37 50/5"				SILT WITH SAND TRACE GRAVEL, fine to coarse sand, light to dark gray, no oxidation, dry, very dense			
			10		S-3		5 25 35				SANDY SILT, fine to coarse sand, light gray to light tan, dry, very dense			
			15		S-4		8 50/5"				SILT WITH SAND, fine sand, oxidation in shoe, light gray, dry, very dense			
				16.0							Bottom of borehole at approximately 16 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: SS-B2

Golder Associates

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.794 LON: -117.475
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 2
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/29/22
CHECKED: R. Hillman DATE:

METHOD: HOLLOW STEM AUGER

DEPTH feet	LAYER ELEVATION	SAMPLE ID	BLOWS PER 6 INCHES	RECOVERY (ft)	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
0					ML	SANDY SILT TRACE GRAVEL, fine to medium sand, fine gravel, gray and tan, dry, dense			
						initial cuttings consist of silty SAND, fine to medium sand, reddish-tan, dry			
		S-1	7 15 23						
5		S-2	14 28 37						
		S-3	16 50/5"						
10		S-4	12 21 50			possibly soft siltstone, SILT WITH SOME SAND, oxidation present, nonplastic, tan to reddish-brown and gray, dry, dense to very dense			
15		S-5	13 20 50			increase in sand, fine to medium sand, mostly fine, very dense			
20		S-6	12 47 50/5"			SILT WITH TRACE SAND, fine to coarse sand, clays present, dark gray to black, very dense			
						20'-25': cuttings becomes dary gray silty SAND			
25		S-7	30 50/5"			SANDY SILT WITH SOME GRAVEL, fine to coarse sand, trace angular gravel up to 1 inch, dark gray, dry, dense			
30	30.0	S-8	14 15 5		SM	SILTY SAND TRACE GRAVEL, fine to coarse sand, well graded, fine gravel, sub-angular, reddish-tan and gray, medium dense			
35									

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: SS-B2

Golder Associates

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.794 LON: -117.475
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 2 OF 2
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/29/22
CHECKED: R. Hillman DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			35	35.0	S-9		7 50 50/5"			ML	SILT WITH SOME SAND, medium to fine sand, dark gray to black, dense to very dense			
			40		S-10		21 50/5"							
			45		S-11		25 50/5"							
			50		S-12		8 50/5"							
				51.0							Bottom of borehole at approximately 51 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: SS-B3

Golder Associates

CLIENT: Toro Energy, LLC	DRIVE WEIGHT: 140 lbs	SHEET: 1 OF 1	
PROJECT: El Sobrante LF RNG Geotech	DROP DISTANCE: 30 in	DRILLER: ABC Liovin Drilling, Inc	
LOCATION: El Sobrante Landfill	LAT: 33.794 LON: -117.475	DRILL RIG: CME-75	
PROJECT NO.:	ELEVATION: DATUM:	LOGGED: M. Gidula	DATE: 7/29/22
	BOREHOLE DIAMETER: 8 inches	CHECKED: R. Hillman	DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							ML	SANDY SILT TRACE GRAVEL, fine to coarse sand, fine gravel up to 1/4 inch, gray to dark gray, very dense			
					S-1		11 22 32				initial cuttings consist of SILTY SAND, light brown and reddish-tan			
			5		S-2		10 23 33							
											hard drilling			
			10	10.0	S-3		4 50/5"			SM	SILTY SAND, fine to coarse sand, transition from dark gray to reddish-tan, dense			
			15	15.0	S-4		12 50/5"			ML	SILT TRACE GRAVEL, fine to coarse gravel, well graded, dark gray, very dense			
			20		S-5		9 27 50/5"							
				21.4							Bottom of borehole at approximately 21.4 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

DRAFT

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: SS-B4

Golder Associates

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.794 LON: -117.475
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/29/22
CHECKED: R. Hillman DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0		BS-1					SM	SILTY SAND TRACE FINE GRAVEL, fine to coarse sand, mostly medium sand, gray, dry, dense to very dense			
					S-1		14 21 30							
			5	5.0	S-2		7 21 26			ML	SILT WITH SOME SAND, fine to medium sand, oxidation present, gray, dry, very dense			
			10											
			15		S-3		20 50/5"							
			20		S-4		6 60/5"							
				21.0							Bottom of borehole at approximately 21 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: SS-B5

CLIENT: Toro Energy, LLC	DRIVE WEIGHT: 140 lbs	SHEET: 1 OF 1	
PROJECT: El Sobrante LF RNG Geotech	DROP DISTANCE: 30 in	DRILLER: ABC Liovin Drilling, Inc	
LOCATION: El Sobrante Landfill	LAT: 33.794 LON: -117.475	DRILL RIG: CME-75	
PROJECT NO.:	ELEVATION: DATUM:	LOGGED: M. Gidula	DATE: 7/28/22
	BOREHOLE DIAMETER: 8 inches	CHECKED: R. Hillman	DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HAND AUGER			0		BS-1					ML	SANDY SILT TRACE GRAVEL, fine to medium sand, mostly fine, oxidation present, dark gray-brown, dry, dense to very dense			
HOLLOW STEM AUGER			5		S-1		7 24 34				SANDY SILT, fine to medium sand, mostly fine, reddish-tan, dry, dense to very dense			
			10		S-2		6 16 27				SANDY SILT, fine sand, mottling, reddish-beige, dense to very dense			
					S-3		9 26 50/5"				becomes more dense			
				14.0							Bottom of borehole at approximately 14 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

DRAFT

Report of borehole must be read in conjunction with accompanying notes and abbreviations

GEOTECH WITH MATERIAL GRAPHICS AND USCS TORO ENERGY - WM- EL SOBRANTE LANDFILL.GPJ GINT STD US LAB.GDT 8/5/22

REPORT OF BOREHOLE: SS-B6

Golder Associates

CLIENT: Toro Energy, LLC
PROJECT: El Sobrante LF RNG Geotech
LOCATION: El Sobrante Landfill
PROJECT NO.:

DRIVE WEIGHT: 140 lbs
DROP DISTANCE: 30 in
LAT: 33.794 LON: -117.475
ELEVATION: DATUM:
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: ABC Liovin Drilling, Inc
DRILL RIG: CME-75
LOGGED: M. Gidula DATE: 7/29/22
CHECKED: R. Hillman DATE:

Drilling					Sampling				Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE ID	SAMPLE TYPE	BLOWS PER 6 INCHES	RECOVERY (ft)	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, density/consistency, particle size/plasticity, gradation, color, moisture, minor components; additional remarks	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0							SM	SILTY SAND TRACE GRAVEL, fine to coarse sand, oxidation present, reddish-brown, dry, very dense			
											Initial cuttings consist of red and brown silty SAND			
					S-1		12 28 48							
			5	5.0	S-2		8 26 50			ML	SILT WITH SAND, oxidation present, red, dry, very dense			
											easy drilling, cuttings change to tan silty SAND			
			10		S-3		7 24 25				9' or 10'? transition to SILT TRACE SAND, fine to medium sand, mottled, oxidation present, gray to pale gray, possible siltstone?			
			15	15.0	S-4		15 25 50/5"			SM	transition to SILTY SAND TRACE GRAVEL, fine to coarse sand, fine gravel, oxidation present, reddish-brown, dry, dense to very dense			
				16.4							Bottom of borehole at approximately 16.4 feet. Groundwater no encountered during drilling. Borehole backfilled with soil cuttings.			

APPENDIX B

Boring Logs for 2017 Study

REPORT OF BOREHOLE: LEGEND

Golder Associates

CLIENT: USA Waste of California, Inc.
PROJECT: Proposed NONA Stormwater Structures
LOCATION: El Sobrante Landfill
PROJECT NO.: 1788269

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: Cascade Drilling, L.P.
DRILL RIG: CME-85
LOGGED: M. Mann DATE: 10/3/17
CHECKED: R. Hillman DATE: 11/1/17

Drilling: METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	Sampling: SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6 INCHES	Material Description: GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0						GP	**Graphic Log:** Standard symbols for soil and rock types			
										USCS: Unified Soil Classification System per ASTM D2487			
										MATERIAL DESCRIPTION FOR SOIL: Soil Classifications are based on the Unified Soil Classification System per ASTM D2487 and include density, particle size, color, moisture and minor components			
										MATERIAL DESCRIPTION FOR ROCK: Rock classification and description of weathering, discontinuities, strength of intact rock, lithification, color, and moisture			
			5							Standard Penetration Test (SPT) or Modified California (MC) Penetration Test: **Blows Per 6 Inches/Penetration** : Number of hammer blows required to drive the sampler 6 inches or the indicated length (i.e., 50/4" indicates 50 hammer blows to drive the sampler 4 inches)			
					1	SPT	7 8 9			**Sample Types:** SPT: 2-inch OD, 1.4-inch ID split-spoon sampler			
			10		2	MC	6 5 4			MC: 3-inch OD, 2.4-inch ID split-barrel sampler			
			15	16.0					SP	Inferred material contact (dashed line) - actual material contact may be gradual			
			20							(see below)			
			25										
			30	30.0						Bottom of borehole. Total borehole depth and additional remarks.			

RELATIVE DENSITY OR CONSISTENCY:

Blows	Coarse-Grained Soil	Blows	Fine-Grained Soil
0-4	Very Loose	0-2	Very soft
5-10	Loose	3-4	Soft
11-30	Medium Dense	5-8	Medium Stiff
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very stiff
		>30	Hard

DESCRIPTIVE TERMINOLOGY DENOTING PROPORTIONS:

Descriptive Terms:	Range of Proportions:
Trace	0-5%
Little	5-12%
Some	12-30%
And	30-50%

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REPORT OF BOREHOLE: B-143

Golder Associates

CLIENT: USA Waste of California, Inc.
PROJECT: Proposed NONA Stormwater Structures
LOCATION: El Sobrante Landfill
PROJECT NO.: 1788269

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: Cascade Drilling, L.P.
DRILL RIG: CME-85
LOGGED: M. Mann DATE: 10/9/17
CHECKED: R. Hillman DATE: 11/1/17

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0						SC	CLAYEY SAND WITH GRAVEL (FILL), fine- to coarse-grained, moist, reddish-brown to gray, loose to medium dense, gravel is mostly fine-grained, approximately 6-inch thick layer of gravel at ground surface			
			5		S-1		5 5 10						
				7.0						Bottom of borehole at approximately 7.0 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

DRAFT

Report of borehole must be read in conjunction with accompanying notes and abbreviations

GEOTECH WITH MATERIAL GRAPHICS AND USCS EL SOBRANTE NONA BASINS.GPJ GINT STD US LAB.GDT 3/27/18

REPORT OF BOREHOLE: B-144

Golder Associates

CLIENT: USA Waste of California, Inc.
PROJECT: Proposed NONA Stormwater Structures
LOCATION: El Sobrante Landfill
PROJECT NO.: 1788269

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: Cascade Drilling, L.P.
DRILL RIG: CME-85
LOGGED: M. Mann DATE: 10/9/17
CHECKED: R. Hillman DATE: 11/1/17

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0						SC	CLAYEY SAND WITH GRAVEL (FILL), fine- to coarse-grained, moist, brown, medium dense, gravel is mostly fine-grained, approximately 6-inch thick layer of gravel at ground surface			
			5		S-1		4 6 10						
			10		S-2		15 23 25						
				11.0					SC	CLAYEY SAND, fine- to coarse-grained, moist, brown to gray, very dense, trace fine-grained gravel			
			15		S-3		20 50/6"						
			20		S-4		50/6"						
										increased gravel content from 22 feet			
			25		S-5		40 50/4"						
				25.8						Bottom of borehole at approximately 25.8 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

DRAFT

Report of borehole must be read in conjunction with accompanying notes and abbreviations

REPORT OF BOREHOLE: B-145

Golder Associates

CLIENT: USA Waste of California, Inc.
PROJECT: Proposed NONA Stormwater Structures
LOCATION: El Sobrante Landfill
PROJECT NO.: 1788269

DRIVE WEIGHT: 140 lbs.
DROP DISTANCE: 30 in.
N: E:
ELEVATION: DATUM:
INCLINATION: -90°
BOREHOLE DIAMETER: 8 inches

SHEET: 1 OF 1
DRILLER: Cascade Drilling, L.P.
DRILL RIG: CME-85
LOGGED: M. Mann DATE: 10/9/17
CHECKED: R. Hillman DATE: 11/1/17

Drilling					Sampling			Material Description					
METHOD	DRILL DATE/ TIME	WATER	DEPTH feet	LAYER ELEVATION	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6 INCHES	GRAPHIC LOG	USCS	(SYMBOL) SOIL NAME, particle size, gradation, shape, minor components; color, contamination; behaviour, moisture, density/consistency	MOISTURE	DRY DENSITY (pcf)	ADDITIONAL LAB TESTING
HOLLOW STEM AUGER			0						CL	SANDY LEAN CLAY, medium plasticity, sand is fine- to coarse-grained, moist, brown to gray, hard, trace fine-grained gravel, approximately 6-inch thick layer of gravel at ground surface			
			5		S-1		7 14 30						
				7.0						Bottom of borehole at approximately 7.0 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings.			

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Report of borehole must be read in conjunction with accompanying notes and abbreviations

APPENDIX C

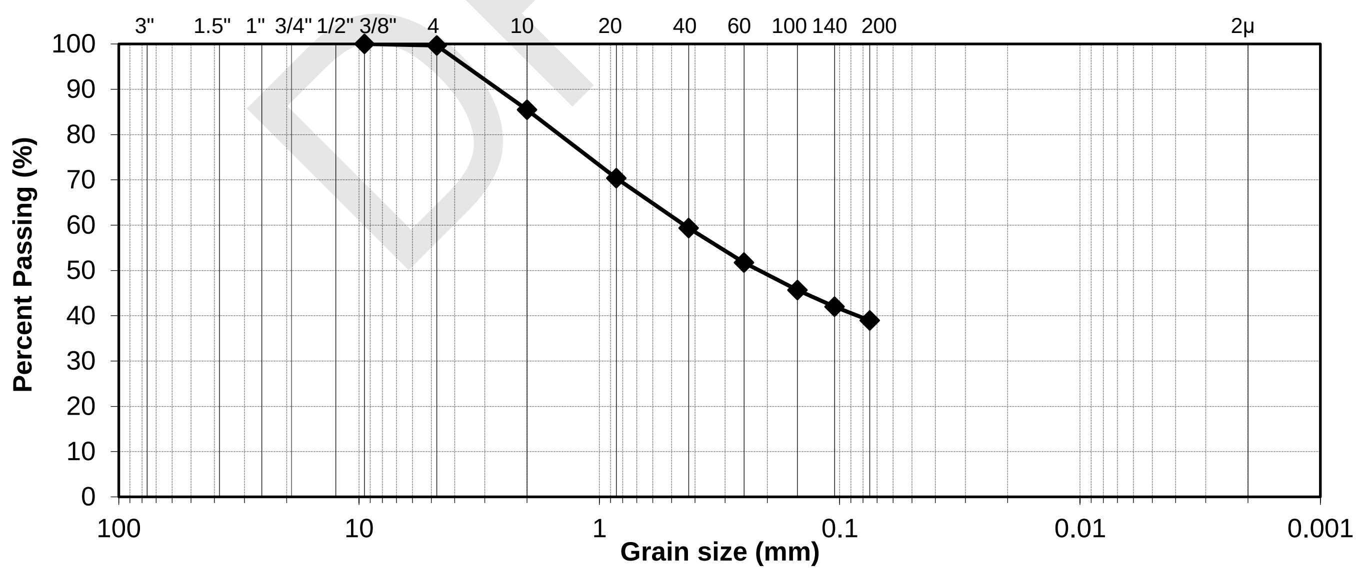
Geotechnical Laboratory Test Results

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	NSB1	*Date:*	08/05/22
Sample No.:	S-1		
Depth (ft):	2.5-4		
Sample Description:	Reddish Brown, Clayey Sand (SC)		

Dry Weight (g) **567.1**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	0.00	0.0	**100.0**	-
3/4 "	19.1	0.00	0.0	**100.0**	-
1/2 "	12.5	0.00	0.0	**100.0**	-
3/8 "	9.5	0.00	0.0	**100.0**	-
# 4	4.75	1.79	0.3	**99.7**	-
# 10	2.00	80.52	14.2	**85.5**	-
# 20	0.85	85.70	15.1	**70.4**	-
# 40	0.425	62.49	11.0	**59.4**	-
# 60	0.250	43.14	7.6	**51.7**	-
# 100	0.150	34.40	6.1	**45.7**	-
# 140	0.105	20.86	3.7	**42.0**	-
# 200	0.075	17.43	3.1	**38.9**	-
Soil % passing 200 sieve (%)		220.78	38.9	**0.0**	-



Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	0.3	60.8	38.9
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Reddish Brown, Clayey Sand (SC)		
	C_c	-			

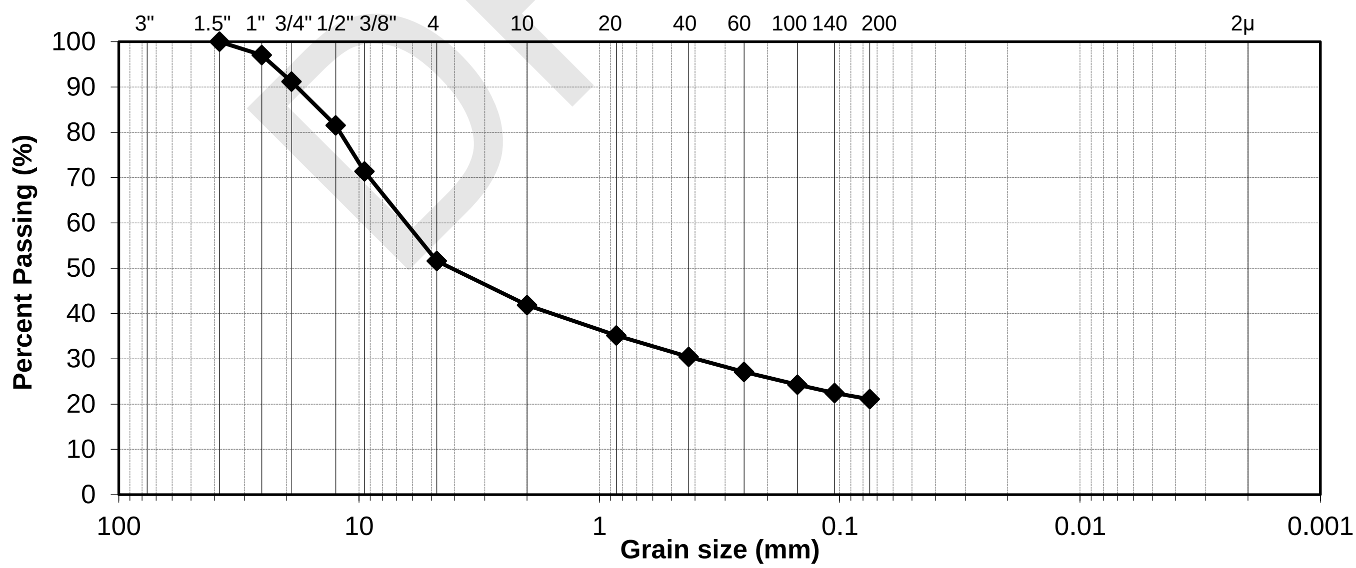
PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	NSB2	*Date:*	08/05/22
Sample No.:	Bulk-1		
Depth (ft):	0-10		
Sample Description:	Brown, Clayey Gravel with Sand (GC)		

Dry Weight (g) **5965.1**

Sieve Size	Aperture	Weight Retained	% Retained	**(Accumulative) % Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	177.28	3.0	**97.0**	**-**
3/4 "	19.1	349.52	5.9	**91.2**	**-**
1/2 "	12.5	576.00	9.7	**81.5**	**-**
3/8 "	9.5	607.52	10.2	**71.3**	**-**
# 4	4.75	1176.90	19.7	**51.6**	**-**
Dry Weight (g)	**800.4**				
# 10	2.00	150.73	18.8	**41.9**	**-**
# 20	0.85	103.95	13.0	**35.2**	**-**
# 40	0.425	73.68	9.2	**30.4**	**-**
# 60	0.250	51.66	6.5	**27.1**	**-**
# 100	0.150	43.80	5.5	**24.3**	**-**
# 140	0.105	28.34	3.5	**22.4**	**-**
# 200	0.075	21.46	2.7	**21.1**	**-**
Soil % passing 200 sieve (%)		326.74	40.8	**21.06**	**-**



Particle-Size Analysis	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	48.4	30.5	21.1
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Brown, Clayey Gravel with Sand (GC)		
	C_c	-			

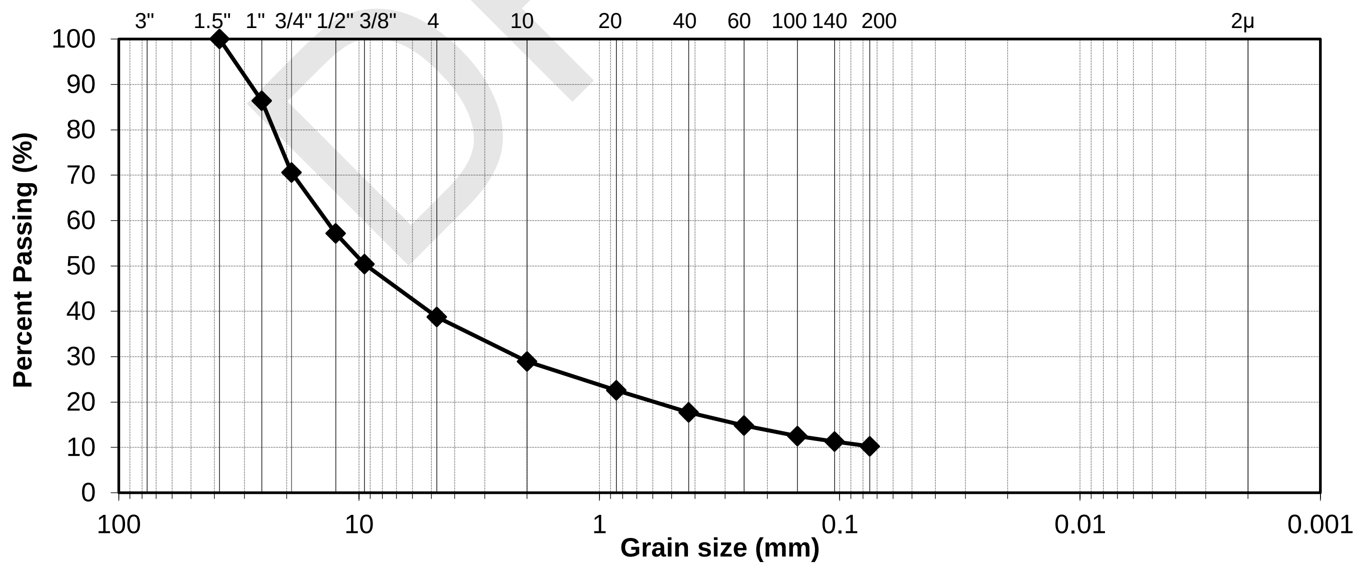
PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D6913

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	NSB2	*Date:*	08/05/22
Sample No.:	S-1		
Depth (ft):	3.5-4		
Sample Description:	Reddish Brown, Poorly Graded Gravel with Clay and Sand (GP-GC)		

Dry Weight (g) **512.7**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	69.75	13.6	**86.4**	**-**
3/4 "	19.1	81.07	15.8	**70.6**	**-**
1/2 "	12.5	68.74	13.4	**57.2**	**-**
3/8 "	9.5	34.70	6.8	**50.4**	**-**
# 4	4.75	59.72	11.6	**38.8**	**-**
# 10	2.00	50.34	9.8	**28.9**	**-**
# 20	0.85	32.56	6.4	**22.6**	**-**
# 40	0.425	24.91	4.9	**17.7**	**-**
# 60	0.250	15.12	2.9	**14.8**	**-**
# 100	0.150	11.87	2.3	**12.5**	**-**
# 140	0.105	5.96	1.2	**11.3**	**-**
# 200	0.075	5.47	1.1	**10.2**	**-**
Soil % passing 200 sieve (%)		52.52	10.2	**0.0**	**-**



Particle-Size Analysis					
	D_{10}	0.07	% Gravel	% Sand	% Fines
	D_{30}	2.30	61.2	28.5	10.2
	D_{60}	13.89	Sample Description / USCS Classification		
	C_u	198.42	Reddish Brown, Poorly Graded Gravel with Clay and Sand (GP-GC)		
	C_c	5.42			

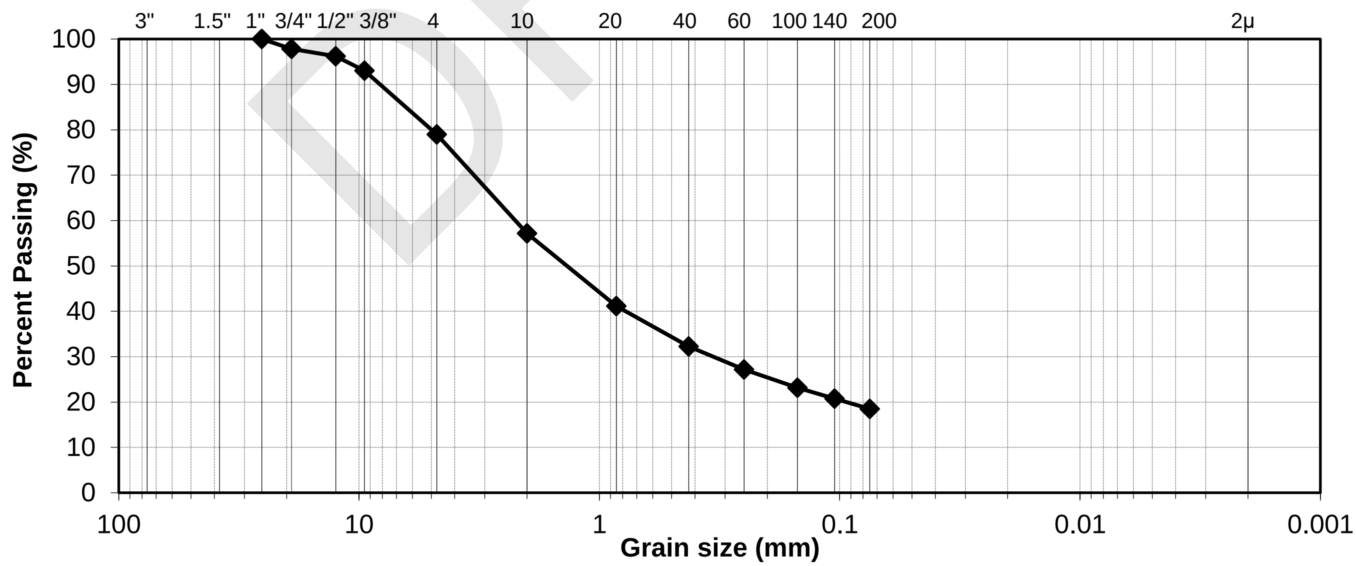
PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D6913

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	NSB3	*Date:*	08/05/22
Sample No.:	S-2		
Depth (ft):	10-11.5		
Sample Description:	Brown, Clayey Sand with Gravel (SC)		

Dry Weight (g) **460.5**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	0.00	0.0	**100.0**	**-**
3/4 "	19.1	10.14	2.2	**97.8**	**-**
1/2 "	12.5	7.41	1.6	**96.2**	**-**
3/8 "	9.5	14.48	3.1	**93.0**	**-**
# 4	4.75	64.90	14.1	**78.9**	**-**
# 10	2.00	100.40	21.8	**57.1**	**-**
# 20	0.85	73.80	16.0	**41.1**	**-**
# 40	0.425	40.99	8.9	**32.2**	**-**
# 60	0.250	23.32	5.1	**27.2**	**-**
# 100	0.150	18.48	4.0	**23.1**	**-**
# 140	0.105	10.91	2.4	**20.8**	**-**
# 200	0.075	10.51	2.3	**18.5**	**-**
Soil % passing 200 sieve (%)		85.12	18.5	**0.0**	**-**



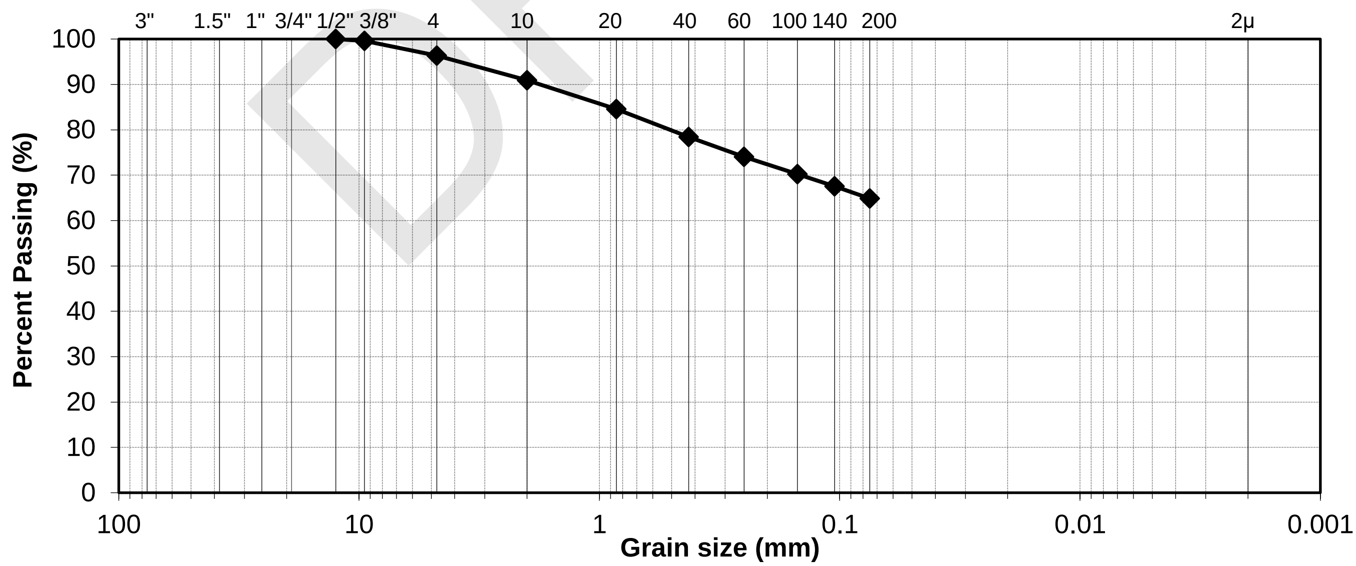
Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	21.1	60.5	18.5
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Brown, Clayey Sand with Gravel (SC)		
	C_c	-			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	SSB1	*Date:*	08/05/22
Sample No.:	S-1		
Depth (ft):	3-4		
Sample Description:	Grayish Brown, Sandy Lean Clay (CL)		

Dry Weight (g) **389.0**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	0.00	0.0	**100.0**	**-**
3/4 "	19.1	0.00	0.0	**100.0**	**-**
1/2 "	12.5	0.00	0.0	**100.0**	**-**
3/8 "	9.5	1.44	0.4	**99.6**	**-**
# 4	4.75	12.88	3.3	**96.3**	**-**
# 10	2.00	21.00	5.4	**90.9**	**-**
# 20	0.85	24.81	6.4	**84.5**	**-**
# 40	0.425	23.83	6.1	**78.4**	**-**
# 60	0.250	16.99	4.4	**74.1**	**-**
# 100	0.150	14.96	3.8	**70.2**	**-**
# 140	0.105	10.43	2.7	**67.5**	**-**
# 200	0.075	10.39	2.7	**64.9**	**-**
Soil % passing 200 sieve (%)		252.31	64.9	**0.0**	**-**



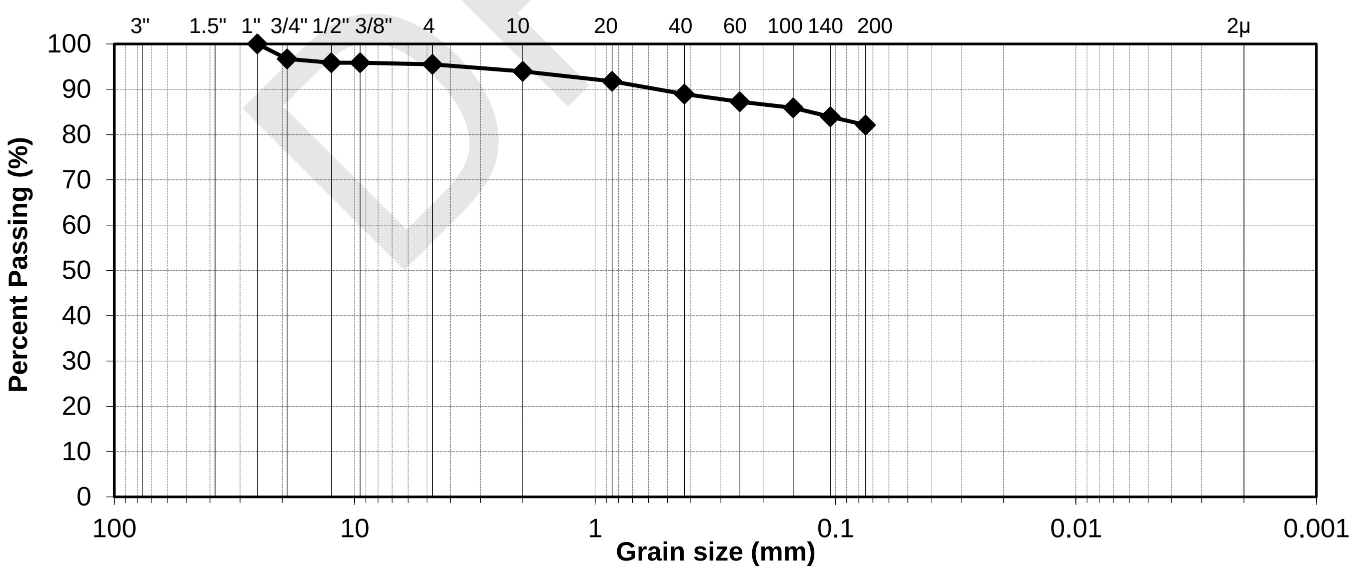
Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	3.7	31.5	64.9
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Grayish Brown, Sandy Lean Clay (CL)		
	C_c	-			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	SSB2	*Date:*	08/05/22
Sample No.:	S-1		
Depth (ft):	2.5-4		
Sample Description:	Tan Brown, Lean Clay with Sand (CL)		

Dry Weight (g) **439.5**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	0.00	0.0	**100.0**	**-**
3/4 "	19.1	14.47	3.3	**96.7**	**-**
1/2 "	12.5	3.89	0.9	**95.8**	**-**
3/8 "	9.5	0.00	0.0	**95.8**	**-**
# 4	4.75	1.56	0.4	**95.5**	**-**
# 10	2.00	6.56	1.5	**94.0**	**-**
# 20	0.85	9.61	2.2	**91.8**	**-**
# 40	0.425	12.56	2.9	**88.9**	**-**
# 60	0.250	7.28	1.7	**87.3**	**-**
# 100	0.150	6.04	1.4	**85.9**	**-**
# 140	0.105	8.82	2.0	**83.9**	**-**
# 200	0.075	7.89	1.8	**82.1**	**-**
Soil % passing 200 sieve (%)		360.84	82.1	**0.0**	**-**



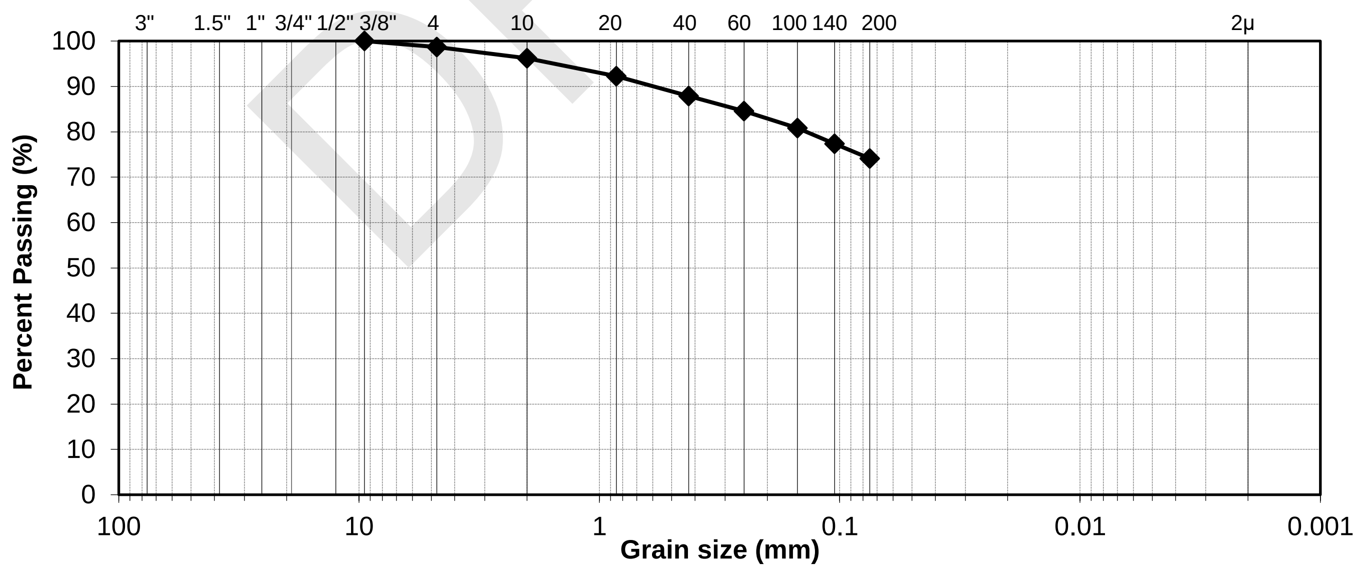
Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	4.5	13.4	82.1
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Tan Brown, Lean Clay with Sand (CL)		
	C_c	-			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	GA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	SSB3	*Date:*	08/05/22
Sample No.:	S-2		
Depth (ft):	5-6.5		
Sample Description:	Gray, Lean Clay with Sand (CL)		

Dry Weight (g) **425.9**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	-
1.5"	38.1	0.00	0.0	**100.0**	-
1"	25.4	0.00	0.0	**100.0**	-
3/4 "	19.1	0.00	0.0	**100.0**	-
1/2 "	12.5	0.00	0.0	**100.0**	-
3/8 "	9.5	0.00	0.0	**100.0**	-
# 4	4.75	5.60	1.3	**98.7**	-
# 10	2.00	10.58	2.5	**96.2**	-
# 20	0.85	16.86	4.0	**92.2**	-
# 40	0.425	18.61	4.4	**87.9**	-
# 60	0.250	14.19	3.3	**84.5**	-
# 100	0.150	15.92	3.7	**80.8**	-
# 140	0.105	14.67	3.4	**77.4**	-
# 200	0.075	13.82	3.2	**74.1**	-
Soil % passing 200 sieve (%)		315.69	74.1	**0.0**	-



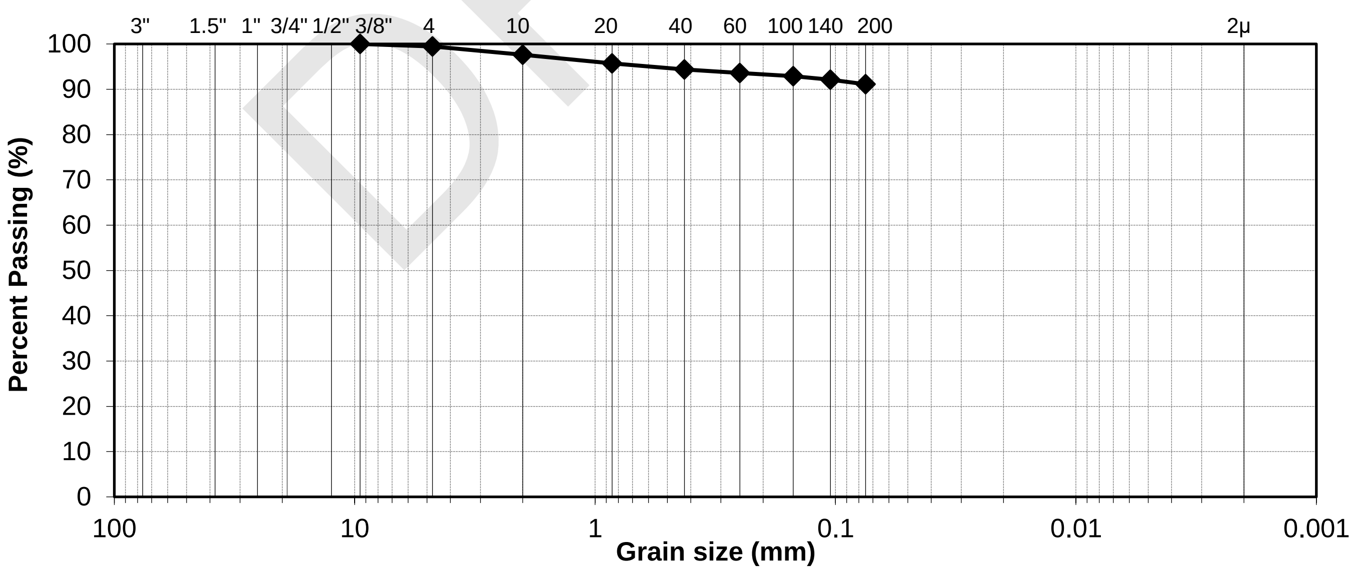
Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	1.3	24.6	74.1
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Gray, Lean Clay with Sand (CL)		
	C_c	-			

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D6913

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring No.:	SSB4	*Date:*	08/05/22
Sample No.:	S-1		
Depth (ft):	3-4		
Sample Description:	Gray, Lean Clay (CL)		

Dry Weight (g) **507.0**

Sieve Size	Aperture	Weight Retained	% Retained	**% Passing**	**Project Specification**
	mm	g	%	**%**	**%**
3"	76.2	0.00	0.0	**100.0**	**-**
1.5"	38.1	0.00	0.0	**100.0**	**-**
1"	25.4	0.00	0.0	**100.0**	**-**
3/4 "	19.1	0.00	0.0	**100.0**	**-**
1/2 "	12.5	0.00	0.0	**100.0**	**-**
3/8 "	9.5	0.00	0.0	**100.0**	**-**
# 4	4.75	2.76	0.5	**99.5**	**-**
# 10	2.00	9.14	1.8	**97.7**	**-**
# 20	0.85	9.75	1.9	**95.7**	**-**
# 40	0.425	6.84	1.3	**94.4**	**-**
# 60	0.250	3.82	0.8	**93.6**	**-**
# 100	0.150	3.65	0.7	**92.9**	**-**
# 140	0.105	4.15	0.8	**92.1**	**-**
# 200	0.075	5.02	1.0	**91.1**	**-**
Soil % passing 200 sieve (%)		461.88	91.1	**0.0**	**-**



Particle-Size Analysis					
	D_{10}	-	% Gravel	% Sand	% Fines
	D_{30}	-	0.5	8.4	91.1
	D_{60}	-	Sample Description / USCS Classification		
	C_u	-	Gray, Lean Clay (CL)		
	C_c	-			

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

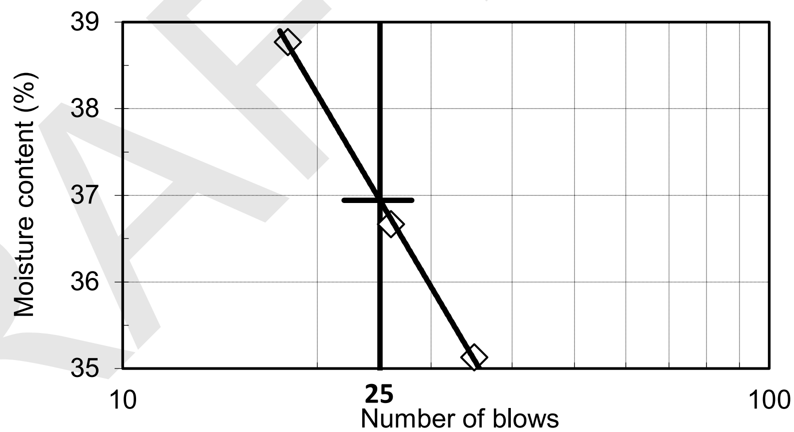
ASTM D4318

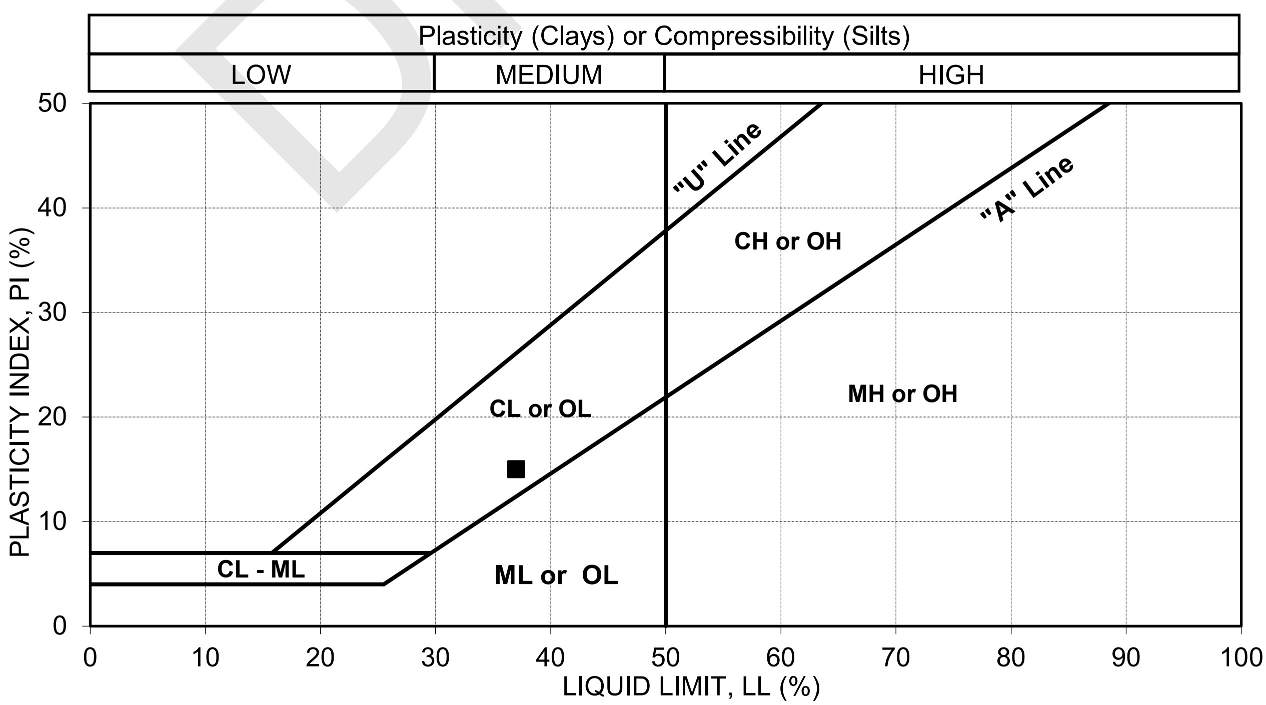
Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	AH
Project No.:	202220280	*Checked by:*	KL
Boring No.:	SSB2	*Date:*	08/05/22
Sample No.:	S-1		
Depth (ft):	2.5-4		
Soil Description:	Tan Brown, Lean Clay with Sand (CL)		

Test		LL	LL	LL	PL	PL
No. of blows	**-**	**35**	**26**	**18**	-	-
Wt. of Wet Soil + Container	(g)	17.7	17.9	17.5	8.6	8.4
Wt. of Dry soil + Container	(g)	16.0	16.2	15.7	7.3	7.1
Wt. of Container	(g)	11.0	11.4	10.9	1.1	1.1
Water content	**(%)**	**35.1**	**36.7**	**38.8**	**21.7**	**22.4**

Liquid Limit (LL)	**37**
Plastic Limit (PL)	**22**
Plasticity Index (PI)	**15**
USCS	**CL**

Remarks:





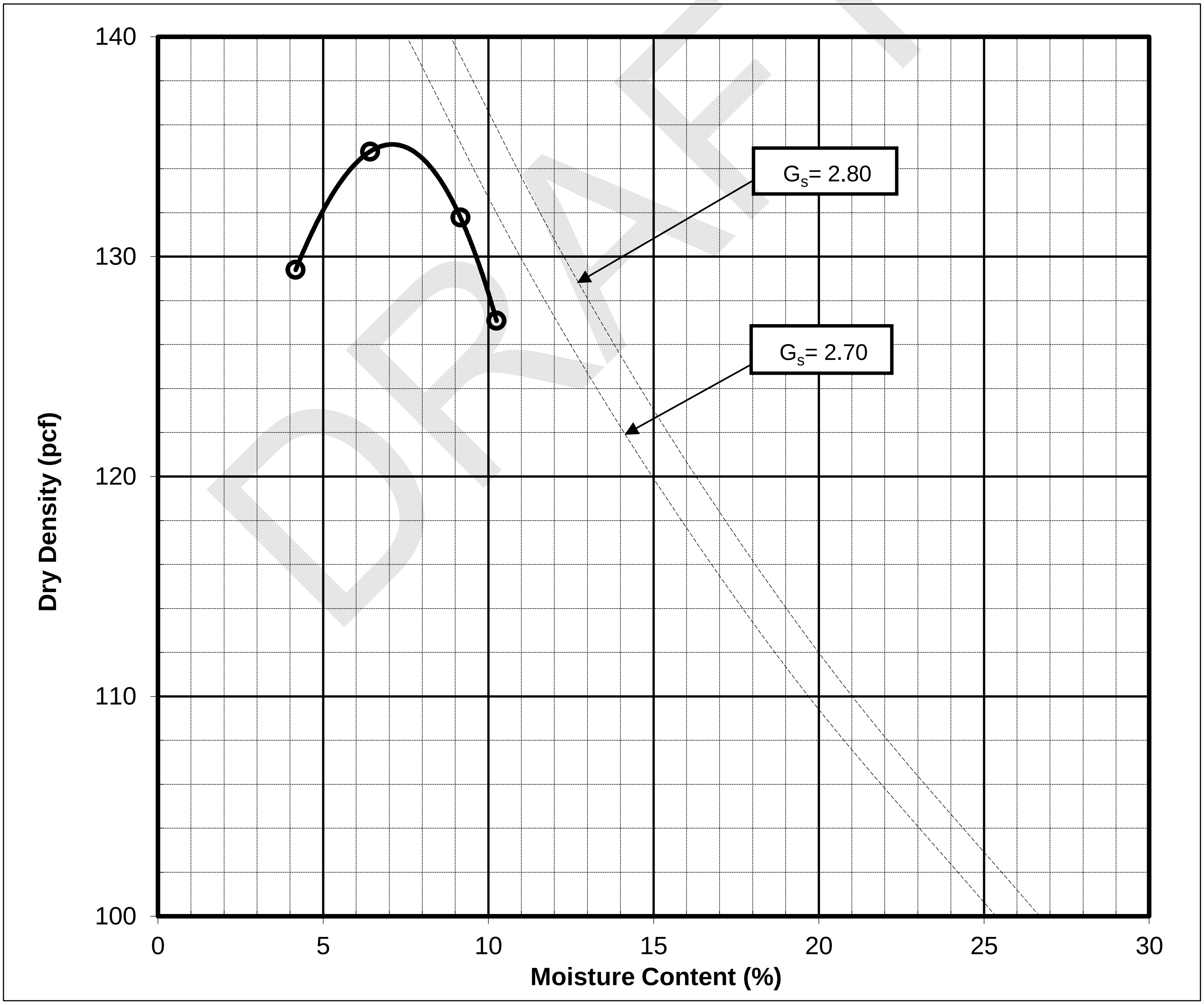
Compaction Characteristics of Soils Using Modified Effort

ASTM D1557

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring Number:	NSB2	*Date:*	08/05/22
Sample Number:	Bulk-1		
Depth (ft) :	0-10		
Soil Description:	Brown, Clayey Gravel with Sand (GC)		

Mold size (in)	6"
Procedure	C
Weight Retained on 3/4":	8.9
Remarks:	

Maximum Dry Density (pcf)	**135.1**
Optimum Moisture Content (%)	**7.1**
Corrected Maximum Dry Density (pcf)	**136.7**
Corrected Optimum Moisture Content (%)	**6.5**



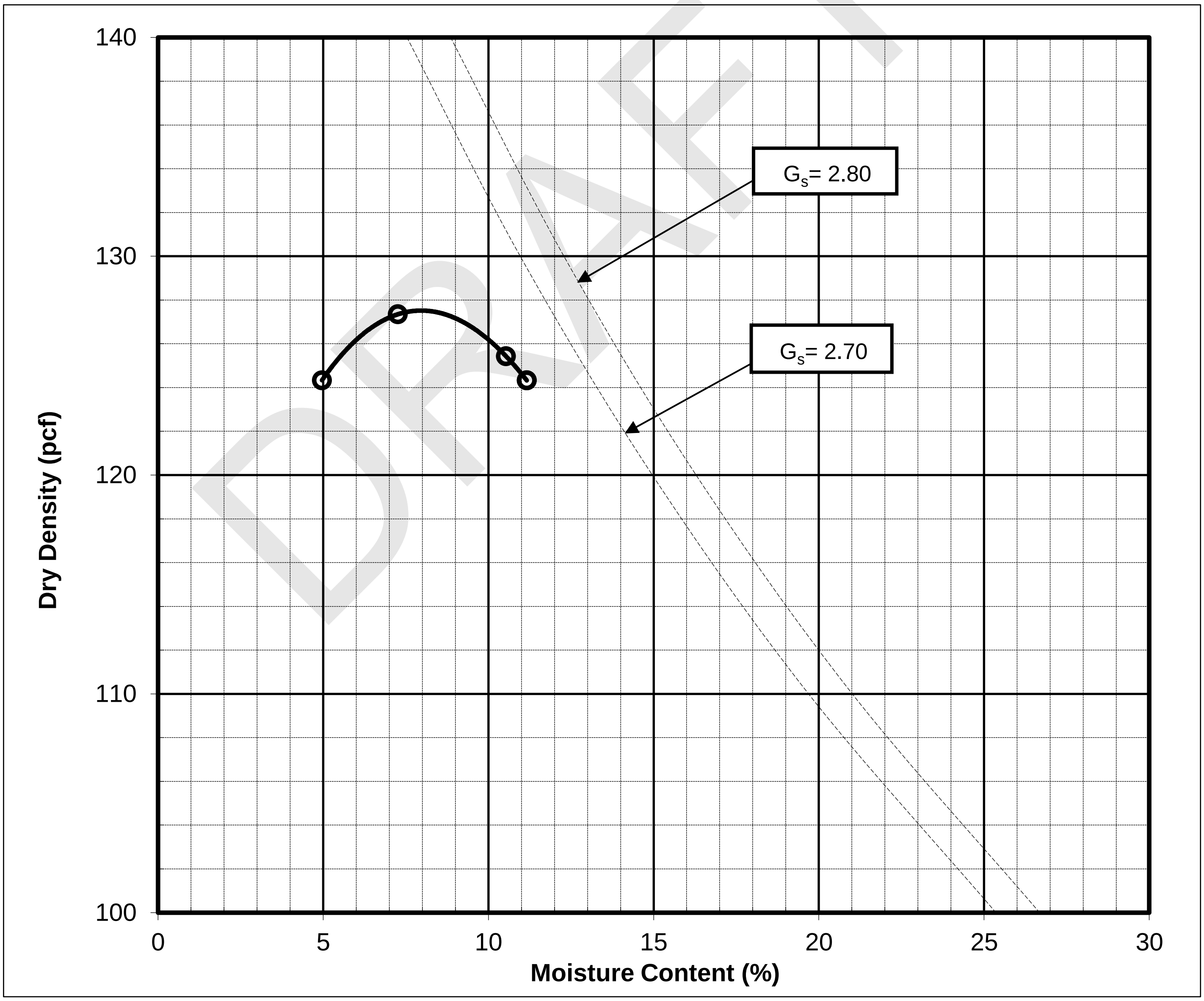
Compaction Characteristics of Soils Using Modified Effort

ASTM D1557

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project:	Toro Energy RNG Facility	*Tested by:*	WA
Project No.:	202220280	*Checked by:*	KL
Boring Number:	SSB4	*Date:*	08/05/22
Sample Number:	Bulk-1		
Depth (ft) :	0-5		
Soil Description:	Dark Grayish Brown, Clayey Sand with Gravel (SC)		

Mold size (in)	6"
Procedure	C
Weight Retained on 3/4":	2.3
Remarks:	

Maximum Dry Density (pcf)	**127.5**
Optimum Moisture Content (%)	**8.0**
Corrected Maximum Dry Density (pcf)	**-**
Corrected Optimum Moisture Content (%)	**-**



EXPANSION INDEX

ASTM D4829

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	AH
Project No.:	202220280	*Checked by:*	KL
Boring No.:	NSB1	*Date:*	8/5/2022
Sample No.:	S-1		
Depth (ft):	2.5-4	*Apparatus No.:*	1
Soil Description:	Reddish Brown, Clayey Sand (SC)		

Initial Specimen Info		
Wt. of wet soil + cont.	224.27	g
Wt. of dry soil + cont.	209.07	g
Wt. of container	25.01	g
Wt. of water	15.20	g
Wt. of dry soil	184.06	g
Moisture Content	**8.3**	**%**

Final Specimen Info		
Wt. of wet soil + cont.	654.13	g
Wt. of dry soil + cont.	585.08	g
Wt. of container	206.50	g
Wt. of water	69.05	g
Wt. of dry soil	378.58	g
Moisture Content	**18.2**	**%**

Wt. of wet soil + ring	612.88	g
Wt. of ring	206.50	g
Wt. of wet soil	406.38	g
Wet density of soil	125.2	pcf
Dry density of soil	115.7	pcf
Specific gravity of soil	2.68	-
Saturation	**49.6**	**%**

Date & Time	**Elapsed Time (min)**	**Dial Reading**	**Δh, Expansion**
8/10/2022 16:12	0	0	0
8/10/2022 16:22	10	0.0000	0
Add Distilled Water to Sample			
8/11/2022 16:12	1440	0.0130	0.0130

Expansion Index = **13** **Very Low**

EXPANSION INDEX

ASTM D4829

Client:	Golder Associates USA Inc.	*HAI Project No.:*	GAUI-22-005
Project Name:	Toro Energy RNG Facility	*Tested by:*	1/0/1900
Project No.:	202220280	*Checked by:*	KL
Boring No.:	SSB1	*Date:*	8/5/2022
Sample No.:	S-1		
Depth (ft):	3-4	*Apparatus No.:*	3
Soil Description:	Grayish Brown, Sandy Lean Clay (CL)		

Initial Specimen Info		
Wt. of wet soil + cont.	102.76	g
Wt. of dry soil + cont.	94.19	g
Wt. of container	11.72	g
Wt. of water	8.57	g
Wt. of dry soil	82.47	g
Moisture Content	**10.4**	**%**

Final Specimen Info		
Wt. of wet soil + cont.	631.93	g
Wt. of dry soil + cont.	542.80	g
Wt. of container	190.75	g
Wt. of water	89.13	g
Wt. of dry soil	352.05	g
Moisture Content	**25.3**	**%**

Wt. of wet soil + ring	581.82	g
Wt. of ring	190.75	g
Wt. of wet soil	391.07	g
Wet density of soil	118.7	pcf
Dry density of soil	107.5	pcf
Specific gravity of soil	2.68	-
Saturation	**50.2**	**%**

Date & Time	**Elapsed Time (min)**	**Dial Reading**	**Δh, Expansion**
8/11/2022 12:00	0	0	0
8/11/2022 12:10	10	0.0000	0
Add Distilled Water to Sample			
8/12/2022 12:00	1440	0.0720	0.0720

Expansion Index = **72** **Medium**

HAI
HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

SWELL / COLLAPSE TEST

ASTM D4546

Client :	Golder Associates USA Inc.	***HAI Project No.:***	GAUI-22-005
Project Name:	Toro Energy RNG Facility	***Tested by:***	KL
Project No.:	202220280	***Checked by:***	SD
Boring No.:	NSB2	***Date:***	08/05/22
Sample No.:	S-1		
Type of Sample:	Undisturbed Ring		
Depth (ft):	3.5-4		
Soil Description:	Reddish Brown, Poorly Graded Gravel with Clay and Sand (GP-GC)	**Load (ksf):**	**2**

Initial Total Weight (g)	Final Total Weight (g)	Final Dry Weight (g)
126.09	137.48	117.53

			Initial Conditions	**Final Conditions**
Height	H	(in)	1.002	0.900
Height of Solids	Hs	(in)	0.584	0.584
Height of Water	Hw	(in)	0.114	0.266
Height of Air	Ha	(in)	0.304	0.051
Dry Density		**(pcf)**	**97.4**	**120.4**
Water Content		**(%)**	**7.3**	**17.0**
Saturation		**(%)**	**27.2**	**83.9**

* Saturation is calcualted using Gs= 2.68

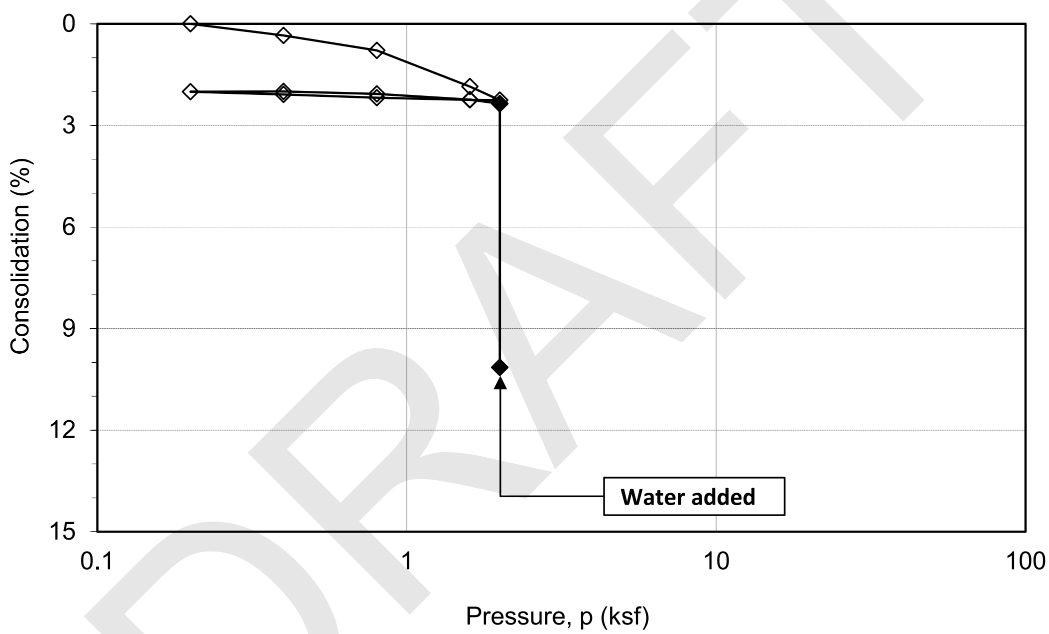
Load (ksf)	**δH (in)**	**H (in)**	**Voids (in)**	**e**	**Consol. (%)**	**a_v (ksf^{-1})**	**M_v (ksf^{-1})**	**Comment**
0.01	-------	1.0020	0.418	0.716	0			
0.2	0.0000	1.0020	0.418	0.716	0.0	0.0E+00	0.0E+00	
0.4	0.0034	0.9986	0.415	0.711	0.3	2.9E-02	1.7E-02	
0.8	0.0078	0.9942	0.410	0.703	0.8	1.9E-02	1.1E-02	
1.6	0.0186	0.9834	0.400	0.685	1.9	2.3E-02	1.4E-02	
2	0.0226	0.9795	0.396	0.678	2.3	1.7E-02	1.0E-02	
1.6	0.0225	0.9795	0.396	0.678	2.2	Unloaded		
0.8	0.0218	0.9802	0.396	0.679	2.2			
0.4	0.0209	0.9811	0.397	0.681	2.1			
0.2	0.0201	0.9819	0.398	0.682	2.0			
0.4	0.0200	0.9820	0.398	0.682	2.0	-6.4E-04	-3.8E-04	
0.8	0.0207	0.9813	0.398	0.681	2.1	3.0E-03	1.8E-03	
1.6	0.0224	0.9796	0.396	0.678	2.2	3.6E-03	2.1E-03	
2	0.0237	0.9784	0.395	0.676	2.4	5.4E-03	3.2E-03	
2	0.1017	0.9003	0.317	0.542	10.1	Water Added		

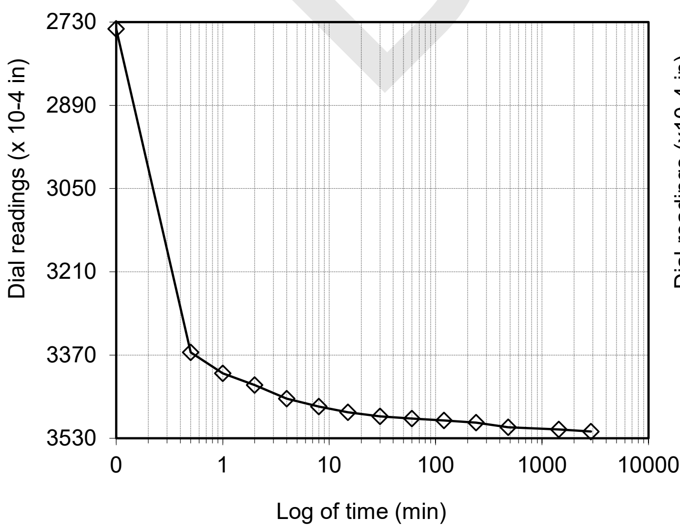
SWELL / COLLAPSE TEST

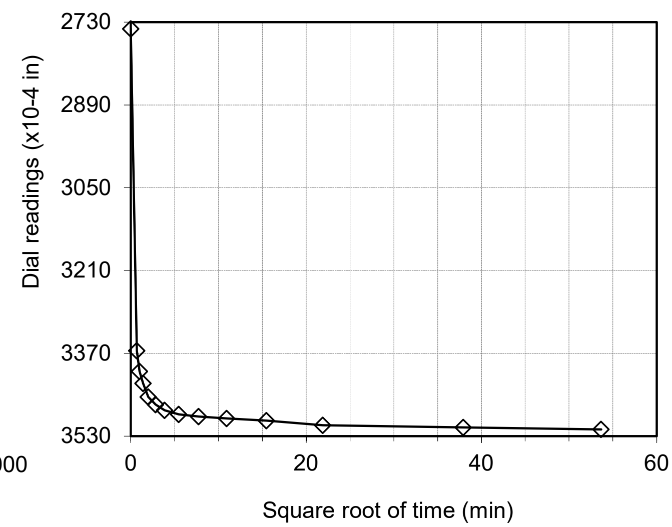
ASTM D4546

HUSHMAND ASSOCIATES, INC.
Geotechnical and Earthquake Engineers

Client :	Golder Associates USA Inc.	***HAI Project No.:***	GAUI-22-005
Project Name:	Toro Energy RNG Facility	***Tested by:***	KL
Project No.:	202220280	***Checked by:***	SD
Boring No.:	NSB2	***Date:***	08/05/22
Sample No.:	S-1		
Type of Sample:	Undisturbed Ring		
Depth (ft):	3.5-4		
Soil Description:	Reddish Brown, Poorly Graded Gravel with Clay and Sand (GP-GC)	**Load (ksf):**	**2**
		Settlement (%)	**7.79**







SWELL / COLLAPSE TEST

ASTM D4546

Client :	Golder Associates USA Inc.	***HAI Project No.:***	GAUI-22-005
Project Name:	Toro Energy RNG Facility	***Tested by:***	KL
Project No.:	202220280	***Checked by:***	SD
Boring No.:	SSB4	***Date:***	08/05/22
Sample No.:	S-1		
Type of Sample:	Undisturbed Ring		
Depth (ft):	3-4		
Soil Description:	Gray, Lean Clay (CL)	**Load (ksf):**	**2**

Initial Total Weight (g)	Final Total Weight (g)	Final Dry Weight (g)
139.90	150.09	120.71

			Initial Conditions	Final Conditions
Height	H	(in)	1.000	0.981
Height of Solids	Hs	(in)	0.600	0.600
Height of Water	Hw	(in)	0.255	0.391
Height of Air	Ha	(in)	0.145	0.000
Dry Density		**(pcf)**	**100.3**	**104.2**
Water Content		**(%)**	**15.9**	**24.3**
Saturation		**(%)**	**63.8**	**100.0**

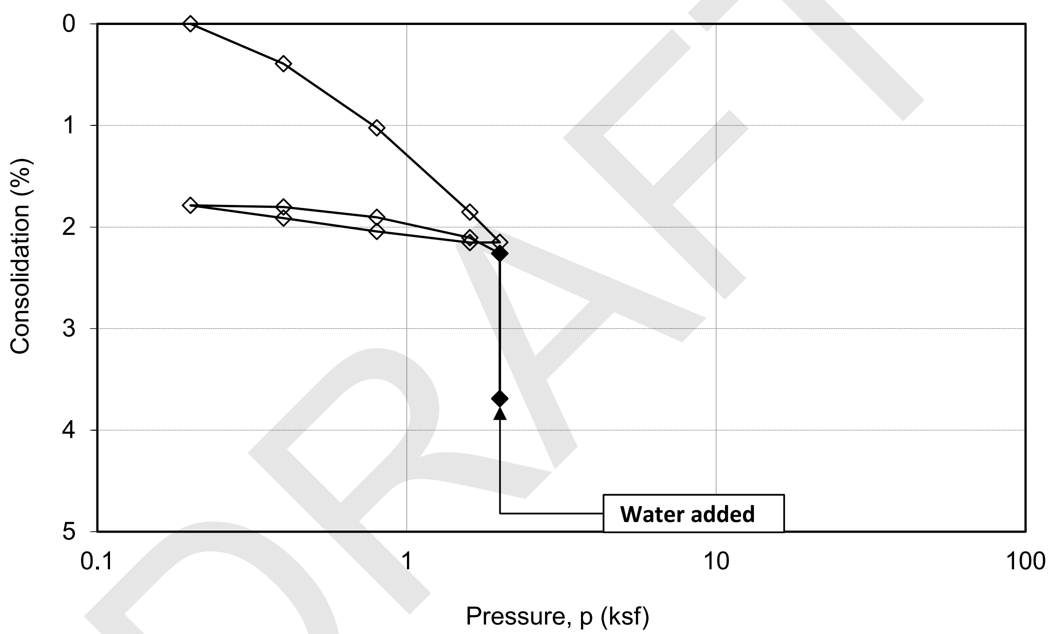
* Saturation is calcualted using Gs= 2.68

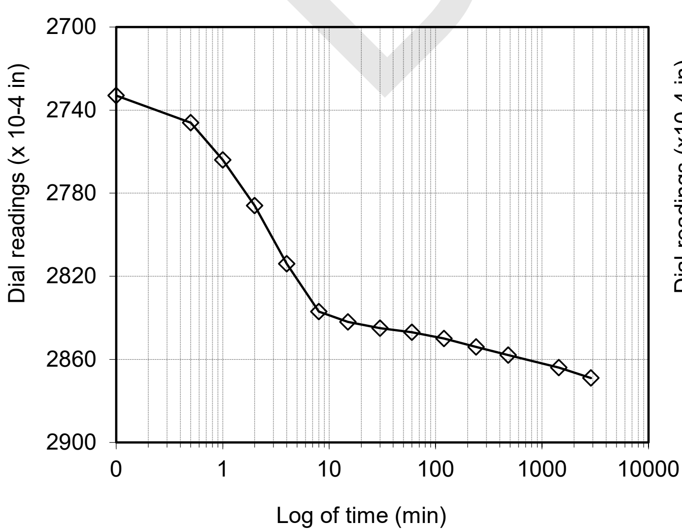
Load (ksf)	δH (in)	H (in)	Voids (in)	e	Consol. (%)	a_v (ksf^{-1})	M_v (ksf^{-1})	Comment
0.01	-------	1.0000	0.400	0.668	0			
0.2	0.0000	1.0000	0.400	0.668	0.0	0.0E+00	0.0E+00	
0.4	0.0039	0.9961	0.397	0.661	0.4	3.3E-02	2.0E-02	
0.8	0.0103	0.9898	0.390	0.651	1.0	2.6E-02	1.6E-02	
1.6	0.0186	0.9815	0.382	0.637	1.9	1.7E-02	1.1E-02	
2	0.0215	0.9785	0.379	0.632	2.2	1.2E-02	7.6E-03	
1.6	0.0216	0.9785	0.379	0.632	2.2	Unloaded		
0.8	0.0205	0.9796	0.380	0.634	2.0			
0.4	0.0191	0.9809	0.381	0.636	1.9			
0.2	0.0179	0.9821	0.383	0.638	1.8			
0.4	0.0180	0.9820	0.382	0.638	1.8	1.3E-03	7.6E-04	
0.8	0.0191	0.9810	0.381	0.636	1.9	4.3E-03	2.6E-03	
1.6	0.0211	0.9790	0.379	0.633	2.1	4.2E-03	2.6E-03	
2	0.0226	0.9774	0.378	0.630	2.3	6.5E-03	4.0E-03	
2	0.0369	0.9631	0.364	0.606	3.7	Water Added		

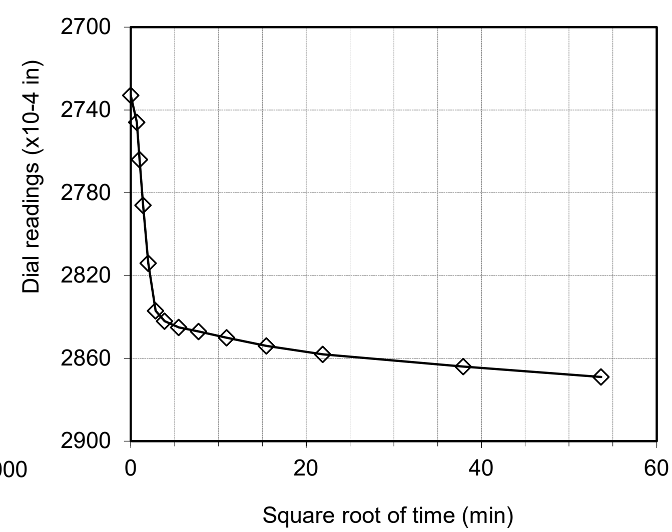
SWELL / COLLAPSE TEST

ASTM D4546

Client :	Golder Associates USA Inc.	***HAI Project No.:***	GAUI-22-005
Project Name:	Toro Energy RNG Facility	***Tested by:***	KL
Project No.:	202220280	***Checked by:***	SD
Boring No.:	SSB4	***Date:***	08/05/22
Sample No.:	S-1		
Type of Sample:	Undisturbed Ring		
Depth (ft):	3-4		
Soil Description:	Gray, Lean Clay (CL)	**Load (ksf):**	**2**
		Settlement (%)	**1.43**







Results Only Soil Testing
for
Toro Energy RNG Facility

August 12, 2022

Prepared for:

Kang Lin
HAI
250 Goddard
Irvine, CA 92618
kang@haieng.com

Project X Job#: S220811J
Client Job or PO#: Gaui-22-005 / 202220280

Respectfully Submitted,

Eduardo Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

REGISTERED PROFESSIONAL ENGINEER
EDUARDO HERNANDEZ
No. M37102
MECHANICAL
STATE OF CALIFORNIA

Soil Analysis Lab Results

Client: HAI
Job Name: Toro Energy RNG Facility
Client Job Number: Gaui-22-005
Project X Job Number: S220811J
August 12, 2022

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd	Minimum	**pH**
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)	
NSB2 S-1	3.5-4	318.3	0.0318	171.3	0.0171	18,760	1,407	7.9
SSB4 Bulk-1	0-5	1,798.4	0.1798	100.6	0.0101	10,050	1,675	3.8

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

APPENDIX D

Percolation Test Results for Current Study

Boring Percolation Test Data Sheet

Project Name: El Sobrante Landfill - Proposed RNG Facility
Project Number: 31405562.000
Date: 7/28/2022
Location: North Site
Boring ID: NS-B1

Test hole dimensions	
Boring Depth* (feet):	15.1
Boring Diameter (inches):	8.0
Pipe Diameter (inches):	2.0

*includes pipe stickup above top of boring

Miscellaneous Test Details	
Liquid Description:	Non-Potable Water
Measurement Method:	Water Level Sounder
Depth to Water Table:	>15 Feet Below Bottom of Boring
Water Remaining In Boring:	2.8 Feet Remaining After Test
Tested By	D. Lam
Checked By	R. Hillman

Pre-Soak / Pre-Test:

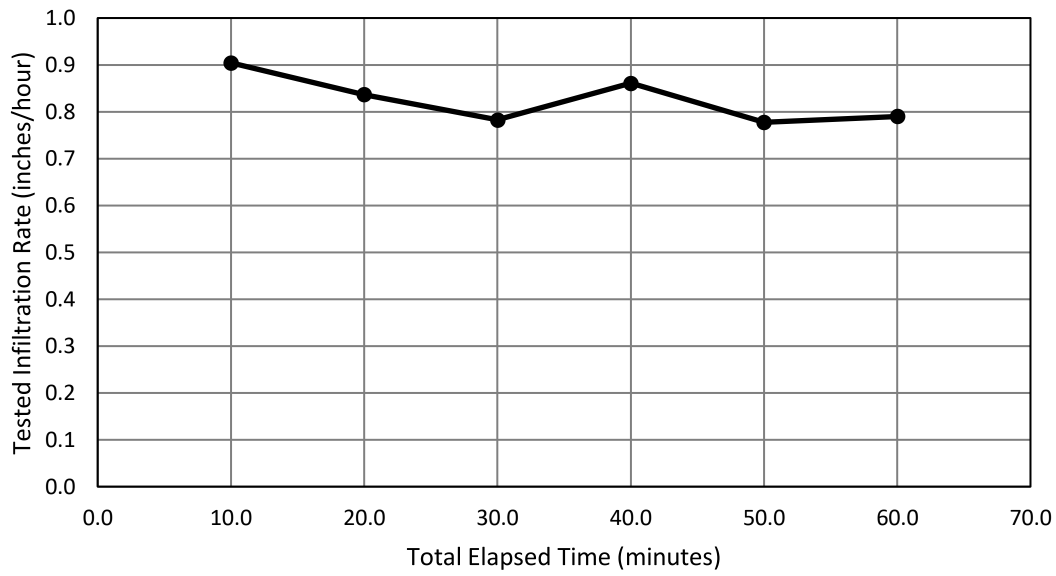
Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Total Change in Water Level, d_2-d_1 (feet)	Comments
1	11:04	11:29	25.0	12.22	13.41	1.19	water level drop exceeded 6 inches in 25 minutes
2	11:29	11:54	25.0	13.41	14.07	0.66	water level drop exceeded 6 inches in 25 minutes

Percolation Test Data:

Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Change in Water Level, ΔH (inches)	Tested Infiltration Rate*, I_t (in/hr)	Design Infiltration Rate**, I_d (in/hr)	Notes/Observations
1	14:01:00	14:11:00	10.0	12.05	12.28	2.76	0.9	0.3	
2	14:11:00	14:21:00	10.0	12.10	12.31	2.52	0.8	0.3	
3	14:21:00	14:31:00	10.0	12.05	12.25	2.40	0.8	0.3	
4	14:31:00	14:41:00	10.0	12.04	12.26	2.64	0.9	0.3	
5	14:41:00	14:51:00	10.0	12.03	12.23	2.40	0.8	0.3	
6	14:51:00	15:01:00	10.0	12.08	12.28	2.40	0.8	0.3	

Percolation Test Results:

Tested Infiltration Rate (in/hr):	0.8
Factor of Safety (FS):	3.0
Design Infiltration Rate (in/hr):	**0.3**



*Calculated using the Porchet equation:

$$I_t = \frac{\Delta H \, 60 \, r}{\Delta t (r + 2H_{avg})}$$

where:

I_t = tested infiltration rate (inches/hour)
ΔH = change in head over the selected time interval (inches)
r = radius of the borehole (inches)
Δt = time interval (minutes)
H_{avg} = average head over the time interval (inches)

**I_d = I_t / FS

Boring Percolation Test Data Sheet

Project Name: El Sobrante Landfill - Proposed RNG Facility
Project Number: 31405562.000
Date: 7/28/2022 (Pre-Soak) and 7/29/2022 (Test)
Location: North Site
Boring ID: NS-B3

Test hole dimensions	
Boring Depth* (feet):	14.7
Boring Diameter (inches):	8.0
Pipe Diameter (inches):	2.0

*includes pipe stickup above top of boring

Miscellaneous Test Details	
Liquid Description:	Non-Potable Water
Measurement Method:	Water Level Sounder
Depth to Water Table:	>15 Feet Below Bottom of Boring
Water Remaining In Boring:	3.1 Feet Remaining After Test
Tested By	D. Lam
Checked By	R. Hillman

Pre-Soak / Pre-Test:

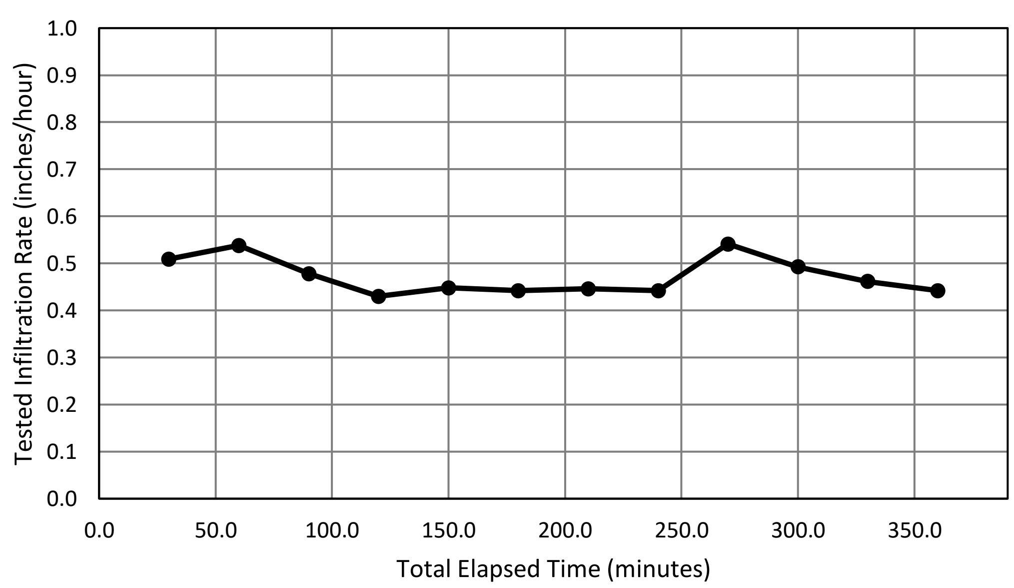
Reading No.	Start Time on 7/28/2022	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Total Change in Water Level, d_2-d_1 (feet)	Comments
1	10:07	10:32	25.0	11.22	11.77	0.55	water level drop exceeded 6 inches in 25 minutes
2	10:41	11:06	25.0	11.22	11.64	0.42	water level drop less than 6 inches in 25 minutes
3	11:06	15:07	241.0	11.64	13.01	1.37	added water after final depth measurement for soak
4	13:09	7/29/22 7:37	1108.0	11.21	14.72	3.51	test hole soaked overnight

Percolation Test Data:

Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Change in Water Level, ΔH (inches)	Tested Infiltration Rate*, I_t (in/hr)	Design Infiltration Rate**, I_d (in/hr)	Notes/Observations
1	8:10:00	8:40:00	30.0	11.21	11.65	5.28	0.5	0.2	
2	8:40:00	9:10:00	30.0	11.00	11.49	5.88	0.5	0.2	
3	9:10:00	9:40:00	30.0	11.16	11.58	5.04	0.5	0.2	
4	9:40:00	10:10:00	30.0	11.26	11.63	4.44	0.4	0.1	
5	10:10:00	10:40:00	30.0	11.21	11.60	4.68	0.4	0.1	
6	10:40:00	11:10:00	30.0	11.26	11.64	4.56	0.4	0.1	
7	11:10:00	11:40:00	30.0	11.29	11.67	4.56	0.4	0.1	
8	11:40:00	12:10:00	30.0	11.26	11.64	4.56	0.4	0.1	
9	12:10:00	12:40:00	30.0	11.10	11.58	5.76	0.5	0.2	
10	12:40:00	13:10:00	30.0	11.18	11.61	5.16	0.5	0.2	
11	13:10:00	13:40:00	30.0	11.22	11.62	4.80	0.5	0.2	
12	13:40:00	14:10:00	30.0	11.26	11.64	4.56	0.4	0.1	

Percolation Test Results:

Tested Infiltration Rate (in/hr):	0.4
Factor of Safety (FS):	3.0
Design Infiltration Rate (in/hr):	**0.1**



*Calculated using the Porchet equation:

$$I_t = \frac{\Delta H \; 60 \; r}{\Delta t (r + 2H_{avg})}$$

where:

I_t = tested infiltration rate (inches/hour)
ΔH = change in head over the selected time interval (inches)
r = radius of the borehole (inches)
Δt = time interval (minutes)
H_{avg} = average head over the time interval (inches)

**$I_d = I_t$ / FS

Boring Percolation Test Data Sheet

Project Name: El Sobrante Landfill - Proposed RNG Facility
Project Number: 31405562.000
Date: 7/28/2022 (Pre-Soak) and 7/29/2022 (Test)
Location: North Site
Boring ID: NS-B4

Test hole dimensions	
Boring Depth* (feet):	5.1
Boring Diameter (inches):	8.0
Pipe Diameter (inches):	2.0

*includes pipe stickup above top of boring

Miscellaneous Test Details	
Liquid Description:	Non-Potable Water
Measurement Method:	Water Level Sounder
Depth to Water Table:	>5 Feet Below Bottom of Boring
Water Remaining In Boring:	2.0 Feet Remaining After Test
Tested By	D. Lam
Checked By	R. Hillman

Pre-Soak / Pre-Test:

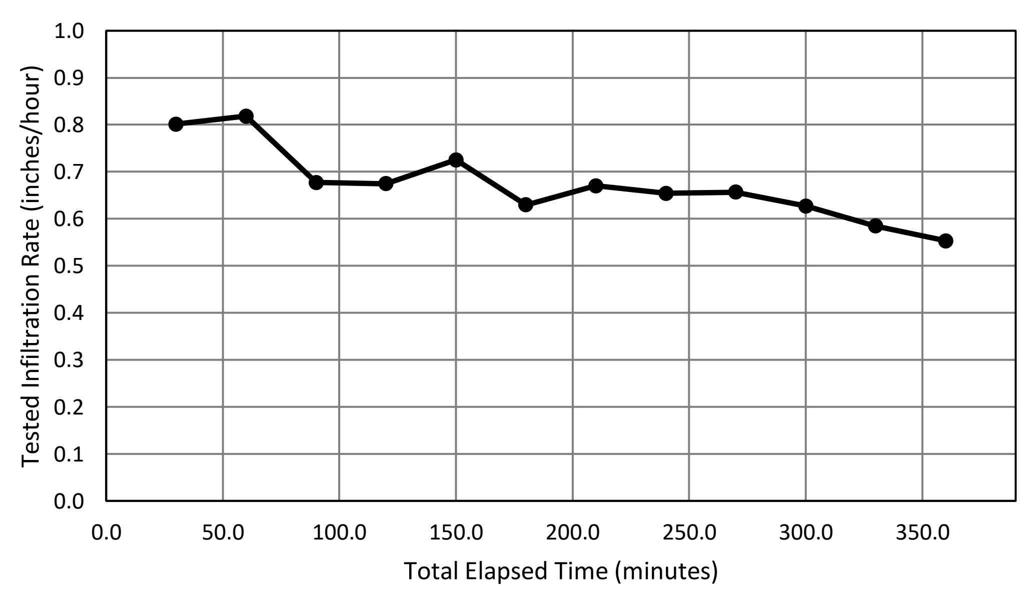
Reading No.	Start Time on 7/28/2022	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Total Change in Water Level, d_2-d_1 (feet)	Comments
1	13:16	13:41	25.0	2.27	2.89	0.62	water level drop exceeded 6 inches in 25 minutes
2	13:41	15:15	94.0	2.89	3.52	0.63	added water after final depth measurement for soak
3	15:22	7/29/22 7:30	968.0	2.27	4.04	1.77	test hole soaked overnight

Percolation Test Data:

Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Change in Water Level, ΔH (inches)	Tested Infiltration Rate*, I_t (in/hr)	Design Infiltration Rate**, I_d (in/hr)	Notes/Observations
1	8:10:00	8:40:00	30.0	2.30	2.84	6.48	0.8	0.3	
2	8:40:00	9:10:00	30.0	2.25	2.81	6.72	0.8	0.3	
3	9:10:00	9:40:00	30.0	2.32	2.78	5.52	0.7	0.2	
4	9:40:00	10:10:00	30.0	2.31	2.77	5.52	0.7	0.2	
5	10:10:00	10:40:00	30.0	2.26	2.76	6.00	0.7	0.2	
6	10:40:00	11:10:00	30.0	2.32	2.75	5.16	0.6	0.2	
7	11:10:00	11:40:00	30.0	2.29	2.75	5.52	0.7	0.2	
8	11:40:00	12:10:00	30.0	2.29	2.74	5.40	0.7	0.2	
9	12:10:00	12:40:00	30.0	2.30	2.75	5.40	0.7	0.2	
10	12:40:00	13:10:00	30.0	2.31	2.74	5.16	0.6	0.2	
11	13:10:00	13:40:00	30.0	2.33	2.73	4.80	0.6	0.2	
12	13:40:00	14:10:00	30.0	2.33	2.71	4.56	0.6	0.2	

Percolation Test Results:

Tested Infiltration Rate (in/hr):	0.6
Factor of Safety (FS):	3.0
Design Infiltration Rate (in/hr):	**0.2**



*Calculated using the Porchet equation:

$$I_t = \frac{\Delta H\ 60\ r}{\Delta t(r+2H_{avg})}$$

where:

I_t = tested infiltration rate (inches/hour)
ΔH = change in head over the selected time interval (inches)
r = radius of the borehole (inches)
Δt = time interval (minutes)
H_{avg} = average head over the time interval (inches)

**I_d = I_t / FS

Boring Percolation Test Data Sheet

Project Name: El Sobrante Landfill - Proposed RNG Facility
Project Number: 31405562.000
Date: 7/28/2022 (Pre-Soak) and 7/29/2022 (Test)
Location: South Site
Boring ID: SS-B5

Test hole dimensions	
Boring Depth* (feet):	15.1
Boring Diameter (inches):	8.0
Pipe Diameter (inches):	2.0

*includes pipe stickup above top of boring

Miscellaneous Test Details	
Liquid Description:	Non-Potable Water
Measurement Method:	Water Level Sounder
Depth to Water Table:	>15 Feet Below Bottom of Boring
Water Remaining In Boring:	4.7 Feet Remaining After Test
Tested By	D. Lam
Checked By	R. Hillman

Pre-Soak / Pre-Test:

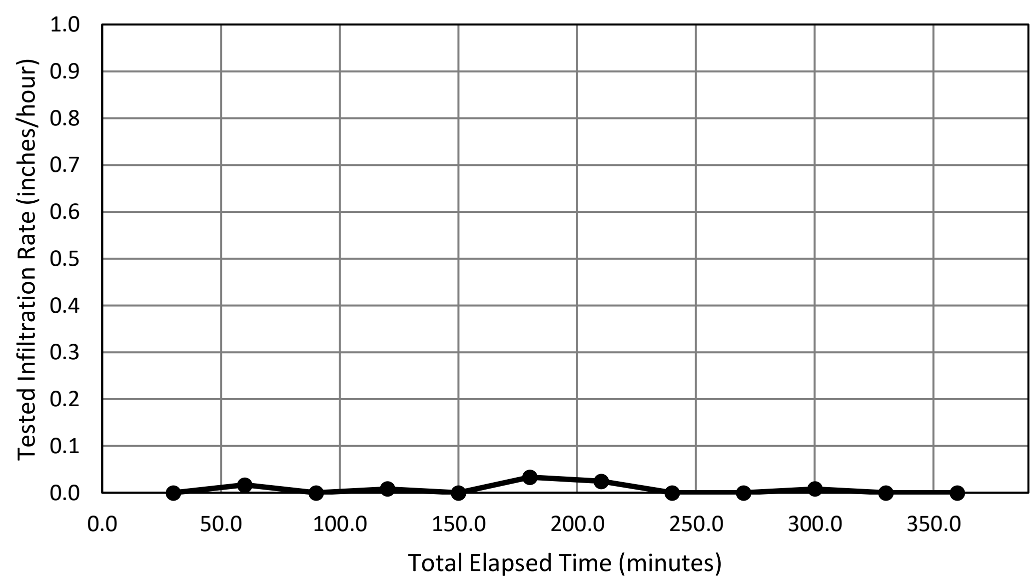
Reading No.	Start Time on 7/28/2022	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Total Change in Water Level, d_2-d_1 (feet)	Comments
1	8:57	16:25	448.0	10.66	10.82	0.16	water level drop less than 6 inches in 25 minutes
2	16:27	7/29/22 7:47	920.0	10.66	10.84	0.18	water added, test hole soaked overnight

Percolation Test Data:

Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Change in Water Level, ΔH (inches)	Tested Infiltration Rate*, I_t (in/hr)	Design Infiltration Rate**, I_d (in/hr)	Notes/Observations
1	7:50:00	8:20:00	30.0	10.38	10.38	0.00	0.0	0.0	
2	8:20:00	8:50:00	30.0	10.38	10.40	0.24	0.0	0.0	
3	8:50:00	9:20:00	30.0	10.38	10.38	0.00	0.0	0.0	
4	9:20:00	9:50:00	30.0	10.38	10.39	0.12	0.0	0.0	
5	9:50:00	10:20:00	30.0	10.39	10.39	0.00	0.0	0.0	
6	10:20:00	10:50:00	30.0	10.37	10.41	0.48	0.0	0.0	
7	10:50:00	11:20:00	30.0	10.35	10.38	0.36	0.0	0.0	
8	11:20:00	11:50:00	30.0	10.35	10.35	0.00	0.0	0.0	
9	11:50:00	12:20:00	30.0	10.35	10.35	0.00	0.0	0.0	
10	12:20:00	12:50:00	30.0	10.35	10.36	0.12	0.0	0.0	
11	12:50:00	13:20:00	30.0	10.36	10.36	0.00	0.0	0.0	
12	13:20:00	13:50:00	30.0	10.36	10.36	0.00	0.0	0.0	

Percolation Test Results:

Tested Infiltration Rate (in/hr):	0.0
Factor of Safety (FS):	3.0
Design Infiltration Rate (in/hr):	**0.0**



*Calculated using the Porchet equation:

$$I_t = \frac{\Delta H \, 60 \, r}{\Delta t (r + 2H_{avg})}$$

where:

I_t = tested infiltration rate (inches/hour)
ΔH = change in head over the selected time interval (inches)
r = radius of the borehole (inches)
Δt = time interval (minutes)
H_{avg} = average head over the time interval (inches)

**I_d = I_t / FS

APPENDIX E

Percolation Test Results for 2017 Study

Boring Percolation Test Data Sheet

Project Name: El Sobrante Landfill - Proposed NONA Structures
Project Number: 1788269
Date: 10/9/2017 (Pre-Soak) and 10/10/2017 (Test)
Location: Existing Operations Maintenance Yard Basin
Boring ID: B-143

Test hole dimensions	
Boring Depth* (feet):	10.1
Boring Diameter (inches):	8.0
Pipe Diameter (inches):	2.0

*includes pipe stickup above top of boring

Miscellaneous Test Details	
Liquid Description:	Non-Potable Water
Measurement Method:	Water Level Sounder
Depth to Water Table:	>10 Feet Below Bottom of Boring
Water Remaining In Boring:	No Water Remaining After Test
Tested By	J. Cox
Checked By	R. Hillman

Pre-Soak / Pre-Test:

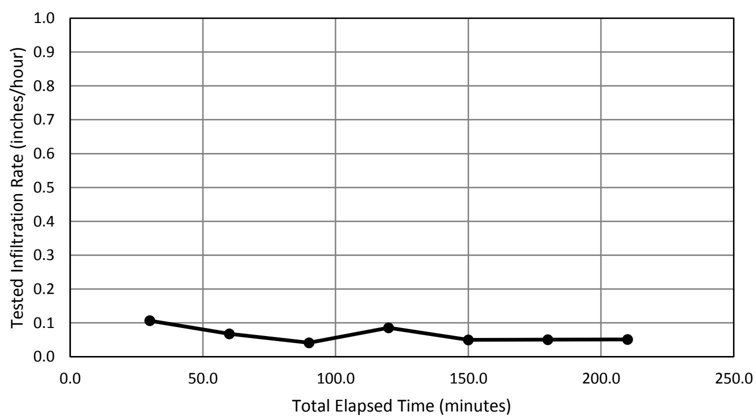
Reading No.	Start Time on 10/9/2017	Stop Time on 10/10/2017	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Total Change in Water Level, d_2-d_1 (feet)	Comments
1	14:48	10:30	1182.0	7.94	8.50	0.56	test hole soaked overnight

Percolation Test Data:

Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Change in Water Level, ΔH (inches)	Tested Infiltration Rate*, I_t (in/hr)	Design Infiltration Rate**, I_d (in/hr)	Notes/Observations
1	10:48:00	11:18:00	30.0	7.26	7.34	0.96	0.1	0.0	
2	11:18:00	11:48:00	30.0	7.34	7.39	0.60	0.1	0.0	
3	11:48:00	12:18:00	30.0	7.39	7.42	0.36	0.0	0.0	
4	12:21:00	12:51:00	30.0	7.01	7.08	0.84	0.1	0.0	
5	12:51:00	13:21:00	30.0	7.08	7.12	0.48	0.0	0.0	
6	13:23:00	13:53:00	30.0	7.12	7.16	0.48	0.1	0.0	
7	13:55:00	14:25:00	30.0	7.16	7.20	0.48	0.1	0.0	test terminated due to
									consistent readings

Percolation Test Results:

Tested Infiltration Rate (in/hr):	0.1
Factor of Safety (FS):	3.0
Design Infiltration Rate (in/hr):	**0.0**



*Calculated using the Porchet equation:

$$I_t = \frac{\Delta H\ 60\ r}{\Delta t(r+2H_{avg})}$$

where:

- I_t = tested infiltration rate (inches/hour)
- ΔH = change in head over the selected time interval (inches)
- r = radius of the borehole (inches)
- Δt = time interval (minutes)
- H_{avg} = average head over the time interval (inches)

**I_d = I_t / FS

Golder Associates

Boring Percolation Test Data Sheet

Project Name: El Sobrante Landfill - Proposed NONA Structures
Project Number: 1788269
Date: 10/10/2017
Location: Existing Operations Maintenance Yard Basin
Boring ID: B-145

Test hole dimensions	
Boring Depth* (feet):	10.0
Boring Diameter (inches):	8.0
Pipe Diameter (inches):	2.0

*includes pipe stickup above top of boring

Miscellaneous Test Details	
Liquid Description:	Non-Potable Water
Measurement Method:	Water Level Sounder
Depth to Water Table:	>10 Feet Below Bottom of Boring
Water Remaining In Boring:	No Water Remaining After Test
Tested By	J. Cox
Checked By	R. Hillman

Pre-Soak / Pre-Test:

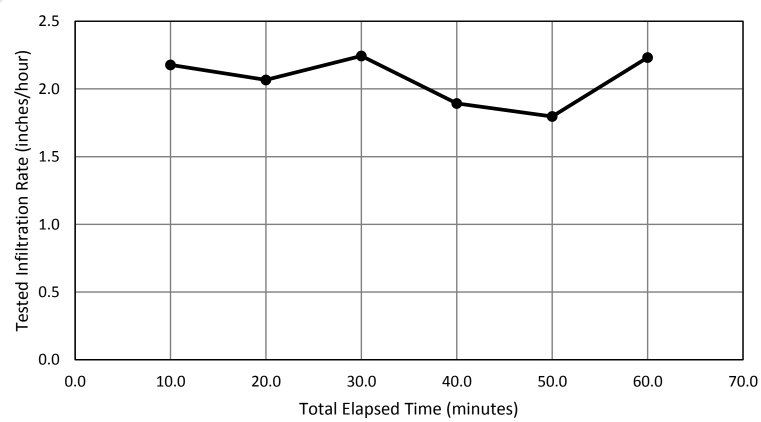
Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Total Change in Water Level, d_2-d_1 (feet)	Comments
1	10:52	11:17	25.0	6.81	8.00	1.19	water level drop exceeded 6 inches in 25 minutes
2	11:22	11:47	25.0	6.99	7.96	0.97	water level drop exceeded 6 inches in 25 minutes

Percolation Test Data:

Reading No.	Start Time	Stop Time	Time Interval, Δt (min)	Initial Depth to Water, d_1 (feet)	Final Depth to Water, d_2 (feet)	Change in Water Level, ΔH (inches)	Tested Infiltration Rate*, I_t (in/hr)	Design Infiltration Rate**, I_d (in/hr)	Notes/Observations
1	14:55:00	15:05:00	10.0	6.70	7.28	6.96	2.2	0.7	
2	15:05:00	15:15:00	10.0	6.15	6.79	7.68	2.1	0.7	
3	15:15:00	15:25:00	10.0	6.21	6.89	8.16	2.2	0.7	
4	15:25:00	15:35:00	10.0	6.15	6.74	7.08	1.9	0.6	
5	15:35:00	15:45:00	10.0	6.74	7.22	5.76	1.8	0.6	
6	15:45:00	15:55:00	10.0	6.19	6.87	8.16	2.2	0.7	

Percolation Test Results:

Tested Infiltration Rate (in/hr):	1.8
Factor of Safety (FS):	3.0
Design Infiltration Rate (in/hr):	**0.6**



*Calculated using the Porchet equation:

$$I_t = \frac{\Delta H \; 60 \; r}{\Delta t (r + 2H_{avg})}$$

where:

I_t = tested infiltration rate (inches/hour)
ΔH = change in head over the selected time interval (inches)
r = radius of the borehole (inches)
Δt = time interval (minutes)
H_{avg} = average head over the time interval (inches)

**I_d = I_t / FS

Golder Associates

APPENDIX F

Important Information About This Geotechnical Engineering Report (by GBA)

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org   www.geoprofessional.org

Appendix G
Paleontological Memorandum

AECOM
300 South Grand Avenue
Los Angeles, CA 90013
www.aecom.com

213.593.8100 tel
213.593.8053 fax

Memorandum

To	Ryan Ross, Planning Division Manager Riverside County Department of Waste Resources 14310 Frederick Street, Moreno Valley, CA 92553
Subject	Paleontological Memorandum for the El Sobrante Landfill Renewable Natural Gas Facility Project (AECOM Project No. 60723843)
From	Joe Stewart, PhD, Principal Paleontologist
Date	July 11, 2024

Introduction

Waste Management (WM) retained AECOM to prepare this paleontological study for the El Sobrante Landfill Renewable Natural Gas (RNG) Facility Project (proposed project) (Attachment 1, Figure 1), to support and inform preparation of the Addendum to the Environmental Impact Report (EIR) for the El Sobrante Landfill Expansion (State Clearinghouse [SCH] #1990020076) and the El Sobrante Landfill Solid Waste Facility Permit Revision Supplemental Environmental Impact Report (SEIR) (SCH #2007081054).

An investigation was conducted to assess the sensitivity for the presence of paleontological resources, and to recommend applicable measures to reduce potential impacts. This document was prepared in accordance with the California Environmental Quality Act (CEQA) Guidelines (Title 14, Division 6, Chapter 3 of the California Code of Regulations) and the professional standards of the Society of Vertebrate Paleontology (SVP) (2010). The Riverside County Department of Waste Resources is the CEQA lead agency for the proposed project.

The study consisted of archival research, geologic mapping research, a literature search, and an assessment of the type of paleontological resources that may be present in the project area. This document summarizes the results of the investigation, presents an inventory of known and probable paleontological resources in the project area, and discusses the proposed project's potential impacts on these resources. This document was compiled by AECOM's principal paleontologist, Dr. Joe Stewart, who meets the criteria of a qualified professional paleontologist as defined by the SVP (2010). Dr. Stewart has published 40 peer-reviewed articles in scientific books and journals, and he has 35 years of experience in studying the paleontology of Southern California.

Project Location and Description

The proposed project would be constructed within three previously disturbed areas, which would involve the following elements: a South RNG site; a North RNG site; a Gas Point of Receipt (POR) site; an underground pipeline connecting the three sites for conveying the landfill gas and processed gas; and an underground pipeline interconnection between the POR site and the Southern California Gas Company's main pipeline in Temescal Canyon Road.

The South RNG site would be an approximately 0.3-acre area adjacent to El Sobrante Landfill's two existing LFG flares (flare station). The 0.3-acre area currently contains three concrete pads that were used previously for co-gen power generation; these existing concrete pads would be removed and replaced with concrete specifically designed for the equipment to be used at the site. The South RNG site location is part of a larger graded area that is associated with the existing landfill entry and scales. The North RNG site would be an approximately 1.2-acre area on an existing graded landfill pad, approximately 0.5 mile north of the South RNG site. The RNG process would conclude at the 0.2-acre Gas POR site in the southwest portion of the El Sobrante Landfill, within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection.

Between the South RNG Site and North RNG Site an approximate 5-foot-8-inch wide by 8.5-foot-deep pipe trench, approximately 3,700 linear feet in length, would be installed via open cut trenching within the existing pavement or shoulder of the landfill access road. Between the South RNG Site and the north side of Temescal Canyon Wash (opposite the Gas POR Site) an approximate 4-foot-wide by 5-foot-deep pipe trench, approximately 6,700 linear feet in length, would be installed via open cut trenching (within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road). Underground piping would then be accomplished via horizontal directional drilling (HDD) boring to cross beneath, and avoid disturbance of, Temescal Canyon Wash. Two bores of approximately 500 linear feet would be drilled beneath the wash with minimum depths of 20-foot below the surface at the center of the wash.

The project area is in Temescal Valley, within Section 23, 26, 34, and 35, Township 4 South, Range 6 West of the San Bernardino Base Meridian, as shown on the Lake Mathews Quadrangles topographic map (Attachment 1, Figure 2).

Geologic Setting

The project area lies within the Peninsular Ranges geomorphologic province. The Peninsular Ranges run predominantly north-south. Rocks in the ranges are dominated by Mesozoic granitic rocks, derived from the same massive batholith that forms the core of the Sierra Nevada in California. Within the province, the project area lies on the Perris Block, separated from the backside of the Santa Ana Mountains by the Elsinore Fault. The project footprint is on the eastern half of the Temescal Valley. The Older Alluvium was deposited by streams in the area.

Older Alluvium manifested as a broad, gently sloping apron at the foot of the Santa Ana Mountains. Locally, this apron forms a slope, stretching from just north of Elsinore almost to Corona. Temescal Wash truncates and is incised into the northeastern edge of this apron.

Geologic Units

The following geologic units and descriptions are taken from the Lake Mathews Quadrangles geologic map (Morton et al. 2002), provided in Attachment 1, Figure 3:

> MzU – Mesozoic metasedimentary rocks, undifferentiated (Mesozoic): wide variety of low metamorphic-grade metamorphic rocks.
>
> Qya – Young axial channel deposits (Holocene and late Pleistocene): gray-hued sand and cobble, and gravel-sand deposits derived from lithicly diverse sedimentary units in the Temescal Valley.
>
> Tlm – Lake Mathews Formation (Miocene): mudstone, conglomerate, and poorly bedded sandstone; massively bedded, nonmarine.

> Tsi – Silverado Formation (Paleocene): nonmarine and marine sandstone, and siltstone thinly overlying thick basal conglomerate; basal conglomerate is thoroughly weathered, pale gray to reddish brown, pebble conglomerate, very locally is a boulder conglomerate that occurs in the Temescal Valley.

Paleontological Records Search

A paleontological records search request for the project area was submitted to the Natural History Museum of Los Angeles County (NHMLA) on January 25, 2024. The results were received on January 28, 2024, and show that a mammalian fossil was reported from the Lake Mathews Formation (Miocene) approximately 4 miles north of the El Sobrante Landfill (Bell 2024). Proctor and Downs (1963) reported finding oreodont (*Ustatochoerus*), camel (*Tanupolama*), camel family (*Camelidae*), and cat family (*Felidae*) at that site. Woodford et al. (1971) repeated this account. The NHMLA records search results are provided in Attachment 2.

The San Bernardino County Museum (SBCM) also houses paleontological collections, collections that may have been among those transferred from University of California (UC), Riverside to the UC Museum of Paleontology at Berkeley. Furthermore, since at least 1998, monitoring for paleontological resources has been mandated at El Sobrante Landfill. Because of known paleontological resources in the Silverado and Lake Mathews formations, Dr. Stewart contacted the Curator of Paleontology at that institution, inquiring whether the museum has acquired any paleontological collections from that monitoring activity. The SBCM indicated that it does not have any holdings from the landfill activities. A formal records search request was not submitted to the SBCM.

Paleontological Literature Search

Langenwalter (1991) cites personal communication with SBCM vertebrate paleontologists Kathleen Springer and Eric Scott that the museum has plant fossils from a locality in the Silverado Formation (Paleocene) 2 miles south of the landfill. In the same report, Langenwalter states that he found a plant fossil site within the boundaries of the landfill. Langenwalter also cites personal communication with Springer and Scott that a tapir fossil was found approximately half of a mile north of the landfill, presumably in the Lake Mathews Formation.

Jefferson (1991a) reported a turtle fossil from Lake View Hot Springs, 22 miles east of the project area. Jefferson (1991b) reported a horse fossil from a gravel pit in the San Jacinto Valley, approximately 26 miles east of the project area. Stewart (2016) documented Pleistocene pocket gopher (*Thomomys*) remains at a depth of 20 feet at the intersection of Temescal Canyon Road and Foster Road, 2 miles north of the project area.

Since approval of the SEIR, paleontological resources monitoring has been required for the El Sobrante Landfill Expansion Project. However, annual reports (RCDWR 2017, 2018, 2019, 2020, 2021, 2022, 2023) indicate that no excavation has been conducted in paleontologically sensitive sediments. Therefore, no monitoring for paleontological resources has been conducted.

Paleontological Potential

According to the SVP (2010) mitigation guidelines, rock units are described as having (a) high, (b) undetermined, (c) low, or (d) no potential for containing significant paleontological resources. These classification categories are described next.

High Potential

Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rock units that are classified as having a high potential for producing paleontological resources include sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras[1]), and some low-grade metamorphic rocks that contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous [SVP 2010:2] and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones). Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units that contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units that may contain new vertebrate deposits, traces, or trackways also are classified as having high potential.

Undetermined Potential

Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine whether these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential sometimes can be determined by strategically located excavations into subsurface stratigraphy.

Low Potential

Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units are poorly represented by fossil specimens in institutional collections, or based on general scientific consensus, only preserve fossils in rare circumstances, and the presence of fossils is the exception not the rule (e.g., basalt flows or Recent colluvium). Rock units with low potential typically would not require mitigation measures to protect fossils.

No Potential

Some rock units have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks (e.g., gneisses, schists) and plutonic igneous rocks (e.g., granites, diorites). Rock units with no potential require no protection or mitigation measures related to paleontological resources.

[1] A *tephra* is a fragmental material that is produced by a volcanic eruption, regardless of composition, fragment size, or emplacement mechanism

Geologic Units in the Project Area

The geologic units that are present in the project area and the paleontological potential rating for each are as follows:

> MzU – Mesozoic metasedimentary rocks, undifferentiated (Mesozoic), are rated as having **low** paleontological potential because of the metamorphism that the sediments have undergone.
>
> Qya – Young axial channel deposits (Holocene and late Pleistocene) are rated as having **low paleontological potential at the surface but having higher potential at depth**. The lower parts are of older Holocene and late Pleistocene age. Pleistocene fossils have been found at a depth of 20 feet only 2 miles north of the project area.
>
> Tlm – The Lake Mathews Formation (Miocene) is rated as having **high** paleontological potential. It has produced significant vertebrate fossils only a few miles from the project area.
>
> Tsi – The Silverado Formation (Paleocene) is rated as having **high** paleontological potential. It has produced significant plant fossils, and a record of plant fossils is within the landfill boundaries.

Project Impacts

As noted above, the project has the potential to impact several geologic units rated as having high paleontological potential. Excavation for the pipe trench between the South RNG Site and North RNG Site would impact the Lake Mathews Formation (Tlm). Additionally, the HDD boring process would impact young axial channel deposits (Qya) and possibly an underlying deposit beneath the Temescal Canyon Wash. Although Qya deposits are rated as having low paleontological potential at the surface, paleontological potential increases with depth and Pleistocene fossils have been found at a depth of 20 feet, which is the minimum depth of HDD boring at the center of the wash.

Project activities are not anticipated to impact the Silverado Formation (Tsi).

Conclusions and Recommendations

The proposed project’s impacts on paleontological resources within the Lake Mathews Formation (Tlm) and Young axial channel deposits (Qya) potentially could be significant. Therefore, prior to ground disturbance a paleontological monitoring and mitigation program with provisions for testing sediment samples for microvertebrate fossils should be developed for project activities within these formations. The program should be developed by a qualified professional paleontologist, as defined by the CEQA Guidelines and consistent with SVP standard procedures (2010). Project activities within the formations with low potential (MzU) or those with high potential that will not be impacted by project activities (Silverado Formation) do not require monitoring.

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Acronyms and Abbreviations

CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
NHMLA	Natural History Museum of Los Angeles County
POR	Point of Receipt
proposed project	El Sobrante Landfill Renewable Natural Gas Facility Project
RNG	renewable natural gas
SBCM	Sana Bernardino County Museum
SCH	State Clearinghouse
SEIR	Supplemental Environmental Impact Report
SVP	Society of Vertebrate Paleontology
UC	University of California
WM	Waste Management

Attachment 1 – Figures

Figure 1: Overview Map

Figure 2: Topographic Map

Figure 3: Lake Mathews Quadrangles Geologic Map

AECOM Oakland CA 4/17/2024 USER stevensona1 PATH \\na\lfs\AMER\Orange-USORA1\DCS\Projects\ENV\60723843_ESL_Toro_RNG\900_CAD_GIS\920_GIS\02_Maps\02_Report_Maps\Cultural\ELS_Landfill_Cultural.aprx

AECOM

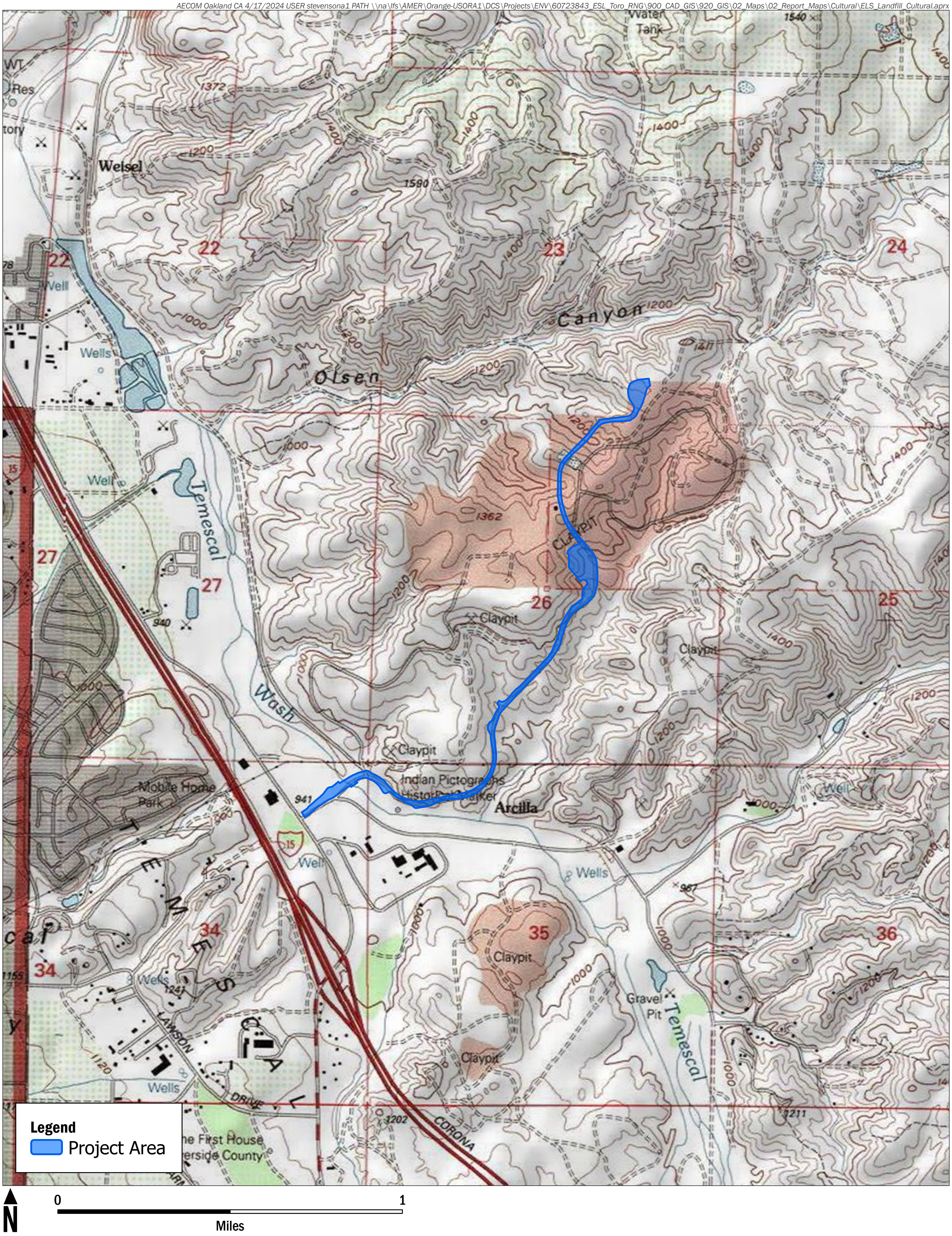
Waste Management National Services, Inc.

Renewable Natural Gas (RNG) Facility Project

PROJECT: 60723843

FIGURE 1

Overview Map



AECOM

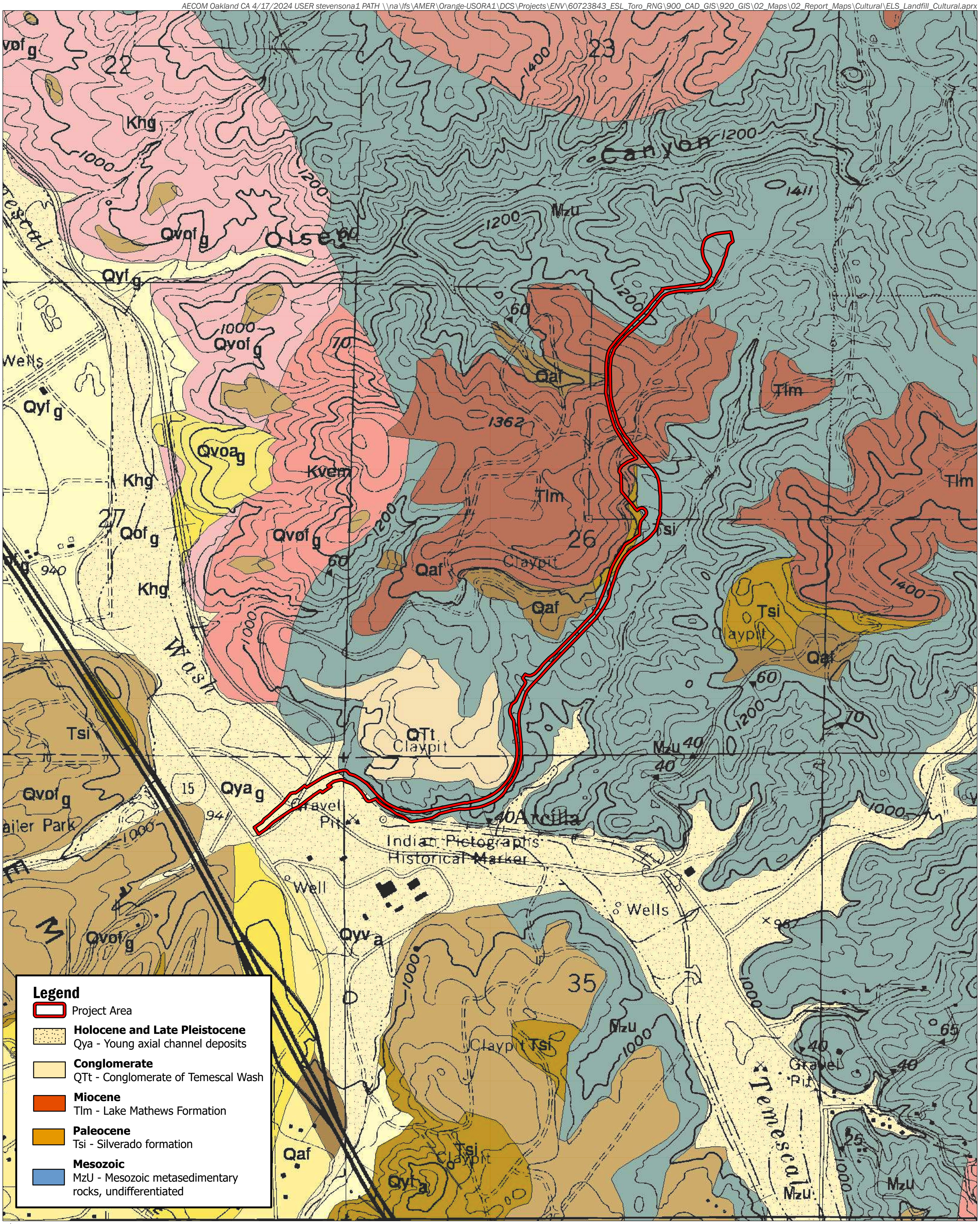
Waste Management National Services, Inc.

Renewable Natural Gas (RNG) Facility Project

PROJECT: 60723843

FIGURE 2

USGS Lake Mathews 1997 7.5′ Topographic Map



AECOM

Waste Management National Services, Inc.

Renewable Natural Gas (RNG) Facility Project

PROJECT: 60723843

FIGURE 3

Morton et al. 2002

Lake Mathews Quadrangles Geologic Map

Attachment 2 – NHMLA Records Search Results

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Research & Collections

e-mail: paleorecords@nhm.org

January 28, 2024

AECOM
Attn: Alec Stevenson

re: Paleontological resources for the Renewable Natural Gas Facility Project

Dear Alec:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Renewable Natural Gas Facility project area as outlined on the portion of the Lake Mathews USGS topographic quadrangle map that you sent to me via e-mail on January 25, 2024. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that may occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County (NHMLA).

Locality Number	Location	Formation	Taxa	Depth
LACM VP 1541	Lake Mathews; Borrow pit used for embankment fill material for the enlargement of Mathews Dam	Lake Mathews Formation	Oreodont (*Ustatochoerus*), camel (*Tanupolama*), camel family (Camelidae), cat family (Felidae)	Unknown

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the NHMLA. It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,

Alyssa Bell

Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice

Appendix H
Flood Risk Summary Memo

Toro Energy – LFG Project at ESL, Flood Risk Summary Memo

To: Toro Energy
From: Jessica Cassman, PE, CFM
Date: May 24, 2023
Subject: Project Flood Risk Summary

Introduction

The Toro Energy project (Project), in coordination with Waste Management and SoCal Gas, will convert landfill gas (LFG) from El Sobrante Landfill (ESL) to renewable natural gas. The Project is located at Dawson Canyon Rd and Park Canyon Dr, in the Temescal Valley area of unincorporated Riverside County, see Figure 1.

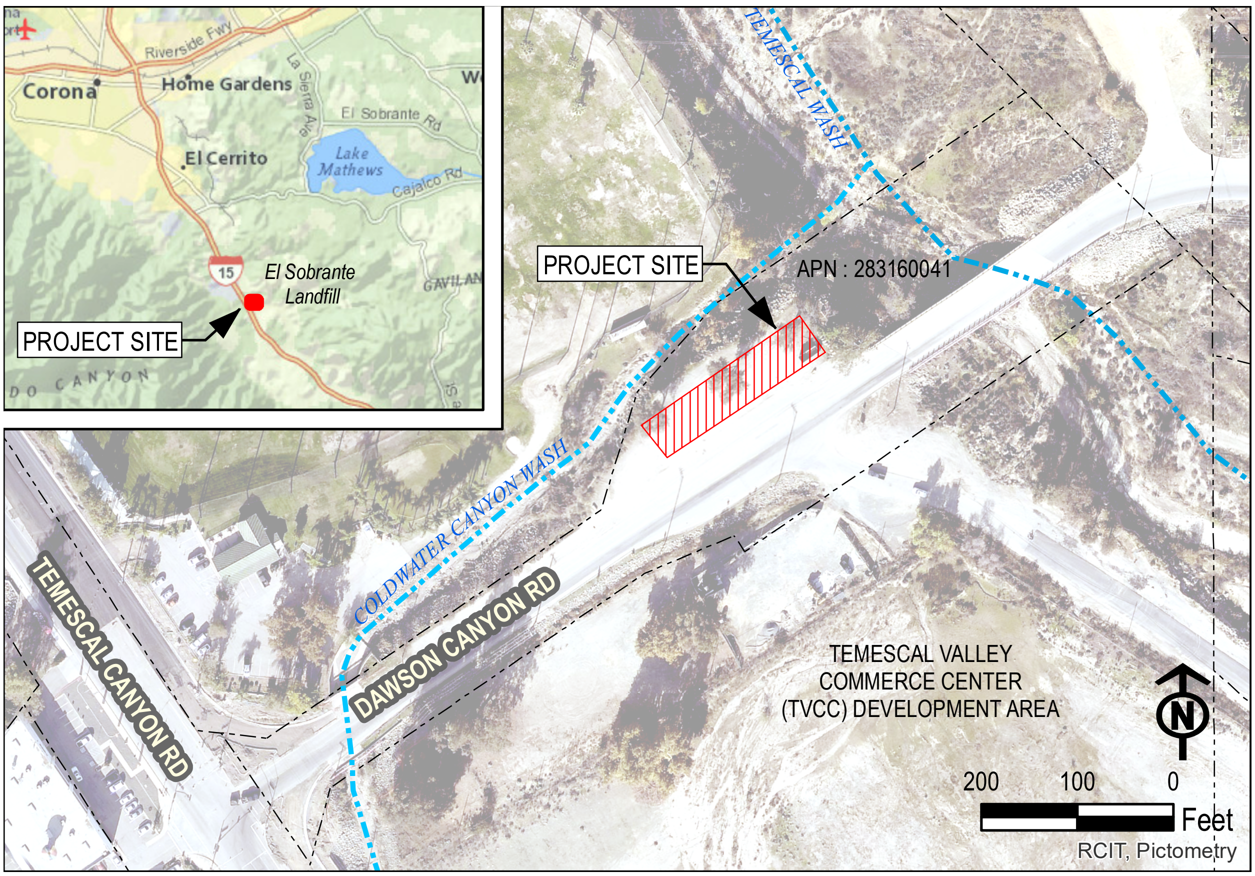


Figure 1 - Location and Vicinity Map

Temescal Canyon Wash borders the project site on the east, and Coldwater Canyon Wash borders the project site on the north. Project design is impacted by Federal Emergency Management Agency (FEMA) special flood hazard areas (SFHAs) associated with these riverine systems.

This memo summarizes the information gathered from FEMA and Riverside County as it relates to Project flood hazard and risk mitigation.

Existing Conditions

Based on survey data, the elevation of the existing project site is flat, at an elevation of approximately 930 feet.

The Project is in a FEMA SFHA Zone AE, with an effective Base Flood Elevation (BFE) of between 927 and 932 feet (NAVD88), effective Flood Insurance Rate Map (FIRM) data is shown in Figure 2.

Separately, a Riverside County Flood Control (RCFC) flood hazard zone (FHZ) associated with Coldwater Canyon Wash (CCW) has been established based on a Special Study. No flood elevations are determined for this area.

A small golf course is located just north of the Project, and a potential future Temescal Valley Commercial Center (TVCC) development area is located just south of the project. The golf course area is lower in elevation than the project site, approximately 926 feet.

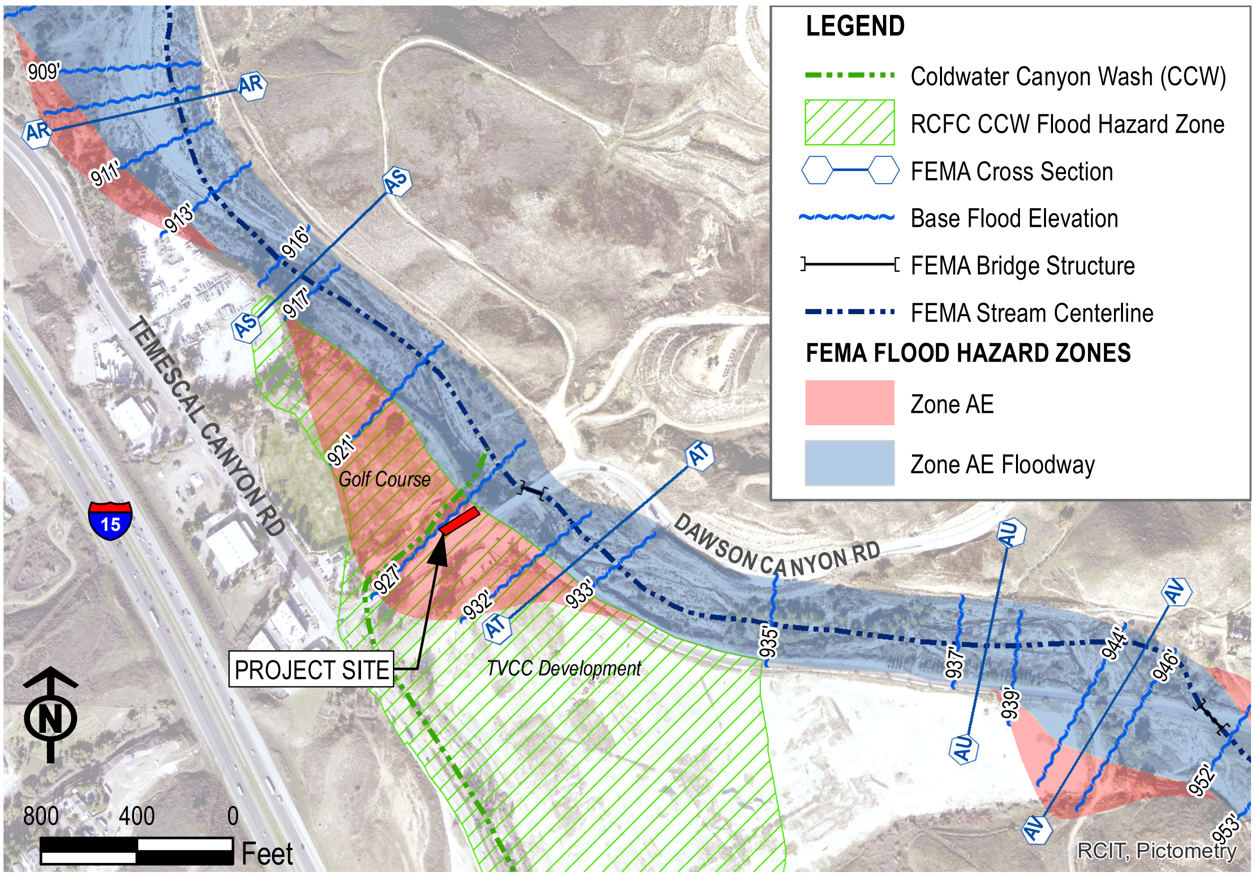


Figure 2 – Effective FEMA FIRM Data

Project Design

The project site contains the Point of Receipt (POR) for the Renewable Natural Gas Facility's refined natural gas product. The POR site would include an electrical shelter, analyzer shelter and odorant skid with canopy. The shelters are approximately 10 feet square and will be designed with a finish floor elevation of 933 feet, one foot above the effective BFE. All water sensitive equipment would be elevated to 933 feet or higher. The POR site may extend to the top of slope adjacent to CCW via a retaining wall. Retaining wall placement will be in accordance with applicable building code, structural and geotechnical recommendation. The Project would not encroach into CCW defined slopes that designate the existing floodway.

Data Review Summary

The following documents were reviewed to understand Project risk and hazard mitigation:

- Attachment 1: Effective Flood Insurance Study (Volumes 06037CV001F – 06037CV009F), Flood Insurance Rate Map (FIRM), FEMA Backup data, original HEC-2 Analysis
- Attachment 2: TVCC CLOMR Application & Technical Backup Data
- Attachment 3: Existing Site Topography
- Attachment 4: Riverside County Flood Control Special Study Coldwater Canyon Wash Geomorphology Study

Effective Flood Insurance Rate Map & Backup Data

The effective SFHA boundaries and BFEs are based on a HEC-2 hydraulic model completed in the mid-1990s. Review of the Effective Model in HEC-2 resulted in the following notes:

- Model reflects NGVD29 datum
- Topography is significantly out of date in the vicinity of the Project, even with a datum shift of +2.6 feet from NGVD29 to NAVD88
- The Dawson Canyon Rd Bridge is not accurately modeled
- The HEC-2 Model assumes a flow split due to the bridge overtopping Dawson Canyon Rd Bridge

Existing Flood Hazard Risk

The future TVCC development just south of the Project has developed a Conditional Letter of Map Revision request (Rick Engineering, January 2023) for the portion of Temescal Wash in the vicinity of the Project. This study was reviewed to understand the existing flood hazard risk at the project site. The study includes an Existing Conditions model which updates the Effective Model in the following ways:

- Converts the hydraulic model from HEC-2 to HEC-RAS
- Applies a datum conversion for the entire model of +2.6 feet to convert from NGVD 29 to NAVD 88
- Updated the Dawson Canyon Road Bridge geometry based on survey information
- Removed the split flow at Dawson Canyon Road based on the determination that flow does not overtop Dawson Canyon Rd
- Updated topography to U.S. Geological Survey (USGS) one meter data and surveyed data

Figure 3 shows the existing condition hydraulic model workmap comparing the effective SFHA to the existing SFHA. Figure 4 shows the effective bridge cross section compared with the existing bridge cross section from survey. Figure 5 shows the effective flood profile compared with the existing condition.

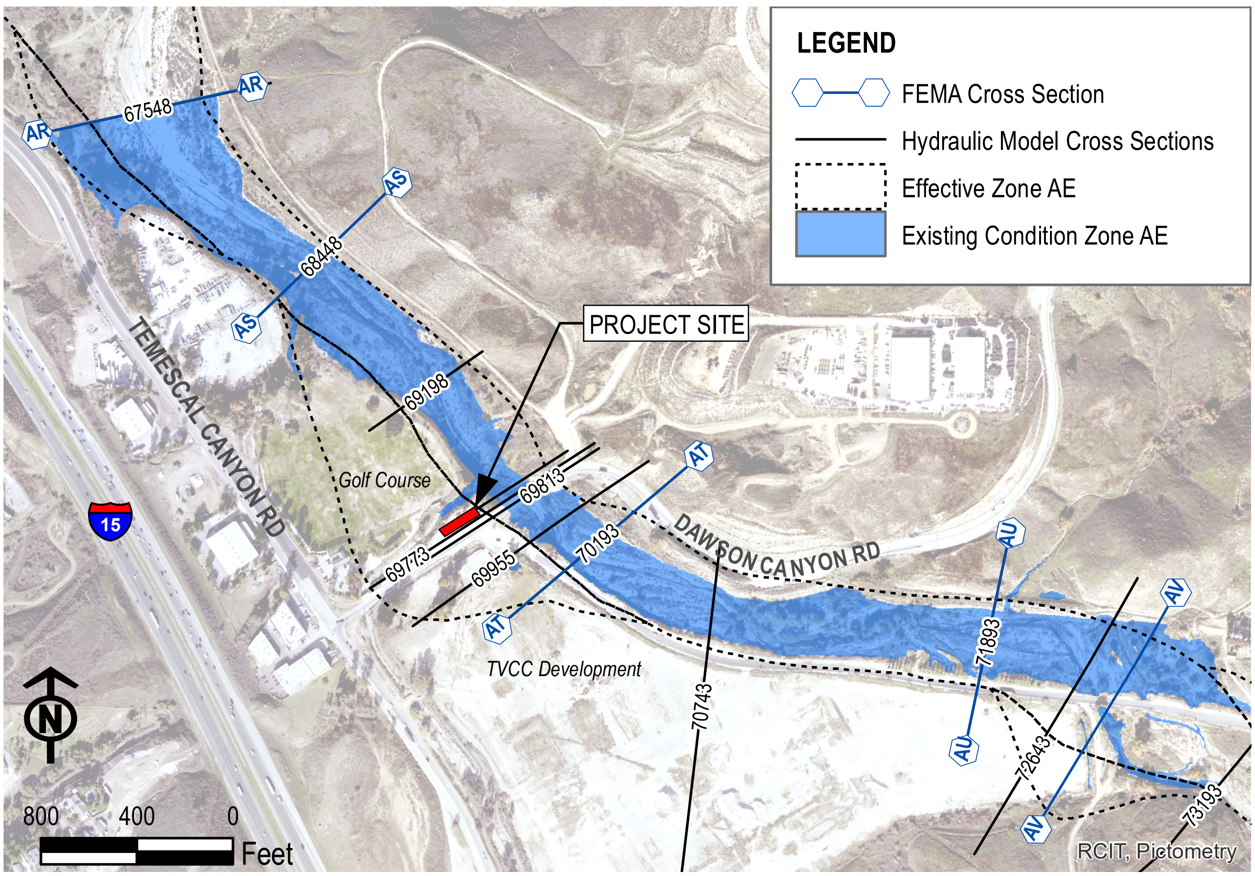


Figure 3 - Existing Condition Hydraulic Model Workmap

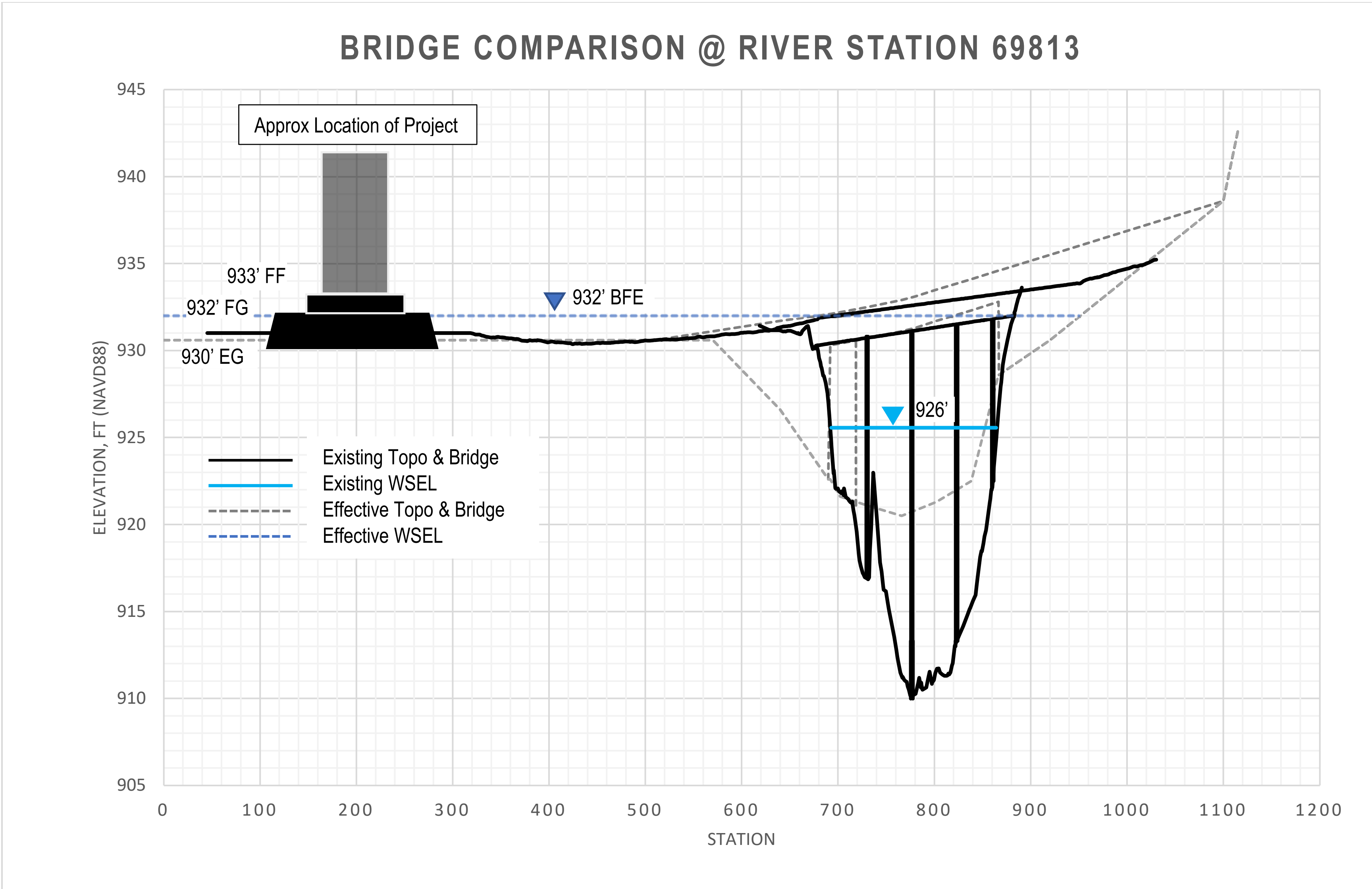


Figure 4 - Bridge Cross Section Comparison

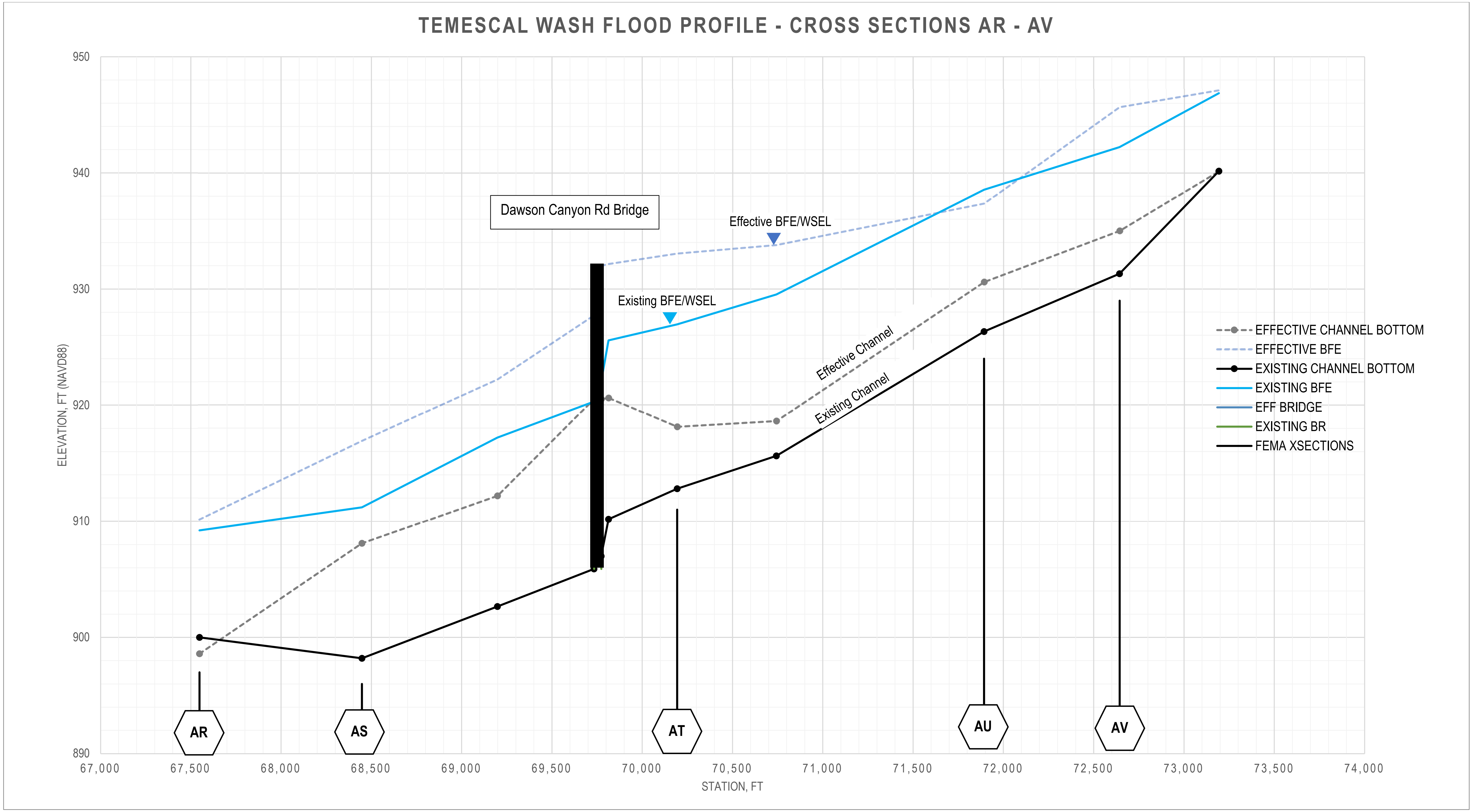


Figure 5 - Existing Condition vs Effective Model Flood Profile Comparison

Coldwater Canyon Wash (CCW) Geomorphology Review

The CCW FHZ was delineated based on the Coldwater Canyon Wash Geomorphology Study (JE Fuller, 2018 – 2019) for RCFC. FHZ boundaries represent the probable erosion and flood hazard based on overall geomorphic setting and are not associated with a specific or singular storm event. Historically, the confluence of CCW and Temescal Wash was alluvial, meandering through areas that are currently a golf course to the north, the project site, and the future TVCC development to the south. CCW was realigned and channelized along Temescal Canyon Rd and Dawson Canyon Road in the mid-1990s. The study concluded a broad definition of FHZ in this vicinity based on the historical spread of flow and moderate erosion potential in the existing CCW channel.

The following notes are based on a review of the study:

- Inadequate capacity to convey the 100-year flood in CCW along Temescal Canyon Rd and under Dawson Canyon Rd would result in localized flooding in lower lying areas relative to the project site. Localized flooding would occur in Temescal Canyon Rd, the golf course to the north, and TVCC development area to the south of the project.
- Vertical and lateral erosion is likely to occur in the portion of CCW located along the north boundary of the Project based on findings stated in the report. This does not currently take into account the potential stormwater routing by TVCC which is currently in plan check with Riverside County Flood. In the event TVCC project does not proceed with proposed improvements, there is long term erosion potential that can occur over time and it is storm dependent. Erosion potential can be assessed on an annual basis to determine potential upkeep requirements.
- Development opportunities for the TVCC development area have been proposed in different forms since 2006. The report shows that rerouting CCW through this area instead of under Dawson Canyon Rd was a part of the development proposal. More recently, the TVCC CLOMR application also shows a similar rerouting of CCW. When this area is developed, rerouting of CCW will be required by RCFC as a condition, as it considers the private development adequate for the purpose of stabilizing the lower reaches of CCW at a planning level. This event will significantly decrease erosion potential in CCW near the Project site.

Conclusion

Proposed Project design would maintain a finished floor and equipment elevation of 933 feet minimum, which is one foot above the effective BFE of 932 feet. Although this elevation is appropriate to minimize flood hazard risk based on the effective FIRM, it is also conservative considering the existing conditions and likely future development. Updated flood models based on existing topography and bridge geometry show that the one percent annual chance flood is contained within the Temescal Wash main channel in the vicinity of the Project.

Localized flooding on the project site due to CCW would be insignificant, as flood water would seek Temescal Wash through lower lying areas relative to the Project. Potential lateral erosion along the north edge of the Project in CCW can be mitigated with an operation and maintenance plan. The Project would be monitored with an erosion control plan ready for implementation as needed. Future realignment of CCW away from the Project would further mitigate localized flooding and erosion concerns within CCW in the Project vicinity.

Attachment 1

Effective Flood Insurance Study (Volumes 06037CV001F – 06037CV009F), Flood Insurance Rate Map (FIRM), FEMA Backup data, original HEC-2 Analysis

National Flood Hazard Layer FIRMette

FEMA

117°29'32"W 33°47'18"N

117°28'55"W 33°46'48"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) *Zone A, V, A99*
		With BFE or Depth *Zone AE, AO, AH, VE, AR*
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
		Future Conditions 1% Annual Chance Flood Hazard *Zone X*
		Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
		Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
		Effective LOMRs
		Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES	B 20.2 / 17.5	Cross Sections with 1% Annual Chance Water Surface Elevation
	8	Coastal Transect
	513	Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

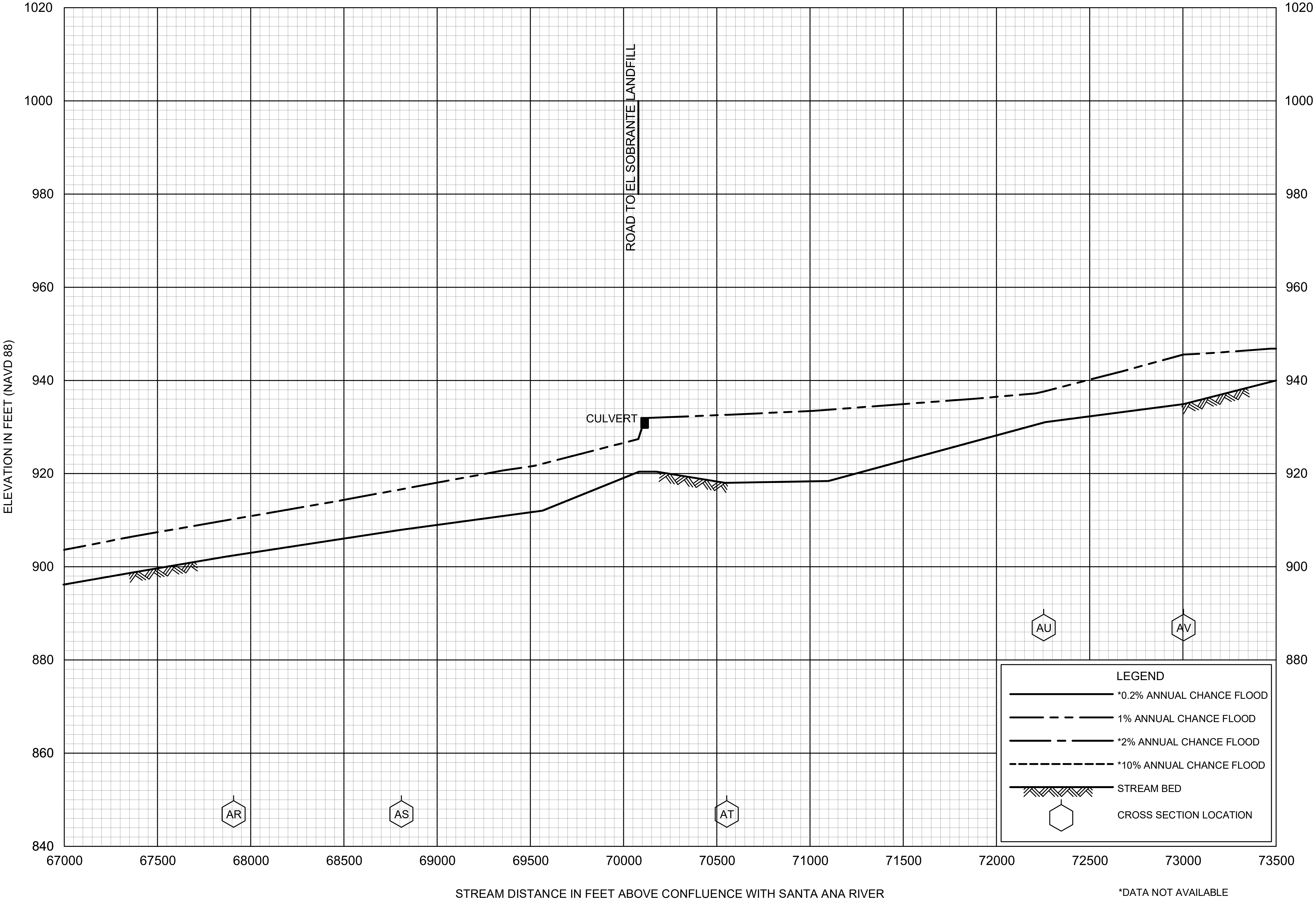
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/18/2023 at 7:50 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



FLOOD PROFILES

TEMESCAL WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERSIDE COUNTY, CA

AND INCORPORATED AREAS

Table 9: Summary of Discharges *(continued)*

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent Annual-Chance	0.2-Percent-Annual-Chance
Stetson Avenue Channel	At San Jacinto Street	1.3	300	*	490	650	1,500
Stovepipe Canyon Creek	At State Highway 71	1.3	150	*	460	750	1,700
Stream A	At 2S./5E.-29 NW. corner	0.6	440	*	620	740	970
Taylor Avenue Drain	At Cota Street	1.5	280	*	590	850	1,900
Taylor Avenue Drain	At Riverside Freeway	1.4	260	*	550	800	1,800
Taylor Avenue Drain	At Grand Boulevard	1.3	220	*	500	750	1,700
Taylor Avenue Drain	At Olive Avenue	0.9	160	*	370	550	1,200
Taylor Avenue Drain	At Citron Avenue	0.8	150	*	340	500	1,100
Taylor Avenue Drain	At Ontario Avenue	0.7	130	*	300	450	1,000
Temecula Creek	At mouth	370.0	7,500	*	27,000	36,000	58,000
Temescal Wash	Below confluence with Oak Street	249.0	4,170	*	9,900	12,700	19,400
Temescal Wash	Below confluence with Arlington Channel	224.0	3,840	*	9,030	11,500	17,500
Temescal Wash	Above confluence with Arlington Channel	*	1,970	*	12,180	24,000	58,090
Temescal Wash	At Magnolia Avenue	134.0	1,800	*	11,700	22,000	52,000
Tequesquite Arroyo	At Tequesquite Avenue	4.89 [12]	1,972	*	*	2,880	*
Tequesquite Arroyo	At Magnolia Avenue	3.54 [12]	685	*	*	750	*
Tequesquite Arroyo	At Atchison, Topeka & Santa Fe Railway	3.01 [12]	1,240	*	*	2,350	*
Thousand Palms Canyon	At Apex	84.1	5,330	*	11,170	14,510	24,600

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Table 12: Summary of Hydrologic and Hydraulic Analyses *(continued)*

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Temecula Creek	33.47398, -117.111356	33.501244, -117.003378	*	*	*	A	*
Temecula Creek	33.474739, -117.14102	33.474218, -117.111806	*	*	*	AE	*
Temescal Wash	33.904802, -117.611408	33.680929, -117.331863	Log Pearson Type III Frequency Analysis	HEC 2, normal-depth calculations with extensive field investigations and analysis of existing topography	*	AE	LP Analysis used USGS gage 11072000, Temescal Wash near Corona. Portion of boundary taken from City of Corona FIS (HUD 1978). Levee 5: An attempt was made to map the riverside base flood elevations on the landward side of the levee using detailed topographic data provided by Riverside County. Using the riverside base flood elevations, a levee failure floodplain could not be mapped (11/20/1996).
Temescal Wash	33.904802, -117.611408	33.680929, -117.331863	*	*	02/02/2018	AE w/ Floodway	LOMR 17-09-1498P
Tequesquite Arroyo	33.975537, -117.398942	33.954758, -117.343908	*	*	11/20/1996	AE	*
The Veldt	*	*	*	HEC 2	9/17/1980	A	*
Third Street Basin	*	*	*	*	9/17/1980	A	*

*Data not available

Table 23: Floodway Data *(continued)*

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Temescal Wash								
AA	49,916	231	2,345	10.4	786.3	786.3	787.0	0.7
AB	50,376	185	2,612	8.7	792.4	792.4	793.0	0.6
AC	51,226	274	4,004	6.1	797.5	797.5	798.4	0.9
AD	52,626	260	2,297	10.6	805.2	805.2	805.2	0.0
AE	53,676	200	2,073	11.8	812.1	812.1	812.4	0.3
AF	54,676	110	1,318	18.5	817.7	817.7	818.3	0.6
AG	55,576	194	1,699	14.4	831.7	831.7	832.3	0.6
AH	56,276	159	2,084	11.7	837.6	837.6	838.2	0.6
AI	57,550	111	1,345	18.1	844.9	844.9	845.1	0.2
AJ	58,573	160	1,994	9.7	851.4	851.4	851.8	0.4
AK	59,723	190	1,680	11.6	859.5	859.5	859.8	0.3
AL	61,013	790	3,031	6.4	872.8	872.8	873.0	0.2
AM	62,073	480	2,424	8.0	879.1	879.1	879.1	0.0
AN	63,173	269	2,260	8.6	884.7	884.7	884.8	0.1
AO	64,323	537	5,331	3.6	887.1	887.1	887.4	0.3
AP	65,323	286	1,476	13.1	891.0	891.0	891.0	0.0
AQ	66,473	743	2,731	7.1	902.2	902.2	902.4	0.2
AR	67,548	465	2,564	7.6	910.0	910.0	910.0	0.0
AS	68,448	315	1,986	9.8	916.8	916.8	916.8	0.0
AT	70,193	379	3,000	5.3	932.0	932.0	932.0	0.0
AU	71,893	290	1,305	12.2	937.2	937.2	937.2	0.0
AV	72,643	554	2,406	6.6	945.6	945.6	945.6	0.0
AW	74,155	243	1,736	9.0	959.0	959.0	959.6	0.6
AX	75,605	386	3,130	5.1	969.1	969.1	969.3	0.2
AY	76,855	689	3,643	4.4	971.3	971.3	972.1	0.8
AZ	78,955	410	1,861	8.5	987.7	987.7	987.7	0.0

[1] Feet above confluence with Santa Ana River

TABLE 23	FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERSIDE COUNTY, CA** AND INCORPORATED AREAS	**FLOODWAY DATA** **FLOODING SOURCE: TEMESCAL WASH**

06065CV003F

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 *  VERSION OF NOVEMBER 1976                         *                                      *  THE HYDROLOGIC ENGINEERING CENTER *
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 T2      RIVERSIDE COUNTY FIS, FEMA0590
 T3      TEMESCAL WASH                  FILE : FLWY-FL1.HEC

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 NC      .035      .035      .060      .100      .300      .000      .000      .000      .000      .000
 QT     2.000 24400.000 24400.000      .000      .000      .000      .000      .000      .000      .000
 ET      .000     9.100     7.100     9.100     9.100     9.100  3940.900  5039.100  3940.000  5039.480
 X1 34400.000    11.000  4960.000  5050.000      .000      .000      .000      .000      .000      .000
 GR   700.000  3445.000   684.000  3475.000   680.000  3500.000   678.000  3835.000   676.000  4120.000
 GR   676.000  4235.000   674.000  4640.000   680.000  4960.000   672.000  5000.000   680.000  5050.000
 GR   700.000  5115.000      .000      .000      .000      .000      .000      .000      .000      .000

 ET      .000     9.100     7.100     9.100     9.100     9.100  4580.000  5540.000  4370.000  5570.000
 X1 35425.000    14.000  4975.000  5540.000   600.000   950.000  1025.000      .000      .000      .000
 GR   700.000  4110.000   684.000  4140.000   680.000  4160.000   680.000  4580.000   676.000  4610.000
 GR   676.000  4705.000   680.000  4750.000   680.000  4950.000   680.000  4975.000   677.400  5000.000
 GR   676.000  5345.000   676.000  5380.000   680.000  5540.000   700.000  5570.000      .000      .000

 ET      .000     9.100     7.100     9.100     9.100     9.100  4700.800  5700.000  4585.000  5700.000
 X1 36325.000    20.000  4715.000  5145.000   830.000  1165.000   900.000      .000      .000      .000
 GR   720.000  4585.000   700.000  4630.000   692.000  4645.000   688.000  4675.000   684.000  4715.000
 GR   680.000  4865.000   680.000  5000.000   680.000  5025.000   684.000  5040.000   684.000  5065.000
 GR   680.000  5105.000   684.000  5145.000   684.000  5225.000   684.000  5285.000   680.000  5305.000
 GR   680.000  5695.000   684.000  5725.000   688.000  5780.000   692.000  5835.000   700.000  5895.000
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 NC      .035      .035      .025      .300      .500      .000      .000      .000      .000      .000
 ET      .000     9.100     7.100     9.100     9.100     9.100  4733.500  5290.000  4675.000  5290.000
 X1 36461.000    25.000  4950.000  5120.000   100.000   400.000   136.000      .000      .000      .000
 GR   700.000  4660.000   692.000  4715.000   688.000  4730.000   684.000  4740.000   684.000  4795.000
 GR   684.000  4855.000   680.000  4950.000   680.000  5000.000   680.000  5010.000   676.000  5030.000
 GR   674.000  5045.000   676.000  5060.000   680.000  5105.000   680.000  5105.000   684.000  5120.000
 GR   688.000  5130.000   692.000  5150.000   688.000  5200.000   684.000  5250.000   686.000  5285.000
 GR   688.000  5320.000   688.000  5490.000   692.000  5565.000   696.000  5610.000   700.000  5665.000

 ET      .000     9.110     7.100     9.110     9.110     9.110  4795.600  5290.000  4675.000  5290.000
 X1 36486.000    20.000  4977.500  5022.500    25.000    25.000    25.000      .000      .000      .000
 BT    -7.000  4950.000   684.000   684.000  4977.500   686.000   682.500  4994.000   686.000   682.500
 BT      .000  5000.000   686.000   682.500  5006.000   685.700   682.200  5022.500   685.000   681.500
 BT      .000  5105.000   684.000   684.000      .000      .000      .000      .000      .000      .000
 GR   708.000  4675.000   704.000  4690.000   700.000  4730.000   696.000  4745.000   692.000  4780.000
 GR   688.000  4800.000   684.000  4820.000   680.000  4895.000   684.000  4950.000   682.500  4977.500
 GR   674.000  4994.000   674.000  5000.000   674.000  5006.000   681.500  5022.500   684.000  5105.000
 GR   688.000  5160.000   688.000  5290.000   688.000  5490.000   692.000  5570.000   700.000  5660.000

 ET      .000     9.110     7.100     9.110     9.110     9.110  4797.000  5345.000  4738.000  5345.000
 X1 36518.000    20.000  4977.500  5022.500    32.000    32.000    32.000      .000      .000      .000
 BT    -7.000  4950.000   684.000   684.000  4977.500   686.000   682.500  4994.000   686.000   682.500
 BT      .000  5000.000   686.000   682.500  5006.000   685.700   682.200  5022.500   685.000   681.500
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 BT      .000  5105.000   684.000   684.000      .000      .000      .000      .000      .000      .000
 GR   708.000  4710.000   704.000  4730.000   700.000  4745.000   696.000  4760.000   692.000  4795.000
 GR   688.000  4800.000   684.000  4820.000   680.000  4895.000   684.000  4950.000   682.500  4977.500
 GR   674.000  4994.000   674.000  5000.000   674.000  5006.000   681.500  5022.500   684.000  5105.000
 GR   688.000  5160.000   688.000  5290.000   688.000  5490.000   692.000  5570.000   700.000  5660.000

 NC      .035      .035      .060      .300      .500      .000      .000      .000      .000      .000
 ET      .000     9.100     7.100     9.100     9.100     9.100  4765.100  5275.400  4738.000  5345.000
 X1 36519.000    17.000  4850.000  5140.000     1.000     1.000     1.000      .000      .000      .000
 GR   720.000  4695.000   700.000  4755.000   676.000  4770.000   672.000  4820.000   684.000  4850.000
 GR   680.000  4895.000   676.000  4905.000   674.000  4960.000   676.000  5000.000   676.000  5050.000
 GR   680.000  5100.000   684.000  5140.000   688.000  5230.000   688.000  5460.000   692.000  5530.000
 GR   696.000  5570.000   700.000  5605.000      .000      .000      .000      .000      .000      .000

 NC      .035      .035      .030      .300      .500      .000      .000      .000      .000      .000
 ET      .000     9.100     7.100     9.100     9.100     9.100  4795.400  5208.300  4715.000  5215.000
 X1 36669.000    35.000  4795.000  5215.000   150.000    80.000   150.000      .000      .000      .000
 GR   708.000  4715.000   700.000  4735.000   696.000  4745.000   692.000  4795.000   688.000  4800.000
 GR   686.200  4820.000   682.400  4857.000   679.200  4895.000   678.300  4909.000   677.950  4922.000
 GR   678.500  4935.000   679.200  4948.000   679.100  4961.000   676.800  4973.000   676.100  4987.000
 GR   675.400  5000.000   678.400  5012.000   677.900  5026.000   676.500  5039.000   678.700  5052.000
 GR   677.400  5065.000   677.300  5078.000   677.500  5090.000   678.800  5104.000   679.300  5117.000
 GR   679.900  5130.000   679.300  5143.000   680.800  5156.000   679.800  5170.000   687.000  5195.000
 GR   694.000  5215.000   688.000  5260.000   688.000  5430.000   692.000  5510.000   700.000  5590.000
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 ET      .000      .000     7.100     9.100     9.100     9.100  4795.000  5208.200      .000      .000
 X1 36670.000    71.000  4795.000  5215.000     1.000     1.000     1.000      .000      .000      .000
 X3    10.000      .000      .000      .000      .000      .000      .000      .000      .000      .000
 BT   -67.000  4745.000   696.000   696.000  4795.000   692.500   692.000  4800.000   692.500   689.200
 BT      .000  4816.500   692.540   689.240  4816.700   692.540   689.240  4819.500   692.540   689.240
 BT      .000  4819.700   692.540   689.240  4831.000   692.600   689.300  4844.000   692.630   689.330
 BT      .000  4855.500   692.660   689.360  4855.700   692.660   689.360  4858.500   692.660   689.360
 BT      .000  4858.700   692.660   689.360  4870.000   692.690   689.390  4883.000   692.720   689.420
 BT      .000  4894.500   692.750   689.450  4894.700   692.750   689.450  4897.500   692.750   689.450
 BT      .000  4897.700   692.750   689.450  4909.000   692.780   689.480  4922.000   692.820   689.520
 BT      .000  4933.500   692.850   689.550  4933.700   692.850   689.550  4936.500   692.850   689.550
 BT      .000  4936.700   692.850   689.550  4948.000   692.880   689.580  4961.000   692.910   689.610
 BT      .000  4972.500   692.940   689.640  4972.700   692.940   689.640  4975.500   692.940   689.640
 BT      .000  4975.700   692.940   689.640  4987.000   692.900   689.600  5000.000   693.000   689.700
 BT      .000  5011.500   693.100   689.800  5011.700   693.100   689.800  5014.500   693.100   689.800
 BT      .000  5014.700   693.100   689.800  5026.000   693.150   689.850  5039.000   693.200   689.900
 BT      .000  5050.500   693.250   689.950  5050.700   693.250   689.950  5053.500   693.250   689.950
 BT      .000  5053.700   693.250   689.950  5065.000   693.310   690.010  5078.000   693.380   690.080
 BT      .000  5089.500   693.440   690.140  5089.700   693.440   690.140  5092.500   693.440   690.140
 BT      .000  5092.700   693.440   690.140  5104.000   693.500   690.200  5117.000   693.570   690.270
 BT      .000  5128.500   693.630   690.370  5128.700   693.630   690.370  5131.500   693.630   690.370
 BT      .000  5131.700   693.630   690.370  5143.000   693.700   690.400  5156.000   693.750   690.450
 BT      .000  5167.500   693.830   690.530  5167.700   693.830   690.530  5170.500   693.830   690.530
 BT      .000  5170.700   693.830   690.530  5182.000   693.920   690.620  5194.500   694.000   690.700
 BT      .000  5194.700   694.000   690.700  5195.500   694.000   690.700  5195.700   694.000   690.700
 BT      .000  5215.000   694.000   694.000      .000      .000      .000      .000      .000      .000
 GR   696.000  4745.000   692.000  4795.000   688.000  4800.000   686.200  4816.500   689.240  4816.700
 GR   689.240  4819.500   686.200  4819.700   682.500  4831.000   681.830  4844.000   682.400  4855.500
 GR   689.360  4855.700   689.360  4858.500   682.400  4858.700   682.800  4870.000   682.230  4883.000
 GR   679.200  4894.500   689.450  4894.700   689.450  4897.500   679.200  4897.700   678.300  4909.000
 GR   677.950  4922.000   678.500  4933.500   689.550  4933.700   689.550  4936.500   678.500  4936.700
 GR   679.200  4948.000   679.100  4961.000   676.800  4972.500   689.640  4972.700   689.640  4975.500
 GR   676.800  4975.700   676.100  4987.000   675.400  5000.000   678.400  5011.500   689.800  5011.700
 GR   689.800  5014.500   678.400  5014.700   677.900  5026.000   676.500  5039.000   678.700  5050.500
 GR   689.950  5050.700   689.950  5053.500   678.700  5053.700   677.400  5065.000   677.300  5078.000
 GR   677.500  5089.500   690.140  5089.700   690.140  5092.500   677.500  5092.700   678.800  5104.000
 GR   679.300  5117.000   679.900  5128.500   690.370  5128.700   690.370  5131.500   679.900  5131.700
 GR   679.300  5143.000   680.800  5156.000   679.800  5167.500   690.530  5167.700   690.530  5170.500
 GR   679.800  5170.700   681.700  5182.000   687.000  5194.500   690.700  5194.700   690.700  5195.500
 GR   687.000  5195.700   694.000  5215.000   688.000  5260.000   688.000  5430.000   692.000  5510.000
 GR   700.000  5590.000      .000      .000      .000      .000      .000      .000      .000      .000

 ET      .000      .000     7.100     9.100     9.100     9.100  4795.500  5208.300      .000      .000
 X1 36690.000      .000      .000      .000    20.000    20.000    20.000      .000      .000      .000
 X2      .000      .000      .000      .000      .000      .000     1.000      .000      .000      .000
 X3    10.000      .000      .000      .000      .000      .000      .000      .000      .000      .000

 NC      .035      .035      .060      .300      .000     5.000      .000      .000      .000      .000
 ET      .000     9.100     7.100     9.100     9.100     9.100  4795.100  5209.100  4740.000  5215.000
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 X1 36691.000    35.000  4795.000  5215.000     1.000     1.000     1.000      .000      .000      .000
 GR   708.000  4715.000   700.000  4735.000   696.000  4745.000   692.000  4795.000   688.000  4800.000
 GR   686.200  4820.000   682.400  4857.000   679.200  4895.000   678.300  4909.000   677.950  4922.000
 GR   678.500  4935.000   679.200  4948.000   679.100  4961.000   676.800  4973.000   676.100  4987.000
 GR   675.400  5000.000   678.400  5012.000   677.900  5026.000   676.500  5039.000   678.700  5052.000
 GR   677.400  5065.000   677.300  5078.000   677.500  5090.000   678.800  5104.000   679.300  5117.000
 GR   679.900  5130.000   679.300  5143.000   680.800  5156.000   679.800  5170.000   687.000  5195.000
 GR   694.000  5215.000   688.000  5260.000   688.000  5430.000   692.000  5510.000   700.000  5590.000

 NC      .035      .035      .060      .100      .300      .000      .000      .000      .000      .000
 ET      .000     9.100     7.100     9.100     9.100     9.100  4770.000  5065.000  4720.000  5100.000
 X1 36941.000    18.000  4750.000  5065.000   380.000    90.000   250.000      .000      .000      .000
 GR   720.000  4720.000   700.000  4750.000   692.000  4770.000   688.000  4790.000   684.000  4870.000
 GR   680.000  4890.000   680.000  5000.000   680.000  5020.000   684.000  5035.000   692.000  5065.000
 GR   694.200  5100.000   692.000  5115.000   688.000  5135.000   688.000  5170.000   692.000  5315.000
 GR   700.000  5395.000   708.000  5465.000   720.000  5595.000      .000      .000      .000      .000

 ET      .000     9.100     7.100     9.100     9.100     9.100  4678.100  5073.700  4590.000  5080.000
 X1 37166.000    13.000  4655.000  5080.000   230.000   200.000   225.000      .000      .000      .000
 GR   740.000  4590.000   700.000  4655.000   688.000  4700.000   680.000  4800.000   680.000  5000.000
 GR   680.000  5035.000   692.000  5060.000   694.700  5080.000   692.000  5125.000   700.000  5155.000
 GR   720.000  5200.000   740.000  5225.000   740.000  5255.000      .000      .000      .000      .000
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 ET       .000       .000      7.100      9.100      9.100      9.100   4640.000   5183.000       .000       .000
 X1  38166.000      9.000   4750.000   5220.000   1050.000    925.000   1000.000       .000       .000       .000
 GR    740.000   4495.000    696.000   4605.000    692.000   4640.000    692.000   4735.000    688.000   4750.000
 GR    684.700   5000.000    688.000   5100.000    700.000   5220.000    740.000   5285.000       .000       .000

 ET       .000       .000      7.100      9.100      9.100      9.100   4779.500   5355.000       .000       .000
 X1  39116.000     21.000   4855.000   5215.000   1250.000    625.000    950.000       .000       .000       .000
 X3       .000    690.000       .000       .000       .000       .000       .000       .000       .000       .000
 GR    740.000   4515.000    720.000   4630.000    700.000   4640.000    696.000   4650.000    692.000   4790.000
 GR    684.000   4855.000    680.000   4910.000    680.000   4975.000    662.000   5000.000    680.000   5100.000
 GR    684.000   5170.000    686.000   5215.000    684.000   5250.000    684.000   5340.000    692.000   5355.000
 GR    695.800   5395.500    696.000   5425.000    700.000   5440.000    700.000   5460.000    720.000   5585.000
 GR    740.000   5650.000       .000       .000       .000       .000       .000       .000       .000       .000

 ET       .000       .000      7.100      9.100      9.100      9.100   4840.000   5120.000       .000       .000
 X1  40116.000     16.000   4890.000   5090.000   1000.000   1000.000   1000.000       .000       .000       .000
 GR    760.000   4560.000    720.000   4640.000    708.000   4670.000    708.000   4805.000    704.000   4840.000
 GR    700.000   4890.000    700.000   4950.000    696.000   4960.000    695.500   5000.000    696.000   5035.000
 GR    700.000   5090.000    705.300   5120.000    708.000   5145.000    720.000   5190.000    740.000   5255.000
 GR    760.000   5355.000       .000       .000       .000       .000       .000       .000       .000       .000

 ET       .000       .000      7.100      9.100      9.100      9.100   4770.000   5240.000       .000       .000
 X1  41116.000     17.000   4835.000   5145.000    960.000   1075.000   1000.000       .000       .000       .000
 GR    760.000   4630.000    720.000   4705.000    720.000   4745.000    712.000   4770.000    708.000   4835.000
 GR    704.000   4870.000    704.000   4885.000    705.000   5000.000    708.000   5145.000    711.000   5165.000
 GR    708.000   5180.000    712.000   5240.000    716.000   5250.000    720.000   5310.000    728.000   5350.000
 GR    740.000   5370.000    760.000   5410.000       .000       .000       .000       .000       .000       .000
1
  03/17/93    09:52:58                                                                                PAGE    5



 ET       .000       .000      7.100      9.100      9.100      9.100   4933.000   5425.000       .000       .000
 X1  42091.000     16.000   4890.000   5100.000    850.000   1050.000    975.000       .000       .000       .000
 GR    780.000   4825.000    760.000   4860.000    740.000   4890.000    720.000   4950.000    712.000   4975.000
 GR    711.200   5000.000    712.000   5025.000    716.000   5080.000    724.000   5100.000    724.000   5250.000
 GR    724.000   5425.000    760.000   5445.000    764.000   5635.000    764.000   5685.000    768.000   5730.000
 GR    780.000   5755.000       .000       .000       .000       .000       .000       .000       .000       .000

 ET       .000      9.100      7.100      9.100      9.100      9.100   4880.000   5360.000   4630.000   5360.000
 X1  42641.000     17.000   4880.000   5160.000    550.000    525.000    550.000       .000       .000       .000
 GR    800.000   4630.000    760.000   4730.000    740.000   4775.000    736.000   4800.000    728.500   4880.000
 GR    720.000   4930.000    714.600   5000.000    720.000   5045.000    728.000   5160.000    728.000   5190.000
 GR    800.000   5191.000    800.000   5315.000    728.000   5316.000    728.000   5325.000    732.000   5400.000
 GR    740.000   5410.000    760.000   5460.000       .000       .000       .000       .000       .000       .000

 ET       .000      9.100      7.100       .000      9.100      9.100   4880.000   5315.000   4705.000   5315.000
 X1  42956.000     22.000   4880.000   5099.500    350.000    250.000    315.000       .000       .000       .000
 GR    780.000   4705.000    740.000   4805.000    732.000   4830.000    732.000   4880.000    722.900   4920.000
 GR    721.500   4940.000    719.900   4960.000    720.900   4980.000    717.500   5000.000    720.100   5020.000
 GR    719.360   5040.000    718.500   5049.500    720.100   5059.300    721.900   5080.000    728.800   5099.500
 GR    730.500   5120.000    731.000   5205.000    770.000   5210.000    770.000   5255.000    731.000   5256.000
 GR    731.000   5330.000    770.000   5331.000       .000       .000       .000       .000       .000       .000

 NC       .035       .035       .020       .300       .500       .000       .000       .000       .000       .000
 ET       .000       .000      7.100      9.100      9.100      9.100   4858.000   5330.000       .000       .000
 X1  42991.000     20.000   4899.500   5099.500     35.000     35.000     35.000       .000       .000       .000
 GR    760.000   4745.000    740.000   4810.000    736.000   4815.000    732.400   4860.000    730.000   4899.500
 GR    722.900   4920.000    721.500   4940.000    719.900   4960.000    720.900   4980.000    720.600   5000.000
 GR    720.100   5020.000    719.360   5040.000    718.500   5049.500    720.100   5059.300    721.900   5080.000
 GR    728.800   5099.500    730.800   5130.000    731.000   5280.000    731.000   5330.000    750.000   5331.000

 SB      1.050      1.320      2.500       .000    140.000     18.000   1393.000      1.750    720.000    719.800
 ET       .000      9.110      7.100      9.110      9.110      9.110   4834.400   5300.000   4745.000   5300.000
 X1  43011.000     20.000   4899.500   5099.500     20.000     20.000     20.000       .000       .000       .000
 X2       .000       .000      1.000    730.000    731.800       .000       .000       .000       .000       .000
 BT    -15.000   4860.000    732.400    732.400   4899.500    733.000    730.000   4920.000    732.900    729.900
 BT       .000   4940.000    732.800    729.800   4960.000    732.600    729.600   4980.000    732.500    729.500
 BT       .000   5000.000    732.400    729.400   5020.000    732.300    729.300   5040.000    732.200    729.200
 BT       .000   5049.500    732.200    729.200   5059.300    732.000    729.000   5080.000    731.900    728.900
 BT       .000   5099.500    731.800    728.800   5130.000    730.800    730.800   5280.000    731.000    731.000
 GR    760.000   4745.000    740.000   4810.000    736.000   4815.000    732.400   4860.000    730.000   4899.500
 GR    722.900   4920.000    721.500   4940.000    719.900   4960.000    720.900   4980.000    720.600   5000.000
 GR    720.100   5020.000    719.360   5040.000    718.500   5049.500    720.100   5059.300    721.900   5080.000
 GR    728.800   5099.500    730.800   5130.000    731.000   5280.000    731.000   5300.000    750.000   5301.000

 NC       .035       .035       .060       .100       .300       .000       .000       .000       .000       .000
 ET       .000       .000      7.100      9.100      9.100      9.100   4850.000   5275.000       .000       .000
 X1  43051.000     20.000   4895.000   5085.000     40.000     40.000     40.000       .000       .000       .000
 GR    780.000   4640.000    760.000   4660.000    740.000   4735.000    736.000   4750.000    733.100   4835.000
 GR    732.000   4895.000    728.000   4905.000    724.000   4930.000    720.000   4960.000    718.400   5000.000
 GR    720.000   5040.000    724.000   5070.000    728.000   5085.000    731.500   5110.000    731.500   5205.000
 GR    740.000   5206.000    740.000   5245.000    731.500   5246.000    731.500   5275.000    760.000   5276.000
1
  03/17/93    09:52:58                                                                                PAGE    6



 ET       .000       .000      7.100      9.100      9.100      9.100   4796.000   5130.000       .000       .000
 X1  43341.000     15.000   4905.000   5130.000    250.000    350.000    290.000       .000       .000       .000
 GR    800.000   4495.000    780.000   4555.000    760.000   4600.000    740.000   4650.000    736.000   4735.000
 GR    735.900   4795.000    732.000   4905.000    724.000   4965.000    719.200   5000.000    724.000   5070.000
 GR    735.800   5130.000    736.000   5170.000    740.000   5200.000    760.000   5230.000    780.000   5255.000

 NC       .035       .035       .080       .100       .300       .000       .000       .000       .000       .000
 ET       .000       .000      7.100      9.100      9.100      9.100   4885.000   5160.000       .000       .000
 X1  44016.000     14.000   4885.000   5160.000    650.000    750.000    675.000       .000       .000       .000
 GR    780.000   4670.000    760.000   4725.000    744.000   4775.000    740.000   4885.000    736.000   4895.000
 GR    732.000   4905.000    728.000   4920.000    726.300   5000.000    728.000   5080.000    732.000   5135.000
 GR    740.000   5160.000    745.500   5215.000    760.000   5280.000    780.000   5310.000       .000       .000

 ET       .000       .000      7.100      9.100      9.100      9.100   4869.000   5240.000       .000       .000
 X1  45016.000     16.000   4930.000   5220.000    850.000   1100.000   1000.000       .000       .000       .000
 GR    800.000   4725.000    780.000   4755.000    772.000   4770.000    772.000   4820.000    760.000   4840.000
 GR    740.000   4885.000    740.000   4930.000    736.000   4950.000    735.000   5000.000    736.000   5065.000
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GR    736.000   5120.000    740.000   5220.000    755.700   5265.000    760.000   5300.000    780.000   5310.000
GR    800.000   5340.000       .000       .000       .000       .000       .000       .000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4500.000   5099.000       .000       .000
X1  46166.000     17.000   4515.000   5080.000   1300.000   1100.000   1150.000       .000       .000       .000
GR    800.000   4090.000    780.000   4125.000    768.000   4150.000    764.000   4180.000    760.000   4420.000
GR    756.000   4440.000    752.000   4500.000    748.000   4515.000    744.000   4900.000    744.000   4980.000
GR    743.100   5000.000    744.000   5020.000    748.000   5080.000    760.000   5120.000    768.000   5140.000
GR    780.000   5170.000    800.000   5190.000       .000       .000       .000       .000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4900.000   5500.000       .000       .000
X1  47166.000     13.000   4900.000   5275.000   1100.000   1000.000   1000.000       .000       .000       .000
GR    800.000   4850.000    780.000   4870.000    760.000   4900.000    752.000   4910.000    750.800   5000.000
GR    752.000   5070.000    756.000   5275.000    756.000   5275.000    756.000   5405.000    760.000   5500.000
GR    773.000   5540.000    780.000   5570.000    800.000   5625.000       .000       .000       .000       .000

NC       .035       .035       .050       .100       .300       .000       .000       .000       .000       .000
ET       .000       .000      7.100      9.100      9.100      9.100   4970.000   5550.000       .000       .000
X1  47916.000      9.000   4970.000   5550.000    750.000    825.000    750.000       .000       .000       .000
GR    800.000   4860.000    780.000   4885.000    760.000   4970.000    756.400   5000.000    757.800   5250.000
GR    760.000   5550.000    776.000   5590.000    780.000   5610.000    800.000   5660.000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4972.000   5645.000       .000       .000
X1  49016.000     11.000   4985.000   5660.000   1050.000   1375.000   1100.000       .000       .000       .000
GR    820.000   4820.000    800.000   4890.000    780.000   4935.000    768.000   4985.000    764.000   5000.000
GR    764.000   5020.000    768.000   5300.000    768.000   5640.000    780.000   5660.000    800.000   5705.000
GR    820.000   5735.000       .000       .000       .000       .000       .000       .000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4910.000   5350.000       .000       .000
X1  49916.000     16.000   4910.000   5310.000    925.000    700.000    900.000       .000       .000       .000
GR    812.000   4245.000    808.000   4345.000    804.000   4500.000    800.000   4690.000    796.000   4820.000
GR    792.000   4850.000    780.000   4910.000    773.200   5000.000    776.000   5030.000    776.000   5310.000
GR    780.000   5350.000    784.000   5370.000    788.000   5410.000    792.000   5440.000    800.000   5450.000
GR    820.000   5480.000       .000       .000       .000       .000       .000       .000       .000       .000
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ET       .000       .000      7.100      9.100      9.100      9.100   4914.300   5204.600       .000       .000
X1  50376.000     15.000   4900.000   5250.000    510.000    400.000    460.000       .000       .000       .000
GR    832.000   4350.000    808.000   4425.000    804.000   4480.000    800.000   4560.000    796.000   4675.000
GR    792.000   4775.000    788.000   4900.000    784.000   4960.000    776.000   4990.000    775.100   5000.000
GR    776.000   5030.000    780.000   5140.000    792.000   5250.000    796.000   5310.000    840.000   5370.000

ET       .000      9.100      7.100      9.100      9.100      9.100   4605.000   5041.800   4530.000   5135.000
X1  51226.000     10.000   4635.000   5055.000    900.000    725.000    850.000       .000       .000       .000
GR    810.000   4529.000    793.800   4530.000    792.000   4605.000    788.000   4635.000    784.000   4950.000
GR    780.000   5000.000    784.000   5020.000    800.000   5055.000    804.000   5105.000    820.000   5135.000

ET       .000      9.100      7.100      9.100      9.100      9.100   4370.000   5047.500   4370.000   5285.000
X1  51776.000     14.000   4610.000   5085.000    160.000    600.000    550.000       .000       .000       .000
GR    808.000   3780.000    804.000   3900.000    800.000   4070.000    796.000   4200.000    792.000   4610.000
GR    788.000   4950.000    785.800   5000.000    788.000   5020.000    796.000   5045.000    800.000   5085.000
GR    804.000   5140.000    804.000   5200.000    808.000   5220.000    820.000   5285.000       .000       .000

NC       .035       .035       .020       .300       .500       .000       .000       .000       .000       .000
QT      2.000  18580.000  18580.000       .000       .000       .000       .000       .000       .000       .000
ET       .000      9.100      7.100      9.100      9.100      9.100   4914.200   5097.900   4914.100   5099.000
X1  52081.000     12.000   4914.100   5099.000    180.000    465.000    305.000       .000       .000       .000
GR    802.300   4914.100    798.300   4914.200    791.900   4928.100    791.900   4962.500    792.900   4999.300
GR    788.200   4999.300    788.200   5000.000    788.900   5036.100    789.800   5072.000    791.400   5082.000
GR    798.700   5098.600    803.200   5099.000       .000       .000       .000       .000       .000       .000

SB       .900      1.510      2.500       .000    190.000      6.000   1711.000      2.320    793.000    792.800
QT      2.000  24400.000  24400.000       .000       .000       .000       .000       .000       .000       .000
ET       .000      9.110      7.100      9.110      9.110      9.110   4558.000   5099.000   4430.000   5099.000
X1  52121.000     25.000   4914.000   5099.200     40.000     40.000     40.000       .000       .000       .000
X2       .000       .000      1.000    801.400    800.500       .000       .000       .000       .000       .000
BT    -25.000   3830.000    808.000    808.000   4000.000    804.000    804.000   4160.000    800.500    800.000
BT       .000   4195.000    800.000    800.000   4540.000    800.000    800.000   4645.000    800.700    796.000
BT       .000   4914.000    802.500    796.000   4914.200    802.500    800.400   4928.000    802.600    800.500
BT       .000   4962.000    802.800    800.700   4999.000    803.000    800.900   5000.000    803.000    800.900
BT       .000   5036.000    803.200    801.100   5072.000    803.400    801.300   5082.000    803.400    801.300
BT       .000   5099.000    803.500    801.400   5099.200    803.500    792.000   5120.000    804.000    792.000
BT       .000   5145.000    804.500    792.000   5195.000    805.000    796.000   5315.000    806.000    800.000
BT       .000   5430.000    807.300    804.000   5505.000    808.000    804.000   5560.000    809.500    808.000
BT       .000   5900.000    812.000    812.000       .000       .000       .000       .000       .000       .000
GR    808.000   3830.000    804.000   4000.000    800.000   4160.000    800.000   4195.000    800.000   4540.000
GR    796.000   4645.000    796.000   4914.000    796.000   4914.200    791.900   4928.000    791.900   4962.000
GR    792.900   4999.000    788.200   5000.000    788.900   5036.000    789.800   5072.000    791.400   5082.000
GR    792.000   5099.000    792.000   5099.200    792.000   5120.000    792.000   5145.000    796.000   5195.000
GR    800.000   5315.000    804.000   5430.000    804.000   5505.000    808.000   5560.000    812.000   5900.000

NC       .035       .035       .050       .100       .300       .000       .000       .000       .000       .000
ET       .000      9.100      7.100      9.100      9.100      9.100   4780.000   5137.000   4780.000   5140.000
X1  52626.000     10.000   4780.000   5050.000    530.000    180.000    505.000       .000       .000       .000
GR    816.000   4630.000    800.000   4660.000    797.600   4780.000    796.000   4860.000    796.000   4970.000
GR    792.700   5000.000    796.000   5022.000    800.000   5050.000    804.000   5185.000    808.000   5275.000
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ET       .000       .000      7.100      9.100      9.100      9.100   4864.000   5150.500       .000       .000
X1  52836.000     10.000   4845.000   5185.000    210.000    210.000    210.000       .000       .000       .000
GR    816.000   4845.000    804.000   4870.000    800.000   4945.000    796.000   4975.000    794.200   5000.000
GR    796.000   5060.000    800.000   5090.000    804.000   5130.000    808.000   5160.000    810.000   5185.000

ET       .000       .000      7.100      9.100      9.100      9.100   4919.300   5187.800       .000       .000
X1  53676.000      9.000   4910.000   5200.000    840.000    840.000    840.000       .000       .000       .000
GR    820.000   4910.000    808.000   4935.000    804.000   4960.000    800.000   5000.000    804.000   5050.000
GR    808.000   5090.000    812.000   5170.000    816.000   5190.000    820.000   5200.000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4900.000   5130.000       .000       .000
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X1  54676.000    10.000  4900.000  5090.000  1000.000   950.000  1000.000      .000      .000      .000
GR    840.000  4855.000   820.000  4900.000   812.000  4925.000   808.000  5000.000   812.000  5010.000
GR    813.500  5090.000   816.000  5120.000   820.000  5130.000   824.000  5175.000   840.000  5230.000

ET       .000      .000     7.100     9.100     9.100     9.100  4913.000  5370.000      .000      .000
X1  55576.000    13.000  4890.000  5275.000   800.000  1050.000   900.000      .000      .000      .000
GR    856.000  4795.000   852.000  4810.000   848.000  4875.000   840.000  4890.000   820.000  4930.000
GR    816.000  5000.000   820.000  5010.000   824.000  5275.000   828.000  5370.000   832.000  5415.000
GR    836.000  5490.000   840.000  5510.000   860.000  5535.000      .000      .000      .000      .000

ET       .000     9.100     7.100     9.100     9.100     9.100  4866.700  5036.600  4825.000  5070.000
X1  56276.000    16.000  4825.000  5070.000   750.000  1000.000   700.000      .000      .000      .000
GR    860.000  4825.000   840.000  4855.000   828.000  4890.000   824.000  5000.000   828.000  5020.000
GR    840.000  5045.000   856.000  5070.000   854.000  5085.000   854.000  5325.000   856.000  5345.000
GR    836.000  5375.000   836.000  5440.000   840.000  5460.000   852.000  5485.000   856.000  5500.000
GR    860.000  5570.000      .000      .000      .000      .000      .000      .000      .000      .000

ET       .000     9.100     7.100     9.100     9.100     9.100  4859.800  5049.400  4815.000  5085.000
X1  56381.000    18.000  4850.000  5085.000   105.000   105.000   105.000      .000      .000      .000
GR    880.000  4815.000   860.000  4850.000   840.000  4855.000   828.000  4910.000   826.000  5000.000
GR    828.000  5015.000   832.000  5032.000   840.000  5052.000   860.000  5085.000   858.000  5087.000
GR    854.000  5088.000   854.000  5360.000   856.000  5382.000   840.000  5410.000   836.000  5420.000
GR    836.000  5482.000   840.000  5495.000   860.000  5540.000      .000      .000      .000      .000

ET       .000      .000     7.100     9.100     9.100     9.100  4890.500  5109.900      .000      .000
X1  57601.000     9.000  4860.000  5150.000  1245.000  1145.000  1220.000      .000      .000      .000
GR    860.000  4795.000   856.000  4860.000   830.000  4955.000   830.000  5000.000   830.000  5030.000
GR    832.000  5050.000   836.000  5070.000   840.000  5085.000   860.000  5150.000      .000      .000

QT      2.000 19400.000 19400.000      .000      .000      .000      .000      .000      .000      .000
ET       .000     9.100     7.100     9.100     9.100     9.100  4875.000  5114.600  4875.000  5190.000
NC       .035      .035      .030      .300      .500      .000      .000      .000      .000      .000
X1  57901.000    12.000  4875.000  5090.000   280.000   330.000   300.000      .000      .000      .000
GR    860.000  4395.000   856.000  4630.000   852.000  4745.000   848.000  4845.000   844.600  4875.000
GR    840.000  4920.000   832.000  4940.000   831.000  5000.000   832.000  5040.000   836.000  5065.000
GR    840.000  5090.000   840.000  5190.000      .000      .000      .000      .000      .000      .000
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ET       .000     9.110     7.100     9.110     9.110     9.110  4890.980  5235.000  4890.000  5235.000
X1  57902.000    25.000  4925.000  5075.000     1.000     1.000     1.000      .000      .000      .000
BT    -22.000  4924.000   848.000   848.000  4925.000   848.000   842.500  4953.500   847.000   841.500
BT       .000  4953.500   847.000   841.500  4956.500   847.000   841.500  4956.500   847.000   841.500
BT       .000  4983.500   845.900   840.400  4983.500   845.900   840.400  4986.500   845.900   840.400
BT       .000  4986.500   845.900   840.400  5013.500   844.900   839.400  5013.500   844.900   839.400
BT       .000  5016.500   844.900   839.400  5016.500   844.900   839.400  5043.500   844.100   838.600
BT       .000  5043.500   844.100   838.600  5046.500   844.100   838.600  5046.500   844.100   838.600
BT       .000  5075.000   843.600   838.100  5076.000   843.600   836.000  5100.000   843.000   840.000
BT       .000  5255.000   840.000   840.000      .000      .000      .000      .000      .000      .000
GR    860.000  4390.000   856.000  4610.000   852.000  4710.000   848.000  4924.000   842.500  4925.000
GR    832.000  4953.500   841.500  4953.500   841.500  4956.500   832.000  4956.500   831.200  4983.500
GR    840.400  4983.500   840.400  4986.500   831.200  4986.500   831.200  5013.500   839.400  5013.500
GR    839.400  5016.500   831.200  5016.500   832.000  5043.500   838.600  5043.500   838.600  5046.500
GR    832.000  5046.500   836.000  5075.000   836.000  5076.000   840.000  5100.000   840.000  5255.000

ET       .000     9.110     7.100     9.110     9.110     9.110  4892.900  5250.000  4892.000  5250.000
X1  57922.000    24.000  4925.000  5075.000    20.000    20.000    20.000      .000      .000      .000
BT    -21.000  4924.000   848.000   848.000  4925.000   848.000   842.500  4953.500   847.000   841.500
BT       .000  4953.500   847.000   841.500  4956.500   847.000   841.500  4956.500   847.000   841.500
BT       .000  4983.500   845.900   840.400  4983.500   845.900   840.400  4986.500   845.900   840.400
BT       .000  4986.500   845.900   840.400  5013.500   844.900   839.400  5013.500   844.900   839.400
BT       .000  5016.500   844.900   839.400  5016.500   844.900   839.400  5043.500   844.100   838.600
BT       .000  5043.500   844.100   838.600  5046.500   844.100   838.600  5046.500   844.100   838.600
BT       .000  5075.000   843.600   838.100  5076.000   843.600   843.600  5255.000   840.000   840.000
GR    860.000  4390.000   856.000  4610.000   852.000  4710.000   848.000  4924.000   842.500  4925.000
GR    832.000  4953.500   841.500  4953.500   841.500  4956.500   832.000  4956.500   831.200  4983.500
GR    840.400  4983.500   840.400  4986.500   831.200  4986.500   831.200  5013.500   839.400  5013.500
GR    839.400  5016.500   831.200  5016.500   832.000  5043.500   838.600  5043.500   838.600  5046.500
GR    832.000  5046.500   838.100  5075.000   843.600  5076.000   840.000  5255.000      .000      .000

NC       .035      .035      .050      .100      .300      .000      .000      .000      .000      .000
ET       .000     9.100     7.100     9.100     9.100     9.100  4930.000  5259.000  4890.000  5260.000
X1  57923.000    12.000  4930.000  5130.000     1.000     1.000     1.000      .000      .000      .000
GR    860.000  4335.000   856.000  4430.000   852.000  4720.000   848.000  4930.000   840.000  4960.000
GR    832.000  4975.000   831.800  5000.000   832.000  5025.000   836.000  5085.000   840.000  5105.000
GR    844.000  5130.000   844.000  5365.000      .000      .000      .000      .000      .000      .000

ET       .000      .000     7.100     9.100     9.100     9.100  4885.100  5032.900      .000      .000
X1  58573.000     6.000  4870.000  5045.000   700.000   600.000   650.000      .000      .000      .000
GR    860.000  4870.000   844.000  4895.000   840.000  4910.000   836.000  5000.000   840.000  5020.000
GR    860.000  5045.000      .000      .000      .000      .000      .000      .000      .000      .000

ET       .000     9.100     7.100     9.100     9.100     9.100  4850.700  5203.100  4850.000  5240.000
X1  59723.000    16.000  4850.000  5240.000  1250.000  1100.000  1150.000      .000      .000      .000
GR    880.000  3850.000   876.000  4065.000   872.000  4300.000   860.000  4365.000   856.000  4525.000
GR    852.900  4684.000   870.000  4685.000   870.000  4850.000   852.000  4851.000   852.000  4930.000
GR    848.000  4955.000   846.900  5000.000   848.000  5055.000   852.000  5190.000   856.000  5200.000
GR    880.000  5240.000      .000      .000      .000      .000      .000      .000      .000      .000
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ET       .000     9.100     7.100     9.100     9.100     9.100  4450.000  5151.600  4250.000  5200.000
X1  60873.000    10.000  4770.000  5200.000  1300.000  1100.000  1150.000      .000      .000      .000
GR    880.000  4090.000   876.000  4095.000   872.000  4110.000   868.000  4190.000   867.600  4770.000
GR    864.000  4930.000   860.000  5000.000   864.000  5140.000   876.000  5175.000   880.000  5200.000

ET       .000     9.100     7.100     9.100     9.100     9.100  4370.000  5112.900  4215.000  5185.000
X1  61013.000    10.000  4808.000  5130.000   135.000   130.000   140.000      .000      .000      .000
GR    880.000  4050.000   876.000  4075.000   872.000  4095.000   868.000  4370.000   868.000  4808.000
GR    864.000  4972.000   861.000  5000.000   864.000  5100.000   880.000  5130.000   900.000  5185.000
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ET       .000     9.100     7.100     9.100     9.100     9.100  4890.000  5370.000  4580.000  5370.000
X1  62073.000     9.000  4890.000  5165.000   940.000  1170.000  1060.000      .000      .000      .000
GR    892.000  4030.000   880.000  4250.000   876.000  4485.000   876.000  4890.000   872.000  4910.000
GR    868.000  5000.000   872.000  5165.000   876.000  5480.000   880.000  5505.000      .000      .000

ET       .000      .000     7.100     9.100     9.100     9.100  4816.000  5085.000      .000      .000
X1  63173.000    16.000  4870.000  5085.000  1150.000  1050.000  1100.000      .000      .000      .000
X3       .000   871.000      .000      .000      .000      .000      .000      .000      .000      .000
GR    900.000  4465.000   896.000  4490.000   892.000  4680.000   888.000  4705.000   884.000  4760.000
GR    880.000  4810.000   876.000  4870.000   860.000  4940.000   856.000  4960.000   852.000  4980.000
GR    850.000  5000.000   852.000  5010.000   856.000  5030.000   880.000  5085.000   888.000  5125.000
GR    900.000  5160.000      .000      .000      .000      .000      .000      .000      .000      .000

ET       .000     9.100     7.100     9.100     9.100     9.100  4711.000  5247.900  4710.000  5410.000
X1  64323.000    18.000  4711.000  5150.000  1000.000  1400.000  1150.000      .000      .000      .000
X3       .000   875.000      .000      .000      .000      .000      .000      .000      .000      .000
GR    900.000  4360.000   896.000  4495.000   868.000  4600.000   860.000  4640.000   859.000  4711.000
GR    856.000  4895.000   852.000  4970.000   851.500  5000.000   852.000  5010.000   856.000  5025.000
GR    860.000  5060.000   864.000  5125.000   872.000  5150.000   876.000  5270.000   880.000  5340.000
GR    884.000  5410.000   888.000  5470.000   900.000  5520.000      .000      .000      .000      .000

ET       .000      .000     7.100     9.100     9.100     9.100  4799.400  5086.400      .000      .000
X1  65323.000     9.000  4720.000  5170.000  1100.000  1000.000  1000.000      .000      .000      .000
GR    900.000  4659.000   892.000  4660.000   892.000  4720.000   888.000  4810.000   884.000  4885.000
GR    880.000  4980.000   878.000  5000.000   880.000  5025.000   900.000  5170.000      .000      .000

ET       .000      .000     7.100     9.100     9.100     9.100  4855.000  5117.700      .000      .000
X1  65463.000    14.000  4855.000  5170.000   140.000   140.000   140.000      .000      .000      .000
GR    900.000  4629.000   893.000  4630.000   892.000  4762.000   888.000  4855.000   884.000  4870.000
GR    884.000  4975.000   880.000  4995.000   879.000  5000.000   880.000  5012.000   884.000  5085.000
GR    888.000  5105.000   892.000  5120.000   896.000  5140.000   900.000  5170.000      .000      .000

ET       .000     9.100     7.100     9.100     9.100     9.100  4463.000  5210.000  4285.000  5400.000
X1  66473.000    14.000  4565.000  5210.000   990.000   940.000  1010.000      .000      .000      .000
GR    920.000  3835.000   900.000  4040.000   900.000  4455.000   896.000  4565.000   896.000  4930.000
GR    892.000  5000.000   896.000  5075.000   900.000  5210.000   904.000  5265.000   916.000  5290.000
GR    916.000  5310.000   912.000  5325.000   912.000  5350.000   920.000  5400.000      .000      .000
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ET       .000      .000     7.100     9.100     9.100     9.100  4320.000  5080.000      .000      .000
X1  66998.000    13.000  4320.000  5080.000   540.000   520.000   525.000      .000      .000      .000
GR    910.000  4105.000   908.000  4225.000   908.000  4310.000   904.000  4320.000   900.000  4340.000
GR    896.000  4530.000   904.000  4595.000   907.000  4645.000   904.000  4680.000   896.300  5000.000
GR    900.000  5030.000   904.000  5080.000   916.000  5120.000      .000      .000      .000      .000

ET       .000     9.100     7.100     9.100     9.100     9.100  4660.600  5125.300  4660.000  5375.000
X1  67548.000    19.000  4660.000  5130.000   590.000   560.000   550.000      .000      .000      .000
X3       .000   900.000      .000      .000      .000      .000      .000      .000      .000      .000
GR    940.000  4320.000   924.000  4355.000   920.000  4420.000   908.000  4460.000   904.000  4490.000
GR    900.000  4570.000   896.000  4710.000   896.000  4750.000   900.000  4800.000   904.000  4825.000
GR    904.000  4910.000   900.000  5000.000   904.000  5090.000   908.000  5130.000   912.000  5200.000
GR    920.000  5225.000   920.000  5285.000   924.000  5305.000   940.000  5375.000      .000      .000

ET       .000      .000     7.100     9.100     9.100     9.100  4821.100  5136.700      .000      .000
X1  68448.000    18.000  4800.000  5165.000  1050.000   850.000   900.000      .000      .000      .000
GR    940.000  3955.000   936.000  3990.000   932.000  4195.000   928.000  4245.000   924.000  4350.000
GR    920.000  4455.000   916.000  4490.000   916.000  4750.000   916.000  4800.000   912.000  4850.000
GR    908.000  4875.000   905.500  5000.000   908.000  5105.000   912.000  5130.000   924.000  5165.000
GR    928.000  5190.000   932.000  5205.000   940.000  5225.000      .000      .000      .000      .000

QT      2.000 15900.000 15900.000      .000      .000      .000      .000      .000      .000      .000
ET       .000     9.100     7.100     9.100     9.100     9.100  4776.700  5137.800  4625.000  5200.000
X1  69198.000    14.000  4775.000  5140.000   700.000   730.000   750.000      .000      .000      .000
GR    930.000  4625.000   920.000  4626.000   920.000  4775.000   916.000  4790.000   912.000  4800.000
GR    912.000  4970.000   909.600  5000.000   912.000  5040.000   916.000  5120.000   920.000  5140.000
GR    928.000  5165.000   932.000  5180.000   936.000  5195.000   940.000  5200.000      .000      .000

NC       .035      .035      .020      .300      .500      .000      .000      .000      .000      .000
QT      2.000 13220.000 13220.000      .000      .000      .000      .000      .000      .000      .000
ET       .000     9.100     7.100     9.100     9.100     9.100  4913.200  5080.300  4912.000  5087.000
X1  69733.000    11.000  4912.000  5087.000   540.000   550.000   535.000      .000      .000      .000
GR    929.500  4912.000   927.700  4913.000   925.100  4913.200   919.000  4922.200   918.500  4950.200
GR    917.900  4986.200   918.000  5000.000   918.700  5022.200   919.900  5058.400   926.600  5086.700
GR    930.200  5087.000      .000      .000      .000      .000      .000      .000      .000      .000

SB       .900     1.550     2.500      .000   130.000     5.400  1425.000     1.470   920.000   919.800
QT      2.000 15900.000 15900.000      .000      .000      .000      .000      .000      .000      .000
ET       .000     9.110     7.110     9.110     9.110     9.110  4790.000  5094.200  4440.000  5087.000
X1  69773.000    18.000  4790.000  5087.000    40.000    40.000    40.000      .000      .000      .000
X2       .000      .000     1.000   930.200   928.000      .000      .000      .000      .000      .000
BT    -18.000  4220.000   928.000   928.000  4500.000   928.000   928.000  4730.000   928.000   928.000
BT       .000  4790.000   928.500   928.000  4860.000   929.100   924.000  4910.000   929.480   920.000
BT       .000  4912.000   929.500   927.700  4922.200   929.600   927.800  4950.200   929.900   928.100
BT       .000  4986.200   930.300   928.500  5000.000   930.500   928.700  5022.200   930.900   929.100
BT       .000  5058.400   931.500   929.700  5086.700   932.000   930.200  5087.000   932.000   926.000
BT       .000  5140.000   932.900   928.000  5320.000   936.000   936.000  5335.000   940.000   940.000
GR    928.000  4220.000   928.000  4500.000   928.000  4730.000   928.000  4790.000   924.000  4860.000
GR    920.000  4910.000   920.000  4912.000   919.000  4922.200   918.500  4950.200   917.900  4986.200
GR    918.200  5000.000   918.700  5022.200   919.900  5058.400   926.000  5086.700   926.000  5087.000
GR    928.000  5140.000   936.000  5320.000   940.000  5335.000      .000      .000      .000      .000
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NC       .035      .035      .050      .100      .300      .000      .000      .000      .000      .000
ET       .000     9.100     7.100     9.100     9.100     9.100  4790.000  5080.000  4435.000  5080.000
X1  69813.000    11.000  4790.000  5080.000    40.000    40.000    40.000      .000      .000      .000
GR    928.000  4435.000   928.000  4790.000   924.000  4860.000   920.000  4910.000   918.000  5000.000
GR    920.000  5070.000   924.000  5080.000   928.000  5140.000   932.000  5215.000   936.000  5305.000
GR    940.000  5325.000      .000      .000      .000      .000      .000      .000      .000      .000
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ET	.000	9.100	7.100	9.100	9.100	9.100	4830.000	5209.100	4470.000	5240.000
X1	70193.000	12.000	4830.000	5225.000	380.000	360.000	380.000	.000	.000	.000
GR	936.000	4155.000	932.000	4520.000	928.000	4830.000	924.000	4900.000	920.000	4950.000
GR	916.000	4975.000	915.500	5000.000	920.000	5025.000	920.000	5150.000	932.000	5225.000
GR	940.000	5350.000	960.000	5380.000	.000	.000	.000	.000	.000	.000

ET	.000	.000	7.100	9.100	9.100	9.100	4914.900	5234.500	.000	.000
X1	70743.000	14.000	4780.000	5280.000	670.000	400.000	550.000	.000	.000	.000
GR	960.000	3280.000	948.000	3350.000	944.000	3815.000	944.000	3990.000	940.000	4645.000
GR	936.000	4780.000	932.000	4910.000	920.000	4950.000	916.000	5000.000	920.000	5040.000
GR	924.000	5210.000	932.000	5240.000	936.000	5280.000	960.000	5310.000	.000	.000

ET	.000	.000	7.100	9.100	9.100	9.100	4952.900	5243.400	.000	.000
X1	71893.000	11.000	4945.000	5250.000	1150.000	1000.000	1150.000	.000	.000	.000
GR	960.000	4235.000	944.000	4305.000	940.000	4610.000	936.000	4835.000	936.000	4945.000
GR	932.000	4970.000	928.000	5000.000	932.000	5240.000	940.000	5250.000	944.000	5275.000
GR	960.000	5315.000	.000	.000	.000	.000	.000	.000	.000	.000

ET	.000	9.100	7.100	9.100	9.100	9.100	4480.000	5035.300	4485.000	5130.000
X1	72643.000	17.000	4700.000	5110.000	530.000	730.000	750.000	.000	.000	.000
GR	960.000	4040.000	944.000	4170.000	940.000	4340.000	940.000	4470.000	944.000	4520.000
GR	944.000	4560.000	940.000	4620.000	940.000	4700.000	936.000	4720.000	938.500	4890.000
GR	936.000	4950.000	932.400	5000.000	948.000	5050.000	949.000	5065.000	948.000	5070.000
GR	960.000	5110.000	980.000	5130.000	.000	.000	.000	.000	.000	.000

ET	.000	9.100	7.100	9.100	9.100	9.100	4606.000	5310.000	4605.000	5101.000
X1	73193.000	34.000	4900.000	5101.000	40.000	600.000	550.000	.000	.000	.000
GR	956.000	4225.000	952.000	4265.000	948.000	4280.000	944.000	4295.000	942.000	4440.000
GR	944.000	4480.000	944.000	4530.000	940.000	4680.000	940.000	4730.000	940.000	4780.000
GR	940.000	4830.000	940.000	4900.000	940.750	4901.000	939.640	4901.200	938.260	4902.160
GR	937.550	4903.690	937.700	4905.360	938.660	4906.740	940.190	4907.450	940.750	4907.500
GR	943.700	5092.500	942.330	5092.740	940.640	5093.930	939.760	5095.810	939.940	5097.870
GR	941.130	5099.560	943.010	5100.440	943.700	5100.500	944.000	5101.000	944.000	5190.000
GR	944.000	5230.000	944.000	5360.000	948.000	5590.000	952.000	5880.000	.000	.000

NC	.035	.035	.015	.300	.500	.000	.000	.000	.000	.000
ET	.000	9.110	7.110	9.110	9.110	9.110	4605.000	5310.000	4605.000	5101.000
X1	73194.000	34.000	4900.000	5101.000	1.000	1.000	1.000	.000	.000	.000
BT	-32.000	4280.000	948.000	948.000	4295.000	944.000	944.000	4440.000	944.000	942.000
BT	.000	4480.000	944.000	944.000	4530.000	944.000	944.000	4680.000	944.000	940.000
BT	.000	4730.000	944.000	940.000	4780.000	943.000	940.000	4830.000	944.000	940.000
BT	.000	4900.000	945.000	940.000	4901.000	945.000	940.750	4901.200	945.000	941.860
BT	.000	4902.160	945.000	943.240	4903.690	945.000	943.950	4905.360	945.000	943.800
BT	.000	4906.740	945.000	942.840	4907.450	945.000	941.310	4907.500	945.000	940.750
BT	.000	5092.500	949.000	943.700	5092.740	949.000	945.070	5093.930	949.000	946.760
BT	.000	5095.810	949.000	947.640	5097.870	949.000	947.460	5099.560	949.000	946.270

BT	.000	5100.440	949.000	944.390	5100.500	949.000	943.700	5101.000	949.000	944.000
BT	.000	5190.000	948.750	944.000	5230.000	948.500	944.000	5360.000	948.400	944.000
BT	.000	5590.000	948.000	948.000	5880.000	952.000	952.000	.000	.000	.000
GR	956.000	4225.000	952.000	4265.000	948.000	4280.000	944.000	4295.000	942.000	4440.000
GR	944.000	4480.000	944.000	4530.000	940.000	4680.000	940.000	4730.000	940.000	4780.000
GR	940.000	4830.000	940.000	4900.000	940.750	4901.000	939.640	4901.200	938.260	4902.160
GR	937.550	4903.690	937.700	4905.360	938.660	4906.740	940.190	4907.450	940.750	4907.500
GR	943.700	5092.500	942.330	5092.740	940.640	5093.930	939.760	5095.810	939.940	5097.870
GR	941.130	5099.560	943.010	5100.440	943.700	5100.500	944.000	5101.000	944.000	5190.000
GR	944.000	5230.000	944.000	5360.000	948.000	5590.000	952.000	5880.000	.000	.000

QT	2.000	15900.000	15900.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	9.110	7.110	9.110	9.110	9.110	4605.000	5325.000	4605.000	5101.000
X1	73234.000	34.000	4900.000	5101.000	40.000	40.000	40.000	.000	.000	.000
BT	-32.000	4280.000	948.000	948.000	4295.000	944.000	944.000	4440.000	944.000	942.000
BT	.000	4480.000	944.000	944.000	4530.000	944.000	944.000	4680.000	944.000	940.000
BT	.000	4730.000	944.000	940.000	4780.000	943.000	940.000	4830.000	944.000	944.000
BT	.000	4900.000	945.000	944.000	4901.000	945.000	940.750	4901.200	945.000	941.860
BT	.000	4902.160	945.000	943.240	4903.690	945.000	943.950	4905.360	945.000	943.800
BT	.000	4906.740	945.000	942.840	4907.450	945.000	941.310	4907.500	945.000	940.750
BT	.000	5092.500	949.000	943.700	5092.740	949.000	945.070	5093.930	949.000	946.760
BT	.000	5095.810	949.000	947.640	5097.870	949.000	947.460	5099.560	949.000	946.270
BT	.000	5100.440	949.000	944.390	5100.500	949.000	943.700	5101.000	949.000	944.000
BT	.000	5190.000	948.750	944.000	5230.000	948.500	944.000	5360.000	948.400	944.000
BT	.000	5590.000	948.000	948.000	5880.000	952.000	952.000	.000	.000	.000
GR	956.000	4225.000	952.000	4265.000	948.000	4280.000	944.000	4295.000	942.000	4440.000
GR	944.000	4480.000	944.000	4530.000	940.000	4680.000	940.000	4730.000	940.000	4780.000
GR	944.000	4830.000	944.000	4900.000	940.750	4901.000	939.640	4901.200	938.260	4902.160
GR	937.550	4903.690	937.700	4905.360	938.660	4906.740	940.190	4907.450	940.750	4907.500
GR	943.700	5092.500	942.330	5092.740	940.640	5093.930	939.760	5095.810	939.940	5097.870
GR	941.130	5099.560	943.010	5100.440	943.700	5100.500	944.000	5101.000	944.000	5190.000
GR	944.000	5230.000	944.000	5360.000	948.000	5590.000	952.000	5880.000	.000	.000

NC	.035	.035	.050	.100	.300	.000	.000	.000	.000	.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4605.000	5325.000	4605.000	5101.000
X1	73235.000	34.000	4900.000	5101.000	1.000	1.000	1.000	.000	.000	.000
GR	956.000	4225.000	952.000	4265.000	948.000	4280.000	944.000	4295.000	942.000	4440.000
GR	944.000	4480.000	944.000	4530.000	940.000	4680.000	940.000	4730.000	940.000	4780.000
GR	944.000	4830.000	944.000	4900.000	940.750	4901.000	939.640	4901.200	938.260	4902.160
GR	937.550	4903.690	937.700	4905.360	938.660	4906.740	940.190	4907.450	940.750	4907.500
GR	943.700	5092.500	942.330	5092.740	940.640	5093.930	939.760	5095.810	939.940	5097.870
GR	941.130	5099.560	943.010	5100.440	943.700	5100.500	944.000	5101.000	944.000	5190.000
GR	944.000	5230.000	944.000	5360.000	948.000	5590.000	952.000	5880.000	.000	.000

NC	.050	.050	.050	.100	.300	.000	.000	.000	.000	.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4680.000	5250.000	4630.000	5130.000
X1	73335.000	11.000	4680.000	5120.000	90.000	70.000	100.000	.000	.000	.000
GR	960.000	4300.000	948.000	4415.000	944.000	4555.000	943.700	4680.000	942.500	5000.000
GR	944.000	5120.000	944.000	5200.000	948.000	5435.000	952.000	5675.000	956.000	6055.000
GR	960.000	6070.000	.000	.000	.000	.000	.000	.000	.000	.000

ET	.000	9.100	7.100	9.100	9.100	9.100	4930.000	5205.000	4920.000	5205.000
X1	73555.000	11.000	4930.000	5205.000	360.000	100.000	220.000	.000	.000	.000
GR	960.000	4920.000	948.000	4930.000	944.000	4940.000	943.800	5000.000	944.000	5100.000
GR	946.000	5205.000	948.000	5300.000	952.000	5480.000	956.000	5810.000	956.000	6045.000
GR	960.000	6060.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4892.000	5135.000	4820.000	5330.000
X1	74155.000	17.000	4885.000	5135.000	600.000	560.000	600.000	.000	.000	.000
GR	1000.000	4820.000	960.000	4885.000	952.000	4900.000	948.000	4955.000	946.600	5000.000
GR	948.000	5035.000	952.000	5060.000	952.000	5135.000	956.000	5295.000	960.000	5495.000
GR	964.000	5685.000	964.000	5725.000	960.000	5755.000	960.000	5790.000	964.000	5855.000
GR	968.000	5936.000	980.000	5970.000	.000	.000	.000	.000	.000	.000
ET	.000	.000	7.100	9.100	9.100	9.100	4940.700	5104.800	.000	.000
X1	75005.000	10.000	4940.000	5120.000	950.000	700.000	850.000	.000	.000	.000
GR	967.500	4760.000	964.000	4940.000	960.000	4950.000	956.000	4960.000	952.000	4965.000
GR	953.500	5000.000	952.000	5050.000	956.000	5065.000	960.000	5090.000	967.500	5120.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4916.990	5202.600	4870.000	5280.000
X1	75255.000	18.000	4870.000	5070.000	200.000	300.000	250.000	.000	.000	.000
GR	972.000	4638.000	960.000	4665.000	956.000	4730.000	956.000	4795.000	960.000	4835.000
GR	964.000	4850.000	967.600	4870.000	968.000	4900.000	964.000	4940.000	960.000	4950.000
GR	952.000	4962.000	952.000	5000.000	952.000	5040.000	956.000	5070.000	956.000	5220.000
GR	960.000	5240.000	964.000	5250.000	968.000	5280.000	.000	.000	.000	.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4856.800	5243.100	4840.000	5620.000
X1	75605.000	11.000	4850.000	5220.000	360.000	420.000	350.000	.000	.000	.000
GR	1000.000	4710.000	960.000	4770.000	960.000	4790.000	968.000	4820.000	968.000	4850.000
GR	960.000	4900.000	956.000	5000.000	960.000	5220.000	964.000	5440.000	968.000	5560.000
GR	1000.000	5620.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	.000	7.100	9.100	9.100	9.100	4890.000	5579.300	.000	.000
X1	76855.000	14.000	4890.000	5240.000	1250.000	1250.000	1250.000	.000	.000	.000
GR	1000.000	4370.000	972.000	4520.000	972.000	4575.000	976.000	4770.000	976.000	4790.000
GR	972.000	4810.000	968.000	4890.000	964.000	4980.000	963.700	5000.000	964.000	5040.000
GR	964.000	5240.000	964.000	5785.000	968.000	5885.000	1000.000	6020.000	.000	.000
NC	.030	.030	.030	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	7.100	9.100	9.100	9.100	4878.000	5670.000	.000	.000
X1	78055.000	15.000	4870.000	5225.000	1200.000	1275.000	1200.000	.000	.000	.000
GR	1000.000	4810.000	992.000	4825.000	988.000	4850.000	980.000	4870.000	976.000	4940.000
GR	972.000	5000.000	976.000	5030.000	976.000	5225.000	980.000	5300.000	980.000	5560.000
GR	976.500	5640.000	980.000	5675.000	984.000	5735.000	988.000	5770.000	1000.000	5805.000
ET	.000	.000	7.100	9.100	9.100	9.100	4890.000	5300.000	.000	.000
X1	78955.000	19.000	4890.000	5300.000	750.000	950.000	900.000	.000	.000	.000
X3	.000	980.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	1020.000	3970.000	1004.000	4055.000	1000.000	4110.000	1000.000	4210.000	1004.000	4280.000
GR	1004.000	4310.000	1000.000	4320.000	988.000	4420.000	988.000	4490.000	984.000	4890.000
GR	980.000	5000.000	980.000	5020.000	968.000	5060.000	964.000	5100.000	960.000	5270.000
GR	984.000	5300.000	988.000	5460.000	988.000	5525.000	1020.000	5610.000	.000	.000

ET	.000	.000	7.100	9.100	9.100	9.100	4943.600	5235.000	.000	.000
X1	79955.000	15.000	4930.000	5235.000	1000.000	930.000	1000.000	.000	.000	.000
X3	.000	988.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	1020.000	3810.000	1016.000	4035.000	1012.000	4245.000	1008.000	4410.000	1004.000	4590.000
GR	1000.000	4725.000	996.000	4930.000	968.000	4965.000	966.500	5000.000	968.000	5025.000
GR	972.000	5180.000	984.000	5205.000	992.000	5235.000	1000.000	5260.000	1020.000	5320.000
NC	.045	.045	.050	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	7.100	9.100	9.100	9.100	4690.000	5080.000	.000	.000
X1	80955.000	10.000	4690.000	5080.000	1050.000	830.000	1000.000	.000	.000	.000
X3	.000	996.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	1040.000	4265.000	1008.000	4340.000	1004.000	4525.000	1000.000	4690.000	960.000	4730.000
GR	960.000	5000.000	960.000	5050.000	1000.000	5080.000	1004.000	5095.000	1040.000	5200.000
NC	.050	.050	.050	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	7.100	.000	.000	.000	4845.000	5112.000	.000	.000
X1	81615.000	12.000	4895.000	5100.000	660.000	660.000	660.000	.000	.000	.000
GR	1028.000	4510.000	1020.000	4545.000	1016.000	4560.000	1012.000	4590.000	1008.200	4835.000
GR	1008.000	4835.000	1004.000	4895.000	999.000	5000.000	1000.000	5020.000	1004.000	5100.000
GR	1020.000	5155.000	1028.000	5170.000	.000	.000	.000	.000	.000	.000
QT	2.000	12500.000	12500.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4550.000	5046.000	4450.000	5095.000
X1	82355.000	14.000	4550.000	5060.000	700.000	700.000	740.000	.000	.000	.000
GR	1040.000	4170.000	1032.000	4210.000	1028.000	4250.000	1024.000	4360.000	1020.000	4390.000
GR	1016.000	4430.000	1012.000	4485.000	1011.700	4550.000	1009.500	4800.000	1008.000	4975.000
GR	1004.000	5000.000	1008.000	5030.000	1020.000	5060.000	1040.000	5095.000	.000	.000
NC	.070	.070	.070	.100	.300	.000	.000	.000	.000	.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4581.000	5110.000	4580.000	5570.000
X1	83505.000	16.000	4780.000	5110.000	1200.000	1100.000	1150.000	.000	.000	.000
GR	1060.000	4155.000	1040.000	4185.000	1028.000	4210.000	1024.000	4230.000	1024.000	4375.000
GR	1020.000	4680.000	1020.000	4705.000	1020.000	4735.000	1023.000	4780.000	1020.000	5000.000
GR	1024.000	5110.000	1024.000	5405.000	1028.000	5515.000	1032.000	5590.000	1036.000	5685.000
GR	1060.000	6145.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	9.100	7.100	9.100	9.100	9.100	4895.000	5359.000	4760.000	5470.000
X1	84655.000	11.000	4895.000	5200.000	1150.000	1050.000	1150.000	.000	.000	.000
GR	1060.000	4695.000	1040.000	4760.000	1036.000	4780.000	1032.000	4895.000	1032.000	4955.000
GR	1028.000	5000.000	1032.000	5030.000	1032.000	5200.000	1032.000	5490.000	1040.000	5500.000
GR	1060.000	5545.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.070	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	7.100	9.100	9.100	9.100	4880.000	5214.000	.000	.000
X1	85655.000	6.000	4880.000	5195.000	1000.000	950.000	1000.000	.000	.000	.000
GR	1080.000	4830.000	1044.000	4880.000	1040.000	5000.000	1044.000	5195.000	1048.000	5240.000
GR	1080.000	5315.000	.000	.000	.000	.000	.000	.000	.000	.000

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ET       .000       .000      7.100      9.100      9.100      9.100   4755.000   5170.000       .000       .000
X1  86895.000     12.000   4755.000   5170.000   1225.000   1245.000   1240.000       .000       .000       .000
GR   1100.000   4660.000   1080.000   4710.000   1060.000   4730.000   1056.000   4755.000   1052.000   4990.000
GR   1048.000   5000.000   1052.000   5050.000   1052.000   5120.000   1056.000   5170.000   1060.000   5190.000
GR   1080.000   5255.000   1100.000   5295.000       .000       .000       .000       .000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4823.700   5372.500       .000       .000
X1  88145.000      8.000   4805.000   5410.000    925.000   1300.000   1250.000       .000       .000       .000
GR   1100.000   4770.000   1080.000   4805.000   1068.000   4835.000   1068.200   5000.000   1072.000   5225.000
GR   1072.000   5370.000   1080.000   5410.000   1100.000   5515.000       .000       .000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4892.600   5194.900       .000       .000
X1  89095.000      9.000   4870.000   5210.000    875.000   1200.000    950.000       .000       .000       .000
GR   1120.000   4815.000   1100.000   4870.000   1088.000   4900.000   1084.000   4935.000   1080.000   5000.000
GR   1084.000   5030.000   1088.000   5190.000   1100.000   5210.000   1120.000   5260.000       .000       .000

QT      2.000  10450.000  10450.000       .000       .000       .000       .000       .000       .000       .000
ET       .000       .000      7.100      9.100      9.100      9.100   4485.000   5021.000       .000       .000
X1  90395.000      9.000   4880.000   5080.000   1350.000   1250.000   1300.000       .000       .000       .000
GR   1140.000   4405.000   1120.000   4440.000   1108.000   4485.000   1108.000   4880.000   1104.000   4945.000
GR   1100.000   5000.000   1104.000   5010.000   1120.000   5040.000   1140.000   5080.000       .000       .000

ET       .000      9.100      7.100      9.100      9.100      9.100   4611.000   5044.000   4580.000   5070.000
X1  90670.000      9.000   4580.000   5050.000    700.000    180.000    275.000       .000       .000       .000
GR   1140.000   4400.000   1120.000   4580.000   1116.000   4630.000   1112.000   4960.000   1110.000   5000.000
GR   1112.000   5030.000   1120.000   5050.000   1140.000   5110.000   1160.000   5150.000       .000       .000

ET       .000       .000      7.100      9.100      9.100      9.100   4803.000   5015.600       .000       .000
X1  90745.000     10.000   4290.000   5040.000    200.000     75.000     75.000       .000       .000       .000
GR   1140.000   4290.000   1132.000   4310.000   1128.000   4320.000   1128.000   4620.000   1124.000   4760.000
GR   1120.000   4800.000   1116.000   4885.000   1112.000   5000.000   1120.000   5015.000   1140.000   5040.000
EJ       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *PROF 1

 CCHV=    .100 CEHV=    .300
 *SECNO 34400.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=    3940.0    5039.5  TYPE=     1  TARGET=    1099.480
  34400.00     6.32   678.32   678.32      .00   679.69     1.37      .00      .00   680.00
    24400.   23037.    1363.       0.    2413.     225.       0.       0.       0. 100000.00
       .00     9.55     6.07      .00     .035     .060     .035     .000   672.00  3940.00
   .013210       0.       0.       0.        0        4        0      .00  1001.48  5039.48
0
 FLOW DISTRIBUTION FOR SECNO=  34400.00          CWSEL=    678.32

 STA=    3940.    4120.    4235.    4640.    4870.    5050.
   PER Q=      8.6      9.4     59.8     16.6      5.6
    AREA=    303.9    266.8   1344.6    497.7    224.7
     VEL=      6.9      8.6     10.9      8.2      6.1

 *SECNO 35425.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4370.0    5570.0  TYPE=     1  TARGET=    1200.000
  35425.00     6.82   682.82      .00      .00   683.16      .34     3.37      .10   680.00
    24400.   11978.   12409.      14.    2237.    3225.       6.      73.      18.    680.00
       .04     5.35     3.85     2.30     .035     .060     .035     .000   676.00  4370.00
   .002367     600.    1025.     950.        6        0        0      .00  1174.23  5544.23
0
 FLOW DISTRIBUTION FOR SECNO=  35425.00          CWSEL=    682.82

 STA=    4370.    4580.    4610.    4705.    4750.    4950.    4975.    5540.    5544.
   PER Q=      9.9      3.5     19.7      5.2      9.5      1.2     50.9       .1
    AREA=    592.5    144.6    648.0    217.0    564.2     70.5   3225.0      6.0
     VEL=      4.1      5.9      7.4      5.9      4.1      4.1      3.8      2.3

 *SECNO 36325.000
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3470 ENCROACHMENT STATIONS=    4585.0    5700.0  TYPE=     1  TARGET=    1115.000
  36325.00     5.42   685.42      .00      .00   686.10      .68     2.84      .10   684.00
    24400.      20.    6573.   17807.      10.    1739.    2404.     178.      42.    684.00
       .09     2.02     3.78     7.41     .035     .060     .035     .000   680.00  4700.84
   .003625     830.     900.    1165.        4        0        0      .00   999.16  5700.00
0
 FLOW DISTRIBUTION FOR SECNO=  36325.00          CWSEL=    685.42

 STA=    4701.    4715.    5145.    5225.    5285.    5305.    5695.    5700.
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  PER Q=       .1     26.9      1.5      1.1      1.6     68.3       .5
   AREA=     10.0   1739.0    113.3     85.0     68.3   2112.4     25.4
    VEL=      2.0      3.8      3.2      3.2      5.7      7.9      4.8

CCHV=    .300 CEHV=    .500
*SECNO 36461.000

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    4675.0    5290.0  TYPE=     1  TARGET=     615.000
 36461.00    12.61   686.61   686.61      .00   689.22     2.62      .83      .97   680.00
   24400.    4534.   19514.     352.     746.    1373.     110.     195.      46.   684.00
      .09     6.08    14.21     3.21     .035     .025     .035     .000   674.00  4733.48
  .003564     100.     136.     400.       20       20        0      .00   465.63  5290.00
0
FLOW DISTRIBUTION FOR SECNO=  36461.00          CWSEL=    686.61

STA=    4733.    4740.    4795.    4855.    4950.    5120.    5127.    5250.    5285.    5290.
  PER Q=       .1      2.8      3.1     12.6     80.0       .1       .5       .8       .0
   AREA=      8.5    143.4    156.4    437.7   1373.3      8.5     42.5     56.3      2.3
    VEL=      2.9      4.8      4.8      7.0     14.2      2.9      3.0      3.5      1.5

*SECNO 36486.000
1
 03/17/93    09:52:58                                                                                    PAGE   19


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


     3700.   BRIDGE STENCL=   4675.00    STENCR=   5290.00

3370 NORMAL BRIDGE,NRD=  7 MIN ELTRD=  684.00 MAX ELLC=  684.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=    4675.0    5290.0  TYPE=     1  TARGET=     615.000
 36486.00    14.88   688.88   688.88      .00   691.24     2.36      .13      .08   682.50
   24400.   14577.    4208.    5616.    1060.     380.     633.     196.      46.   681.50
      .09    13.75    11.07     8.87     .035     .025     .035     .000   674.00  4795.61
  .009055      25.      25.      25.       20       15        0  -350.00   494.39  5290.00
0
FLOW DISTRIBUTION FOR SECNO=  36486.00          CWSEL=    688.88

STA=    4796.    4800.    4820.    4895.    4950.    4978.    5023.    5105.    5160.    5290.
  PER Q=       .0      1.9     30.9     22.6      4.3     17.2     16.0      5.3      1.7
   AREA=      1.9     57.5    515.8    378.2    106.6    380.0    361.1    158.2    114.0
    VEL=      2.3      8.1     14.6     14.6     10.0     11.1     10.8      8.2      3.7

*SECNO 36518.000
     3700.   BRIDGE STENCL=   4738.00    STENCR=   5345.00

3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE,NRD=  7 MIN ELTRD=  684.00 MAX ELLC=  684.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3470 ENCROACHMENT STATIONS=    4738.0    5345.0  TYPE=     1  TARGET=     607.000
 36518.00    16.78   690.78   689.06      .00   691.80     1.02      .15      .40   682.50
   24400.   12961.    3361.    8078.    1400.     465.    1294.     198.      47.   681.50
      .09     9.26     7.22     6.24     .035     .025     .035     .000   674.00  4796.53
  .002940      32.      32.      32.       26       16        0  -350.00   548.47  5345.00
0
FLOW DISTRIBUTION FOR SECNO=  36518.00          CWSEL=    690.78

STA=    4797.    4800.    4820.    4895.    4950.    4978.    5023.    5105.    5160.    5290.    5345.
  PER Q=       .0      2.5     26.4     19.3      4.8     13.8     16.6      7.0      6.7      2.8
   AREA=      4.8     95.5    658.1    482.6    158.8    465.4    517.7    262.6    360.7    152.6
    VEL=      2.4      6.4      9.8      9.8      7.4      7.2      7.8      6.5      4.5      4.4

1
 03/17/93    09:52:58                                                                                    PAGE   20


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


CCHV=    .300 CEHV=    .500
*SECNO 36519.000

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=    4738.0    5345.0  TYPE=     1  TARGET=     607.000
 36519.00    19.71   691.71      .00      .00   692.01      .31      .00      .21   684.00
   24400.    8383.   13394.    2623.    1374.    4022.     941.     198.      47.   684.00
      .09     6.10     3.33     2.79     .035     .060     .035     .000   672.00  4760.18
  .000546       1.       1.       1.        2        0        0      .00   584.82  5345.00
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0
 FLOW DISTRIBUTION FOR SECNO=  36519.00          CWSEL=    691.71

 STA=    4760.    4770.    4820.    4850.    5140.    5230.    5345.
   PER Q=       .8     24.4      9.1     54.9      6.7      4.1
    AREA=     77.1    885.6    411.4   4021.5    514.1    426.9
     VEL=      2.6      6.7      5.4      3.3      3.2      2.3

 CCHV=    .300 CEHV=    .500
 *SECNO 36669.000

 3470 ENCROACHMENT STATIONS=    4715.0    5215.0  TYPE=     1  TARGET=     500.000
  36669.00    16.32   691.72      .00      .00   692.13      .41      .07      .05   692.00
    24400.       0.   24400.       0.       0.    4740.       0.     216.      48. 100000.00
       .10      .00     5.15      .00     .035     .030     .035     .000   675.40  4795.35
   .000424     150.     150.      80.        2        0        0      .00   413.15  5208.49
0
 FLOW DISTRIBUTION FOR SECNO=  36669.00          CWSEL=    691.72

 STA=    4795.    5215.
   PER Q=    100.0
    AREA=   4740.4
     VEL=      5.1

 *SECNO 36670.000

 3370 NORMAL BRIDGE,NRD= 67 MIN ELTRD=  692.50 MAX ELLC=  696.00

1
  03/17/93    09:52:58                                                                                                                      PAGE   21


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      692.00 ELREA=      694.00

  36670.00    16.19   691.59      .00      .00   692.27      .67      .00      .13   692.00
    24400.       0.   24400.       0.       0.    3704.       0.     217.      48.    694.00
       .10      .00     6.59      .00     .035     .030     .035     .000   675.40  4795.51
   .002968       1.       1.       1.        2        0        0  -709.78   412.85  5208.36
0
 FLOW DISTRIBUTION FOR SECNO=  36670.00          CWSEL=    691.59

 STA=    4796.    5215.
   PER Q=    100.0
    AREA=   3703.9
     VEL=      6.6

 *SECNO 36690.000

 3370 NORMAL BRIDGE,NRD= 67 MIN ELTRD=  692.50 MAX ELLC=  696.00


 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      692.00 ELREA=      694.00

  36690.00    16.25   691.65      .00      .00   692.33      .67      .06      .00   692.00
    24400.       0.   24400.       0.       0.    3704.       0.     218.      48.    694.00
       .10      .00     6.59      .00     .035     .030     .035     .000   675.40  4795.44
   .002970      20.      20.      20.        2        0        0  -733.98   413.09  5208.53
0
 FLOW DISTRIBUTION FOR SECNO=  36690.00          CWSEL=    691.65

 STA=    4795.    5215.
   PER Q=    100.0
    AREA=   3704.3
     VEL=      6.6

 CCHV=    .300 CEHV=    .500
 *SECNO 36691.000

 3470 ENCROACHMENT STATIONS=    4740.0    5215.0  TYPE=     1  TARGET=     475.000
  36691.00    16.62   692.02      .00      .00   692.41      .39      .00      .08   692.00
    24400.       0.   24400.       0.       0.    4865.       0.     218.      48. 100000.00
       .10      .02     5.02      .00     .035     .060     .035     .000   675.40  4794.72
   .001561       1.       1.       1.        2        0        0      .00   414.63  5209.35
0
1
  03/17/93    09:52:58                                                                                                                      PAGE   22


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  36691.00          CWSEL=    692.02

 STA=    4795.    5215.
   PER Q=    100.0
    AREA=   4864.6
     VEL=      5.0

 CCHV=    .100 CEHV=    .300
 *SECNO 36941.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4720.0    5100.0  TYPE=     1  TARGET=     380.000
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```
  36941.00    12.08   692.08      .00      .00   693.47     1.40      .76      .30   700.00
    24400.       0.   24400.       0.       0.    2574.       0.     240.      50.   692.00
       .11      .00     9.48      .04     .035     .060     .035     .000   680.00  4769.80
   .008256     380.     250.      90.        2        0        0      .00   296.48  5066.28
0
 FLOW DISTRIBUTION FOR SECNO=  36941.00          CWSEL=    692.08

 STA=    4770.    5065.
   PER Q=    100.0
    AREA=   2573.8
     VEL=      9.5

 *SECNO 37166.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4590.0    5080.0  TYPE=     1  TARGET=     490.000
  37166.00    13.89   693.89      .00      .00   694.34      .45      .77      .09   700.00
    24400.       0.   24400.       0.       0.    4527.       0.     258.      52. 100000.00
       .12      .00     5.39      .00     .035     .060     .035     .000   680.00  4677.93
   .001864     230.     225.     200.        2        0        0      .00   396.04  5073.97
0
 FLOW DISTRIBUTION FOR SECNO=  37166.00          CWSEL=    693.89

 STA=    4678.    5080.
   PER Q=    100.0
    AREA=   4527.0
     VEL=      5.4

1
  03/17/93    09:52:58                                                                                         PAGE   23


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 38166.000
  38166.00    11.45   696.15      .00      .00   696.64      .49     2.29      .01   688.00
    24400.    3286.   21114.       0.     562.    3762.       0.     360.      63.   700.00
       .17     5.85     5.61      .00     .035     .060     .035     .000   684.70  4604.62
   .002865    1050.    1000.     925.        3        0        0      .00   576.88  5181.50
0
 FLOW DISTRIBUTION FOR SECNO=  38166.00          CWSEL=    696.15

 STA=    4605.    4640.    4735.    4750.    5220.
   PER Q=      1.2      9.5      2.8     86.5
    AREA=     75.3    394.3     92.3   3762.2
     VEL=      3.8      5.9      7.5      5.6

 *SECNO 39116.000
  39116.00     8.15   698.15      .00      .00   698.51      .36     1.85      .01   690.00
    24400.    5165.   11087.    8148.    1051.    2933.    1372.     466.      79.   690.00
       .23     4.91     3.78     5.94     .035     .060     .035     .000   690.00  4644.63
   .001421    1250.     950.     625.        2        0        0      .00   788.42  5433.05
0
 FLOW DISTRIBUTION FOR SECNO=  39116.00          CWSEL=    698.15

 STA=    4645.    4650.    4790.    4855.    5215.    5250.    5340.    5355.    5396.    5425.    5433.
   PER Q=       .0      9.8     11.3     45.4      7.6     19.5      2.6      3.0       .7       .1
    AREA=      5.8    580.5    464.5   2932.8    285.1    733.2    107.2    172.0     66.3      8.6
     VEL=      1.6      4.1      5.9      3.8      6.5      6.5      5.9      4.2      2.7      1.6

 *SECNO 40116.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  40116.00     9.76   705.26   705.26      .00   708.29     3.03     3.62      .80   700.00
    24400.    2298.   21167.     935.     170.    1501.      78.     547.      91.   700.00
       .25    13.50    14.10    11.93     .035     .060     .035     .000   695.50  4828.94
   .022172    1000.    1000.    1000.       20       11        0      .00   290.85  5119.79
0
 FLOW DISTRIBUTION FOR SECNO=  40116.00          CWSEL=    705.26

 STA=    4829.    4840.    4890.    5090.    5120.
   PER Q=       .1      9.3     86.7      3.8
    AREA=      7.0    163.2   1501.5     78.4
     VEL=      4.6     13.9     14.1     11.9

1
  03/17/93    09:52:58                                                                                         PAGE   24


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 41116.000

 3301 HV CHANGED MORE THAN HVINS

  41116.00    10.91   714.91      .00      .00   715.58      .67     7.05      .24   708.00
    24400.    2322.   18510.    3568.     332.    2892.     495.     611.     100.   708.00
       .29     6.98     6.40     7.22     .035     .060     .035     .000   704.00  4760.91
   .003404     960.    1000.    1075.        6        0        0      .00   486.37  5247.27
0
 FLOW DISTRIBUTION FOR SECNO=  41116.00          CWSEL=    714.91
```

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 STA=    4761.    4770.    4835.    5145.    5165.    5180.    5240.    5247.
   PER Q=       .2      9.3     75.9      3.4      2.5      8.6       .1
    AREA=     13.2    319.1   2892.1    108.2     81.1    294.6     10.6
     VEL=      3.1      7.1      6.4      7.6      7.5      7.1      3.0

 *SECNO 42091.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  42091.00    14.39   725.59   725.59      .00   727.69     2.10     5.52      .43   740.00
    24400.       0.   21252.    3148.       0.    1735.     517.     678.     111.   724.00
       .31      .00    12.25     6.09     .035     .060     .035     .000   711.20  4933.23
   .011096     850.     975.    1050.       20       12        0      .00   492.65  5425.88
0
 FLOW DISTRIBUTION FOR SECNO=  42091.00          CWSEL=    725.59

 STA=    4933.    5100.    5250.    5425.    5426.
   PER Q=     87.1      6.0      6.9       .0
    AREA=   1735.3    238.4    278.2       .7
     VEL=     12.2      6.1      6.1      2.4

 *SECNO 42641.000

 3265 DIVIDED FLOW

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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4630.0    5360.0  TYPE=     1  TARGET=     730.000
  42641.00    16.38   730.98      .00      .00   732.08     1.11     4.29      .10   728.50
    24400.     122.   23203.    1075.      33.    2711.     188.     710.     117.   728.00
       .33     3.73     8.56     5.73     .035     .060     .035     .000   714.60  4853.60
   .005827     550.     550.     525.        2        0        0      .00   380.49  5360.00
0
 FLOW DISTRIBUTION FOR SECNO=  42641.00          CWSEL=    730.98

 STA=    4854.    4880.    5160.    5190.    5325.    5360.
   PER Q=       .5     95.1      2.3       .6      1.5
    AREA=     32.7   2711.1     89.3     26.8     71.5
     VEL=      3.7      8.6      6.3      5.5      5.1

 *SECNO 42956.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=    4705.0    5315.0  TYPE=     1  TARGET=     610.000
  42956.00    15.21   732.71      .00      .00   734.04     1.33     1.89      .07   732.00
    24400.      97.   22505.    1798.      36.    2363.     331.     730.     119.   728.80
       .34     2.67     9.52     5.44     .035     .060     .035     .000   717.50  4827.78
   .006333     350.     315.     250.        3        0        0      .00   436.48  5315.00
0
 FLOW DISTRIBUTION FOR SECNO=  42956.00          CWSEL=    732.71

 STA=    4828.    4880.    5100.    5120.    5205.    5315.
   PER Q=       .4     92.2      1.8      3.6      1.9
    AREA=     36.3   2363.4     62.7    166.6    101.1
     VEL=      2.7      9.5      7.1      5.3      4.6

 CCHV=    .300 CEHV=    .500
 *SECNO 42991.000
  42991.00    14.08   732.58      .00      .00   734.30     1.72      .06      .20   730.00
    24400.      85.   23526.     789.      55.    2194.     416.     733.     120.   728.80
       .34     1.55    10.72     1.89     .035     .020     .035     .000   718.50  4857.72
   .000871      35.      35.      35.        2        0        0      .00   472.36  5330.08
0
1
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  42991.00          CWSEL=    732.58

 STA=    4858.    4900.    5100.    5130.    5280.    5330.
   PER Q=       .3     96.4       .9      1.8       .5
    AREA=     54.8   2193.6     84.9    252.3     79.1
     VEL=      1.5     10.7      2.5      1.8      1.7


 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      1.05      1.32      2.50       .00    140.00     18.00   1393.00      1.75    720.00    719.80

 *SECNO 43011.000
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      3700.   BRIDGE STENCL=   4745.00    STENCR=   5300.00

 3301 HV CHANGED MORE THAN HVINS

 PRESSURE AND WEIR FLOW


  EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                AREA
     738.87    735.04       .74     7633.    16768.     1393.     1395.     730.00    731.80



 3470 ENCROACHMENT STATIONS=    4745.0     5300.0  TYPE=      1  TARGET=     555.000
  43011.00    15.95   734.45       .00       .00   735.55      1.10      1.25       .00   730.00
    24400.     283.   22482.     1634.      154.    2567.      743.      734.      120.    728.80
       .34     1.83     8.76      2.20      .035      .020      .035      .000   718.50  4834.41
   .000471      20.      20.       20.         3         0         2       .00   465.59  5300.00
0
 FLOW DISTRIBUTION FOR SECNO=  43011.00          CWSEL=    734.45

 STA=    4834.    4860.    4900.    5100.    5130.    5280.    5300.
   PER Q=       .1      1.1     92.1      1.5      4.7       .5
    AREA=     26.2    128.3   2566.6    141.7    532.1     68.9
     VEL=       .9      2.0      8.8      2.6      2.1      1.9

 CCHV=    .100 CEHV=    .300
 *SECNO 43051.000
1
  03/17/93    09:52:58                                                                                                                        PAGE   27


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST



 3265 DIVIDED FLOW

  43051.00    16.09   734.49       .00       .00   735.59      1.11       .04       .00   732.00
    24400.     571.   20746.     3083.      144.    2355.      489.      737.      120.    728.00
       .34     3.98     8.81      6.31      .035      .060      .035      .000   718.40  4794.57
   .004478      40.      40.       40.         1         0         0       .00   440.23  5275.10
0
 FLOW DISTRIBUTION FOR SECNO=  43051.00          CWSEL=    734.49

 STA=    4795.    4835.    4895.    5085.    5110.    5205.    5275.    5275.
   PER Q=       .3      2.1     85.0      3.9      6.8      2.0       .0
    AREA=     27.9    115.8   2355.1    118.2    283.0     87.4       .2
     VEL=      2.2      4.4      8.8      8.0      5.9      5.5       .4

 *SECNO 43341.000
  43341.00    16.66   735.86       .00       .00   737.35      1.49      1.64       .11   732.00
    24400.    1187.   23213.        0.      211.    2329.        0.      756.      123.    735.80
       .35     5.62     9.97       .39      .035      .060      .035      .000   719.20  4795.84
   .007273     250.     290.      350.         2         0         0       .00   348.18  5144.02
0
 FLOW DISTRIBUTION FOR SECNO=  43341.00          CWSEL=    735.86

 STA=    4796.    4905.    5130.    5144.
   PER Q=      4.9     95.1       .0
    AREA=    211.2   2328.8       .5
     VEL=      5.6     10.0       .4

 CCHV=    .100 CEHV=    .300
 *SECNO 44016.000

 3301 HV CHANGED MORE THAN HVINS

  44016.00    14.78   741.08       .00       .00   741.96       .88      4.55       .06   740.00
    24400.      35.   24352.       13.       16.    3231.        6.      800.      128.    740.00
       .38     2.22     7.54      2.21      .035      .080      .035      .000   726.30  4855.48
   .006266     650.     675.      750.         2         0         0       .00   315.26  5170.74
0
 FLOW DISTRIBUTION FOR SECNO=  44016.00          CWSEL=    741.08

 STA=    4855.    4885.    5160.    5171.
   PER Q=       .1     99.8       .1
    AREA=     15.8   3231.2      5.8
     VEL=      2.2      7.5      2.2

1
  03/17/93    09:52:58                                                                                                                        PAGE   28


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 *SECNO 45016.000
  45016.00    11.97   746.97       .00       .00   747.85       .88      5.89       .00   740.00
    24400.    4033.   19875.      492.      368.    2998.       70.      877.      136.    740.00
       .41    10.96     6.63      7.07      .035      .080      .035      .000   735.00  4869.33
   .005670     850.    1000.     1100.         2         0         0       .00   370.64  5239.97
0
 FLOW DISTRIBUTION FOR SECNO=  45016.00          CWSEL=    746.97

 STA=    4869.    4885.    4930.    5220.    5240.
   PER Q=      1.5     15.0     81.5      2.0
    AREA=     54.6    313.5   2997.7     69.5
     VEL=      6.9     11.7      6.6      7.1
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 *SECNO 46166.000
  46166.00    10.48   753.58      .00      .00   754.01      .42     6.11      .05   748.00
    24400.     414.   23689.     298.      73.    4545.      52.     984.     149.    748.00
       .47     5.69     5.21     5.72     .035     .080     .035     .000   743.10  4476.20
   .004888    1300.    1150.    1100.        2        0        0      .00   622.43  5098.62
0
 FLOW DISTRIBUTION FOR SECNO=  46166.00          CWSEL=    753.58

 STA=    4476.    4500.    4515.    5080.    5099.
   PER Q=       .2      1.5     97.1      1.2
    AREA=     18.9     53.8   4544.6     52.0
     VEL=      2.5      6.8      5.2      5.7

 *SECNO 47166.000
  47166.00     9.18   759.98      .00      .00   760.87      .89     6.72      .14   760.00
    24400.       0.   17703.    6697.       0.    2637.     705.    1076.     163.    756.00
       .51      .00     6.71     9.50     .035     .080     .035     .000   750.80  4900.03
   .009793    1100.    1000.    1000.        3        0        0      .00   599.40  5499.43
0
 FLOW DISTRIBUTION FOR SECNO=  47166.00          CWSEL=    759.98

 STA=    4900.    5275.    5405.    5499.
   PER Q=     72.6     22.3      5.1
    AREA=   2637.0    516.9    187.7
     VEL=      6.7     10.5      6.6

1
  03/17/93    09:52:58                                                                                                                      PAGE   29


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 CCHV=    .100 CEHV=    .300
 *SECNO 47916.000
  47916.00     8.22   764.62      .00      .00   765.25      .62     4.35      .03   760.00
    24400.     202.   24082.     115.      45.    3789.      27.    1139.     174.    760.00
       .54     4.46     6.36     4.32     .035     .050     .035     .000   756.40  4950.36
   .003746     750.     750.     825.        2        0        0      .00   611.19  5561.55
0
 FLOW DISTRIBUTION FOR SECNO=  47916.00          CWSEL=    764.62

 STA=    4950.    4970.    5550.    5562.
   PER Q=       .8     98.7       .5
    AREA=     45.4   3789.1     26.7
     VEL=      4.5      6.4      4.3

 *SECNO 49016.000

 3301 HV CHANGED MORE THAN HVINS

  49016.00     7.19   771.19      .00      .00   772.38     1.19     6.96      .17   768.00
    24400.     137.   24263.       0.      21.    2768.       0.    1223.     190.    780.00
       .58     6.46     8.77      .00     .035     .050     .035     .000   764.00  4971.71
   .012908    1050.    1100.    1375.        3        0        0      .00   673.61  5645.32
0
 FLOW DISTRIBUTION FOR SECNO=  49016.00          CWSEL=    771.19

 STA=    4972.    4985.    5660.
   PER Q=       .6     99.4
    AREA=     21.2   2767.9
     VEL=      6.5      8.8

 *SECNO 49916.000
  49916.00     8.50   781.70      .00      .00   783.27     1.57    10.78      .11   780.00
    24400.      29.   22751.    1620.       7.    2267.     155.    1276.     202.    776.00
       .60     3.99    10.03    10.44     .035     .050     .035     .000   773.20  4901.51
   .011294     925.     900.     700.        4        0        0      .00   456.98  5358.49
0
 FLOW DISTRIBUTION FOR SECNO=  49916.00          CWSEL=    781.70

 STA=    4902.    4910.    5310.    5350.    5358.
   PER Q=       .1     93.2      6.5       .1
    AREA=      7.2   2267.3    147.9      7.2
     VEL=      4.0     10.0     10.8      4.0

1
  03/17/93    09:52:58                                                                                                                      PAGE   30


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 50376.000

 3301 HV CHANGED MORE THAN HVINS

  50376.00    11.80   786.90      .00      .00   789.40     2.51     5.85      .28   788.00
    24400.       0.   24400.       0.       0.    1921.       0.    1299.     206.    792.00
       .61      .00    12.70      .00     .035     .050     .035     .000   775.10  4916.54
   .014579     510.     460.     400.        2        0        0      .00   286.69  5203.23
0
 FLOW DISTRIBUTION FOR SECNO=  50376.00          CWSEL=    786.90

 STA=    4917.    5250.
   PER Q=    100.0
    AREA=   1920.6
     VEL=     12.7
```

```
 *SECNO 51226.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4530.0    5135.0  TYPE=     1  TARGET=     605.000
  51226.00    13.88   793.88      .00      .00   794.60      .72     5.02      .18   788.00
    24400.     854.   23546.       0.     189.    3419.       0.    1353.     213.   800.00
       .65     4.51     6.89      .00     .035     .050     .035     .000   780.00  4530.00
   .003168     900.     850.     725.        4        0        0      .00   511.60  5041.60
0
 FLOW DISTRIBUTION FOR SECNO=  51226.00          CWSEL=    793.88

 STA=    4530.    4605.    4635.    5055.
   PER Q=       .7      2.8     96.5
    AREA=     73.2    116.3   3419.0
     VEL=      2.3      5.9      6.9

 *SECNO 51776.000

 3470 ENCROACHMENT STATIONS=    4370.0    5285.0  TYPE=     1  TARGET=     915.000
  51776.00    10.10   795.90      .00      .00   796.71      .82     2.09      .03   792.00
    24400.    3994.   20406.       0.     655.    2733.       0.    1394.     219.   800.00
       .67     6.10     7.47      .00     .035     .050     .035     .000   785.80  4370.00
   .005461     160.     550.     600.        3        0        0      .00   674.69  5044.69
0
1
  03/17/93    09:52:58                                                                                                   PAGE   31


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  51776.00          CWSEL=    795.90

 STA=    4370.    4610.    5085.
   PER Q=     16.4     83.6
    AREA=    654.8   2733.2
     VEL=      6.1      7.5

 CCHV=    .300 CEHV=    .500
 *SECNO 52081.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4914.1    5099.0  TYPE=     1  TARGET=     184.900
  52081.00     9.85   798.05   798.05      .00   801.49     3.44     1.27     1.31   802.30
    18580.       0.   18580.       0.       0.    1248.       0.    1409.     222. 100000.00
       .67      .00    14.89      .00     .035     .020     .035     .000   788.20  4914.73
   .003262     180.     305.     465.       20        8        0      .00   182.40  5097.13
0
 FLOW DISTRIBUTION FOR SECNO=  52081.00          CWSEL=    798.05

 STA=    4915.    5099.
   PER Q=    100.0
    AREA=   1248.2
     VEL=     14.9


 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .90      1.51      2.50       .00    190.00      6.00   1711.00      2.32    793.00    792.80

 *SECNO 52121.000
      3700.   BRIDGE STENCL=   4430.00    STENCR=   5099.00
 6840,FLOW IS BY WEIR AND LOW FLOW

 3301 HV CHANGED MORE THAN HVINS

 3420 BRIDGE W.S.=     799.82 BRIDGE VELOCITY=,     14.64      CALCULATED CHANNEL AREA=,     1362.
1
  03/17/93    09:52:58                                                                                                   PAGE   32


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



  EGPRS      EGLWC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
     802.82    803.15      1.76     4107.    20259.     1711.     1709.     801.40    800.50



 3470 ENCROACHMENT STATIONS=    4430.0    5099.0  TYPE=     1  TARGET=     669.000
  52121.00    14.20   802.40      .00      .00   803.15      .75     1.65      .00   796.00
    24400.    7275.   17125.       0.    2446.    2124.       0.    1412.     222. 100000.00
       .68     2.97     8.06      .00     .035     .020     .000     .000   788.20  4430.00
   .000504      40.      40.      40.        3        0        3      .00   669.00  5099.00
0
 FLOW DISTRIBUTION FOR SECNO=  52121.00          CWSEL=    802.40

 STA=    4430.    4540.    4645.    4914.    5099.
```

```
   PER Q=      1.8      4.8     23.2     70.2
    AREA=    263.6    461.6   1720.7   2124.4
     VEL=      1.7      2.6      3.3      8.1

 CCHV=    .100 CEHV=    .300
 *SECNO 52626.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4780.0    5140.0  TYPE=     1  TARGET=     360.000
  52626.00    10.02   802.72   802.72      .00   805.37     2.64      .73      .57   797.60
    24400.       0.   23551.     849.       0.    1781.     125.    1450.     228.    800.00
       .69      .00    13.22     6.78     .035     .050     .035     .000   792.70  4780.00
   .016450     530.     505.     180.       20       16        0      .00   360.00  5140.00
0
 FLOW DISTRIBUTION FOR SECNO=  52626.00          CWSEL=    802.72

 STA=    4780.    5050.    5140.
   PER Q=     96.5      3.5
    AREA=   1781.5    125.2
     VEL=     13.2      6.8
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    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 52836.000
  52836.00    11.87   806.07      .00      .00   808.62     2.55     3.24      .01   816.00
    24400.       0.   24400.       0.       0.    1906.       0.    1459.     230.    810.00
       .69      .00    12.80      .00     .035     .050     .035     .000   794.20  4865.68
   .014484     210.     210.     210.        2        0        0      .00   279.85  5145.54
0
 FLOW DISTRIBUTION FOR SECNO=  52836.00          CWSEL=    806.07

 STA=    4866.    5185.
   PER Q=    100.0
    AREA=   1905.7
     VEL=     12.8

 *SECNO 53676.000

 3301 HV CHANGED MORE THAN HVINS

  53676.00    15.30   815.30      .00      .00   817.03     1.73     8.34      .08   820.00
    24400.       0.   24400.       0.       0.    2308.       0.    1499.     235.    820.00
       .71      .00    10.57      .00     .035     .050     .035     .000   800.00  4919.79
   .007223     840.     840.     840.        3        0        0      .00   266.71  5186.50
0
 FLOW DISTRIBUTION FOR SECNO=  53676.00          CWSEL=    815.30

 STA=    4920.    5200.
   PER Q=    100.0
    AREA=   2308.4
     VEL=     10.6

 *SECNO 54676.000
  54676.00    14.00   822.00      .00      .00   823.93     1.92     6.83      .06   820.00
    24400.      15.   21192.    3193.       5.    1910.     280.    1551.     241.    813.50
       .74     3.23    11.09    11.40     .035     .050     .035     .000   808.00  4895.50
   .006517    1000.    1000.     950.        4        0        0      .00   257.02  5152.52
0
 FLOW DISTRIBUTION FOR SECNO=  54676.00          CWSEL=    822.00

 STA=    4895.    4900.    5090.    5120.    5130.    5153.
   PER Q=       .1     86.9     11.4      1.3       .3
    AREA=      4.5   1910.3    217.5     40.0     22.5
     VEL=      3.2     11.1     12.8      8.2      3.4
```



```
    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 55576.000

 3301 HV CHANGED MORE THAN HVINS

  55576.00    12.57   828.57      .00      .00   829.69     1.11     5.68      .08   840.00
    24400.       0.   22898.    1502.       0.    2661.     246.    1604.     249.    824.00
       .77      .00     8.60     6.10     .035     .050     .035     .000   816.00  4912.85
   .005929     800.     900.    1050.        2        0        0      .00   463.59  5376.45
0
 FLOW DISTRIBUTION FOR SECNO=  55576.00          CWSEL=    828.57

 STA=    4913.    5275.    5370.    5376.
   PER Q=     93.8      6.1       .0
    AREA=   2661.2    244.4      1.8
     VEL=      8.6      6.1      1.4

 *SECNO 56276.000
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 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4825.0    5070.0  TYPE=     1  TARGET=     245.000
  56276.00    12.03   836.03   836.03      .00   840.34     4.30     6.83      .96   860.00
    24400.       0.   24400.       0.       0.    1466.       0.    1640.     254. 100000.00
       .78      .00    16.64      .00     .035     .050     .035     .000   824.00  4866.56
   .018267     750.     700.    1000.       20        8        0      .00   170.17  5036.74
0
 FLOW DISTRIBUTION FOR SECNO=  56276.00          CWSEL=    836.03

 STA=    4867.    5070.
   PER Q=    100.0
    AREA=   1465.9
     VEL=     16.6

 *SECNO 56381.000

 3301 HV CHANGED MORE THAN HVINS

1
  03/17/93    09:52:58                                                                                        PAGE   35


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3470 ENCROACHMENT STATIONS=    4815.0    5085.0  TYPE=     1  TARGET=     270.000
  56381.00    12.93   838.93      .00      .00   841.99     3.06     1.53      .12   860.00
    24400.       0.   24400.       0.       0.    1738.       0.    1644.     255. 100000.00
       .78      .00    14.04      .00     .035     .050     .035     .000   826.00  4859.91
   .011873     105.     105.     105.        4        0        0      .00   189.41  5049.32
0
 FLOW DISTRIBUTION FOR SECNO=  56381.00          CWSEL=    838.93

 STA=    4860.    5085.
   PER Q=    100.0
    AREA=   1737.9
     VEL=     14.0

 *SECNO 57601.000

 3301 HV CHANGED MORE THAN HVINS

  57601.00    17.67   847.67      .00      .00   848.90     1.23     6.73      .18   856.00
    24400.       0.   24400.       0.       0.    2744.       0.    1707.     260.   860.00
       .82      .00     8.89      .00     .035     .050     .035     .000   830.00  4890.42
   .003171    1245.    1220.    1145.        4        0        0      .00   219.51  5109.94
0
 FLOW DISTRIBUTION FOR SECNO=  57601.00          CWSEL=    847.67

 STA=    4890.    5150.
   PER Q=    100.0
    AREA=   2743.8
     VEL=      8.9

 CCHV=    .300 CEHV=    .500
 *SECNO 57901.000
 3280 CROSS SECTION  57901.00 EXTENDED      9.01 FEET


 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4875.0    5190.0  TYPE=     1  TARGET=     315.000
  57901.00    18.00   849.00      .00      .00   849.43      .42      .29      .24   844.60
    19400.       0.   16314.    3086.       0.    2963.     901.    1730.     262.   840.00
       .84      .00     5.51     3.43     .035     .030     .035     .000   831.00  4875.00
   .000390     280.     300.     330.        2        0        0      .00   315.00  5190.00
0
1
  03/17/93    09:52:58                                                                                        PAGE   36


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  57901.00          CWSEL=    849.00

 STA=    4875.    5090.    5190.
   PER Q=     84.1     15.9
    AREA=   2963.0    900.7
     VEL=      5.5      3.4

 *SECNO 57902.000
      3700.   BRIDGE STENCL=   4890.00    STENCR=   5235.00
 3280 CROSS SECTION  57902.00 EXTENDED      8.76 FEET


 3370 NORMAL BRIDGE,NRD= 22 MIN ELTRD=  840.00 MAX ELLC=  848.00


 3470 ENCROACHMENT STATIONS=    4890.0    5235.0  TYPE=     1  TARGET=     345.000
  57902.00    17.56   848.76      .00      .00   849.68      .92      .00      .25   842.50
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   19400.      32.   11830.    7538.      16.    1429.    1117.    1730.     262.    836.00
      .84     2.06     8.28     6.75     .035     .030     .035     .000   831.20  4890.00
  .006794       1.       1.       1.        8        0        0 -1164.00   345.00  5235.00
0
 FLOW DISTRIBUTION FOR SECNO=  57902.00          CWSEL=    848.76

 STA=    4890.    4924.    4925.    5075.    5076.    5100.    5235.
   PER Q=       .2       .0     61.0       .1      7.3     31.4
    AREA=     14.9       .8   1429.4      6.2    131.0    979.6
     VEL=      2.0      2.9      8.3      4.5     10.8      6.2

 *SECNO 57922.000
      3700.   BRIDGE STENCL=   4892.00    STENCR=   5250.00
 3280 CROSS SECTION  57922.00 EXTENDED      8.84 FEET


 3370 NORMAL BRIDGE,NRD= 21 MIN ELTRD=  840.00 MAX ELLC=  848.00


 3470 ENCROACHMENT STATIONS=    4892.0    5250.0  TYPE=     1  TARGET=     358.000
  57922.00    17.64   848.84      .00      .00   849.79      .94      .10      .01   842.50
   19400.      31.    8403.   10965.      18.    1412.    1222.    1731.     262.    838.10
      .84     1.71     5.95     8.97     .035     .030     .035     .000   831.20  4892.00
  .003572      20.      20.      20.       13        0        0  -830.50   358.00  5250.00
0
1
  03/17/93    09:52:58                                                                                        PAGE   37


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  57922.00          CWSEL=    848.84

 STA=    4892.    4924.    4925.    5075.    5076.    5250.
   PER Q=       .2       .0     43.3       .2     56.3
    AREA=     17.4       .8   1412.4      5.2   1216.7
     VEL=      1.7      2.3      5.9      7.7      9.0

 CCHV=    .100 CEHV=    .300
 *SECNO 57923.000
 3280 CROSS SECTION  57923.00 EXTENDED      5.26 FEET


 3470 ENCROACHMENT STATIONS=    4890.0    5260.0  TYPE=     1  TARGET=     370.000
  57923.00    17.46   849.26      .00      .00   849.83      .57      .00      .04   848.00
   19400.      53.   15992.    3355.      35.    2547.     684.    1731.     262.    844.00
      .84     1.52     6.28     4.91     .035     .050     .035     .000   831.80  4890.00
  .001540       1.       1.       1.        2        0        0      .00   370.00  5260.00
0
 FLOW DISTRIBUTION FOR SECNO=  57923.00          CWSEL=    849.26

 STA=    4890.    4930.    5130.    5260.
   PER Q=       .3     82.4     17.3
    AREA=     35.1   2546.9    683.7
     VEL=      1.5      6.3      4.9

 *SECNO 58573.000

 3301 HV CHANGED MORE THAN HVINS

  58573.00    13.83   849.83      .00      .00   852.41     2.58     1.98      .60   860.00
   19400.       0.   19400.       0.       0.    1506.       0.    1767.     266.    860.00
      .85      .00    12.88      .00     .035     .050     .035     .000   836.00  4885.88
  .008864     700.     650.     600.        3        0        0      .00   146.41  5032.29
0
 FLOW DISTRIBUTION FOR SECNO=  58573.00          CWSEL=    849.83

 STA=    4886.    5045.
   PER Q=    100.0
    AREA=   1506.4
     VEL=     12.9

1
  03/17/93    09:52:58                                                                                        PAGE   38


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 59723.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4850.0    5240.0  TYPE=     1  TARGET=     390.000
  59723.00    10.99   857.89      .00      .00   858.63      .74     6.03      .18   870.00
   19400.       0.   19400.       0.       0.    2814.       0.    1824.     273. 100000.00
      .90      .00     6.89      .00     .035     .050     .035     .000   846.90  4850.67
  .003464    1250.    1150.    1100.        4        0        0      .00   352.48  5203.15
0
 FLOW DISTRIBUTION FOR SECNO=  59723.00          CWSEL=    857.89

 STA=    4851.    5240.
   PER Q=    100.0
    AREA=   2814.2
     VEL=      6.9

 *SECNO 60873.000
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 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4250.0    5200.0  TYPE=     1  TARGET=     950.000
  60873.00     8.71   868.71   868.71      .00   869.89     1.18     6.61      .13   867.60
    19400.    2049.   17351.       0.     482.    1906.       0.    1893.     290. 100000.00
       .94     4.25     9.11      .00     .035     .050     .035     .000   860.00  4250.00
   .011116    1300.    1150.    1100.       20       14        0      .00   903.73  5153.73
0
 FLOW DISTRIBUTION FOR SECNO=  60873.00          CWSEL=    868.71

 STA=    4250.    4770.    5200.
   PER Q=     10.6     89.4
    AREA=    482.0   1905.6
     VEL=      4.3      9.1

 *SECNO 61013.000

 3470 ENCROACHMENT STATIONS=    4215.0    5185.0  TYPE=     1  TARGET=     970.000
  61013.00     9.33   870.33      .00      .00   871.04      .71     1.10      .05   868.00
    19400.    6563.   12837.       0.    1207.    1750.       0.    1902.     293.   880.00
       .94     5.44     7.34      .00     .035     .050     .035     .000   861.00  4215.00
   .005951     135.     140.     130.        2        0        0      .00   896.87  5111.87
0
1
  03/17/93    09:52:58                                                                                                                      PAGE   39


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  61013.00          CWSEL=    870.33

 STA=    4215.    4370.    4808.    5130.
   PER Q=      3.6     30.3     66.2
    AREA=    186.4   1020.3   1749.8
     VEL=      3.7      5.8      7.3

 *SECNO 62073.000

 3470 ENCROACHMENT STATIONS=    4580.0    5370.0  TYPE=     1  TARGET=     790.000
  62073.00     8.59   876.59      .00      .00   877.54      .94     6.43      .07   876.00
    19400.     448.   13938.    5014.     187.    1736.     677.    1968.     313.   872.00
       .98     2.40     8.03     7.41     .035     .050     .035     .000   868.00  4580.00
   .006272     940.    1060.    1170.        3        0        0      .00   790.00  5370.00
0
 FLOW DISTRIBUTION FOR SECNO=  62073.00          CWSEL=    876.59

 STA=    4580.    4890.    5165.    5370.
   PER Q=      2.3     71.8     25.8
    AREA=    187.0   1735.9    676.8
     VEL=      2.4      8.0      7.4

 *SECNO 63173.000
  63173.00    11.23   882.23      .00      .00   883.37     1.14     5.77      .06   876.00
    19400.    1969.   17394.      37.     284.    1990.      12.    2030.     327.   880.00
      1.01     6.93     8.74     3.01     .035     .050     .035     .000   871.00  4782.25
   .004477    1150.    1100.    1050.        2        0        0      .00   313.85  5096.10
0
 FLOW DISTRIBUTION FOR SECNO=  63173.00          CWSEL=    882.23

 STA=    4782.    4810.    4870.    5085.    5096.
   PER Q=       .5      9.7     89.7       .2
    AREA=     30.8    253.2   1989.8     12.3
     VEL=      3.0      7.4      8.7      3.0

 *SECNO 64323.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4710.0    5410.0  TYPE=     1  TARGET=     700.000
1
  03/17/93    09:52:58                                                                                                                      PAGE   40


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


  64323.00     9.65   884.65      .00      .00   884.81      .17     1.35      .10   875.00
    19400.       9.   12878.    6514.      10.    4234.    1748.    2144.     341.   875.00
      1.11      .90     3.04     3.73     .035     .050     .035     .000   875.00  4710.00
   .000510    1000.    1150.    1400.        4        0        0      .00   700.00  5410.00
0
 FLOW DISTRIBUTION FOR SECNO=  64323.00          CWSEL=    884.65

 STA=    4710.    4711.    5150.    5270.    5340.    5410.
   PER Q=       .0     66.4     23.7      8.1      1.7
    AREA=      9.6   4234.4   1097.5    465.2    185.2
     VEL=       .9      3.0      4.2      3.4      1.8

 *SECNO 65323.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
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  65323.00    10.46   888.46   888.46      .00   891.11     2.65     1.53      .74   892.00
    19400.       0.   19400.       0.       0.    1485.       0.    2229.     352.   900.00
      1.14      .00    13.06      .00     .035     .050     .035     .000   878.00  4799.69
   .021637    1100.    1000.    1000.       20        8        0      .00   286.63  5086.32
0
 FLOW DISTRIBUTION FOR SECNO=  65323.00          CWSEL=    888.46

 STA=    4800.    5170.
   PER Q=    100.0
    AREA=   1485.2
     VEL=     13.1

 *SECNO 65463.000

 3301 HV CHANGED MORE THAN HVINS

  65463.00    12.44   891.44      .00      .00   892.68     1.24     1.43      .14   888.00
    19400.     648.   18752.       0.     138.    2076.       0.    2235.     353.   900.00
      1.14     4.70     9.03      .00     .035     .050     .035     .000   879.00  4774.92
   .005937     140.     140.     140.        2        0        0      .00   342.99  5117.92
0
1
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    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  65463.00          CWSEL=    891.44

 STA=    4775.    4855.    5170.
   PER Q=      3.3     96.7
    AREA=    137.9   2075.8
     VEL=      4.7      9.0

 *SECNO 66473.000

 3470 ENCROACHMENT STATIONS=    4285.0    5400.0  TYPE=     1  TARGET=    1115.000
  66473.00     7.72   899.72      .00      .00   900.58      .86     7.86      .04   896.00
    19400.    1263.   18137.       0.     190.    2422.       0.    2291.     366.   900.00
      1.18     6.63     7.49      .00     .035     .050     .035     .000   892.00  4462.66
   .010675     990.    1010.     940.        4        0        0      .00   737.95  5200.60
0
 FLOW DISTRIBUTION FOR SECNO=  66473.00          CWSEL=    899.72

 STA=    4463.    4565.    5210.
   PER Q=      6.5     93.5
    AREA=    190.4   2421.8
     VEL=      6.6      7.5

 *SECNO 66998.000

 3265 DIVIDED FLOW

  66998.00     8.16   904.16      .00      .00   904.79      .63     4.18      .02   904.00
    19400.       0.   19400.       0.       0.    3056.       0.    2325.     374.   904.00
      1.20      .03     6.35      .03     .035     .050     .035     .000   896.00  4319.60
   .006161     540.     525.     520.        2        0        0      .00   680.49  5080.54
0
 FLOW DISTRIBUTION FOR SECNO=  66998.00          CWSEL=    904.16

 STA=    4320.    5080.
   PER Q=    100.0
    AREA=   3056.3
     VEL=      6.3

 *SECNO 67548.000

 3470 ENCROACHMENT STATIONS=    4660.0    5375.0  TYPE=     1  TARGET=     715.000
1
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    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


  67548.00     7.55   907.55      .00      .00   908.44      .89     3.57      .08   900.00
    19400.       0.   19400.       0.       0.    2559.       0.    2361.     381.   908.00
      1.22      .00     7.58      .00     .035     .050     .035     .000   900.00  4660.00
   .006866     590.     550.     560.        3        0        0      .00   465.48  5125.48
0
 FLOW DISTRIBUTION FOR SECNO=  67548.00          CWSEL=    907.55

 STA=    4660.    5130.
   PER Q=    100.0
    AREA=   2558.8
     VEL=      7.6

 *SECNO 68448.000

 3301 HV CHANGED MORE THAN HVINS

  68448.00     8.78   914.28      .00      .00   915.76     1.48     7.15      .18   916.00
    19400.       0.   19400.       0.       0.    1989.       0.    2408.     389.   924.00
      1.25      .00     9.75      .00     .035     .050     .035     .000   905.50  4821.39
   .009287    1050.     900.     850.        2        0        0      .00   315.29  5136.68
0
 FLOW DISTRIBUTION FOR SECNO=  68448.00          CWSEL=    914.28
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 STA=    4821.    5165.
   PER Q=    100.0
    AREA=   1988.8
     VEL=      9.8

 *SECNO 69198.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4625.0    5200.0  TYPE=     1  TARGET=     575.000
  69198.00      9.97   919.57      .00       .00   920.22      .65      4.37       .08   920.00
    15900.        0.   15900.       0.        0.    2456.       0.     2446.     395.    920.00
      1.28       .00     6.47      .00      .035     .050     .035      .000   909.60  4776.64
    .003710      700.     750.     730.        2        0        0       .00   361.18  5137.82
0
1
  03/17/93    09:52:58                                                                                                  PAGE   43


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  69198.00          CWSEL=    919.57

 STA=    4777.    5140.
   PER Q=    100.0
    AREA=   2455.6
     VEL=      6.5

 CCHV=    .300 CEHV=    .500
 *SECNO 69733.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4912.0    5087.0  TYPE=     1  TARGET=     175.000
  69733.00      7.19   925.09   925.09       .00   927.99     2.90      1.89      1.12   929.50
    13220.        0.   13220.       0.        0.     967.       0.     2467.     398. 100000.00
      1.29       .00    13.66      .00      .035     .020     .035      .000   917.90  4913.22
    .003319      540.     535.     550.       20       15        0       .00   167.10  5080.32
0
 FLOW DISTRIBUTION FOR SECNO=  69733.00          CWSEL=    925.09

 STA=    4913.    5087.
   PER Q=    100.0
    AREA=    967.4
     VEL=     13.7


 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .90      1.55      2.50       .00    130.00      5.40   1425.00      1.47    920.00    919.80

 *SECNO 69773.000
      3700.   BRIDGE STENCL=   4440.00    STENCR=   5087.00
 6840,FLOW IS BY WEIR AND LOW FLOW

 3301 HV CHANGED MORE THAN HVINS

 3420 BRIDGE W.S.=     926.27 BRIDGE VELOCITY=,     15.49      CALCULATED CHANNEL AREA=,      839.
1
  03/17/93    09:52:58                                                                                                  PAGE   44


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



  EGPRS      EGLWC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
     930.20    930.00      1.18     2721.    13227.     1425.     1424.     930.20    928.00



 3470 ENCROACHMENT STATIONS=    4440.0    5087.0  TYPE=     1  TARGET=     647.000
  69773.00     11.47   929.37      .00       .00   930.00      .63      2.01       .00   928.00
    15900.      559.   15341.       0.      484.    2373.       0.     2469.     399. 100000.00
      1.29      1.16     6.47      .00      .035     .020     .000      .000   917.90  4440.00
    .000483       40.      40.      40.        2        0        0       .00   647.00  5087.00
0
 FLOW DISTRIBUTION FOR SECNO=  69773.00          CWSEL=    929.37

 STA=    4440.    4500.    4730.    4790.    5087.
   PER Q=       .6      2.3       .6     96.5
    AREA=     82.9    317.9     82.9   2372.8
     VEL=      1.1      1.2      1.2      6.5

 CCHV=    .100 CEHV=    .300
 *SECNO 69813.000

 3470 ENCROACHMENT STATIONS=    4435.0    5080.0  TYPE=     1  TARGET=     645.000
  69813.00     11.53   929.53      .00       .00   930.05      .52       .04       .01   928.00
    15900.     1538.   14362.       0.      542.    2383.       0.     2472.     399. 100000.00
      1.29      2.84     6.03      .00      .035     .050     .035      .000   918.00  4435.00
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   .002556      40.      40.      40.        2        0        0      .00   645.00  5080.00
0
 FLOW DISTRIBUTION FOR SECNO=  69813.00          CWSEL=    929.53

 STA=    4435.    4790.    5080.
   PER Q=      9.7     90.3
    AREA=    542.1   2382.8
     VEL=      2.8      6.0

 *SECNO 70193.000

 3470 ENCROACHMENT STATIONS=    4470.0    5240.0  TYPE=     1  TARGET=     770.000
  70193.00    14.93   930.43      .00      .00   930.75      .32      .68      .02   928.00
    15900.     405.   15495.       0.     229.    3370.       0.    2500.     405.   932.00
      1.32     1.77     4.60      .00     .035     .050     .035     .000   915.50  4641.61
   .001335     380.     380.     360.        2        0        0      .00   573.58  5215.19
0
1
  03/17/93    09:52:58                                                                                    PAGE   45


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  70193.00          CWSEL=    930.43

 STA=    4642.    4830.    5225.
   PER Q=      2.5     97.5
    AREA=    229.0   3370.4
     VEL=      1.8      4.6

 *SECNO 70743.000
  70743.00    15.16   931.16      .00      .00   931.58      .42      .80      .03   936.00
    15900.       0.   15900.       0.       0.    3045.       0.    2542.     411.   936.00
      1.35      .00     5.22      .00     .035     .050     .035     .000   916.00  4912.81
   .001576     670.     550.     400.        2        0        0      .00   324.04  5236.84
0
 FLOW DISTRIBUTION FOR SECNO=  70743.00          CWSEL=    931.16

 STA=    4913.    5280.
   PER Q=    100.0
    AREA=   3044.6
     VEL=      5.2

 *SECNO 71893.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  71893.00     6.74   934.74   934.74      .00   937.03     2.29     4.54      .56   936.00
    15900.       0.   15900.       0.       0.    1309.       0.    2600.     419.   940.00
      1.37      .00    12.15      .00     .035     .050     .035     .000   928.00  4952.85
   .022593    1150.    1150.    1000.        4       12        0      .00   290.58  5243.43
0
 FLOW DISTRIBUTION FOR SECNO=  71893.00          CWSEL=    934.74

 STA=    4953.    5250.
   PER Q=    100.0
    AREA=   1309.2
     VEL=     12.1

 *SECNO 72643.000
1
  03/17/93    09:52:58                                                                                    PAGE   46


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4485.0    5130.0  TYPE=     1  TARGET=     645.000
  72643.00    10.65   943.05      .00      .00   943.75      .69     6.55      .16   940.00
    15900.    1824.   14076.       0.     336.    2060.       0.    2631.     425.   960.00
      1.40     5.44     6.83      .00     .035     .050     .035     .000   932.40  4485.00
   .004716     530.     750.     730.        5        0        0      .00   483.09  5034.14
0
 FLOW DISTRIBUTION FOR SECNO=  72643.00          CWSEL=    943.05

 STA=    4485.    4508.    4620.    4700.    5110.
   PER Q=       .4      1.7      9.4     88.5
    AREA=     21.5     69.9    244.2   2060.1
     VEL=      2.6      3.9      6.1      6.8

 *SECNO 73193.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4605.0    5101.0  TYPE=     1  TARGET=     496.000
  73193.00     6.86   944.41   944.36      .00   946.06     1.65     2.02      .29   940.00
    15900.   13453.    2447.       0.    1223.     476.       0.    2648.     429. 100000.00
      1.41    11.00     5.14      .00     .035     .050     .035     .000   937.55  4605.00
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  .010020      40.     550.     600.        7       14        0      .00   496.00  5101.00
0
 FLOW DISTRIBUTION FOR SECNO=  73193.00          CWSEL=    944.41

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     15.1     15.8     15.8     15.8     22.1     15.4
    AREA=    255.1    220.1    220.1    220.1    308.1    476.3
     VEL=      9.4     11.4     11.4     11.4     11.4      5.1

 CCHV=    .300 CEHV=    .500
 *SECNO 73194.000
1
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


      3700.   BRIDGE STENCL=   4605.00    STENCR=   5101.00

 3370 NORMAL BRIDGE,NRD= 32 MIN ELTRD=  943.00 MAX ELLC=  952.00

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4605.0    5101.0  TYPE=     1  TARGET=     496.000
  73194.00      9.94   947.49   947.49      .00   949.21     1.72      .01      .04   940.00
    15900.   13169.    2731.       0.    1269.     242.       0.    2648.     429. 100000.00
      1.41    10.38    11.29      .00     .035     .015     .035     .000   937.55  4605.00
   .007847       1.       1.       1.       20       19        0 -1720.06   496.00  5101.00
0
 FLOW DISTRIBUTION FOR SECNO=  73194.00          CWSEL=    947.49

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     39.3      9.5     11.9     11.9     10.3     17.2
    AREA=    486.6    174.4    199.4    199.4    209.2    241.8
     VEL=     12.9      8.7      9.5      9.5      7.8     11.3

 *SECNO 73234.000
      3700.   BRIDGE STENCL=   4605.00    STENCR=   5101.00

 3301 HV CHANGED MORE THAN HVINS


 3370 NORMAL BRIDGE,NRD= 32 MIN ELTRD=  943.00 MAX ELLC=  952.00


 3470 ENCROACHMENT STATIONS=    4605.0    5101.0  TYPE=     1  TARGET=     496.000
  73234.00     11.15   948.70      .00      .00   949.64      .94      .19      .24   944.00
    15900.   12310.    3590.       0.    1626.     424.       0.    2649.     429. 100000.00
      1.41     7.57     8.47      .00     .035     .015     .035     .000   937.55  4605.00
   .003118      40.      40.      40.       15        0        0 -1398.86   496.00  5101.00
0
 FLOW DISTRIBUTION FOR SECNO=  73234.00          CWSEL=    948.70

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     33.0      9.8     11.6     11.6     11.4     22.6
    AREA=    577.2    234.8    259.8    259.8    293.8    423.8
     VEL=      9.1      6.6      7.1      7.1      6.2      8.5

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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 CCHV=    .100 CEHV=    .300
 *SECNO 73235.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4605.0    5101.0  TYPE=     1  TARGET=     496.000
  73235.00     11.84   949.39      .00      .00   949.70      .31      .00      .06   944.00
    15900.   11319.    4581.       0.    2318.    1479.       0.    2649.     429. 100000.00
      1.41     4.88     3.10      .00     .035     .050     .035     .000   937.55  4605.00
   .000840       1.       1.       1.        2        0        0      .00   496.00  5101.00
0
 FLOW DISTRIBUTION FOR SECNO=  73235.00          CWSEL=    949.39

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     18.9     16.2     16.2     10.9      9.0     28.8
    AREA=    630.1    470.0    470.0    370.0    378.1   1479.2
     VEL=      4.8      5.5      5.5      4.7      3.8      3.1

 CCHV=    .100 CEHV=    .300
 *SECNO 73335.000

 3470 ENCROACHMENT STATIONS=    4630.0    5130.0  TYPE=     1  TARGET=     500.000
  73335.00      6.96   949.46      .00      .00   949.86      .41      .13      .03   943.70
    15900.    1285.   14423.     192.     285.    2778.      55.    2657.     430.    944.00
      1.42     4.51     5.19     3.52     .050     .050     .050     .000   942.50  4630.00
   .002613      90.     100.      70.        2        0        0      .00   500.00  5130.00
0
 FLOW DISTRIBUTION FOR SECNO=  73335.00          CWSEL=    949.46

 STA=    4630.    4680.    5120.    5130.
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   PER Q=      8.1     90.7      1.2
    AREA=    284.8   2778.4     54.6
     VEL=      4.5      5.2      3.5

 *SECNO 73555.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4920.0    5205.0  TYPE=     1  TARGET=     285.000
1
  03/17/93    09:52:58                                                                                                  PAGE   49


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


  73555.00      5.79   949.59      .00      .00   951.51     1.92     1.19      .45   948.00
    15900.        3.   15897.       0.       1.    1428.       0.    2669.     432. 100000.00
      1.42      2.39    11.13      .00     .050     .050     .050     .000   943.80  4928.67
   .015925      360.     220.     100.        2        0        0      .00   276.32  5205.00
0
 FLOW DISTRIBUTION FOR SECNO=  73555.00          CWSEL=    949.59

 STA=    4929.    4930.    5205.
   PER Q=       .0    100.0
    AREA=      1.1   1428.3
     VEL=      2.4     11.1

 *SECNO 74155.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4820.0    5330.0  TYPE=     1  TARGET=     510.000
  74155.00      9.92   956.52      .00      .00   957.59     1.07     6.00      .09   960.00
    15900.        0.   14049.    1851.       0.    1618.     410.    2692.     437.    952.00
      1.44       .00     8.69     4.51     .050     .050     .050     .000   946.60  4891.52
   .006899      600.     600.     560.        4        0        0      .00   429.52  5321.04
0
 FLOW DISTRIBUTION FOR SECNO=  74155.00          CWSEL=    956.52

 STA=    4892.    5135.    5295.    5321.
   PER Q=     88.4     11.6       .0
    AREA=   1617.6    403.3      6.8
     VEL=      8.7      4.6      1.0

 *SECNO 75005.000

 3301 HV CHANGED MORE THAN HVINS

  75005.00     11.02   963.02      .00      .00   965.50     2.48     7.48      .42   964.00
    15900.        0.   15900.       0.       0.    1259.       0.    2724.     442.    967.50
      1.46       .00    12.63      .00     .050     .050     .050     .000   952.00  4942.45
   .011901      950.     850.     700.        3        0        0      .00   159.63  5102.08
0
1
  03/17/93    09:52:58                                                                                                  PAGE   50


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  75005.00          CWSEL=    963.02

 STA=    4942.    5120.
   PER Q=    100.0
    AREA=   1258.6
     VEL=     12.6

 *SECNO 75255.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4870.0    5280.0  TYPE=     1  TARGET=     410.000
  75255.00     14.07   966.07      .00      .00   966.42      .35      .70      .21   967.60
    15900.        0.    8026.    7874.       0.    1642.    1728.    2738.     444.    956.00
      1.48       .00     4.89     4.56     .050     .050     .050     .000   952.00  4919.33
   .001155      200.     250.     300.        2        0        0      .00   346.17  5265.50
0
 FLOW DISTRIBUTION FOR SECNO=  75255.00          CWSEL=    966.07

 STA=    4919.    5070.    5220.    5240.    5250.    5266.
   PER Q=     50.5     44.7      4.1       .6       .1
    AREA=   1642.1   1510.0    161.3     40.7     16.0
     VEL=      4.9      4.7      4.0      2.4      1.0

 *SECNO 75605.000

 3470 ENCROACHMENT STATIONS=    4840.0    5620.0  TYPE=     1  TARGET=     780.000
  75605.00     10.63   966.63      .00      .00   966.89      .26      .47      .01   968.00
    15900.        0.   12670.    3230.       0.    2901.    1124.    2770.     448.    960.00
      1.50       .00     4.37     2.87     .050     .050     .050     .000   956.00  4858.52
   .001346      360.     350.     420.        2        0        0      .00   660.59  5519.11
0
 FLOW DISTRIBUTION FOR SECNO=  75605.00          CWSEL=    966.63

 STA=    4859.    5220.    5440.    5519.
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   PER Q=     79.7     19.5       .9
    AREA=   2901.5   1020.1    104.3
     VEL=      4.4      3.0      1.3

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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 76855.000
  76855.00     5.05   968.75      .00      .00   968.96      .21     2.06      .01   968.00
    15900.       4.    5291.   10605.       6.    1490.    2862.    2890.     472.    964.00
      1.60      .70     3.55     3.71     .050     .050     .050     .000   963.70  4875.09
   .002070    1250.    1250.    1250.        2        0        0      .00  1013.06  5888.15
0
 FLOW DISTRIBUTION FOR SECNO=  76855.00          CWSEL=    968.75

 STA=    4875.    4890.    5240.    5785.    5885.    5888.
   PER Q=       .0     33.3     62.1      4.6       .0
    AREA=      5.6   1489.9   2586.3    274.6      1.2
     VEL=       .7      3.6      3.8      2.6       .7

 CCHV=    .100 CEHV=    .300
 *SECNO 78055.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  78055.00     7.52   979.52   979.52      .00   981.27     1.75     4.58      .46   980.00
    15900.       0.   14224.    1676.       0.    1290.     265.    2974.     494.    976.00
      1.63      .00    11.02     6.32     .030     .030     .030     .000   972.00  4878.47
   .008599    1200.    1200.    1275.       20       14        0      .00   511.56  5670.16
0
 FLOW DISTRIBUTION FOR SECNO=  78055.00          CWSEL=    979.52

 STA=    4878.    5225.    5291.    5640.    5670.
   PER Q=     89.5      4.9      3.9      1.7
    AREA=   1290.2    115.9    104.0     45.5
     VEL=     11.0      6.7      6.0      6.0

 *SECNO 78955.000

 3301 HV CHANGED MORE THAN HVINS

  78955.00     5.22   985.22      .00      .00   986.31     1.08     4.97      .07   984.00
    15900.     167.   15666.      67.      75.    1863.      30.    3011.     505.    984.00
      1.66     2.21     8.41     2.21     .030     .030     .030     .000   980.00  4767.23
   .003831     750.     900.     950.        3        0        0      .00   581.88  5349.11
0
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  78955.00          CWSEL=    985.22

 STA=    4767.    4890.    5300.    5349.
   PER Q=      1.0     98.5       .4
    AREA=     75.4   1863.4     30.1
     VEL=      2.2      8.4      2.2

 *SECNO 79955.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  79955.00     4.89   992.89   992.89      .00   995.17     2.27     5.36      .36   996.00
    15900.       0.   15897.       3.       0.    1314.       1.    3049.     515.    992.00
      1.68      .00    12.10     2.51     .030     .030     .030     .000   988.00  4943.59
   .008042    1000.    1000.     930.       20       11        0      .00   294.20  5237.79
0
 FLOW DISTRIBUTION FOR SECNO=  79955.00          CWSEL=    992.89

 STA=    4944.    5235.    5238.
   PER Q=    100.0       .0
    AREA=   1313.8      1.2
     VEL=     12.1      2.5

 CCHV=    .100 CEHV=    .300
 *SECNO 80955.000

 3301 HV CHANGED MORE THAN HVINS

  80955.00     5.76  1001.76      .00      .00  1002.62      .86     7.31      .14  1000.00
    15900.     158.   15728.      14.      64.    2107.       6.    3089.     524.   1000.00
      1.72     2.48     7.47     2.42     .045     .050     .045     .000   996.00  4617.39
   .006669    1050.    1000.     830.        4        0        0      .00   469.21  5086.60
0
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 FLOW DISTRIBUTION FOR SECNO=  80955.00          CWSEL=   1001.76

 STA=    4617.    4690.    5080.    5087.
   PER Q=      1.0     98.9       .1
    AREA=     63.9   2106.5      5.8
     VEL=      2.5      7.5      2.4

1
  03/17/93    09:52:58                                                                                                   PAGE   53


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 CCHV=    .100 CEHV=    .300
 *SECNO 81615.000

 3301 HV CHANGED MORE THAN HVINS

  81615.00     8.36  1007.36  1007.23      .00  1009.81     2.45     6.72      .48  1004.00
    15900.     470.   15324.     105.      85.    1202.      19.    3115.     530.   1004.00
      1.74     5.54    12.75     5.40     .050     .050     .050     .000   999.00  4844.53
   .017416     660.     660.     660.        4       14        0      .00   267.04  5111.57
0
 FLOW DISTRIBUTION FOR SECNO=  81615.00          CWSEL=   1007.36

 STA=    4845.    4895.    5100.    5112.
   PER Q=      3.0     96.4       .7
    AREA=     84.9   1202.3     19.5
     VEL=      5.5     12.7      5.4

 *SECNO 82355.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4450.0    5095.0  TYPE=     1  TARGET=     645.000
  82355.00    10.52  1014.52      .00      .00  1014.85      .34     4.83      .21  1011.70
    12500.     619.   11881.       0.     217.    2510.       0.    3149.     537.   1020.00
      1.78     2.85     4.73      .00     .050     .050     .050     .000  1004.00  4450.39
   .002937     700.     740.     700.        4        0        0      .00   595.90  5046.29
0
 FLOW DISTRIBUTION FOR SECNO=  82355.00          CWSEL=   1014.52

 STA=    4450.    4485.    4550.    5060.
   PER Q=       .7      4.3     95.1
    AREA=     43.5    173.3   2509.9
     VEL=      1.9      3.1      4.7

 CCHV=    .100 CEHV=    .300
 *SECNO 83505.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
1
  03/17/93    09:52:58                                                                                                   PAGE   54


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4580.0    5570.0  TYPE=     1  TARGET=     990.000
  83505.00     3.94  1023.94  1023.94      .00  1025.22     1.29     8.71      .29  1023.00
    12500.    6595.    5905.       0.     654.     749.       0.    3204.     552.   1024.00
      1.82    10.08     7.88      .00     .070     .070     .070     .000  1020.00  4580.00
   .045882    1200.    1150.    1100.        4       15        0      .00   528.27  5108.27
0
 FLOW DISTRIBUTION FOR SECNO=  83505.00          CWSEL=   1023.94

 STA=    4580.    4680.    4705.    4735.    4780.    5110.
   PER Q=     25.9      8.9     10.7      7.2     47.2
    AREA=    328.1     98.4    118.1    109.7    749.2
     VEL=      9.9     11.3     11.3      8.2      7.9

 *SECNO 84655.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4760.0    5470.0  TYPE=     1  TARGET=     710.000
  84655.00     8.70  1036.70      .00      .00  1036.95      .25    11.62      .10  1032.00
    12500.     849.    6688.    4963.     312.    1583.    1269.    3263.     568.   1032.00
      1.90     2.72     4.22     3.91     .070     .070     .070     .000  1028.00  4776.50
   .004412    1150.    1150.    1050.        7        0        0      .00   693.50  5470.00
0
 FLOW DISTRIBUTION FOR SECNO=  84655.00          CWSEL=   1036.70

 STA=    4777.    4895.    5200.    5470.
   PER Q=      6.8     53.5     39.7
    AREA=    311.7   1583.4   1268.9
     VEL=      2.7      4.2      3.9

 CCHV=    .100 CEHV=    .300
 *SECNO 85655.000

 3301 HV CHANGED MORE THAN HVINS
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  85655.00      5.71  1045.71  1045.66      .00  1047.45      1.74     10.05       .45  1044.00
    12500.       10.   12399.      92.       2.    1168.       16.     3312.      580.   1044.00
      1.92      4.86    10.61     5.57     .050      .070      .050      .000  1040.00  4877.63
   .043539     1000.    1000.     950.        8       14         0       .00   336.60  5214.23
0
1
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  85655.00          CWSEL=   1045.71

 STA=    4878.    4880.    5195.    5214.
   PER Q=        .1     99.2       .7
    AREA=      2.0   1168.4     16.4
     VEL=      4.9     10.6      5.6

 *SECNO 86895.000

 3301 HV CHANGED MORE THAN HVINS

  86895.00     11.40  1059.40      .00      .00  1059.74       .34     12.16       .14  1056.00
    12500.       99.   12323.      78.      36.    2622.       29.     3367.      591.   1056.00
      1.99      2.73     4.70     2.71     .050      .070      .050      .000  1048.00  4733.74
   .004213     1225.    1240.    1245.        7        0         0       .00   453.27  5187.01
0
 FLOW DISTRIBUTION FOR SECNO=  86895.00          CWSEL=   1059.40

 STA=    4734.    4755.    5170.    5187.
   PER Q=        .8     98.6       .6
    AREA=     36.2   2621.6     28.9
     VEL=      2.7      4.7      2.7

 *SECNO 88145.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  88145.00      4.51  1072.51  1072.51      .00  1073.80      1.29     12.90       .29  1080.00
    12500.        0.   12500.       0.       0.    1369.        0.     3425.      605.   1080.00
      2.03       .00     9.13      .00     .050      .070      .050      .000  1068.00  4823.73
   .054816      925.    1250.    1300.        5       18         0       .00   548.81  5372.54
0
 FLOW DISTRIBUTION FOR SECNO=  88145.00          CWSEL=   1072.51

 STA=    4824.    5410.
   PER Q=    100.0
    AREA=   1368.9
     VEL=      9.1

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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 89095.000

 3301 HV CHANGED MORE THAN HVINS

  89095.00     10.96  1090.96      .00      .00  1091.68       .72     17.81       .06  1100.00
    12500.        0.   12500.       0.       0.    1836.        0.     3460.      614.   1100.00
      2.07       .00     6.81      .00     .050      .070      .050      .000  1080.00  4892.60
   .009364      875.     950.    1200.        7        0         0       .00   302.33  5194.93
0
 FLOW DISTRIBUTION FOR SECNO=  89095.00          CWSEL=   1090.96

 STA=    4893.    5210.
   PER Q=    100.0
    AREA=   1836.1
     VEL=      6.8

 *SECNO 90395.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  90395.00      9.55  1109.55  1109.55      .00  1110.60      1.05     16.95       .10  1108.00
    10450.     3517.    6933.       0.     615.     750.        0.     3509.      627.   1140.00
      2.12      5.71     9.25      .00     .050      .070      .050      .000  1100.00  4479.20
   .020781     1350.    1300.    1250.        6        9         0       .00   541.20  5020.40
0
 FLOW DISTRIBUTION FOR SECNO=  90395.00          CWSEL=   1109.55

 STA=    4479.    4485.    4880.    5080.
   PER Q=        .2     33.5     66.3
    AREA=      4.5    611.0    749.9
     VEL=      3.5      5.7      9.2

 *SECNO 90670.000

 3470 ENCROACHMENT STATIONS=     4580.0     5070.0  TYPE=      1  TARGET=     490.000
  90670.00      7.08  1117.08      .00      .00  1117.85       .77      7.22       .03  1120.00
    10450.        0.   10450.       0.       0.    1484.        0.     3521.      632.   1120.00
      2.13       .00     7.04      .00     .050      .070      .050      .000  1110.00  4616.42
   .020919      700.     275.     180.        3        0         0       .00   426.29  5042.72
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0
1
  03/17/93   09:52:58                                                                                                  PAGE   57

    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 FLOW DISTRIBUTION FOR SECNO=  90670.00          CWSEL=   1117.08

 STA=    4616.    5050.
   PER Q=    100.0
    AREA=   1484.2
     VEL=      7.0

 *SECNO 90745.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  90745.00     7.87  1119.87  1119.87      .00  1122.00     2.13     2.23      .41  1140.00
    10450.       0.   10450.       0.       0.     892.       0.    3523.     633.   1140.00
      2.13      .00    11.71      .00     .050     .070     .050     .000  1112.00  4802.75
   .045375     200.      75.      75.       20        8        0      .00   212.00  5014.76
0
 FLOW DISTRIBUTION FOR SECNO=  90745.00          CWSEL=   1119.87

 STA=    4803.    5040.
   PER Q=    100.0
    AREA=    892.3
     VEL=     11.7

1
  03/17/93   09:52:58                                                                                                  PAGE   58



                                                                                    THIS RUN EXECUTED 03/17/93   09:53:37
  **************************************************
    HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
    ERROR CORR -  01,02,03,04,05,06
    MODIFICATION -  50,51,52,53,54,55,56
    IBM-PC-XT VERSION APRIL 1985
  **************************************************


 T1      SCHAAF & WHEELER, CONSULTING CIVIL ENGINEERS
 T2      RIVERSIDE COUNTY FIS, FEMA0590
 T3      TEMESCAL WASH            FILE : FLWY-FL1.HEC

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

        0.        3.        0.        0.   .000000       .00        .0        0.   678.320      .000

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      15.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

1
  03/17/93   09:52:58                                                                                                  PAGE   59

    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *PROF 2

 CCHV=    .100 CEHV=    .300
 *SECNO 34400.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=    3940.9    5039.1  TYPE=     1  TARGET=    1098.200
  34400.00     6.32   678.32   678.32   678.32   679.69     1.37      .00      .00   680.00
    24400.   23033.    1367.       0.    2412.     225.       0.       0.       0. 100000.00
       .00     9.55     6.08      .00     .035     .060     .035     .000   672.00  3940.90
   .013210       0.       0.       0.        0        4        0      .00  1000.20  5039.10
0
 *SECNO 35425.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4580.0    5540.0  TYPE=     1  TARGET=     960.000
  35425.00     7.02   683.02      .00   682.82   683.43      .41     3.65      .10   680.00
    24400.   10685.   13715.       0.    1723.    3337.       0.      70.      17. 100000.00
       .04     6.20     4.11      .00     .035     .060     .035     .000   676.00  4580.00
   .002598     600.    1025.     950.        5        0        0      .00   960.00  5540.00
0
 *SECNO 36325.000

 3470 ENCROACHMENT STATIONS=    4700.8    5700.0  TYPE=     1  TARGET=     999.200
  36325.00     5.65   685.65      .00   685.42   686.26      .61     2.76      .06   684.00
    24400.      30.    6644.   17727.      13.    1840.    2535.     174.      38.    684.00
       .09     2.23     3.61     6.99     .035     .060     .035     .000   680.00  4700.80
```

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   .003068     830.     900.    1165.        4        0        0      .00   999.20  5700.00
0
 CCHV=    .300 CEHV=    .500
 *SECNO 36461.000

 3265 DIVIDED FLOW

1
  03/17/93    09:52:58                                                                                                                          PAGE   60


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4733.5    5290.0  TYPE=     1  TARGET=     556.500
  36461.00    12.62   686.62   686.62   686.61   689.22     2.61      .76     1.00   680.00
    24400.    4541.   19505.     354.     748.    1375.     110.     192.      42.   684.00
       .09     6.07    14.19     3.21     .035     .025     .035     .000   674.00  4733.50
   .003549     100.     136.     400.       20       17        0      .00   465.73  5290.00
0
 *SECNO 36486.000

 3370 NORMAL BRIDGE,NRD=  7 MIN ELTRD=  684.00 MAX ELLC=  684.00

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4795.6    5290.0  TYPE=     1  TARGET=     494.400
  36486.00    15.02   689.02   689.02   688.88   691.23     2.21      .13      .12   682.50
    24400.   14473.    4137.    5790.    1086.     386.     671.     194.      43.   681.50
       .09    13.33    10.71     8.63     .035     .025     .035     .000   674.00  4795.60
   .008281      25.      25.      25.       20       16        0  -350.00   494.40  5290.00
0
 *SECNO 36518.000

 3301 HV CHANGED MORE THAN HVINS


 3370 NORMAL BRIDGE,NRD=  7 MIN ELTRD=  684.00 MAX ELLC=  684.00


 3470 ENCROACHMENT STATIONS=    4797.0    5345.0  TYPE=     1  TARGET=     548.000
  36518.00    16.67   690.67   689.06   690.78   691.73     1.06      .15      .35   682.50
    24400.   13033.    3397.    7969.    1380.     460.    1258.     196.      43.   681.50
       .09     9.44     7.38     6.33     .035     .025     .035     .000   674.00  4797.00
   .003112      32.      32.      32.       18       16        0  -350.00   548.00  5345.00
0
1
  03/17/93    09:52:58                                                                                                                          PAGE   61


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 CCHV=    .300 CEHV=    .500
 *SECNO 36519.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4765.1    5275.4  TYPE=     1  TARGET=     510.300
  36519.00    19.61   691.61      .00   691.71   691.95      .34      .00      .22   684.00
    24400.    8577.   13793.    2030.    1347.    3994.     670.     196.      43.   684.00
       .09     6.37     3.45     3.03     .035     .060     .035     .000   672.00  4765.10
   .000593       1.       1.       1.        2        0        0      .00   510.30  5275.40
0
 CCHV=    .300 CEHV=    .500
 *SECNO 36669.000

 3470 ENCROACHMENT STATIONS=    4795.4    5208.3  TYPE=     1  TARGET=     412.900
  36669.00    16.24   691.64      .00   691.72   692.06      .42      .07      .04100000.00
    24400.       0.   24400.       0.       0.    4708.       0.     214.      44. 100000.00
       .10      .00     5.18      .00     .035     .030     .035     .000   675.40  4795.44
   .000433     150.     150.      80.        2        0        0      .00   412.82  5208.27
0
 *SECNO 36670.000

 3370 NORMAL BRIDGE,NRD= 67 MIN ELTRD=  692.50 MAX ELLC=  696.00


 3470 ENCROACHMENT STATIONS=    4795.0    5208.2  TYPE=     1  TARGET=     413.200

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      692.00 ELREA=   100000.00

  36670.00    16.12   691.52      .00   691.59   692.19      .67      .00      .13   692.00
    24400.       0.   24400.       0.       0.    3703.       0.     214.      44. 100000.00
       .10      .00     6.59      .00     .035     .030     .035     .000   675.40  4795.60
   .002966       1.       1.       1.        2        0        0  -679.16   412.55  5208.15
0
 *SECNO 36690.000
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 3370 NORMAL BRIDGE,NRD= 67 MIN ELTRD=  692.50 MAX ELLC=  696.00
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3470 ENCROACHMENT STATIONS=    4795.5    5208.3  TYPE=     1  TARGET=     412.800

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  36690.00    16.18   691.58      .00   691.65   692.25      .67      .06      .00100000.00
    24400.       0.   24400.       0.       0.    3704.       0.     215.      45. 100000.00
       .10      .00     6.59      .00     .035     .030     .035     .000   675.40  4795.53
   .002968      20.      20.      20.        2        0        0  -703.22   412.77  5208.30
0
 CCHV=    .300 CEHV=    .500
 *SECNO 36691.000

 3470 ENCROACHMENT STATIONS=    4795.1    5209.1  TYPE=     1  TARGET=     414.000
  36691.00    16.54   691.94      .00   692.02   692.34      .40      .00      .08100000.00
    24400.       0.   24400.       0.       0.    4830.       0.     215.      45. 100000.00
       .10      .00     5.05      .00     .035     .060     .035     .000   675.40  4795.10
   .001597       1.       1.       1.        2        0        0      .00   414.00  5209.10
0
 CCHV=    .100 CEHV=    .300
 *SECNO 36941.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4770.0    5065.0  TYPE=     1  TARGET=     295.000
  36941.00    12.00   692.00      .00   692.08   693.42     1.42      .78      .31100000.00
    24400.       0.   24400.       0.       0.    2551.       0.     237.      47. 100000.00
       .11      .00     9.57      .00     .035     .060     .035     .000   680.00  4770.00
   .008497     380.     250.      90.        2        0        0      .00   295.00  5065.00
0
 *SECNO 37166.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4678.1    5073.7  TYPE=     1  TARGET=     395.600
  37166.00    13.85   693.85      .00   693.89   694.30      .45      .78      .10100000.00
    24400.       0.   24400.       0.       0.    4511.       0.     255.      48. 100000.00
       .12      .00     5.41      .00     .035     .060     .035     .000   680.00  4678.10
   .001883     230.     225.     200.        2        0        0      .00   395.56  5073.66
0
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 38166.000

 3470 ENCROACHMENT STATIONS=    4640.0    5183.0  TYPE=     1  TARGET=     543.000
  38166.00    11.44   696.14      .00   696.15   696.66      .51     2.34      .02   688.00
    24400.    2976.   21424.       0.     486.    3759.       0.     356.      59. 100000.00
       .17     6.13     5.70      .00     .035     .060     .035     .000   684.70  4640.00
   .002958    1050.    1000.     925.        3        0        0      .00   541.42  5181.42
0
 *SECNO 39116.000

 3470 ENCROACHMENT STATIONS=    4779.5    5355.0  TYPE=     1  TARGET=     575.500
  39116.00     8.27   698.27      .00   698.15   698.78      .51     2.12      .00   690.00
    24400.    3470.   12757.    8173.     537.    2976.    1142.     452.      72.    690.00
       .22     6.47     4.29     7.15     .035     .060     .035     .000   690.00  4779.50
   .001792    1250.     950.     625.        2        0        0      .00   575.50  5355.00
0
 *SECNO 40116.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4840.0    5120.0  TYPE=     1  TARGET=     280.000
  40116.00     9.70   705.20   705.20   705.26   708.32     3.12     4.38      .78   700.00
    24400.    2200.   21277.     923.     160.    1489.      77.     525.      81.    700.00
       .23    13.75    14.29    12.06     .035     .060     .035     .000   695.50  4840.00
   .023053    1000.    1000.    1000.       20       11        0      .00   279.43  5119.43
0
 *SECNO 41116.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4770.0    5240.0  TYPE=     1  TARGET=     470.000
  41116.00    10.97   714.97      .00   714.91   715.64      .67     7.07      .24   708.00
    24400.    2251.   18625.    3524.     323.    2912.     490.     588.      90.    708.00
       .28     6.96     6.40     7.19     .035     .060     .035     .000   704.00  4770.00
   .003369     960.    1000.    1075.        6        0        0      .00   470.00  5240.00
0
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```
   SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 42091.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4933.0    5425.0  TYPE=     1  TARGET=     492.000
  42091.00     14.37   725.57   725.57   725.59   727.70      2.13      5.51      .44100000.00
    24400.        0.   21314.    3086.       0.    1732.     510.      655.     101.    724.00
       .30       .00    12.31     6.05     .035     .060     .035      .000   711.20  4933.29
   .011231      850.     975.    1050.       20       12        0       .00   491.70  5425.00
0
 *SECNO 42641.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4880.0    5360.0  TYPE=     1  TARGET=     480.000
  42641.00     16.42   731.02      .00   730.98   732.13      1.11      4.33      .10   728.50
    24400.        0.   23295.    1105.       0.    2722.     190.      688.     106.    728.00
       .32       .00     8.56     5.80     .035     .060     .035      .000   714.60  4880.00
   .005866      550.     550.     525.        2        0        0       .00   354.08  5360.00
0
 *SECNO 42956.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=    4880.0    5315.0  TYPE=     1  TARGET=     435.000
  42956.00     15.25   732.75      .00   732.71   734.08      1.33      1.89      .07   732.00
    24400.        0.   22545.    1855.       0.    2373.     338.      707.     109.    728.80
       .33       .00     9.50     5.50     .035     .060     .035      .000   717.50  4880.00
   .006299      350.     315.     250.        3        0        0       .00   384.27  5315.00
0
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   SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 CCHV=    .300 CEHV=    .500
 *SECNO 42991.000

 3470 ENCROACHMENT STATIONS=    4858.0    5330.0  TYPE=     1  TARGET=     472.000
  42991.00     14.13   732.63      .00   732.58   734.33      1.70       .06      .18   730.00
    24400.       89.   23492.     819.      57.    2204.     428.      710.     109.    728.80
       .33      1.57    10.66     1.91     .035     .020     .035      .000   718.50  4858.00
   .000854       35.      35.      35.        2        0        0       .00   472.00  5330.00
0

 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      1.05      1.32      2.50       .00    140.00     18.00   1393.00      1.75    720.00    719.80

 *SECNO 43011.000

 3301 HV CHANGED MORE THAN HVINS

 PRESSURE AND WEIR FLOW


  EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
     738.92    735.05       .72     7707.    16693.     1393.     1395.     730.00    731.80



 3470 ENCROACHMENT STATIONS=    4834.4    5300.0  TYPE=     1  TARGET=     465.600
  43011.00     15.98   734.48      .00   734.45   735.58      1.09      1.24      .00   730.00
    24400.      288.   22461.    1651.     157.    2574.     750.      711.     109.    728.80
       .33      1.84     8.73     2.20     .035     .020     .035      .000   718.50  4834.40
   .000466       20.      20.      20.        3        0        2       .00   465.60  5300.00
0
 CCHV=    .100 CEHV=    .300
 *SECNO 43051.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=    4850.0    5275.0  TYPE=     1  TARGET=     425.000
  43051.00     16.11   734.51      .00   734.49   735.63      1.12       .04      .01   732.00
    24400.      429.   20842.    3129.      94.    2361.     493.      714.     110.    728.00
       .33      4.54     8.83     6.35     .035     .060     .035      .000   718.40  4850.00
   .004484       40.      40.      40.        0        0        0       .00   384.71  5275.00
0
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   SECNO    DEPTH   CWSEL   CRIWS   WSELK   EG      HV      HL      OLOSS  BANK ELEV
   Q        QLOB    QCH     QROB    ALOB    ACH     AROB    VOL     TWA   LEFT/RIGHT
   TIME     VLOB    VCH     VROB    XNL     XNCH    XNR     WTN     ELMIN      SSTA
   SLOPE    XLOBL   XLCH    XLOBR   ITRIAL  IDC     ICONT   CORAR   TOPWID     ENDST


 *SECNO 43341.000

 3470 ENCROACHMENT STATIONS=    4796.0    5130.0  TYPE=     1  TARGET=     334.000
  43341.00    16.69   735.89     .00   735.86   737.37    1.48     1.64      .11   732.00
    24400.    1213.   23187.      0.     215.    2336.      0.     732.     112. 100000.00
       .34     5.65     9.93     .00     .035     .060    .035     .000   719.20  4796.00
   .007187     250.     290.    350.        2        0       0      .00   334.00  5130.00
0
 CCHV=    .100 CEHV=    .300
 *SECNO 44016.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4885.0    5160.0  TYPE=     1  TARGET=     275.000
  44016.00    14.79   741.09     .00   741.08   741.98     .88     4.55      .06   740.00
    24400.       0.   24400.      0.       0.    3234.      0.     777.     117. 100000.00
       .36      .00     7.54     .00     .035     .080    .035     .000   726.30  4885.00
   .006336     650.     675.    750.        2        0       0      .00   275.00  5160.00
0
 *SECNO 45016.000

 3470 ENCROACHMENT STATIONS=    4869.0    5240.0  TYPE=     1  TARGET=     371.000
  45016.00    12.00   747.00     .00   746.97   747.87     .88     5.89      .00   740.00
    24400.    4041.   19864.    495.     370.    3005.     70.     853.     124.    740.00
       .40    10.93     6.61    7.06     .035     .080    .035     .000   735.00  4869.27
   .005617     850.    1000.   1100.        2        0       0      .00   370.73  5240.00
0
 *SECNO 46166.000

 3470 ENCROACHMENT STATIONS=    4500.0    5099.0  TYPE=     1  TARGET=     599.000
  46166.00    10.49   753.59     .00   753.58   754.01     .43     6.10      .04   748.00
    24400.     344.   23757.    299.      54.    4546.     52.     961.     137.    748.00
       .46     6.39     5.23    5.74     .035     .080    .035     .000   743.10  4500.00
   .004911    1300.    1150.   1100.        2        0       0      .00   598.63  5098.63
0
 *SECNO 47166.000

 3470 ENCROACHMENT STATIONS=    4900.0    5500.0  TYPE=     1  TARGET=     600.000
```



```
   SECNO    DEPTH   CWSEL   CRIWS   WSELK   EG      HV      HL      OLOSS  BANK ELEV
   Q        QLOB    QCH     QROB    ALOB    ACH     AROB    VOL     TWA   LEFT/RIGHT
   TIME     VLOB    VCH     VROB    XNL     XNCH    XNR     WTN     ELMIN      SSTA
   SLOPE    XLOBL   XLCH    XLOBR   ITRIAL  IDC     ICONT   CORAR   TOPWID     ENDST


  47166.00     9.19   759.99     .00   759.98   760.88     .89     6.72      .14   760.00
    24400.       0.   17693.   6707.       0.    2641.    707.    1053.     151.    756.00
       .50      .00     6.70    9.49     .035     .080    .035     .000   750.80  4900.02
   .009738    1100.    1000.   1000.        3        0       0      .00   599.63  5499.65
0
 CCHV=    .100 CEHV=    .300
 *SECNO 47916.000

 3470 ENCROACHMENT STATIONS=    4970.0    5550.0  TYPE=     1  TARGET=     580.000
  47916.00     8.27   764.67     .00   764.62   765.30     .63     4.40      .03   760.00
    24400.       0.   24400.      0.       0.    3816.      0.    1115.     161. 100000.00
       .53      .00     6.39     .00     .035     .050    .035     .000   756.40  4970.00
   .003837     750.     750.    825.        2        0       0      .00   580.00  5550.00
0
 *SECNO 49016.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4972.0    5645.0  TYPE=     1  TARGET=     673.000
  49016.00     7.25   771.25     .00   771.19   772.41    1.16     6.95      .16   768.00
    24400.     143.   24257.      0.      22.    2809.      0.    1199.     177. 100000.00
       .57     6.51     8.64     .00     .035     .050    .035     .000   764.00  4972.00
   .012281    1050.    1100.   1375.        3        0       0      .00   673.00  5645.00
0
 *SECNO 49916.000

 3470 ENCROACHMENT STATIONS=    4910.0    5350.0  TYPE=     1  TARGET=     440.000
  49916.00     8.46   781.66     .00   781.70   783.27    1.61    10.72      .14   780.00
    24400.       0.   22850.   1550.       0.    2251.    146.    1253.     188.    776.00
       .59      .00    10.15   10.59     .035     .050    .035     .000   773.20  4910.00
   .011728     925.     900.    700.        4        0       0      .00   440.00  5350.00
0
 *SECNO 50376.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4914.3    5204.6  TYPE=     1  TARGET=     290.300
```



```
   SECNO    DEPTH   CWSEL   CRIWS   WSELK   EG      HV      HL      OLOSS  BANK ELEV
   Q        QLOB    QCH     QROB    ALOB    ACH     AROB    VOL     TWA   LEFT/RIGHT
   TIME     VLOB    VCH     VROB    XNL     XNCH    XNR     WTN     ELMIN      SSTA
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```
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


  50376.00    11.86   786.96      .00   786.90   789.42     2.46     5.90      .25100000.00
    24400.       0.   24400.       0.       0.    1940.       0.    1275.     192. 100000.00
       .60      .00    12.57      .00     .035     .050     .035     .000   775.10  4915.50
   .014195     510.     460.     400.        2        0        0      .00   288.36  5203.86
0
 *SECNO 51226.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4605.0    5041.8  TYPE=     1  TARGET=     436.800
  51226.00    13.88   793.88      .00   793.88   794.62      .74     5.03      .17   788.00
    24400.     660.   23740.       0.     116.    3419.       0.    1329.     199. 100000.00
       .64     5.68     6.94      .00     .035     .050     .035     .000   780.00  4605.00
   .003221     900.     850.     725.        4        0        0      .00   436.60  5041.60
0
 *SECNO 51776.000

 3470 ENCROACHMENT STATIONS=     4370.0    5047.5  TYPE=     1  TARGET=     677.500
  51776.00    10.12   795.92      .00   795.90   796.73      .81     2.10      .02   792.00
    24400.    4027.   20373.       0.     662.    2745.       0.    1369.     205. 100000.00
       .66     6.09     7.42      .00     .035     .050     .035     .000   785.80  4370.00
   .005364     160.     550.     600.        3        0        0      .00   674.77  5044.77
0
 CCHV=     .300 CEHV=     .500
 *SECNO 52081.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4914.2    5097.9  TYPE=     1  TARGET=     183.700
  52081.00     9.86   798.06   798.06   798.05   801.49     3.44     1.25     1.31100000.00
    18580.       0.   18580.       0.       0.    1249.       0.    1385.     208. 100000.00
       .66      .00    14.88      .00     .035     .020     .035     .000   788.20  4914.73
   .003256     180.     305.     465.       20        8        0      .00   182.41  5097.14
0
1
  03/17/93    09:52:58                                                                                                PAGE   69


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .90      1.51      2.50       .00    190.00      6.00   1711.00      2.32    793.00    792.80

 *SECNO 52121.000
 6840,FLOW IS BY WEIR AND LOW FLOW

 3301 HV CHANGED MORE THAN HVINS

 3420 BRIDGE W.S.=     799.31 BRIDGE VELOCITY=,      14.57      CALCULATED CHANNEL AREA=,      1254.

  EGPRS     EGLWC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD
                                                                AREA
    802.83    802.61      1.26     5782.    18579.     1711.     1709.     801.40    800.50



 3470 ENCROACHMENT STATIONS=     4558.0    5099.0  TYPE=     1  TARGET=     541.000
  52121.00    13.40   801.60      .00   802.40   802.61     1.01     1.11      .00   796.00
    24400.    6325.   18075.       0.    1850.    1977.       0.    1387.     208. 100000.00
       .66     3.42     9.14      .00     .035     .020     .000     .000   788.20  4558.00
   .000709      40.      40.      40.        3        0        2      .00   541.00  5099.00
0
 CCHV=     .100 CEHV=     .300
 *SECNO 52626.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4780.0    5137.0  TYPE=     1  TARGET=     357.000
  52626.00    10.00   802.70   802.70   802.72   805.37     2.67      .98      .50   797.60
    24400.       0.   23556.     844.       0.    1774.     123.    1420.     213.    800.00
       .68      .00    13.28     6.88     .035     .050     .035     .000   792.70  4780.00
   .016683     530.     505.     180.       20       19        0      .00   357.00  5137.00
0
 *SECNO 52836.000

 3470 ENCROACHMENT STATIONS=     4864.0    5150.5  TYPE=     1  TARGET=     286.500
  52836.00    11.89   806.09      .00   806.07   808.62     2.53     3.24      .01100000.00
    24400.       0.   24400.       0.       0.    1912.       0.    1429.     215. 100000.00
       .68      .00    12.76      .00     .035     .050     .035     .000   794.20  4865.64
   .014335     210.     210.     210.        2        0        0      .00   280.07  5145.71
0
1
  03/17/93    09:52:58                                                                                                PAGE   70


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
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   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 53676.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4919.3    5187.8  TYPE=     1  TARGET=     268.500
  53676.00    15.29   815.29      .00   815.30   817.03     1.74     8.33      .08100000.00
    24400.       0.   24400.       0.       0.    2305.       0.    1470.     220. 100000.00
       .70      .00    10.59      .00     .035     .050     .035     .000   800.00  4919.82
   .007258     840.     840.     840.        3        0        0      .00   266.61  5186.43
0
 *SECNO 54676.000

 3470 ENCROACHMENT STATIONS=    4900.0    5130.0  TYPE=     1  TARGET=     230.000
  54676.00    14.03   822.03      .00   822.00   823.99     1.96     6.90      .07   820.00
    24400.       0.   21278.    3122.       0.    1915.     259.    1521.     226.   813.50
       .73      .00    11.11    12.07     .035     .050     .035     .000   808.00  4900.00
   .006603    1000.    1000.     950.        4        0        0      .00   230.00  5130.00
0
 *SECNO 55576.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4913.0    5370.0  TYPE=     1  TARGET=     457.000
  55576.00    12.62   828.62      .00   828.57   829.72     1.10     5.64      .09100000.00
    24400.       0.   22877.    1523.       0.    2679.     249.    1575.     233.   824.00
       .76      .00     8.54     6.11     .035     .050     .035     .000   816.00  4913.00
   .005786     800.     900.    1050.        2        0        0      .00   457.00  5370.00
0
 *SECNO 56276.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4866.7    5036.6  TYPE=     1  TARGET=     169.900
  56276.00    11.97   835.97   835.97   836.03   840.34     4.37     6.78      .98100000.00
    24400.       0.   24400.       0.       0.    1455.       0.    1611.     238. 100000.00
       .77      .00    16.78      .00     .035     .050     .035     .000   824.00  4866.76
   .018698     750.     700.    1000.       20       11        0      .00   169.84  5036.60
0
1
  03/17/93    09:52:58                                                                                        PAGE   71


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 56381.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4859.8    5049.4  TYPE=     1  TARGET=     189.600
  56381.00    12.97   838.97      .00   838.93   842.00     3.03     1.53      .13100000.00
    24400.       0.   24400.       0.       0.    1746.       0.    1615.     239. 100000.00
       .77      .00    13.98      .00     .035     .050     .035     .000   826.00  4859.80
   .011719     105.     105.     105.        4        0        0      .00   189.60  5049.40
0
 *SECNO 57601.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4890.5    5109.9  TYPE=     1  TARGET=     219.400
  57601.00    17.66   847.66      .00   847.67   848.89     1.23     6.71      .18100000.00
    24400.       0.   24400.       0.       0.    2741.       0.    1678.     244. 100000.00
       .81      .00     8.90      .00     .035     .050     .035     .000   830.00  4890.50
   .003181    1245.    1220.    1145.        4        0        0      .00   219.39  5109.89
0
 CCHV=     .300 CEHV=     .500
 *SECNO 57901.000
 3280 CROSS SECTION  57901.00 EXTENDED      8.82 FEET


 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4875.0    5114.6  TYPE=     1  TARGET=     239.600
  57901.00    17.82   848.82      .00   849.00   849.43      .62      .36      .18   844.60
    19400.       0.   18660.     740.       0.    2924.     217.    1698.     246.   840.00
       .82      .00     6.38     3.41     .035     .030     .035     .000   831.00  4875.00
   .000533     280.     300.     330.        2        0        0      .00   239.60  5114.60
0
 *SECNO 57902.000
 3280 CROSS SECTION  57902.00 EXTENDED      8.60 FEET

1
  03/17/93    09:52:58                                                                                        PAGE   72


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
```

```
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 3370 NORMAL BRIDGE,NRD= 22 MIN ELTRD=  840.00 MAX ELLC=  848.00


 3470 ENCROACHMENT STATIONS=    4891.0    5235.0  TYPE=     1  TARGET=     344.020
  57902.00    17.40   848.60      .00   848.76   849.66     1.06      .00      .22   842.50
    19400.      13.    9196.   10191.      10.    1405.    1065.    1698.     246.    836.00
       .82     1.29     6.54     9.57     .035     .030     .035     .000   831.20  4892.04
   .004343       1.       1.       1.        2        0        0 -1190.13   342.96  5235.00
0
 *SECNO 57922.000
 3280 CROSS SECTION  57922.00 EXTENDED     8.82 FEET


 3370 NORMAL BRIDGE,NRD= 21 MIN ELTRD=  840.00 MAX ELLC=  848.00


 3470 ENCROACHMENT STATIONS=    4892.9    5250.0  TYPE=     1  TARGET=     357.100
  57922.00    17.62   848.82      .00   848.84   849.77      .95      .08      .03   842.50
    19400.      29.    8410.   10961.      17.    1409.    1218.    1699.     246.    838.10
       .82     1.69     5.97     9.00     .035     .030     .035     .000   831.20  4892.90
   .003603      20.      20.      20.        2        0        0  -830.50   357.10  5250.00
0
 CCHV=    .100 CEHV=    .300
 *SECNO 57923.000
 3280 CROSS SECTION  57923.00 EXTENDED     5.23 FEET


 3470 ENCROACHMENT STATIONS=    4930.0    5259.0  TYPE=     1  TARGET=     329.000
  57923.00    17.43   849.23      .00   849.26   849.81      .58      .00      .04   848.00
    19400.       0.   16059.    3341.       0.    2542.     675.    1699.     246.    844.00
       .82      .00     6.32     4.95     .035     .050     .035     .000   831.80  4930.00
   .001576       1.       1.       1.        2        0        0      .00   329.00  5259.00
0
 *SECNO 58573.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4885.1    5032.9  TYPE=     1  TARGET=     147.800
1
  03/17/93    09:52:58                                                                                          PAGE   73


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


  58573.00    13.85   849.85      .00   849.83   852.42     2.57     2.01      .60100000.00
    19400.       0.   19400.       0.       0.    1509.       0.    1734.     250. 100000.00
       .84      .00    12.86      .00     .035     .050     .035     .000   836.00  4885.86
   .008820     700.     650.     600.        3        0        0      .00   146.46  5032.31
0
 *SECNO 59723.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4850.7    5203.1  TYPE=     1  TARGET=     352.400
  59723.00    10.99   857.89      .00   857.89   858.63      .74     6.02      .18100000.00
    19400.       0.   19400.       0.       0.    2814.       0.    1791.     256. 100000.00
       .88      .00     6.90      .00     .035     .050     .035     .000   846.90  4850.70
   .003466    1250.    1150.    1100.        4        0        0      .00   352.40  5203.10
0
 *SECNO 60873.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4450.0    5151.6  TYPE=     1  TARGET=     701.600
  60873.00     8.52   868.52   868.52   868.71   869.99     1.47     7.12      .22   867.60
    19400.    1127.   18273.       0.     259.    1834.       0.    1856.     271. 100000.00
       .92     4.35     9.96      .00     .035     .050     .035     .000   860.00  4450.00
   .013929    1300.    1150.    1100.       20       16        0      .00   701.60  5151.60
0
 *SECNO 61013.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4370.0    5112.9  TYPE=     1  TARGET=     742.900
  61013.00     9.51   870.51      .00   870.33   871.22      .71     1.16      .08   868.00
    19400.    6382.   13018.       0.    1099.    1804.       0.    1864.     273. 100000.00
       .92     5.81     7.22      .00     .035     .050     .035     .000   861.00  4370.00
   .005535     135.     140.     130.        2        0        0      .00   742.20  5112.20
0
1
  03/17/93    09:52:58                                                                                          PAGE   74


   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 62073.000
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 3470 ENCROACHMENT STATIONS=    4890.0    5370.0  TYPE=     1  TARGET=     480.000
  62073.00      8.62   876.62      .00   876.59   877.62     1.00     6.31      .09   876.00
    19400.        0.   14242.    5158.       0.    1742.     682.    1929.     288.    872.00
       .96       .00     8.17     7.57     .035     .050     .035     .000   868.00  4890.00
   .006489      940.    1060.    1170.        3        0        0      .00   480.00  5370.00
0
 *SECNO 63173.000

 3470 ENCROACHMENT STATIONS=    4816.0    5085.0  TYPE=     1  TARGET=     269.000
  63173.00     11.34   882.34      .00   882.23   883.49     1.15     5.83      .05   876.00
    19400.     1836.   17564.       0.     245.    2015.       0.    1987.     297. 100000.00
       .99      7.49     8.72      .00     .035     .050     .035     .000   871.00  4816.00
   .004439     1150.    1100.    1050.        2        0        0      .00   269.00  5085.00
0
 *SECNO 64323.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4711.0    5247.9  TYPE=     1  TARGET=     536.900
  64323.00      9.94   884.94      .00   884.65   885.16      .22     1.57      .09   875.00
    19400.        0.   14958.    4442.       0.    4370.     962.    2090.     308.    875.00
      1.08       .00     3.42     4.62     .035     .050     .035     .000   875.00  4711.00
   .000638     1000.    1150.    1400.        3        0        0      .00   536.90  5247.90
0
 *SECNO 65323.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4799.4    5086.4  TYPE=     1  TARGET=     287.000
  65323.00     10.42   888.42   888.42   888.46   891.11     2.68     1.86      .74100000.00
    19400.        0.   19400.       0.       0.    1476.       0.    2168.     317. 100000.00
      1.10       .00    13.15      .00     .035     .050     .035     .000   878.00  4800.44
   .022004     1100.    1000.    1000.       20        8        0      .00   285.64  5086.08
0
1
  03/17/93    09:52:58                                                                                        PAGE   75


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 65463.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4855.0    5117.7  TYPE=     1  TARGET=     262.700
  65463.00     12.41   891.41      .00   891.44   892.78     1.37     1.54      .13   888.00
    19400.        0.   19400.       0.       0.    2066.       0.    2174.     318. 100000.00
      1.11       .00     9.39      .00     .035     .050     .035     .000   879.00  4855.00
   .006557      140.     140.     140.        2        0        0      .00   262.70  5117.70
0
 *SECNO 66473.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4463.0    5210.0  TYPE=     1  TARGET=     747.000
  66473.00      7.88   899.88      .00   899.72   900.66      .78     7.82      .06   896.00
    19400.     1355.   18045.       0.     207.    2524.       0.    2229.     330. 100000.00
      1.15      6.55     7.15      .00     .035     .050     .035     .000   892.00  4463.00
   .009308      990.    1010.     940.        3        0        0      .00   743.02  5206.02
0
 *SECNO 66998.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=    4320.0    5080.0  TYPE=     1  TARGET=     760.000
  66998.00      8.08   904.08      .00   904.16   904.73      .65     4.05      .01   904.00
    19400.        0.   19400.       0.       0.    3004.       0.    2264.     338. 100000.00
      1.17       .00     6.46      .00     .035     .050     .035     .000   896.00  4320.00
   .006498      540.     525.     520.        1        0        0      .00   677.38  5080.00
0
 *SECNO 67548.000

 3470 ENCROACHMENT STATIONS=    4660.6    5125.3  TYPE=     1  TARGET=     464.700
  67548.00      7.57   907.57      .00   907.55   908.46      .89     3.66      .07100000.00
    19400.        0.   19400.       0.       0.    2564.       0.    2299.     346. 100000.00
      1.19       .00     7.57      .00     .035     .050     .035     .000   900.00  4660.60
   .006808      590.     550.     560.        3        0        0      .00   464.70  5125.30
0
1
  03/17/93    09:52:58                                                                                        PAGE   76


    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 68448.000

 3301 HV CHANGED MORE THAN HVINS
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 3470 ENCROACHMENT STATIONS=    4821.1    5136.7  TYPE=     1  TARGET=     315.600
  68448.00     8.78   914.28      .00   914.28   915.76     1.48     7.13      .18100000.00
    19400.       0.   19400.       0.       0.    1986.       0.    2346.     354. 100000.00
      1.21      .00     9.77      .00     .035     .050     .035     .000   905.50  4821.51
   .009329    1050.     900.     850.        2        0        0      .00   315.14  5136.65
0
 *SECNO 69198.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4776.7    5137.8  TYPE=     1  TARGET=     361.100
  69198.00     9.97   919.57      .00   919.57   920.22      .65     4.37      .08100000.00
    15900.       0.   15900.       0.       0.    2457.       0.    2384.     359. 100000.00
      1.25      .00     6.47      .00     .035     .050     .035     .000   909.60  4776.70
   .003700     700.     750.     730.        2        0        0      .00   361.10  5137.80
0
 CCHV=    .300 CEHV=    .500
 *SECNO 69733.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4913.2    5080.3  TYPE=     1  TARGET=     167.100
  69733.00     7.16   925.06   925.06   925.09   927.99     2.93     1.90     1.14100000.00
    13220.       0.   13220.       0.       0.     963.       0.    2405.     363. 100000.00
      1.26      .00    13.73      .00     .035     .020     .035     .000   917.90  4913.26
   .003369     540.     535.     550.       20       19        0      .00   166.94  5080.20
0
1
  03/17/93    09:52:58                                                                                                                  PAGE   77


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .90      1.55      2.50       .00    130.00      5.40   1425.00      1.47    920.00    919.80

 *SECNO 69773.000
      3700.   BRIDGE STENCL=   4790.00    STENCR=   5094.20
 **ERROR** ELTRD.LT.MIN ROAD ELEV, ELTRD SET EQUAL TO MIN ROAD ELEV

 3301 HV CHANGED MORE THAN HVINS

 3420 BRIDGE W.S.=    925.58 BRIDGE VELOCITY=,     17.51      CALCULATED CHANNEL AREA=,      741.

  EGPRS      EGLWC       H3      QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD
                                                                 AREA
       .00    928.08       .34        0.     9423.     1425.     1424.     930.20    928.50



 3470 ENCROACHMENT STATIONS=    4790.0    5094.2  TYPE=     1  TARGET=     304.200
  69773.00     8.37   926.27      .00   929.37   928.08     1.80      .09      .00   928.00
    15900.       0.   15899.       1.       0.    1476.       1.    2406.     363.    926.00
      1.26      .00    10.77      .53     .000     .020     .035     .000   917.90  4820.20
   .002159      40.      40.      40.        0        0        0      .00   274.00  5094.20
0
 CCHV=    .100 CEHV=    .300
 *SECNO 69813.000

 3470 ENCROACHMENT STATIONS=    4790.0    5080.0  TYPE=     1  TARGET=     290.000
  69813.00     8.67   926.67      .00   929.53   928.26     1.59      .17      .02   928.00
    15900.       0.   15900.       0.       0.    1570.       0.    2408.     363. 100000.00
      1.26      .00    10.13      .00     .035     .050     .035     .000   918.00  4813.28
   .011134      40.      40.      40.        3        0        0      .00   266.72  5080.00
0
 *SECNO 70193.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4830.0    5209.1  TYPE=     1  TARGET=     379.100
  70193.00    13.96   929.46      .00   930.43   929.90      .44     1.52      .12   928.00
    15900.       0.   15900.       0.       0.    3000.       0.    2428.     366. 100000.00
      1.28      .00     5.30      .00     .035     .050     .035     .000   915.50  4830.00
   .002039     380.     380.     360.        2        0        0      .00   379.10  5209.10
0
1
  03/17/93    09:52:58                                                                                                                  PAGE   78


    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 70743.000

 3470 ENCROACHMENT STATIONS=    4914.9    5234.5  TYPE=     1  TARGET=     319.600
  70743.00    14.52   930.52      .00   931.16   931.01      .49     1.10      .02100000.00
    15900.       0.   15900.       0.       0.    2841.       0.    2465.     370. 100000.00
      1.31      .00     5.60      .00     .035     .050     .035     .000   916.00  4914.92
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   .001948     670.     550.     400.        3        0        0      .00   319.55  5234.47
0
 *SECNO 71893.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4952.9    5243.4  TYPE=     1  TARGET=     290.500
  71893.00      6.73   934.73   934.73   934.74   937.03     2.30     5.37      .55100000.00
    15900.        0.   15900.       0.       0.    1305.       0.    2519.     378. 100000.00
      1.33       .00    12.18      .00     .035     .050     .035     .000   928.00  4952.93
   .022808     1150.    1150.    1000.        4       14        0      .00   290.47  5243.40
0
 *SECNO 72643.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4480.0    5035.3  TYPE=     1  TARGET=     555.300
  72643.00     10.65   943.05      .00   943.05   943.74      .69     6.55      .16   940.00
    15900.     1859.   14041.       0.     346.    2060.       0.    2551.     385. 100000.00
      1.36      5.37     6.81      .00     .035     .050     .035     .000   932.40  4480.00
   .004691      530.     750.     730.        5        0        0      .00   488.11  5034.14
0
 *SECNO 73193.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4606.0    5310.0  TYPE=     1  TARGET=     704.000
  73193.00      6.98   944.53   944.53   944.41   945.99     1.46     1.93      .23   940.00
    15900.    13128.    2487.     286.    1259.     502.     111.    2568.     390.    944.00
      1.37     10.43     4.95     2.58     .035     .050     .035     .000   937.55  4606.00
   .008654       40.     550.     600.        3       14        0      .00   704.00  5310.00
0
 CCHV=    .300 CEHV=    .500
 *SECNO 73194.000
      3700.   BRIDGE STENCL=   4605.00    STENCR=   5310.00

 3370 NORMAL BRIDGE,NRD= 32 MIN ELTRD=  943.00 MAX ELLC=  952.00

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4605.0    5310.0  TYPE=     1  TARGET=     705.000
  73194.00      9.69   947.24   947.24   947.49   948.98     1.74      .01      .14   940.00
    15900.    12721.    2453.     726.    1195.     212.     165.    2568.     390.    944.00
      1.37     10.65    11.59     4.41     .035     .015     .035     .000   937.55  4605.00
   .008843        1.       1.       1.       20       19        0 -2211.63   705.00  5310.00
0
 *SECNO 73234.000
      3700.   BRIDGE STENCL=   4605.00    STENCR=   5325.00

 3301 HV CHANGED MORE THAN HVINS


 3370 NORMAL BRIDGE,NRD= 32 MIN ELTRD=  943.00 MAX ELLC=  952.00


 3470 ENCROACHMENT STATIONS=    4605.0    5325.0  TYPE=     1  TARGET=     720.000
  73234.00     10.92   948.47      .00   948.70   949.43      .96      .21      .24   944.00
    15900.    12110.    3317.     473.    1558.     384.     211.    2570.     390.    944.00
      1.37      7.77     8.63     2.24     .035     .015     .035     .000   937.55  4605.00
   .003455       40.      40.      40.       16        0        0 -2182.19   720.00  5325.00
0
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 CCHV=    .100 CEHV=    .300
 *SECNO 73235.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4605.0    5325.0  TYPE=     1  TARGET=     720.000
  73235.00     11.78   949.33      .00   949.39   949.50      .18      .00      .08   944.00
    15900.     8799.    3617.    3484.    2299.    1466.    1195.    2570.     390.    944.00
      1.38      3.83     2.47     2.92     .035     .050     .035     .000   937.55  4605.00
   .000521        1.       1.       1.        2        0        0      .00   720.00  5325.00
0
```

```
 CCHV=    .100 CEHV=    .300
 *SECNO 73335.000

 3470 ENCROACHMENT STATIONS=    4680.0    5250.0  TYPE=     1  TARGET=     570.000
  73335.00      6.80   949.30       .00   949.46   949.64       .35       .09       .05   943.70
    15900.        0.   13075.     2825.       0.    2709.      667.     2579.      392.   944.00
      1.38       .00     4.83      4.23     .050     .050      .050      .000    942.50  4680.00
   .002377       90.     100.       70.        2        0         0       .00    570.00  5250.00
0
 *SECNO 73555.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4930.0    5205.0  TYPE=     1  TARGET=     275.000
  73555.00      5.27   949.07   949.07   949.59   951.45      2.37      1.14       .61   948.00
    15900.        0.   15900.        0.       0.    1286.        0.     2590.      394. 100000.00
      1.39       .00    12.36       .00     .050     .050      .050      .000    943.80  4930.00
   .022636      360.     220.      100.        3       15         0       .00    275.00  5205.00
0
 *SECNO 74155.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4892.0    5135.0  TYPE=     1  TARGET=     243.000
1
  03/17/93    09:52:58                                                                                    PAGE   81


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


  74155.00     10.52   957.12       .00   956.52   958.38      1.26      6.83       .11100000.00
    15900.        0.   15900.        0.       0.    1763.        0.     2611.      397. 100000.00
      1.40       .00     9.02       .00     .050     .050      .050      .000    946.60  4892.00
   .006824      600.     600.      560.        4        0         0       .00    243.00  5135.00
0
 *SECNO 75005.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4940.7    5104.8  TYPE=     1  TARGET=     164.100
  75005.00     11.46   963.46       .00   963.02   965.68      2.22      7.01       .29100000.00
    15900.        0.   15900.        0.       0.    1329.        0.     2641.      401. 100000.00
      1.42       .00    11.97       .00     .050     .050      .050      .000    952.00  4941.37
   .010178      950.     850.      700.        3        0         0       .00    162.45  5103.81
0
 *SECNO 75255.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4917.0    5202.6  TYPE=     1  TARGET=     285.610
  75255.00     14.22   966.22       .00   966.07   966.65       .43       .79       .18100000.00
    15900.        0.    9078.     6822.       0.    1665.     1355.     2654.      403.   956.00
      1.44       .00     5.45      5.03     .050     .050      .050      .000    952.00  4917.81
   .001429      200.     250.      300.        2        0         0       .00    284.79  5202.60
0
 *SECNO 75605.000

 3470 ENCROACHMENT STATIONS=    4856.8    5243.1  TYPE=     1  TARGET=     386.300
  75605.00     10.84   966.84       .00   966.63   967.24       .40       .59       .00100000.00
    15900.        0.   15318.      582.       0.    2976.      153.     2680.      405.   960.00
      1.46       .00     5.15      3.80     .050     .050      .050      .000    956.00  4857.23
   .001816      360.     350.      420.        2        0         0       .00    385.87  5243.10
0
 *SECNO 76855.000

 3470 ENCROACHMENT STATIONS=    4890.0    5579.3  TYPE=     1  TARGET=     689.300
  76855.00      5.84   969.54       .00   968.75   969.84       .30      2.58       .01   968.00
    15900.        0.    7492.     8408.       0.    1766.     1878.     2777.      421.   964.00
      1.54       .00     4.24      4.48     .050     .050      .050      .000    963.70  4890.00
   .002370     1250.    1250.     1250.        2        0         0       .00    689.30  5579.30
0
1
  03/17/93    09:52:58                                                                                    PAGE   82


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 CCHV=    .100 CEHV=    .300
 *SECNO 78055.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4878.0    5670.0  TYPE=     1  TARGET=     792.000
  78055.00      7.55   979.55   979.55   979.52   981.26      1.71      4.93       .42100000.00
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    15900.        0.   14200.    1700.        0.    1303.     271.    2851.     438.    976.00
      1.57       .00    10.90     6.27     .030     .030     .030     .000   972.00  4878.00
   .008315    1200.    1200.    1275.       20       11        0      .00   513.36  5670.00
0
 *SECNO 78955.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4890.0    5300.0  TYPE=     1  TARGET=     410.000
  78955.00      5.22   985.22      .00   985.22   986.35     1.13     5.03      .06   984.00
    15900.        0.   15900.       0.       0.    1861.       0.    2886.     447. 100000.00
      1.60       .00     8.54      .00     .030     .030     .030     .000   980.00  4890.00
   .003995     750.     900.     950.        3        0        0      .00   410.00  5300.00
0
 *SECNO 79955.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4943.6    5235.0  TYPE=     1  TARGET=     291.400
  79955.00      4.71   992.71   992.71   992.89   994.99     2.28     5.56      .34100000.00
    15900.        0.   15900.       0.       0.    1312.       0.    2923.     455. 100000.00
      1.62       .00    12.11      .00     .030     .030     .030     .000   988.00  4943.60
   .008252    1000.    1000.     930.        3       11        0      .00   291.40  5235.00
0
1
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 CCHV=     .100 CEHV=     .300
 *SECNO 80955.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4690.0    5080.0  TYPE=     1  TARGET=     390.000
  80955.00      5.76  1001.76      .00  1001.76  1002.65      .88     7.52      .14  1000.00
    15900.        0.   15900.       0.       0.    2108.       0.    2962.     463. 100000.00
      1.66       .00     7.54      .00     .045     .050     .045     .000   996.00  4690.00
   .006880    1050.    1000.     830.        4        0        0      .00   390.00  5080.00
0
 CCHV=     .100 CEHV=     .300
 *SECNO 81615.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4845.0    5112.0  TYPE=     1  TARGET=     267.000
  81615.00      8.45  1007.45  1007.31  1007.36  1009.82     2.38     6.73      .45  1004.00
    15900.      496.   15295.     109.      89.    1218.      20.    2988.     468.   1004.00
      1.67      5.60    12.56     5.35     .050     .050     .050     .000   999.00  4845.00
   .016632     660.     660.     660.        3       14        0      .00   266.82  5111.82
0
 *SECNO 82355.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4550.0    5046.0  TYPE=     1  TARGET=     496.000
  82355.00     10.59  1014.59      .00  1014.52  1014.96      .37     4.94      .20  1011.70
    12500.        0.   12500.       0.       0.    2549.       0.    3021.     475. 100000.00
      1.72       .00     4.90      .00     .050     .050     .050     .000  1004.00  4550.00
   .003111     700.     740.     700.        3        0        0      .00   496.00  5046.00
0
 CCHV=     .100 CEHV=     .300
 *SECNO 83505.000

 3301 HV CHANGED MORE THAN HVINS

1
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4581.0    5110.0  TYPE=     1  TARGET=     529.000
  83505.00      3.93  1023.93  1023.93  1023.94  1025.23     1.30     9.14      .28  1023.00
    12500.     6590.    5910.       0.     650.     746.       0.    3073.     488. 100000.00
      1.75     10.14     7.92      .00     .070     .070     .070     .000  1020.00  4581.00
   .046584    1200.    1150.    1100.        5       22        0      .00   526.99  5107.99
0
 *SECNO 84655.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4895.0    5359.0  TYPE=     1  TARGET=     464.000
  84655.00      9.45  1037.45      .00  1036.70  1037.79      .34    12.47      .10  1032.00
    12500.        0.    8638.    3862.       0.    1814.     867.    3126.     501.   1032.00
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     1.82      .00     4.76     4.45     .070     .070     .070     .000  1028.00  4895.00
   .004792    1150.    1150.    1050.       8        0        0      .00   464.00  5359.00
0
 CCHV=    .100 CEHV=    .300
 *SECNO 85655.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4880.0    5214.0  TYPE=     1  TARGET=     334.000
  85655.00     6.25  1046.25      .00  1045.71  1047.56     1.31     9.47      .29  1044.00
    12500.       0.   12338.     162.       0.    1339.      27.    3172.     510.  1044.00
     1.85      .00     9.21     6.07     .050     .070     .050     .000  1040.00  4880.00
   .027611    1000.    1000.     950.       4        0        0      .00   334.00  5214.00
0
 *SECNO 86895.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4755.0    5170.0  TYPE=     1  TARGET=     415.000
  86895.00    11.23  1059.23      .00  1059.40  1059.60      .37    11.95      .09  1056.00
    12500.       0.   12500.       0.       0.    2550.       0.    3228.     521. 100000.00
     1.92      .00     4.90      .00     .050     .070     .050     .000  1048.00  4755.00
   .004851    1225.    1240.    1245.       6        0        0      .00   415.00  5170.00
0
1
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST


 *SECNO 88145.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=    4823.7    5372.5  TYPE=     1  TARGET=     548.800
  88145.00     4.61  1072.61      .00  1072.51  1073.80     1.19    13.95      .25100000.00
    12500.       0.   12500.       0.       0.    1426.       0.    3285.     535. 100000.00
     1.96      .00     8.76      .00     .050     .070     .050     .000  1068.00  4823.70
   .047831     925.    1250.    1300.       3        0        0      .00   548.80  5372.50
0
 *SECNO 89095.000

 3470 ENCROACHMENT STATIONS=    4892.6    5194.9  TYPE=     1  TARGET=     302.300
  89095.00    10.85  1090.85      .00  1090.96  1091.60      .74    17.75      .04100000.00
    12500.       0.   12500.       0.       0.    1805.       0.    3320.     544. 100000.00
     2.00      .00     6.92      .00     .050     .070     .050     .000  1080.00  4892.86
   .009886     875.     950.    1200.       6        0        0      .00   301.90  5194.76
0
 *SECNO 90395.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4485.0    5021.0  TYPE=     1  TARGET=     536.000
  90395.00     9.51  1109.51  1109.51  1109.55  1110.60     1.10    17.87      .11  1108.00
    10450.    3425.    7025.       0.     595.     744.       0.    3367.     557. 100000.00
     2.04     5.76     9.44      .00     .050     .070     .050     .000  1100.00  4485.00
   .021882    1350.    1300.    1250.       5       13        0      .00   535.32  5020.32
0
 *SECNO 90670.000

 3470 ENCROACHMENT STATIONS=    4611.0    5044.0  TYPE=     1  TARGET=     433.000
  90670.00     7.13  1117.13      .00  1117.08  1117.88      .75     7.24      .03100000.00
    10450.       0.   10450.       0.       0.    1501.       0.    3379.     562. 100000.00
     2.05      .00     6.96      .00     .050     .070     .050     .000  1110.00  4615.93
   .020181     700.     275.     180.       4        0        0      .00   426.89  5042.81
0
 *SECNO 90745.000
1
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    SECNO     DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST



 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=    4803.0    5015.6  TYPE=     1  TARGET=     212.600
  90745.00     7.85  1119.85  1119.85  1119.87  1122.00     2.15     2.19      .42100000.00
    10450.       0.   10450.       0.       0.     889.       0.    3381.     562. 100000.00
     2.06      .00    11.76      .00     .050     .070     .050     .000  1112.00  4803.13
   .045908     200.      75.      75.      20        8        0      .00   211.59  5014.72
0
1
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THIS RUN EXECUTED 03/17/93   09:53:59

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HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION APRIL 1985
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

TEMESCAL WASH

SUMMARY PRINTOUT

SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
34400.000	.00	24400.00	678.32	679.69	6.07	1001.48	2637.66	6.32	3940.00	5039.48	.00	.00
34400.000	.00	24400.00	678.32	679.69	6.08	1000.20	2636.69	6.32	3940.90	5039.10	.00	.00
35425.000	1025.00	24400.00	682.82	683.16	3.85	1174.23	5467.80	6.82	4370.00	5544.23	.00	.00
35425.000	1025.00	24400.00	683.02	683.43	4.11	960.00	5059.92	7.02	4580.00	5540.00	.20	.28
36325.000	900.00	24400.00	685.42	686.10	3.78	999.16	4153.43	5.42	4700.84	5700.00	.00	.00
36325.000	900.00	24400.00	685.65	686.26	3.61	999.20	4388.29	5.65	4700.80	5700.00	.23	.16
* 36461.000	136.00	24400.00	686.61	689.22	14.21	465.63	2228.86	12.61	4733.48	5290.00	.00	.00
* 36461.000	136.00	24400.00	686.62	689.22	14.19	465.73	2232.56	12.62	4733.50	5290.00	.01	.00
* 36486.000	25.00	24400.00	688.88	691.24	11.07	494.39	2073.53	14.88	4795.61	5290.00	.00	.00
* 36486.000	25.00	24400.00	689.02	691.23	10.71	494.40	2143.57	15.02	4795.60	5290.00	.14	-.01
* 36518.000	32.00	24400.00	690.78	691.80	7.22	548.47	3158.85	16.78	4796.53	5345.00	.00	.00
36518.000	32.00	24400.00	690.67	691.73	7.38	548.00	3098.79	16.67	4797.00	5345.00	-.11	-.07
36519.000	1.00	24400.00	691.71	692.01	3.33	584.82	6336.60	19.71	4760.18	5345.00	.00	.00
36519.000	1.00	24400.00	691.61	691.95	3.45	510.30	6009.82	19.61	4765.10	5275.40	-.10	-.06
36669.000	150.00	24400.00	691.72	692.13	5.15	413.15	4740.45	16.32	4795.35	5208.49	.00	.00
36669.000	150.00	24400.00	691.64	692.06	5.18	412.82	4708.03	16.24	4795.44	5208.27	-.08	-.07
36670.000	1.00	24400.00	691.59	692.27	6.59	412.85	3703.88	16.19	4795.51	5208.36	.00	.00
36670.000	1.00	24400.00	691.52	692.19	6.59	412.55	3703.28	16.12	4795.60	5208.15	-.08	-.08
36690.000	20.00	24400.00	691.65	692.33	6.59	413.09	3704.33	16.25	4795.44	5208.53	.00	.00
36690.000	20.00	24400.00	691.58	692.25	6.59	412.77	3703.75	16.18	4795.53	5208.30	-.08	-.08
36691.000	1.00	24400.00	692.02	692.41	5.02	414.63	4864.62	16.62	4794.72	5209.35	.00	.00
36691.000	1.00	24400.00	691.94	692.34	5.05	414.00	4830.26	16.54	4795.10	5209.10	-.08	-.08

SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
36941.000	250.00	24400.00	692.08	693.47	9.48	296.48	2573.81	12.08	4769.80	5066.28	.00	.00
36941.000	250.00	24400.00	692.00	693.42	9.57	295.00	2550.86	12.00	4770.00	5065.00	-.08	-.05
37166.000	225.00	24400.00	693.89	694.34	5.39	396.04	4526.99	13.89	4677.93	5073.97	.00	.00
37166.000	225.00	24400.00	693.85	694.30	5.41	395.56	4510.76	13.85	4678.10	5073.66	-.04	-.04
38166.000	1000.00	24400.00	696.15	696.64	5.61	576.88	4324.01	11.45	4604.62	5181.50	.00	.00
38166.000	1000.00	24400.00	696.14	696.66	5.70	541.42	4244.59	11.44	4640.00	5181.42	-.01	.01
39116.000	950.00	24400.00	698.15	698.51	3.78	788.42	5356.02	8.15	4644.63	5433.05	.00	.00
39116.000	950.00	24400.00	698.27	698.78	4.29	575.50	4655.09	8.27	4779.50	5355.00	.12	.26
* 40116.000	1000.00	24400.00	705.26	708.29	14.10	290.85	1750.09	9.76	4828.94	5119.79	.00	.00
* 40116.000	1000.00	24400.00	705.20	708.32	14.29	279.43	1725.19	9.70	4840.00	5119.43	-.06	.02
41116.000	1000.00	24400.00	714.91	715.58	6.40	486.37	3719.00	10.91	4760.91	5247.27	.00	.00
41116.000	1000.00	24400.00	714.97	715.64	6.40	470.00	3725.19	10.97	4770.00	5240.00	.06	.06
* 42091.000	975.00	24400.00	725.59	727.69	12.25	492.65	2252.57	14.39	4933.23	5425.88	.00	.00
* 42091.000	975.00	24400.00	725.57	727.70	12.31	491.70	2241.54	14.37	4933.29	5425.00	-.02	.00
42641.000	550.00	24400.00	730.98	732.08	8.56	380.49	2931.45	16.38	4853.60	5360.00	.00	.00
42641.000	550.00	24400.00	731.02	732.13	8.56	354.08	2912.36	16.42	4880.00	5360.00	.04	.04
42956.000	315.00	24400.00	732.71	734.04	9.52	436.48	2730.22	15.21	4827.78	5315.00	.00	.00
42956.000	315.00	24400.00	732.75	734.08	9.50	384.27	2710.51	15.25	4880.00	5315.00	.04	.04
42991.000	35.00	24400.00	732.58	734.30	10.72	472.36	2664.79	14.08	4857.72	5330.08	.00	.00
42991.000	35.00	24400.00	732.63	734.33	10.66	472.00	2689.64	14.13	4858.00	5330.00	.05	.03
43011.000	20.00	24400.00	734.45	735.55	8.76	465.59	3463.86	15.95	4834.41	5300.00	.00	.00
43011.000	20.00	24400.00	734.48	735.58	8.73	465.60	3480.38	15.98	4834.40	5300.00	.04	.03
43051.000	40.00	24400.00	734.49	735.59	8.81	440.23	2987.55	16.09	4794.57	5275.10	.00	.00
43051.000	40.00	24400.00	734.51	735.63	8.83	384.71	2948.01	16.11	4850.00	5275.00	.02	.03
43341.000	290.00	24400.00	735.86	737.35	9.97	348.18	2540.49	16.66	4795.84	5144.02	.00	.00
43341.000	290.00	24400.00	735.89	737.37	9.93	334.00	2550.57	16.69	4796.00	5130.00	.03	.02
44016.000	675.00	24400.00	741.08	741.96	7.54	315.26	3252.86	14.78	4855.48	5170.74	.00	.00
44016.000	675.00	24400.00	741.09	741.98	7.54	275.00	3234.38	14.79	4885.00	5160.00	.01	.02
45016.000	1000.00	24400.00	746.97	747.85	6.63	370.64	3435.29	11.97	4869.33	5239.97	.00	.00
45016.000	1000.00	24400.00	747.00	747.87	6.61	370.73	3444.97	12.00	4869.27	5240.00	.03	.02
46166.000	1150.00	24400.00	753.58	754.01	5.21	622.43	4669.32	10.48	4476.20	5098.62	.00	.00
46166.000	1150.00	24400.00	753.59	754.01	5.23	598.63	4651.82	10.49	4500.00	5098.63	.00	.01
47166.000	1000.00	24400.00	759.98	760.87	6.71	599.40	3341.54	9.18	4900.03	5499.43	.00	.00

	47166.000	1000.00	24400.00	759.99	760.88	6.70	599.63	3347.21	9.19	4900.02	5499.65	.01	.01

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
	47916.000	750.00	24400.00	764.62	765.25	6.36	611.19	3861.16	8.22	4950.36	5561.55	.00	.00
	47916.000	750.00	24400.00	764.67	765.30	6.39	580.00	3815.99	8.27	4970.00	5550.00	.05	.06
	49016.000	1100.00	24400.00	771.19	772.38	8.77	673.61	2789.05	7.19	4971.71	5645.32	.00	.00
	49016.000	1100.00	24400.00	771.25	772.41	8.64	673.00	2830.91	7.25	4972.00	5645.00	.06	.03
	49916.000	900.00	24400.00	781.70	783.27	10.03	456.98	2429.62	8.50	4901.51	5358.49	.00	.00
	49916.000	900.00	24400.00	781.66	783.27	10.15	440.00	2397.63	8.46	4910.00	5350.00	-.04	.00
	50376.000	460.00	24400.00	786.90	789.40	12.70	286.69	1920.58	11.80	4916.54	5203.23	.00	.00
	50376.000	460.00	24400.00	786.96	789.42	12.57	288.36	1940.49	11.86	4915.50	5203.86	.07	.01
	51226.000	850.00	24400.00	793.88	794.60	6.89	511.60	3608.50	13.88	4530.00	5041.60	.00	.00
	51226.000	850.00	24400.00	793.88	794.62	6.94	436.60	3535.13	13.88	4605.00	5041.60	.00	.02
	51776.000	550.00	24400.00	795.90	796.71	7.47	674.69	3387.98	10.10	4370.00	5044.69	.00	.00
	51776.000	550.00	24400.00	795.92	796.73	7.42	674.77	3407.09	10.12	4370.00	5044.77	.03	.02
*	52081.000	305.00	18580.00	798.05	801.49	14.89	182.40	1248.23	9.85	4914.73	5097.13	.00	.00
*	52081.000	305.00	18580.00	798.06	801.49	14.88	182.41	1248.96	9.86	4914.73	5097.14	.00	.00
	52121.000	40.00	24400.00	802.40	803.15	8.06	669.00	4570.31	14.20	4430.00	5099.00	.00	.00
	52121.000	40.00	24400.00	801.60	802.61	9.14	541.00	3827.04	13.40	4558.00	5099.00	-.80	-.54
*	52626.000	505.00	24400.00	802.72	805.37	13.22	360.00	1906.70	10.02	4780.00	5140.00	.00	.00
*	52626.000	505.00	24400.00	802.70	805.37	13.28	357.00	1896.72	10.00	4780.00	5137.00	-.03	.00
	52836.000	210.00	24400.00	806.07	808.62	12.80	279.85	1905.68	11.87	4865.68	5145.54	.00	.00
	52836.000	210.00	24400.00	806.09	808.62	12.76	280.07	1912.19	11.89	4865.64	5145.71	.02	.01
	53676.000	840.00	24400.00	815.30	817.03	10.57	266.71	2308.39	15.30	4919.79	5186.50	.00	.00
	53676.000	840.00	24400.00	815.29	817.03	10.59	266.61	2304.67	15.29	4919.82	5186.43	-.01	-.01
	54676.000	1000.00	24400.00	822.00	823.93	11.09	257.02	2194.84	14.00	4895.50	5152.52	.00	.00
	54676.000	1000.00	24400.00	822.03	823.99	11.11	230.00	2174.11	14.03	4900.00	5130.00	.03	.06
	55576.000	900.00	24400.00	828.57	829.69	8.60	463.59	2907.52	12.57	4912.85	5376.45	.00	.00
	55576.000	900.00	24400.00	828.62	829.72	8.54	457.00	2928.40	12.62	4913.00	5370.00	.05	.03
*	56276.000	700.00	24400.00	836.03	840.34	16.64	170.17	1465.94	12.03	4866.56	5036.74	.00	.00
*	56276.000	700.00	24400.00	835.97	840.34	16.78	169.84	1454.51	11.97	4866.76	5036.60	-.07	.00
	56381.000	105.00	24400.00	838.93	841.99	14.04	189.41	1737.89	12.93	4859.91	5049.32	.00	.00
	56381.000	105.00	24400.00	838.97	842.00	13.98	189.60	1745.54	12.97	4859.80	5049.40	.04	.01
	57601.000	1220.00	24400.00	847.67	848.90	8.89	219.51	2743.85	17.67	4890.42	5109.94	.00	.00
	57601.000	1220.00	24400.00	847.66	848.89	8.90	219.39	2740.87	17.66	4890.50	5109.89	-.01	-.01
	57901.000	300.00	19400.00	849.00	849.43	5.51	315.00	3863.70	18.00	4875.00	5190.00	.00	.00
	57901.000	300.00	19400.00	848.82	849.43	6.38	239.60	3140.59	17.82	4875.00	5114.60	-.19	.00

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
	57902.000	1.00	19400.00	848.76	849.68	8.28	345.00	2561.88	17.56	4890.00	5235.00	.00	.00
	57902.000	1.00	19400.00	848.60	849.66	6.54	342.96	2480.83	17.40	4892.04	5235.00	-.16	-.02
	57922.000	20.00	19400.00	848.84	849.79	5.95	358.00	2652.56	17.64	4892.00	5250.00	.00	.00
	57922.000	20.00	19400.00	848.82	849.77	5.97	357.10	2645.05	17.62	4892.90	5250.00	-.02	-.02
	57923.000	1.00	19400.00	849.26	849.83	6.28	370.00	3265.73	17.46	4890.00	5260.00	.00	.00
	57923.000	1.00	19400.00	849.23	849.81	6.32	329.00	3217.18	17.43	4930.00	5259.00	-.02	-.02
	58573.000	650.00	19400.00	849.83	852.41	12.88	146.41	1506.40	13.83	4885.88	5032.29	.00	.00
	58573.000	650.00	19400.00	849.85	852.42	12.86	146.46	1508.85	13.85	4885.86	5032.31	.02	.01
	59723.000	1150.00	19400.00	857.89	858.63	6.89	352.48	2814.19	10.99	4850.67	5203.15	.00	.00
	59723.000	1150.00	19400.00	857.89	858.63	6.90	352.40	2813.51	10.99	4850.70	5203.10	.00	.00
*	60873.000	1150.00	19400.00	868.71	869.89	9.11	903.73	2387.56	8.71	4250.00	5153.73	.00	.00
*	60873.000	1150.00	19400.00	868.52	869.99	9.96	701.60	2093.00	8.52	4450.00	5151.60	-.19	.10
	61013.000	140.00	19400.00	870.33	871.04	7.34	896.87	2956.47	9.33	4215.00	5111.87	.00	.00
	61013.000	140.00	19400.00	870.51	871.22	7.22	742.20	2902.77	9.51	4370.00	5112.20	.18	.19
	62073.000	1060.00	19400.00	876.59	877.54	8.03	790.00	2599.71	8.59	4580.00	5370.00	.00	.00
	62073.000	1060.00	19400.00	876.62	877.62	8.17	480.00	2423.73	8.62	4890.00	5370.00	.03	.08
	63173.000	1100.00	19400.00	882.23	883.37	8.74	313.85	2286.13	11.23	4782.25	5096.10	.00	.00
	63173.000	1100.00	19400.00	882.34	883.49	8.72	269.00	2260.27	11.34	4816.00	5085.00	.12	.13
	64323.000	1150.00	19400.00	884.65	884.81	3.04	700.00	5991.90	9.65	4710.00	5410.00	.00	.00
	64323.000	1150.00	19400.00	884.94	885.16	3.42	536.90	5331.20	9.94	4711.00	5247.90	.30	.35
*	65323.000	1000.00	19400.00	888.46	891.11	13.06	286.63	1485.23	10.46	4799.69	5086.32	.00	.00
*	65323.000	1000.00	19400.00	888.42	891.11	13.15	285.64	1475.69	10.42	4800.44	5086.08	-.03	.00
	65463.000	140.00	19400.00	891.44	892.68	9.03	342.99	2213.66	12.44	4774.92	5117.92	.00	.00
	65463.000	140.00	19400.00	891.41	892.78	9.39	262.70	2066.18	12.41	4855.00	5117.70	-.04	.10
	66473.000	1010.00	19400.00	899.72	900.58	7.49	737.95	2612.20	7.72	4462.66	5200.60	.00	.00
	66473.000	1010.00	19400.00	899.88	900.66	7.15	743.02	2731.07	7.88	4463.00	5206.02	.15	.08
	66998.000	525.00	19400.00	904.16	904.79	6.35	680.49	3056.34	8.16	4319.60	5080.54	.00	.00

66998.000	525.00	19400.00	904.08	904.73	6.46	677.38	3004.37	8.08	4320.00	5080.00	-.08	-.06
67548.000	550.00	19400.00	907.55	908.44	7.58	465.48	2558.80	7.55	4660.00	5125.48	.00	.00
67548.000	550.00	19400.00	907.57	908.46	7.57	464.70	2563.68	7.57	4660.60	5125.30	.02	.02
68448.000	900.00	19400.00	914.28	915.76	9.75	315.29	1988.83	8.78	4821.39	5136.68	.00	.00
68448.000	900.00	19400.00	914.28	915.76	9.77	315.14	1985.79	8.78	4821.51	5136.65	.00	.00
69198.000	750.00	15900.00	919.57	920.22	6.47	361.18	2455.64	9.97	4776.64	5137.82	.00	.00
69198.000	750.00	15900.00	919.57	920.22	6.47	361.10	2457.37	9.97	4776.70	5137.80	.01	.00

SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
* 69733.000	535.00	13220.00	925.09	927.99	13.66	167.10	967.45	7.19	4913.22	5080.32	.00	.00
* 69733.000	535.00	13220.00	925.06	927.99	13.73	166.94	962.68	7.16	4913.26	5080.20	-.03	.00
69773.000	40.00	15900.00	929.37	930.00	6.47	647.00	2856.55	11.47	4440.00	5087.00	.00	.00
69773.000	40.00	15900.00	926.27	928.08	10.77	274.00	1476.76	8.37	4820.20	5094.20	-3.10	-1.92
69813.000	40.00	15900.00	929.53	930.05	6.03	645.00	2924.85	11.53	4435.00	5080.00	.00	.00
69813.000	40.00	15900.00	926.67	928.26	10.13	266.72	1569.75	8.67	4813.28	5080.00	-2.86	-1.78
70193.000	380.00	15900.00	930.43	930.75	4.60	573.58	3599.35	14.93	4641.61	5215.19	.00	.00
70193.000	380.00	15900.00	929.46	929.90	5.30	379.10	3000.08	13.96	4830.00	5209.10	-.97	-.85
70743.000	550.00	15900.00	931.16	931.58	5.22	324.04	3044.64	15.16	4912.81	5236.84	.00	.00
70743.000	550.00	15900.00	930.52	931.01	5.60	319.55	2840.88	14.52	4914.92	5234.47	-.63	-.57
* 71893.000	1150.00	15900.00	934.74	937.03	12.15	290.58	1309.16	6.74	4952.85	5243.43	.00	.00
* 71893.000	1150.00	15900.00	934.73	937.03	12.18	290.47	1305.24	6.73	4952.93	5243.40	-.01	.00
72643.000	750.00	15900.00	943.05	943.75	6.83	483.09	2395.69	10.65	4485.00	5034.14	.00	.00
72643.000	750.00	15900.00	943.05	943.74	6.81	488.11	2406.27	10.65	4480.00	5034.14	.00	.00
73193.000	550.00	15900.00	944.41	946.06	5.14	496.00	1699.61	6.86	4605.00	5101.00	.00	.00
* 73193.000	550.00	15900.00	944.53	945.99	4.95	704.00	1871.41	6.98	4606.00	5310.00	.12	-.07
* 73194.000	1.00	15900.00	947.49	949.21	11.29	496.00	1510.94	9.94	4605.00	5101.00	.00	.00
* 73194.000	1.00	15900.00	947.24	948.98	11.59	705.00	1571.25	9.69	4605.00	5310.00	-.25	-.23
73234.000	40.00	15900.00	948.70	949.64	8.47	496.00	2049.30	11.15	4605.00	5101.00	.00	.00
73234.000	40.00	15900.00	948.47	949.43	8.63	720.00	2154.20	10.92	4605.00	5325.00	-.23	-.21
73235.000	1.00	15900.00	949.39	949.70	3.10	496.00	3797.40	11.84	4605.00	5101.00	.00	.00
73235.000	1.00	15900.00	949.33	949.50	2.47	720.00	4960.19	11.78	4605.00	5325.00	-.07	-.20
73335.000	100.00	15900.00	949.46	949.86	5.19	500.00	3117.78	6.96	4630.00	5130.00	.00	.00
73335.000	100.00	15900.00	949.30	949.64	4.83	570.00	3376.42	6.80	4680.00	5250.00	-.16	-.22
73555.000	220.00	15900.00	949.59	951.51	11.13	276.32	1429.31	5.79	4928.67	5205.00	.00	.00
* 73555.000	220.00	15900.00	949.07	951.45	12.36	275.00	1286.41	5.27	4930.00	5205.00	-.51	-.06
74155.000	600.00	15900.00	956.52	957.59	8.69	429.52	2027.66	9.92	4891.52	5321.04	.00	.00
74155.000	600.00	15900.00	957.12	958.38	9.02	243.00	1763.38	10.52	4892.00	5135.00	.60	.79
75005.000	850.00	15900.00	963.02	965.50	12.63	159.63	1258.59	11.02	4942.45	5102.08	.00	.00
75005.000	850.00	15900.00	963.46	965.68	11.97	162.45	1328.52	11.46	4941.37	5103.81	.44	.19
75255.000	250.00	15900.00	966.07	966.42	4.89	346.17	3370.12	14.07	4919.33	5265.50	.00	.00
75255.000	250.00	15900.00	966.22	966.65	5.45	284.79	3020.17	14.22	4917.81	5202.60	.15	.24
75605.000	350.00	15900.00	966.63	966.89	4.37	660.59	4025.88	10.63	4858.52	5519.11	.00	.00
75605.000	350.00	15900.00	966.84	967.24	5.15	385.87	3129.62	10.84	4857.23	5243.10	.21	.35

SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
76855.000	1250.00	15900.00	968.75	968.96	3.55	1013.06	4357.55	5.05	4875.09	5888.15	.00	.00
76855.000	1250.00	15900.00	969.54	969.84	4.24	689.30	3643.24	5.84	4890.00	5579.30	.79	.88
* 78055.000	1200.00	15900.00	979.52	981.27	11.02	511.56	1555.59	7.52	4878.47	5670.16	.00	.00
* 78055.000	1200.00	15900.00	979.55	981.26	10.90	513.36	1573.98	7.55	4878.00	5670.00	.04	.00
78955.000	900.00	15900.00	985.22	986.31	8.41	581.88	1968.88	5.22	4767.23	5349.11	.00	.00
78955.000	900.00	15900.00	985.22	986.35	8.54	410.00	1860.94	5.22	4890.00	5300.00	.00	.05
* 79955.000	1000.00	15900.00	992.89	995.17	12.10	294.20	1315.00	4.89	4943.59	5237.79	.00	.00
* 79955.000	1000.00	15900.00	992.71	994.99	12.11	291.40	1312.43	4.71	4943.60	5235.00	-.18	-.18
80955.000	1000.00	15900.00	1001.76	1002.62	7.47	469.21	2176.24	5.76	4617.39	5086.60	.00	.00
80955.000	1000.00	15900.00	1001.76	1002.65	7.54	390.00	2108.21	5.76	4690.00	5080.00	.00	.03
81615.000	660.00	15900.00	1007.36	1009.81	12.75	267.04	1306.68	8.36	4844.53	5111.57	.00	.00
81615.000	660.00	15900.00	1007.45	1009.82	12.56	266.82	1326.59	8.45	4845.00	5111.82	.08	.01
82355.000	740.00	12500.00	1014.52	1014.85	4.73	595.90	2726.78	10.52	4450.39	5046.29	.00	.00
82355.000	740.00	12500.00	1014.59	1014.96	4.90	496.00	2548.83	10.59	4550.00	5046.00	.07	.11
* 83505.000	1150.00	12500.00	1023.94	1025.22	7.88	528.27	1403.57	3.94	4580.00	5108.27	.00	.00
* 83505.000	1150.00	12500.00	1023.93	1025.23	7.92	526.99	1395.69	3.93	4581.00	5107.99	-.01	.01
84655.000	1150.00	12500.00	1036.70	1036.95	4.22	693.50	3163.93	8.70	4776.50	5470.00	.00	.00
84655.000	1150.00	12500.00	1037.45	1037.79	4.76	464.00	2681.09	9.45	4895.00	5359.00	.76	.84
85655.000	1000.00	12500.00	1045.71	1047.45	10.61	336.60	1186.83	5.71	4877.63	5214.23	.00	.00
85655.000	1000.00	12500.00	1046.25	1047.56	9.21	334.00	1366.03	6.25	4880.00	5214.00	.54	.11
86895.000	1240.00	12500.00	1059.40	1059.74	4.70	453.27	2686.65	11.40	4733.74	5187.01	.00	.00

86895.000	1240.00	12500.00	1059.23	1059.60	4.90	415.00	2550.28	11.23	4755.00	5170.00	-.18	-.15
* 88145.000	1250.00	12500.00	1072.51	1073.80	9.13	548.81	1368.94	4.51	4823.73	5372.54	.00	.00
88145.000	1250.00	12500.00	1072.61	1073.80	8.76	548.80	1426.28	4.61	4823.70	5372.50	.10	.00
89095.000	950.00	12500.00	1090.96	1091.68	6.81	302.33	1836.13	10.96	4892.60	5194.93	.00	.00
89095.000	950.00	12500.00	1090.85	1091.60	6.92	301.90	1805.40	10.85	4892.86	5194.76	-.10	-.08
* 90395.000	1300.00	10450.00	1109.55	1110.60	9.25	541.20	1365.38	9.55	4479.20	5020.40	.00	.00
* 90395.000	1300.00	10450.00	1109.51	1110.60	9.44	535.32	1338.67	9.51	4485.00	5020.32	-.04	.01
90670.000	275.00	10450.00	1117.08	1117.85	7.04	426.29	1484.23	7.08	4616.42	5042.72	.00	.00
90670.000	275.00	10450.00	1117.13	1117.88	6.96	426.89	1501.16	7.13	4615.93	5042.81	.05	.03
* 90745.000	75.00	10450.00	1119.87	1122.00	11.71	212.00	892.35	7.87	4802.75	5014.76	.00	.00
* 90745.000	75.00	10450.00	1119.85	1122.00	11.76	211.59	888.52	7.85	4803.13	5014.72	-.02	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO= 36461.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 36461.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 36461.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 36461.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 36461.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 36461.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 36486.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 36486.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 36486.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 36486.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 36486.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 36486.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 36518.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 40116.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 40116.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 40116.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 40116.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 40116.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 40116.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 42091.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 42091.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 42091.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 42091.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 42091.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 42091.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 52081.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 52081.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 52081.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 52081.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 52081.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 52081.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 52626.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 52626.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 52626.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 52626.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 52626.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 52626.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 56276.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 56276.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 56276.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 56276.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 56276.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 56276.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION  SECNO= 60873.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 60873.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 60873.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 60873.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 60873.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 60873.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 65323.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 65323.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 65323.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 65323.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 65323.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 65323.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 69733.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 69733.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 69733.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 69733.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 69733.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 69733.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 71893.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 71893.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 71893.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
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CAUTION  SECNO= 71893.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 73193.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 73193.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 73194.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 73194.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 73194.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 73194.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 73194.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 73194.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 73555.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 73555.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 78055.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 78055.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 78055.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 78055.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 78055.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 78055.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 79955.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 79955.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 79955.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 79955.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 79955.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 83505.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 83505.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO= 83505.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 83505.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 88145.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 88145.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 90395.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 90395.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 90395.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 90395.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 90745.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 90745.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 90745.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 90745.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 90745.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 90745.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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FLOODWAY DATA,   TEMESCAL WASH
PROFILE NO. 2

	------- FLOODWAY -------			WATER SURFACE ELEVATION		
STATION	WIDTH	SECTION AREA	MEAN VELOCITY	WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
34400.000	1098.	2637.	9.3	678.3	678.3	.0
35425.000	960.	5060.	4.8	683.0	682.8	.2
36325.000	999.	4388.	5.6	685.6	685.4	.2
36461.000	556.	2233.	10.9	686.6	686.6	.0
36486.000	494.	2144.	11.4	689.0	688.9	.1
36518.000	548.	3099.	7.9	690.8	690.8	.0
36519.000	510.	6010.	4.1	691.7	691.7	.0
36669.000	413.	4708.	5.2	691.7	691.7	.0
36670.000	413.	3703.	6.6	691.6	691.6	.0
36690.000	413.	3704.	6.6	691.7	691.7	.0
36691.000	414.	4830.	5.1	692.0	692.0	.0
36941.000	295.	2551.	9.6	692.1	692.1	.0
37166.000	396.	4511.	5.4	693.9	693.9	.0
38166.000	541.	4245.	5.7	696.1	696.1	.0
39116.000	575.	4655.	5.2	698.2	698.1	.1
40116.000	279.	1725.	14.1	705.3	705.3	.0
41116.000	470.	3725.	6.6	715.0	714.9	.1
42091.000	492.	2242.	10.9	725.6	725.6	.0
42641.000	480.	2912.	8.4	731.0	731.0	.0
42956.000	435.	2711.	9.0	732.7	732.7	.0
42991.000	472.	2690.	9.1	732.7	732.6	.1
43011.000	466.	3480.	7.0	734.4	734.4	.0
43051.000	425.	2948.	8.3	734.5	734.5	.0
43341.000	334.	2551.	9.6	735.9	735.9	.0
44016.000	275.	3234.	7.5	741.1	741.1	.0
45016.000	371.	3445.	7.1	747.0	747.0	.0
46166.000	599.	4652.	5.2	753.6	753.6	.0
47166.000	600.	3347.	7.3	760.0	760.0	.0
47916.000	580.	3816.	6.4	764.6	764.6	.0
49016.000	673.	2831.	8.6	771.3	771.2	.1
49916.000	440.	2398.	10.2	781.7	781.7	.0
50376.000	288.	1940.	12.6	787.0	786.9	.1
51226.000	437.	3535.	6.9	793.9	793.9	.0
51776.000	675.	3407.	7.2	795.9	795.9	.0
52081.000	182.	1249.	14.9	798.1	798.1	.0
52121.000	541.	3827.	6.4	801.7	802.4	-.7
52626.000	357.	1897.	12.9	802.7	802.7	.0
52836.000	280.	1912.	12.8	806.1	806.1	.0
53676.000	267.	2305.	10.6	815.3	815.3	.0

54676.000	230.	2174.	11.2	822.0	822.0	.0
55576.000	457.	2928.	8.3	828.6	828.6	.0
56276.000	170.	1455.	16.8	836.0	836.0	.0

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FLOODWAY DATA, TEMESCAL WASH
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
56381.000	190.	1746.	14.0	838.9	838.9	.0
57601.000	219.	2741.	8.9	847.7	847.7	.0
57901.000	240.	3141.	6.2	848.9	849.0	-.1
57902.000	343.	2481.	7.8	848.7	848.8	-.1
57922.000	357.	2645.	7.3	848.8	848.8	.0
57923.000	329.	3217.	6.0	849.3	849.3	.0
58573.000	146.	1509.	12.9	849.8	849.8	.0
59723.000	352.	2814.	6.9	857.9	857.9	.0
60873.000	702.	2093.	9.3	868.6	868.7	-.1
61013.000	742.	2903.	6.7	870.5	870.3	.2
62073.000	480.	2424.	8.0	876.6	876.6	.0
63173.000	269.	2260.	8.6	882.3	882.2	.1
64323.000	537.	5331.	3.6	884.9	884.6	.3
65323.000	286.	1476.	13.1	888.5	888.5	.0
65463.000	263.	2066.	9.4	891.4	891.4	.0
66473.000	743.	2731.	7.1	899.9	899.7	.2
66998.000	760.	3004.	6.5	904.2	904.2	.0
67548.000	465.	2564.	7.6	907.5	907.5	.0
68448.000	315.	1986.	9.8	914.3	914.3	.0
69198.000	361.	2457.	6.5	919.6	919.6	.0
69733.000	167.	963.	13.7	925.1	925.1	.0
69773.000	274.	1477.	10.8	926.4	929.4	-3.0
69813.000	267.	1570.	10.1	926.7	929.5	-2.8
70193.000	379.	3000.	5.3	929.5	930.4	-.9
70743.000	320.	2841.	5.6	930.7	931.2	-.5
71893.000	290.	1305.	12.2	934.7	934.7	.0
72643.000	554.	2406.	6.6	943.1	943.1	.0
73193.000	704.	1871.	8.5	944.5	944.4	.1
73194.000	705.	1571.	10.1	947.3	947.5	-.2
73234.000	720.	2154.	7.4	948.6	948.7	-.1
73235.000	720.	4960.	3.2	949.4	949.4	.0
73335.000	570.	3376.	4.7	949.4	949.5	-.1
73555.000	275.	1286.	12.4	949.2	949.6	-.4
74155.000	243.	1763.	9.0	957.1	956.5	.6
75005.000	162.	1329.	12.0	963.4	963.0	.4
75255.000	285.	3020.	5.3	966.3	966.1	.2
75605.000	386.	3130.	5.1	966.8	966.6	.2
76855.000	689.	3643.	4.4	969.6	968.8	.8
78055.000	792.	1574.	10.1	979.5	979.5	.0
78955.000	410.	1861.	8.5	985.2	985.2	.0
79955.000	291.	1312.	12.1	992.8	992.9	-.1
80955.000	390.	2108.	7.5	1001.8	1001.8	.0

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FLOODWAY DATA, TEMESCAL WASH
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
81615.000	267.	1327.	12.0	1007.5	1007.4	.1
82355.000	496.	2549.	4.9	1014.6	1014.5	.1
83505.000	527.	1396.	9.0	1023.9	1023.9	.0
84655.000	464.	2681.	4.7	1037.5	1036.7	.8
85655.000	334.	1366.	9.2	1046.2	1045.7	.5
86895.000	415.	2550.	4.9	1059.3	1059.4	-.1
88145.000	549.	1426.	8.8	1072.6	1072.5	.1
89095.000	302.	1805.	6.9	1091.0	1091.0	.0
90395.000	535.	1339.	7.8	1109.5	1109.5	.0
90670.000	427.	1501.	7.0	1117.1	1117.1	.0
90745.000	212.	889.	11.8	1119.9	1119.9	.0

1

THIS RUN EXECUTED 03/17/93 09:54:04

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION APRIL 1985
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1*********************************************                           ***************************************
 *  HEC-2 WATER SURFACE PROFILES             *                           *  U.S. ARMY CORPS OF ENGINEERS       *
 *                                           *                           *  HYDROLOGIC ENGINEERING CENTER      *
 *  Version   4.6.2;  May 1991               *                           *  609 SECOND STREET, SUITE D         *
 *                                           *                           *  DAVIS, CALIFORNIA 95616-4687       *
 *  RUN DATE    16APR20    TIME   10:01:22  *                           *          (916) 756-1104             *
 *********************************************                           ***************************************


                         X     X  XXXXXXX   XXXXX              XXXXX
                         X     X  X        X     X            X     X
                         X     X  X        X                        X
                         XXXXXXX  XXXX     X          XXXXX    XXXXX
                         X     X  X        X                  X
                         X     X  X        X     X            X
                         X     X  XXXXXXX   XXXXX             XXXXXXX
1
   16APR20      10:01:22                                                                                     PAGE    1


                                                                                THIS RUN EXECUTED 16APR20    10:01:22
 *************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.2;  May 1991
 *************************************


 T1      RICK ENGINEERING COMPANY, DUPLICATE EFFECTIVE MODEL
 T2      RIVERSIDE COUNTY FIS, FEMA0590
 T3      TEMESCAL WASH                    FILE : FLWY-FL1.HEC

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

              2.0                 0.0                                               678.32

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN       ALLDC     IBW       CHNIM      ITRACE

     1.0                -1.0                                                                 15.0


 J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38.       39.       43.       1.        3.        26.       4.        25.        8.0       53.0
     54.       50.       61.       200.

 NC     .035      .035      .060       0.1        0.3
 QT     2.0     24400.    24400.
 ET                9.1       7.1       9.1        9.1        9.1     3940.9     5039.10     3940.0     5039.48
        STARTING WSEL OBTAINED FROM HEC-2 RUN D/S
 X1    34400      11.0    4960.0    5050.0        0.0        0.0        0.0
 GR    700.0    3445.0     684.0    3475.0      680.0     3500.0      678.0      3835.0      676.0      4120.0
 GR    676.0    4235.0     674.0    4640.0      680.0     4960.0      672.0      5000.0      680.0      5050.0
 GR    700.0    5115.0

 ET                9.1       7.1       9.1        9.1        9.1     4580.0      5540.0     4370.0      5570.0
 X1    35425      14.0    4975.0    5540.0      600.0      950.0     1025.0
 GR    700.0    4110.0     684.0    4140.0      680.0     4160.0      680.0      4580.0      676.0      4610.0
 GR    676.0    4705.0     680.0    4750.0      680.0     4950.0      680.0      4975.0      677.4      5000.0
 GR    676.0    5345.0     676.0    5380.0      680.0     5540.0      700.0      5570.0

 ET                9.1       7.1       9.1        9.1        9.1     4700.8      5700.0     4585.0      5700.0
        PIT IS ASSUMED FULL TO ELEV 680.0
 X1    36325      20.0    4715.0    5145.0      830.0     1165.0      900.0
 GR    720.0    4585.0     700.0    4630.0      692.0     4645.0      688.0      4675.0      684.0      4715.0
 GR    680.0    4865.0     680.0    5000.0      680.0     5025.0      684.0      5040.0      684.0      5065.0
 GR    680.0    5105.0     684.0    5145.0      684.0     5225.0      684.0      5285.0      680.0      5305.0
 GR    680.0    5695.0     684.0    5725.0      688.0     5780.0      692.0      5835.0      700.0      5895.0
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   16APR20      10:01:22                                                                                     PAGE    2


 NC    0.035     0.035     0.025       0.3        0.5
 ET                9.1       7.1       9.1        9.1        9.1     4733.5      5290.0     4675.0      5290.0
 X1    36461      25.0    4950.0    5120.0      100.0      400.0      136.0
 GR    700.0    4660.0     692.0    4715.0      688.0     4730.0      684.0      4740.0      684.0      4795.0
 GR    684.0    4855.0     680.0    4950.0      680.0     5000.0      680.0      5010.0      676.0      5030.0
 GR    674.0    5045.0     676.0    5060.0      680.0     5105.0      680.0      5105.0      684.0      5120.0
 GR    688.0    5130.0     692.0    5150.0      688.0     5200.0      684.0      5250.0      686.0      5285.0
 GR    688.0    5320.0     688.0    5490.0      692.0     5565.0      696.0      5610.0      700.0      5665.0

 ET               9.11       7.1      9.11       9.11       9.11     4795.6      5290.0     4675.0      5290.0
        ROAD X-ING NR. CAJALCO ST. - NORMAL BRD.
 X1    36486      20.0    4977.5    5022.5       25.0       25.0       25.0
 BT     -7.0    4950.0     684.0     684.0     4977.5      686.0      682.5      4994.0      686.0       682.5
 BT             5000.0     686.0     682.5     5006.0      685.7      682.2      5022.5      685.0       681.5
 BT             5105.0     684.0     684.0
 GR    708.0    4675.0     704.0    4690.0      700.0     4730.0      696.0      4745.0      692.0      4780.0
 GR    688.0    4800.0     684.0    4820.0      680.0     4895.0      684.0      4950.0      682.5      4977.5
 GR    674.0    4994.0     674.0    5000.0      674.0     5006.0      681.5      5022.5      684.0      5105.0
 GR    688.0    5160.0     688.0    5290.0      688.0     5490.0      692.0      5570.0      700.0      5660.0

 ET               9.11       7.1      9.11       9.11       9.11     4797.0      5345.0     4738.0      5345.0
 X1    36518       20.    4977.5    5022.5        32.       32.0       32.0
 BT     -7.0    4950.0     684.0     684.0     4977.5      686.0      682.5      4994.0      686.0       682.5
 BT             5000.0     686.0     682.5     5006.0      685.7      682.2      5022.5      685.0       681.5
 BT             5105.0     684.0     684.0
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 GR    708.0    4710.0     704.0    4730.0     700.0    4745.0     696.0    4760.0     692.0    4795.0
 GR    688.0    4800.0     684.0    4820.0     680.0    4895.0     684.0    4950.0     682.5    4977.5
 GR    674.0    4994.0     674.0    5000.0     674.0    5006.0     681.5    5022.5     684.0    5105.0
 GR    688.0    5160.0     688.0    5290.0     688.0    5490.0     692.0    5570.0     700.0    5660.0

 NC    0.035     0.035     0.060       0.3       0.5
 ET                9.1       7.1       9.1       9.1       9.1    4765.1    5275.4    4738.0    5345.0
 X1    36519      17.0    4850.0    5140.0       1.0       1.0       1.0
 GR    720.0    4695.0     700.0    4755.0     676.0    4770.0     672.0    4820.0     684.0    4850.0
 GR    680.0    4895.0     676.0    4905.0     674.0    4960.0     676.0    5000.0     676.0    5050.0
 GR    680.0    5100.0     684.0    5140.0     688.0    5230.0     688.0    5460.0     692.0    5530.0
 GR    696.0    5570.0     700.0    5605.0

 NC    0.035     0.035     0.030       0.3       0.5
 ET                9.1       7.1       9.1       9.1       9.1    4795.4    5208.3   4715.0     5215.0
 X1    36669      35.0    4795.0    5215.0     150.0      80.0     150.0
 GR    708.0    4715.0     700.0    4735.0     696.0    4745.0     692.0    4795.0    688.0     4800.0
 GR    686.2    4820.0     682.4    4857.0     679.2    4895.0     678.3    4909.0   677.95     4922.0
 GR    678.5    4935.0     679.2    4948.0     679.1    4961.0     676.8    4973.0    676.1     4987.0
 GR    675.4    5000.0     678.4    5012.0     677.9    5026.0     676.5    5039.0    678.7     5052.0
 GR    677.4    5065.0     677.3    5078.0     677.5    5090.0     678.8    5104.0    679.3     5117.0
 GR    679.9    5130.0     679.3    5143.0     680.8    5156.0     679.8    5170.0    687.0     5195.0
 GR    694.0    5215.0     688.0    5260.0     688.0    5430.0     692.0    5510.0    700.0     5590.0
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 ET                          7.1       9.1       9.1       9.1    4795.0    5208.2
        RR BRIDGE NR. CAJALCO ST. -  NORMAL BRD.
 X1    36670      71.0    4795.0    5215.0       1.0       1.0       1.0
 X3     10.0
 BT    -67.0    4745.0     696.0     696.0    4795.0     692.5      692.    4800.0     692.5     689.2
 BT             4816.5    692.54    689.24    4816.7    692.54    689.24    4819.5    692.54    689.24
 BT             4819.7    692.54    689.24    4831.0     692.6     689.3    4844.0    692.63    689.33
 BT             4855.5    692.66    689.36    4855.7    692.66    689.36    4858.5    692.66    689.36
 BT             4858.7    692.66    689.36    4870.0    692.69    689.39    4883.0    692.72    689.42
 BT             4894.5    692.75    689.45    4894.7    692.75    689.45    4897.5    692.75    689.45
 BT             4897.7    692.75    689.45    4909.0    692.78    689.48    4922.0    692.82    689.52
 BT             4933.5    692.85    689.55    4933.7    692.85    689.55    4936.5    692.85    689.55
 BT             4936.7    692.85    689.55    4948.0    692.88    689.58    4961.0    692.91    689.61
 BT             4972.5    692.94    689.64    4972.7    692.94    689.64    4975.5    692.94    689.64
 BT             4975.7    692.94    689.64    4987.0     692.9     689.6    5000.0     693.0    689.70
 BT             5011.5     693.1     689.8    5011.7     693.1     689.8    5014.5     693.1    689.8
 BT             5014.7     693.1     689.8    5026.0    693.15    689.85    5039.0     693.2    689.90
 BT             5050.5    693.25    689.95    5050.7    693.25    689.95    5053.5    693.25    689.95
 BT             5053.7    693.25    689.95    5065.0    693.31    690.01    5078.0    693.38    690.08
 BT             5089.5    693.44    690.14    5089.7    693.44    690.14    5092.5    693.44    690.14
 BT             5092.7    693.44    690.14    5104.0    693.50    690.20    5117.0    693.57    690.27
 BT             5128.5    693.63    690.37    5128.7    693.63    690.37    5131.5    693.63    690.37
 BT             5131.7    693.63    690.37    5143.0     693.7     690.4    5156.0    693.75    690.45
 BT             5167.5    693.83    690.53    5167.7    693.83    690.53    5170.5    693.83    690.53
 BT             5170.7    693.83    690.53    5182.0    693.92    690.62    5194.5    694.0     690.70
 BT             5194.7     694.0     690.7    5195.5     694.0     690.7    5195.7    694.0     690.7
 BT             5215.0     694.0     694.0
 GR     696.    4745.0     692.0    4795.0     688.0    4800.0     686.2    4816.5    689.24    4816.7
 GR   689.24    4819.5     686.2    4819.7     682.5    4831.0    681.83    4844.0     682.4    4855.5
 GR   689.36    4855.7    689.36    4858.5     682.4    4858.7     682.8    4870.0    682.23    4883.0
 GR    679.2    4894.5    689.45    4894.7    689.45    4897.5     679.2    4897.7     678.3    4909.0
 GR   677.95    4922.0    678.50    4933.5    689.55    4933.7    689.55    4936.5     678.5    4936.7
 GR   679.20    4948.0     679.1    4961.0     676.8    4972.5    689.64    4972.7    689.64    4975.5
 GR    676.8    4975.7     676.1    4987.0     675.4    5000.0     678.4    5011.5     689.8    5011.7
 GR    689.8    5014.5     678.4    5014.7     677.9    5026.0     676.5    5039.0     678.7    5050.5
 GR   689.95    5050.7    689.95    5053.5     678.7    5053.7     677.4    5065.0     677.3    5078.0
 GR    677.5    5089.5    690.14    5089.7    690.14    5092.5     677.5    5092.7     678.8    5104.0
 GR    679.3    5117.0    679.90    5128.5    690.37    5128.7    690.37    5131.5     679.9    5131.7
 GR    679.3    5143.0     680.8    5156.0     679.8    5167.5    690.53    5167.7    690.53    5170.5
 GR    679.8    5170.7     681.7    5182.0     687.0    5194.5     690.7    5194.7    690.70    5195.5
 GR    687.0    5195.7     694.0    5215.0     688.0    5260.0     688.0    5430.0     692.0    5510.0
 GR    700.0    5590.0

 ET                          7.1       9.1       9.1       9.1    4795.5    5208.3
 X1    36690                                    20.0      20.0      20.0
 X2                                                                 1.00
 X3      10.
```



```
 NC    0.035     0.035      0.06       0.3        0.    5
 ET                9.1       7.1       9.1       9.1       9.1    4795.1    5209.1    4740.0    5215.0
 X1    36691      35.0    4795.0    5215.0       1.0       1.0       1.0
 GR    708.0    4715.0     700.0    4735.0     696.0    4745.0     692.0    4795.0    688.0     4800.0
 GR    686.2    4820.0     682.4    4857.0     679.2    4895.0     678.3    4909.0   677.95     4922.0
 GR    678.5    4935.0     679.2    4948.0     679.1    4961.0     676.8    4973.0    676.1     4987.0
 GR    675.4    5000.0     678.4    5012.0     677.9    5026.0     676.5    5039.0    678.7     5052.0
 GR    677.4    5065.0     677.3    5078.0     677.5    5090.0     678.8    5104.0    679.3     5117.0
 GR    679.9    5130.0     679.3    5143.0     680.8    5156.0     679.8    5170.0    687.0     5195.0
 GR    694.0    5215.0     688.0    5260.0     688.0    5430.0     692.0    5510.0    700.0     5590.0

 NC     .035      .035     0.060       0.1       0.3
 ET                9.1       7.1       9.1       9.1       9.1    4770.0    5065.0    4720.0    5100.0
 X1    36941      18.0    4750.0    5065.0     380.0      90.0     250.0
 GR    720.0    4720.0     700.0    4750.0     692.0    4770.0     688.0    4790.0     684.0    4870.0
 GR    680.0    4890.0     680.0    5000.0     680.0    5020.0     684.0    5035.0     692.0    5065.0
 GR    694.2    5100.0     692.0    5115.0     688.0    5135.0     688.0    5170.0     692.0    5315.0
 GR    700.0    5395.0     708.0    5465.0     720.0    5595.0

 ET                9.1       7.1       9.1       9.1       9.1    4678.1    5073.7    4590.0    5080.0
 X1    37166      13.0    4655.0    5080.0     230.0     200.0     225.0
 GR    740.0    4590.0     700.0    4655.0     688.0    4700.0     680.0    4800.0     680.0    5000.0
 GR    680.0    5035.0     692.0    5060.0     694.7    5080.0     692.0    5125.0     700.0    5155.0
 GR    720.0    5200.0     740.0    5225.0     740.0    5255.0
```

```
ET                           7.1       9.1       9.1       9.1    4640.0    5183.0
X1     38166       9.0    4750.0    5220.0    1050.0     925.0    1000.0
GR     740.0    4495.0     696.0    4605.0     692.0    4640.0     692.0    4735.0     688.0    4750.0
GR     684.7    5000.0     688.0    5100.0     700.0    5220.0     740.0    5285.0

ET                           7.1       9.1       9.1       9.1    4779.5    5355.0
       PIT IS ASSUMED FULL TO ELEV 690.0
X1     39116      21.0    4855.0    5215.0    1250.0     625.0     950.0
X3               690.0
GR     740.0    4515.0     720.0    4630.0     700.0    4640.0     696.0    4650.0     692.0    4790.0
GR     684.0    4855.0     680.0    4910.0     680.0    4975.0     662.0    5000.0     680.0    5100.0
GR     684.0    5170.0     686.0    5215.0     684.0    5250.0     684.0    5340.0     692.0    5355.0
GR     695.8    5395.5     696.0    5425.0     700.0    5440.0     700.0    5460.0     720.0    5585.0
GR     740.0    5650.0

ET                           7.1       9.1       9.1       9.1    4840.0    5120.0
X1     40116      16.0    4890.0    5090.0    1000.0    1000.0    1000.0
GR     760.0    4560.0     720.0    4640.0     708.0    4670.0     708.0    4805.0     704.0    4840.0
GR     700.0    4890.0     700.0    4950.0     696.0    4960.0     695.5    5000.0     696.0    5035.0
GR     700.0    5090.0     705.3    5120.0     708.0    5145.0     720.0    5190.0     740.0    5255.0
GR     760.0    5355.0

ET                           7.1       9.1       9.1       9.1    4770.0    5240.0
X1     41116      17.0    4835.0    5145.0     960.0    1075.0    1000.0
GR     760.0    4630.0     720.0    4705.0     720.0    4745.0     712.0    4770.0     708.0    4835.0
GR     704.0    4870.0     704.0    4885.0     705.0    5000.0     708.0    5145.0     711.0    5165.0
GR     708.0    5180.0     712.0    5240.0     716.0    5250.0     720.0    5310.0     728.0    5350.0
GR     740.0    5370.0     760.0    5410.0
```



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ET                           7.1       9.1       9.1       9.1    4933.0    5425.0
X1     42091      16.0    4890.0    5100.0     850.0    1050.0     975.0
GR     780.0    4825.0     760.0    4860.0     740.0    4890.0     720.0    4950.0     712.0    4975.0
GR     711.2    5000.0     712.0    5025.0     716.0    5080.0     724.0    5100.0     724.0    5250.0
GR     724.0    5425.0     760.0    5445.0     764.0    5635.0     764.0    5685.0     768.0    5730.0
GR     780.0    5755.0

ET                 9.1       7.1       9.1       9.1       9.1    4880.0    5360.0    4630.0    5360.0
X1     42641      17.0    4880.0    5160.0     550.0     525.0     550.0
GR      800.    4630.0     760.0    4730.0     740.0    4775.0     736.0    4800.0     728.5    4880.0
GR      720.    4930.0     714.6    5000.0     720.0    5045.0     728.0    5160.0     728.0    5190.0
GR      800.    5191.0     800.0    5315.0     728.0    5316.0     728.0    5325.0     732.0    5400.0
GR      740.    5410.0     760.0    5460.0

ET                 9.1       7.1                 9.1       9.1    4880.0    5315.0    4705.0    5315.0
X1     42956      22.0    4880.0    5099.5     350.0     250.0     315.0
GR     780.0    4705.0     740.0    4805.0     732.0    4830.0     732.0    4880.0     722.9    4920.0
GR     721.5    4940.0     719.9    4960.0     720.9    4980.0     717.5    5000.0     720.1    5020.0
GR    719.36    5040.0     718.5    5049.5     720.1    5059.3     721.9    5080.0     728.8    5099.5
GR     730.5    5120.0     731.0    5205.0     770.0    5210.0     770.0    5255.0     731.0    5256.0
GR     731.0    5330.0     770.0    5331.0

NC     0.035     0.035     0.020       0.3       0.5
ET                           7.1       9.1       9.1       9.1    4858.0    5330.0
       ROAD X-ING NR. 3M MAIN OFFICE -  SPECIAL BRD.
X1     42991      20.0    4899.5    5099.5      35.0      35.0      35.0
GR     760.0    4745.0     740.0    4810.0     736.0    4815.0     732.4    4860.0     730.0    4899.5
GR     722.9    4920.0     721.5    4940.0     719.9    4960.0     720.9    4980.0     720.6    5000.0
GR     720.1    5020.0    719.36    5040.0     718.5    5049.5     720.1    5059.3     721.9    5080.0
GR     728.8    5099.5     730.8    5130.0     731.0    5280.0     731.0    5330.0     750.0    5331.0

SB      1.05      1.32       2.5                140.      18.0     1393.     1.750     720.0     719.8
ET                9.11       7.1      9.11      9.11      9.11    4834.4    5300.0    4745.0    5300.0
X1     43011      20.0    4899.5    5099.5      20.0      20.0      20.0
X2                           1.0     730.0     731.8
BT      -15.    4860.0     732.4     732.4    4899.5     733.0     730.0     4920.     732.9     729.9
BT              4940.0     732.8     729.8    4960.0     732.6     729.6     4980.     732.5     729.5
BT              5000.0     732.4     729.4    5020.0     732.3     729.3     5040.     732.2     729.2
BT              5049.5     732.2     729.2    5059.3     732.0     729.0     5080.     731.9     728.9
BT              5099.5     731.8     728.8    5130.0     730.8     730.8     5280.     731.0     731.0
GR     760.0    4745.0     740.0    4810.0     736.0    4815.0     732.4    4860.0     730.0    4899.5
GR     722.9    4920.0     721.5    4940.0     719.9    4960.0     720.9    4980.0     720.6    5000.0
GR     720.1    5020.0    719.36    5040.0     718.5    5049.5     720.1    5059.3     721.9    5080.0
GR     728.8    5099.5     730.8    5130.0     731.0    5280.0     731.0    5300.0     750.0    5301.0

NC     0.035     0.035     0.060       0.1       0.3
ET                           7.1       9.1       9.1       9.1    4850.0    5275.0
X1     43051      20.0    4895.0    5085.0      40.0      40.0      40.0
GR     780.0    4640.0     760.0    4660.0     740.0    4735.0     736.0    4750.0     733.1    4835.0
GR     732.0    4895.0     728.0    4905.0     724.0    4930.0     720.0    4960.0     718.4    5000.0
GR     720.0    5040.0     724.0    5070.0     728.0    5085.0     731.5    5110.0     731.5    5205.0
GR     740.0    5206.0     740.0    5245.0     731.5    5246.0     731.5    5275.0     760.0    5276.0
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ET                           7.1       9.1       9.1       9.1    4796.0    5130.0
X1     43341      15.0    4905.0    5130.0     250.0     350.0     290.0
GR      800.    4495.0     780.0    4555.0     760.0    4600.0     740.0    4650.0     736.0    4735.0
GR     735.9    4795.0      732.    4905.0     724.0    4965.0     719.2    5000.0     724.0    5070.0
GR     735.8    5130.0     736.0    5170.0      740.    5200.0     760.0    5230.0     780.0    5255.0

NC     0.035     0.035      0.08       0.1       0.3
ET                           7.1       9.1       9.1       9.1    4885.0    5160.0
X1     44016      14.0    4885.0    5160.0     650.0     750.0     675.0
GR     780.0    4670.0     760.0    4725.0     744.0    4775.0     740.0    4885.0     736.0    4895.0
GR     732.0    4905.0     728.0    4920.0     726.3    5000.0     728.0    5080.0     732.0    5135.0
GR     740.0    5160.0     745.5    5215.0     760.0    5280.0     780.0    5310.0

ET                           7.1       9.1       9.1       9.1    4869.0    5240.0
X1     45016      16.0    4930.0    5220.0     850.0    1100.0    1000.0
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GR    800.0    4725.0     780.0    4755.0     772.0    4770.0     772.0    4820.0     760.0    4840.0
GR    740.0    4885.0     740.0    4930.0     736.0    4950.0     735.0    5000.0     736.0    5065.0
GR    736.0    5120.0     740.0    5220.0     755.7    5265.0     760.0    5300.0     780.0    5310.0
GR    800.0    5340.0

ET                          7.1       9.1       9.1       9.1    4500.0    5099.0
X1    46166      17.0    4515.0    5080.0    1300.0    1100.0    1150.0
GR    800.0    4090.0     780.0    4125.0     768.0    4150.0     764.0    4180.0     760.0    4420.0
GR    756.0    4440.0     752.0    4500.0     748.0    4515.0     744.0    4900.0     744.0    4980.0
GR    743.1    5000.0     744.0    5020.0     748.0    5080.0     760.0    5120.0     768.0    5140.0
GR    780.0    5170.0     800.0    5190.0

ET                          7.1       9.1       9.1       9.1    4900.0    5500.0
X1    47166      13.0    4900.0    5275.0    1100.0    1000.0    1000.0
GR    800.0    4850.0     780.0    4870.0     760.0    4900.0     752.0    4910.0     750.8    5000.0
GR    752.0    5070.0     756.0    5275.0     756.0    5275.0     756.0    5405.0     760.0    5500.0
GR    773.0    5540.0     780.0    5570.0     800.0    5625.0

NC    0.035     0.035      0.05       0.1       0.3
ET                          7.1       9.1       9.1       9.1    4970.0    5550.0
X1    47916       9.0    4970.0    5550.0     750.0     825.0     750.0
GR     800.    4860.0     780.0    4885.0     760.0    4970.0     756.4    5000.0     757.8    5250.0
GR     760.    5550.0     776.0    5590.0     780.0    5610.0     800.0    5660.0

ET                          7.1       9.1       9.1       9.1    4972.0    5645.0
X1    49016      11.0    4985.0    5660.0    1050.0    1375.0    1100.0
GR    820.0    4820.0     800.0    4890.0     780.0    4935.0     768.0    4985.0     764.0    5000.0
GR    764.0    5020.0     768.0    5300.0     768.0    5640.0     780.0    5660.0     800.0    5705.0
GR    820.0    5735.0

ET                          7.1       9.1       9.1       9.1    4910.0    5350.0
X1    49916      16.0    4910.0    5310.0     925.0     700.0     900.0
GR    812.0    4245.0     808.0    4345.0     804.0    4500.0     800.0    4690.0     796.0    4820.0
GR    792.0    4850.0     780.0    4910.0     773.2    5000.0     776.0    5030.0     776.0    5310.0
GR    780.0    5350.0     784.0    5370.0     788.0    5410.0     792.0    5440.0     800.0    5450.0
GR    820.0    5480.0
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ET                          7.1       9.1       9.1       9.1    4914.3    5204.6
X1    50376      15.0    4900.0    5250.0     510.0     400.0     460.0
GR    832.0    4350.0     808.0    4425.0     804.0    4480.0     800.0    4560.0     796.0    4675.0
GR    792.0    4775.0     788.0    4900.0     784.0    4960.0     776.0    4990.0     775.1    5000.0
GR    776.0    5030.0     780.0    5140.0     792.0    5250.0     796.0    5310.0     840.0    5370.0

ET                9.1       7.1       9.1       9.1       9.1    4605.0    5041.8    4530.0    5135.0
X1    51226      10.0    4635.0    5055.0     900.0     725.0     850.0
GR    810.0    4529.0     793.8    4530.0     792.0    4605.0     788.0    4635.0     784.0    4950.0
GR    780.0    5000.0     784.0    5020.0     800.0    5055.0     804.0    5105.0     820.0    5135.0

ET                9.1       7.1       9.1       9.1       9.1    4370.0    5047.5    4370.0    5285.0
X1    51776      14.0    4610.0    5085.0     160.0     600.0     550.0
GR    808.0    3780.0     804.0    3900.0     800.0    4070.0     796.0    4200.0     792.0    4610.0
GR    788.0    4950.0     785.8    5000.0     788.0    5020.0     796.0    5045.0     800.0    5085.0
GR    804.0    5140.0     804.0    5200.0     808.0    5220.0     820.0    5285.0

NC    0.035     0.035     0.020       0.3       0.5
QT      2.0   18580.0    18580.
ET                9.1       7.1       9.1       9.1       9.1    4914.2    5097.9    4914.1    5099.0
        ROAD X-ING CAJALCO ROAD - SPECIAL BRD.
X1    52081      12.0    4914.1    5099.0     180.0     465.0     305.0
GR    802.3    4914.1     798.3    4914.2     791.9    4928.1     791.9    4962.5     792.9    4999.3
GR    788.2    4999.3     788.2    5000.0     788.9    5036.1     789.8    5072.0     791.4    5082.0
GR    798.7    5098.6     803.2    5099.0

SB      0.9      1.51       2.5               190.0       6.0    1711.0      2.32     793.0     792.8
QT      2.0   24400.0    24400.
ET               9.11       7.1      9.11      9.11      9.11     4558.    5099.0    4430.0    5099.0
X1    52121      25.0    4914.0    5099.2      40.0      40.0      40.0
X2                          1.0     801.4     800.5
BT     -25.     3830.     808.0     808.0    4000.0     804.0     804.0    4160.0     800.5     800.0
BT              4195.     800.0     800.0    4540.0     800.0     800.0    4645.0     800.7     796.0
BT              4914.     802.5     796.0    4914.2     802.5     800.4    4928.0     802.6     800.5
BT              4962.     802.8     800.7    4999.0     803.0     800.9    5000.0     803.0     800.9
BT              5036.     803.2     801.1     5072.     803.4     801.3    5082.0     803.4     801.3
BT             5099.0     803.5     801.4    5099.2     803.5     792.0    5120.0     804.0     792.0
BT             5145.0     804.5     792.0    5195.0     805.0     796.0    5315.0     806.0     800.0
BT             5430.0     807.3     804.0    5505.0     808.0     804.0    5560.0     809.5     808.0
BT             5900.0     812.0     812.0
GR    808.0    3830.0     804.0     4000.     800.0    4160.0     800.0    4195.0     800.0    4540.0
GR    796.0    4645.0     796.0     4914.     796.0    4914.2     791.9    4928.0     791.9    4962.0
GR    792.9    4999.0     788.2    5000.0     788.9     5036.     789.8    5072.0     791.4    5082.0
GR    792.0    5099.0     792.0    5099.2     792.0     5120.     792.0    5145.0     796.0    5195.0
GR    800.0    5315.0     804.0    5430.0     804.0     5505.     808.0    5560.0     812.0    5900.0

NC    0.035     0.035     0.050       0.1       0.3
ET                9.1       7.1       9.1       9.1       9.1    4780.0    5137.0    4780.0    5140.0
X1    52626      10.0    4780.0    5050.0     530.0     180.0     505.0
GR    816.0    4630.0     800.0    4660.0     797.6    4780.0     796.0    4860.0     796.0    4970.0
GR    792.7    5000.0     796.0    5022.0     800.0    5050.0     804.0    5185.0     808.0    5275.0
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ET                          7.1       9.1       9.1       9.1    4864.0    5150.5
X1    52836      10.0    4845.0    5185.0     210.0     210.0     210.0
GR    816.0    4845.0     804.0    4870.0     800.0    4945.0     796.0    4975.0     794.2    5000.0
GR    796.0    5060.0     800.0    5090.0     804.0    5130.0     808.0    5160.0     810.0    5185.0

ET                          7.1       9.1       9.1       9.1    4919.3    5187.8
X1    53676       9.0    4910.0    5200.0     840.0     840.0     840.0
GR    820.0    4910.0     808.0    4935.0     804.0    4960.0     800.0    5000.0     804.0    5050.0
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GR   808.0    5090.0     812.0    5170.0     816.0    5190.0     820.0    5200.0

ET                            7.1       9.1       9.1       9.1    4900.0    5130.0
X1   54676      10.0    4900.0    5090.0    1000.0     950.0    1000.0
GR   840.0    4855.0     820.0    4900.0     812.0    4925.0     808.0    5000.0     812.0    5010.0
GR   813.5    5090.0     816.0    5120.0     820.0    5130.0     824.0    5175.0     840.0    5230.0

ET                            7.1       9.1       9.1       9.1    4913.0    5370.0
X1   55576      13.0    4890.0    5275.0     800.0    1050.0     900.0
GR   856.0    4795.0     852.0    4810.0     848.0    4875.0     840.0    4890.0     820.0    4930.0
GR   816.0    5000.0     820.0    5010.0     824.0    5275.0     828.0    5370.0     832.0    5415.0
GR   836.0    5490.0     840.0    5510.0     860.0    5535.0

ET                 9.1       7.1       9.1       9.1       9.1    4866.7    5036.6    4825.0    5070.0
X1   56276      16.0    4825.0    5070.0     750.0    1000.0     700.0
GR   860.0    4825.0     840.0    4855.0     828.0    4890.0     824.0    5000.0     828.0    5020.0
GR   840.0    5045.0     856.0    5070.0     854.0    5085.0     854.0    5325.0     856.0    5345.0
GR   836.0    5375.0     836.0    5440.0     840.0    5460.0     852.0    5485.0     856.0    5500.0
GR   860.0    5570.0

ET                 9.1       7.1       9.1       9.1       9.1    4859.8    5049.4    4815.0    5085.0
X1   56381      18.0    4850.0    5085.0     105.0     105.0     105.0
GR   880.0    4815.0     860.0    4850.0     840.0    4855.0     828.0    4910.0     826.0    5000.0
GR   828.0    5015.0     832.0    5032.0     840.0    5052.0     860.0    5085.0     858.0    5087.0
GR   854.0    5088.0     854.0    5360.0     856.0    5382.0     840.0    5410.0     836.0    5420.0
GR   836.0    5482.0     840.0    5495.0     860.0    5540.0

ET                            7.1       9.1       9.1       9.1    4890.5    5109.9
      PIT IS ASSUMED FULL TO ELEV 830.0
X1   57601       9.0    4860.0    5150.0    1245.0    1145.0    1220.0
GR   860.0    4795.0     856.0    4860.0     830.0    4955.0     830.0    5000.0     830.0    5030.0
GR   832.0    5050.0     836.0    5070.0     840.0    5085.0     860.0    5150.0

QT     2.0    19400.    19400.
ET                 9.1       7.1       9.1       9.1       9.1    4875.0    5114.6    4875.0    5190.0
NC   0.035     0.035      0.03       0.3       0.5
X1   57901      12.0    4875.0    5090.0     280.0     330.0     300.0
GR   860.0    4395.0     856.0    4630.0     852.0    4745.0     848.0    4845.0     844.6    4875.0
GR   840.0    4920.0     832.0    4940.0     831.0    5000.0     832.0    5040.0     836.0    5065.0
GR   840.0    5090.0     840.0    5190.0
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ET                9.11       7.1      9.11      9.11      9.11   4890.98    5235.0    4890.0    5235.0
      ABANDONED RAIL ROAD BRIDGE - NORMAL BRD.
X1   57902      25.0    4925.0    5075.0       1.0       1.0       1.0
BT   -22.0    4924.0     848.0     848.0    4925.0     848.0     842.5    4953.5     847.0     841.5
BT            4953.5     847.0     841.5    4956.5     847.0     841.5    4956.5     847.0     841.5
BT            4983.5     845.9     840.4    4983.5     845.9     840.4    4986.5     845.9     840.4
BT            4986.5     845.9     840.4    5013.5     844.9     839.4    5013.5     844.9     839.4
BT            5016.5     844.9     839.4    5016.5     844.9     839.4    5043.5     844.1     838.6
BT            5043.5     844.1     838.6    5046.5     844.1     838.6    5046.5     844.1     838.6
BT            5075.0     843.6     838.1    5076.0     843.6     836.0    5100.0     843.0     840.0
BT            5255.0     840.0     840.0
GR   860.0    4390.0     856.0    4610.0     852.0    4710.0     848.0    4924.0     842.5    4925.0
GR   832.0    4953.5     841.5    4953.5     841.5    4956.5     832.0    4956.5     831.2    4983.5
GR   840.4    4983.5     840.4    4986.5     831.2    4986.5     831.2    5013.5     839.4    5013.5
GR   839.4    5016.5     831.2    5016.5     832.0    5043.5     838.6    5043.5     838.6    5046.5
GR   832.0    5046.5     836.0    5075.0     836.0    5076.0     840.0    5100.0     840.0    5255.0

ET                9.11       7.1      9.11      9.11      9.11    4892.9    5250.0    4892.0    5250.0
X1   57922      24.0    4925.0    5075.0      20.0      20.0      20.0
BT   -21.0    4924.0     848.0     848.0    4925.0     848.0     842.5    4953.5     847.0     841.5
BT            4953.5     847.0     841.5    4956.5     847.0     841.5    4956.5     847.0     841.5
BT            4983.5     845.9     840.4    4983.5     845.9     840.4    4986.5     845.9     840.4
BT            4986.5     845.9     840.4    5013.5     844.9     839.4    5013.5     844.9     839.4
BT            5016.5     844.9     839.4    5016.5     844.9     839.4    5043.5     844.1     838.6
BT            5043.5     844.1     838.6    5046.5     844.1     838.6    5046.5     844.1     838.6
BT            5075.0     843.6     838.1    5076.0     843.6     843.6    5255.0     840.0     840.0
GR   860.0    4390.0     856.0    4610.0     852.0    4710.0     848.0    4924.0     842.5    4925.0
GR   832.0    4953.5     841.5    4953.5     841.5    4956.5     832.0    4956.5     831.2    4983.5
GR   840.4    4983.5     840.4    4986.5     831.2    4986.5     831.2    5013.5     839.4    5013.5
GR   839.4    5016.5     831.2    5016.5     832.0    5043.5     838.6    5043.5     838.6    5046.5
GR   832.0    5046.5     838.1    5075.0     843.6    5076.0     840.0    5255.0

NC   0.035     0.035     0.050       0.1       0.3
ET                 9.1       7.1       9.1       9.1       9.1    4930.0    5259.0    4890.0    5260.0
X1   57923      12.0    4930.0    5130.0       1.0       1.0       1.0
GR   860.0    4335.0     856.0    4430.0     852.0    4720.0     848.0    4930.0     840.0    4960.0
GR   832.0    4975.0     831.8    5000.0     832.0    5025.0     836.0    5085.0     840.0    5105.0
GR   844.0    5130.0     844.0    5365.0

ET                            7.1       9.1       9.1       9.1    4885.1    5032.9
X1   58573       6.0    4870.0    5045.0     700.0     600.0     650.0
GR   860.0    4870.0     844.0    4895.0     840.0    4910.0     836.0    5000.0     840.0    5020.0
GR   860.0    5045.0

ET                 9.1       7.1       9.1       9.1       9.1    4850.7    5203.1    4850.0    5240.0
X1   59723      16.0    4850.0    5240.0    1250.0    1100.0    1150.0
GR   880.0    3850.0     876.0    4065.0     872.0    4300.0     860.0    4365.0     856.0    4525.0
GR   852.9    4684.0     870.0    4685.0     870.0    4850.0     852.0    4851.0     852.0    4930.0
GR   848.0    4955.0     846.9    5000.0     848.0    5055.0     852.0    5190.0     856.0    5200.0
GR   880.0    5240.0
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ET                 9.1       7.1       9.1       9.1       9.1    4450.0    5151.6    4250.0    5200.0
X1   60873      10.0    4770.0    5200.0    1300.0    1100.0    1150.0
GR   880.0    4090.0     876.0    4095.0     872.0    4110.0     868.0    4190.0     867.6    4770.0
GR   864.0    4930.0     860.0    5000.0     864.0    5140.0     876.0    5175.0     880.0    5200.0
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 ET               9.1       7.1       9.1        9.1        9.1      4370.0      5112.9      4215.0      5185.0
 X1    61013     10.0    4808.0    5130.0      135.0      130.0       140.0
 GR    880.0   4050.0     876.0    4075.0      872.0     4095.0       868.0      4370.0       868.0      4808.0
 GR    864.0   4972.0     861.0    5000.0      864.0     5100.0       880.0      5130.0       900.0      5185.0

 ET               9.1       7.1       9.1        9.1        9.1      4890.0      5370.0      4580.0      5370.0
 X1    62073      9.0    4890.0    5165.0      940.0     1170.0      1060.0
 GR    892.0   4030.0     880.0    4250.0      876.0     4485.0       876.0      4890.0       872.0      4910.0
 GR    868.0   5000.0     872.0    5165.0      876.0     5480.0       880.0      5505.0

 ET                         7.1       9.1        9.1        9.1      4816.0      5085.0
        PIT IS ASSUMED FULL TO ELEV 871.0
 X1    63173     16.0    4870.0    5085.0     1150.0     1050.0      1100.0
 X3             871.0
 GR    900.0   4465.0     896.0    4490.0      892.0     4680.0       888.0      4705.0       884.0      4760.0
 GR    880.0   4810.0     876.0    4870.0      860.0     4940.0       856.0      4960.0       852.0      4980.0
 GR    850.0   5000.0     852.0    5010.0      856.0     5030.0       880.0      5085.0       888.0      5125.0
 GR    900.0   5160.0

 ET               9.1       7.1       9.1        9.1        9.1      4711.0      5247.9     4710.0      5410.0
        PIT IS ASSUMED FULL TO ELEV 875.0
 X1    64323     18.0    4711.0    5150.0     1000.0     1400.0      1150.0
 X3             875.0
 GR    900.0   4360.0     896.0    4495.0      868.0     4600.0       860.0      4640.0       859.0      4711.0
 GR    856.0   4895.0     852.0    4970.0      851.5     5000.0       852.0      5010.0       856.0      5025.0
 GR    860.0   5060.0     864.0    5125.0      872.0     5150.0       876.0      5270.0       880.0      5340.0
 GR    884.0   5410.0     888.0    5470.0      900.0     5520.0

 ET                         7.1       9.1        9.1        9.1      4799.4      5086.4
 X1    65323      9.0    4720.0    5170.0     1100.0     1000.0      1000.0
 GR    900.0   4659.0     892.0    4660.0      892.0     4720.0       888.0      4810.0       884.0      4885.0
 GR    880.0   4980.0     878.0    5000.0      880.0     5025.0       900.0      5170.0

 ET                         7.1       9.1        9.1        9.1      4855.0      5117.7
 X1    65463     14.0    4855.0    5170.0      140.0      140.0       140.0
 GR    900.0   4629.0     893.0    4630.0      892.0     4762.0       888.0      4855.0       884.0      4870.0
 GR    884.0   4975.0     880.0    4995.0      879.0     5000.0       880.0      5012.0       884.0      5085.0
 GR    888.0   5105.0     892.0    5120.0      896.0     5140.0       900.0      5170.0

 ET               9.1       7.1       9.1        9.1        9.1      4463.0      5210.0      4285.0      5400.0
 X1    66473     14.0    4565.0    5210.0      990.0      940.0      1010.0
 GR    920.0   3835.0     900.0    4040.0      900.0     4455.0       896.0      4565.0       896.0      4930.0
 GR    892.0   5000.0     896.0    5075.0      900.0     5210.0       904.0      5265.0       916.0      5290.0
 GR    916.0   5310.0     912.0    5325.0      912.0     5350.0       920.0      5400.0
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 ET                         7.1       9.1        9.1        9.1      4320.0      5080.0
 X1    66998     13.0    4320.0    5080.0      540.0      520.0       525.0
 GR    910.0   4105.0     908.0    4225.0      908.0     4310.0       904.0      4320.0       900.0      4340.0
 GR    896.0   4530.0     904.0    4595.0      907.0     4645.0       904.0      4680.0       896.3      5000.0
 GR    900.0   5030.0     904.0    5080.0      916.0     5120.0

 ET               9.1       7.1       9.1        9.1        9.1      4660.6      5125.3      4660.0      5375.0
        PIT IS ASSUMED FULL TO ELEV 900.0
 X1    67548     19.0    4660.0    5130.0      590.0      560.0       550.0
 X3             900.0
 GR    940.0   4320.0     924.0    4355.0      920.0     4420.0       908.0      4460.0       904.0      4490.0
 GR    900.0   4570.0     896.0    4710.0      896.0     4750.0       900.0      4800.0       904.0      4825.0
 GR    904.0   4910.0     900.0    5000.0      904.0     5090.0       908.0      5130.0       912.0      5200.0
 GR    920.0   5225.0     920.0    5285.0      924.0     5305.0       940.0      5375.0

 ET                         7.1      9.1         9.1        9.1      4821.1      5136.7
 X1    68448     18.0    4800.0    5165.0     1050.0      850.0       900.0
 GR    940.0   3955.0     936.0    3990.0      932.0     4195.0       928.0      4245.0       924.0      4350.0
 GR    920.0   4455.0     916.0    4490.0      916.0     4750.0       916.0      4800.0       912.0      4850.0
 GR    908.0   4875.0     905.5    5000.0      908.0     5105.0       912.0      5130.0       924.0      5165.0
 GR    928.0   5190.0     932.0    5205.0      940.0     5225.0

 QT      2.0  15900.0    15900.
 ET               9.1       7.1       9.1        9.1        9.1      4776.7      5137.8      4625.0      5200.0
 X1    69198     14.0    4775.0    5140.0      700.0      730.0       750.0
 GR    930.0   4625.0     920.0    4626.0      920.0     4775.0       916.0      4790.0       912.0      4800.0
 GR    912.0   4970.0     909.6    5000.0      912.0     5040.0       916.0      5120.0       920.0      5140.0
 GR    928.0   5165.0     932.0    5180.0      936.0     5195.0       940.0      5200.0

 NC    0.035    0.035     0.020      0.30        0.5
 QT      2.0   13220.    13220.
 ET               9.1       7.1       9.1        9.1        9.1      4913.2      5080.3      4912.0      5087.0
        NR. EL SOBRANTE LANDFILL - SPECIAL BRD
 X1    69733     11.0    4912.0    5087.0      540.0      550.0       535.0
 GR    929.5    4912.     927.7    4913.0      925.1     4913.2       919.0      4922.2       918.5      4950.2
 GR    917.9   4986.2     918.0    5000.0      918.7     5022.2       919.9      5058.4       926.6      5086.7
 GR    930.2    5087.

 SB      0.9     1.55       2.5                130.0        5.4      1425.0        1.47       920.0       919.8
 QT      2.0  15900.0    15900.
 ET              9.11      7.11      9.11       9.11       9.11      4790.0      5094.2      4440.0      5087.0
 X1    69773     18.0    4790.0    5087.0       40.0       40.0        40.0
 X2      0.0      0.0       1.0     930.2      928.0
 BT     -18.   4220.0     928.0     928.0     4500.0      928.0       928.0      4730.0       928.0       928.0
 BT            4790.0     928.5     928.0     4860.0      929.1       924.0      4910.0      929.48       920.0
 BT            4912.0     929.5     927.7     4922.2      929.6       927.8      4950.2       929.9       928.1
 BT            4986.2     930.3     928.5     5000.0      930.5       928.7      5022.2       930.9       929.1
 BT            5058.4     931.5     929.7     5086.7      932.0       930.2      5087.0       932.0       926.0
 BT            5140.0     932.9     928.0     5320.0      936.0       936.0      5335.0       940.0       940.0
 GR     928.   4220.0     928.0    4500.0      928.0     4730.0       928.0      4790.0       924.0      4860.0
 GR     920.   4910.0     920.0    4912.0      919.0     4922.2       918.5      4950.2       917.9      4986.2
 GR    918.2   5000.0     918.7    5022.2      919.9     5058.4       926.0      5086.7       926.0      5087.0
 GR     928.   5140.0     936.0    5320.0      940.0     5335.0
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NC    0.035     0.035     0.050       0.1        0.3
ET                9.1       7.1       9.1        9.1        9.1     4790.0     5080.0     4435.0     5080.0
X1    69813      11.0    4790.0    5080.0       40.0       40.0       40.0
GR    928.0    4435.0     928.0    4790.0      924.0     4860.0      920.0     4910.0      918.0     5000.0
GR    920.0    5070.0     924.0    5080.0      928.0     5140.0      932.0     5215.0      936.0     5305.0
GR    940.0    5325.0

ET                9.1       7.1       9.1        9.1        9.1     4830.0     5209.1     4470.0     5240.0
X1    70193      12.0    4830.0    5225.0      380.0      360.0      380.0
GR    936.0    4155.0     932.0    4520.0      928.0     4830.0      924.0     4900.0      920.0     4950.0
GR    916.0    4975.0     915.5    5000.0      920.0     5025.0      920.0     5150.0      932.0     5225.0
GR    940.0    5350.0     960.0    5380.0

ET                          7.1       9.1        9.1        9.1     4914.9     5234.5
X1    70743      14.0    4780.0    5280.0      670.0      400.0      550.0
GR    960.0    3280.0     948.0    3350.0      944.0     3815.0      944.0     3990.0      940.0     4645.0
GR    936.0    4780.0     932.0    4910.0      920.0     4950.0      916.0     5000.0      920.0     5040.0
GR    924.0    5210.0     932.0    5240.0      936.0     5280.0      960.0     5310.0

ET                          7.1       9.1        9.1        9.1     4952.9     5243.4
X1    71893      11.0    4945.0    5250.0     1150.0     1000.0     1150.0
GR    960.0    4235.0     944.0    4305.0      940.0     4610.0      936.0     4835.0      936.0     4945.0
GR    932.0    4970.0     928.0    5000.0      932.0     5240.0      940.0     5250.0      944.0     5275.0
GR    960.0    5315.0

ET                9.1       7.1       9.1        9.1        9.1     4480.0     5035.3     4485.0     5130.0
X1    72643      17.0    4700.0    5110.0      530.0      730.0      750.0
GR    960.0    4040.0     944.0    4170.0      940.0     4340.0      940.0     4470.0      944.0     4520.0
GR    944.0    4560.0     940.0    4620.0      940.0     4700.0      936.0     4720.0      938.5     4890.0
GR    936.0    4950.0     932.4    5000.0      948.0     5050.0      949.0     5065.0      948.0     5070.0
GR    960.0    5110.0     980.0    5130.0

ET                9.1       7.1       9.1        9.1        9.1     4606.0     5310.0     4605.0     5101.0
X1    73193      34.0    4900.0    5101.0       40.0      600.0      550.0
GR    956.0    4225.0     952.0    4265.0      948.0     4280.0      944.0     4295.0      942.0     4440.0
GR    944.0    4480.0     944.0    4530.0      940.0     4680.0      940.0     4730.0      940.0     4780.0
GR    940.0    4830.0     940.0    4900.0     940.75     4901.0     939.64     4901.2     938.26    4902.16
GR   937.55   4903.69    937.70   4905.36     938.66    4906.74     940.19    4907.45     940.75    4907.50
GR   943.70   5092.50    942.33   5092.74     940.64    5093.93     939.76    5095.81     939.94    5097.87
GR   941.13   5099.56    943.01   5100.44     943.70    5100.50     944.00    5101.00     944.0     5190.0
GR    944.0    5230.0     944.0    5360.0       948.     5590.0      952.0     5880.0

NC    0.035     0.035     0.015       0.3        0.5
ET               9.11      7.11      9.11       9.11       9.11     4605.0     5310.0     4605.0     5101.0
        PARK CANYON DRIVE - 2 RCP'S
X1    73194      34.0    4900.0    5101.0        1.0        1.0        1.0
BT    -32.0    4280.0     948.0     948.0     4295.0      944.0      944.0     4440.0      944.0      942.0
BT             4480.0     944.0     944.0     4530.0      944.0      944.0     4680.0      944.0      940.0
BT             4730.0     944.0     940.0     4780.0      943.0      940.0     4830.0      944.0      940.0
BT             4900.0     945.0     940.0     4901.0      945.0     940.75    4901.20      945.0     941.86
BT            4902.16     945.0    943.24    4903.69      945.0     943.95    4905.36      945.0      943.8
BT            4906.74     945.0    942.84    4907.45      945.0     941.31     4907.5      945.0     940.75
BT             5092.5     949.0    943.70    5092.74      949.0     945.07    5093.93      949.0     946.76
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BT            5095.81     949.0    947.64    5097.87      949.0     947.46    5099.56      949.0     946.27
BT            5100.44     949.0    944.39     5100.5      949.0     943.70     5101.0      949.0       944.
BT             5190.0    948.75     944.0     5230.0      948.5      944.0     5360.0      948.4       944.
BT             5590.0     948.0     948.0     5880.0      952.0      952.0
GR    956.0    4225.0     952.0    4265.0      948.0     4280.0      944.0     4295.0      942.0     4440.0
GR    944.0    4480.0     944.0    4530.0      940.0     4680.0      940.0     4730.0      940.0     4780.0
GR    940.0    4830.0     940.0    4900.0     940.75     4901.0     939.64     4901.2     938.26    4902.16
GR   937.55   4903.69    937.70   4905.36     938.66    4906.74     940.19    4907.45     940.75    4907.50
GR   943.70   5092.50    942.33   5092.74     940.64    5093.93     939.76    5095.81     939.94    5097.87
GR   941.13   5099.56    943.01   5100.44     943.70    5100.50     944.00    5101.00      944.0     5190.0
GR    944.0    5230.0     944.0    5360.0       948.     5590.0      952.0     5880.0

QT      2.0   15900.0    15900.
ET               9.11      7.11      9.11       9.11       9.11     4605.0     5325.0     4605.0     5101.0
X1    73234      34.0    4900.0    5101.0       40.0       40.0       40.0
BT    -32.0    4280.0     948.0     948.0     4295.0      944.0      944.0     4440.0      944.0      942.0
BT             4480.0     944.0     944.0     4530.0      944.0      944.0     4680.0      944.0      940.0
BT             4730.0     944.0     940.0     4780.0      943.0      940.0     4830.0      944.0      944.0
BT             4900.0     945.0     944.0     4901.0      945.0     940.75    4901.20      945.0     941.86
BT            4902.16     945.0    943.24    4903.69      945.0     943.95    4905.36      945.0      943.8
BT            4906.74     945.0    942.84    4907.45      945.0     941.31     4907.5      945.0     940.75
BT             5092.5     949.0    943.70    5092.74      949.0     945.07    5093.93      949.0     946.76
BT            5095.81     949.0    947.64    5097.87      949.0     947.46    5099.56      949.0     946.27
BT            5100.44     949.0    944.39     5100.5      949.0     943.70     5101.0      949.0       944.
BT             5190.0    948.75     944.0     5230.0      948.5      944.0     5360.0      948.4       944.
BT             5590.0     948.0     948.0     5880.0      952.0      952.0
GR    956.0    4225.0     952.0    4265.0      948.0     4280.0      944.0     4295.0      942.0     4440.0
GR    944.0    4480.0     944.0    4530.0      940.0     4680.0      940.0     4730.0      940.0     4780.0
GR    944.0    4830.0     944.0    4900.0     940.75     4901.0     939.64     4901.2     938.26    4902.16
GR   937.55   4903.69    937.70   4905.36     938.66    4906.74     940.19    4907.45     940.75    4907.50
GR   943.70   5092.50    942.33   5092.74     940.64    5093.93     939.76    5095.81     939.94    5097.87
GR   941.13   5099.56    943.01   5100.44     943.70    5100.50     944.00    5101.00      944.0     5190.0
GR    944.0    5230.0     944.0    5360.0       948.     5590.0      952.0     5880.0

NC    0.035     0.035      0.05       0.1        0.3
ET                9.1       7.1       9.1        9.1        9.1     4605.0     5325.0      4605.     5101.0
X1    73235      34.0    4900.0    5101.0        1.0        1.0        1.0
GR    956.0    4225.0     952.0    4265.0      948.0     4280.0      944.0     4295.0      942.0     4440.0
GR    944.0    4480.0     944.0    4530.0      940.0     4680.0      940.0     4730.0      940.0     4780.0
GR    944.0    4830.0     944.0    4900.0     940.75     4901.0     939.64     4901.2     938.26    4902.16
GR   937.55   4903.69    937.70   4905.36     938.66    4906.74     940.19    4907.45     940.75    4907.50
GR   943.70   5092.50    942.33   5092.74     940.64    5093.93     939.76    5095.81     939.94    5097.87
GR   941.13   5099.56    943.01   5100.44     943.70    5100.50     944.00    5101.00      944.0     5190.0
GR    944.0    5230.0     944.0    5360.0       948.     5590.0      952.0     5880.0

NC    0.050     0.050      0.05       0.1        0.3
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 ET              9.1        7.1        9.1         9.1         9.1      4680.0      5250.0      4630.0      5130.0
 X1    73335    11.0     4680.0     5120.0        90.0        70.0       100.0
 GR    960.0  4300.0      948.0     4415.0       944.0      4555.0       943.7      4680.0       942.5      5000.0
 GR    944.0  5120.0      944.0     5200.0       948.0      5435.0       952.0      5675.0       956.0      6055.0
 GR    960.0  6070.0
```



```
 ET              9.1        7.1        9.1         9.1         9.1      4930.0      5205.0      4920.0      5205.0
 X1    73555    11.0     4930.0     5205.0       360.0       100.0       220.0
 GR     960.  4920.0      948.0     4930.0       944.0      4940.0       943.8      5000.0       944.0      5100.0
 GR    946.0  5205.0       948.     5300.0       952.0      5480.0       956.0      5810.0       956.0      6045.0
 GR    960.0  6060.0

 ET              9.1        7.1        9.1         9.1         9.1      4892.0      5135.0      4820.0      5330.0
 X1    74155    17.0     4885.0     5135.0       600.0       560.0       600.0
 GR   1000.0  4820.0      960.0     4885.0       952.0      4900.0       948.0      4955.0       946.6      5000.0
 GR    948.0  5035.0      952.0     5060.0       952.0      5135.0       956.0      5295.0       960.0      5495.0
 GR    964.0  5685.0      964.0     5725.0       960.0      5755.0       960.0      5790.0       964.0      5855.0
 GR    968.0  5936.0      980.0     5970.0

 ET                         7.1        9.1         9.1         9.1      4940.7      5104.8
        ABANDONED RAIL ROAD BRIDGE
 X1    75005    10.0     4940.0     5120.0       950.0       700.0       850.0
 GR    967.5  4760.0      964.0     4940.0       960.0      4950.0       956.0      4960.0       952.0      4965.0
 GR    953.5  5000.0      952.0     5050.0       956.0      5065.0       960.0      5090.0       967.5      5120.0

 ET              9.1        7.1        9.1         9.1         9.1     4916.99      5202.6      4870.0      5280.0
 X1    75255    18.0     4870.0     5070.0       200.0       300.0       250.0
 GR    972.0  4638.0      960.0     4665.0       956.0      4730.0       956.0      4795.0       960.0      4835.0
 GR    964.0  4850.0      967.6     4870.0       968.0      4900.0       964.0      4940.0       960.0      4950.0
 GR    952.0  4962.0      952.0     5000.0       952.0      5040.0       956.0      5070.0       956.0      5220.0
 GR    960.0  5240.0      964.0     5250.0       968.0      5280.0

 ET              9.1        7.1        9.1         9.1         9.1      4856.8      5243.1      4840.0      5620.0
 X1    75605    11.0     4850.0     5220.0       360.0       420.0       350.0
 GR    1000.  4710.0      960.0     4770.0       960.0      4790.0       968.0      4820.0       968.0      4850.0
 GR    960.0  4900.0      956.0     5000.0       960.0      5220.0       964.0      5440.0       968.0      5560.0
 GR    1000.  5620.0

 ET                         7.1        9.1         9.1         9.1      4890.0      5579.3
 X1    76855    14.0     4890.0     5240.0      1250.0      1250.0      1250.0
 GR    1000.  4370.0      972.0     4520.0       972.0      4575.0       976.0      4770.0       976.0      4790.0
 GR    972.0  4810.0      968.0     4890.0       964.0      4980.0       963.7      5000.0       964.0      5040.0
 GR    964.0  5240.0      964.0     5785.0       968.0      5885.0      1000.0      6020.0

 NC     0.03    0.03       0.03        0.1         0.3
 ET                         7.1        9.1         9.1         9.1      4878.0      5670.0
 X1    78055    15.0     4870.0     5225.0      1200.0      1275.0      1200.0
 GR    1000.  4810.0      992.0     4825.0       988.0      4850.0       980.0      4870.0       976.0      4940.0
 GR    972.0  5000.0      976.0     5030.0       976.0      5225.0       980.0      5300.0       980.0      5560.0
 GR    976.5  5640.0      980.0     5675.0       984.0      5735.0       988.0      5770.0      1000.0      5805.0

 ET                         7.1        9.1         9.1         9.1      4890.0      5300.0
        PIT IS ASSUMED FULL TO ELEV 980.0
 X1    78955    19.0     4890.0     5300.0       750.0       950.0       900.0
 X3            980.0
 GR    1020.  3970.0     1004.0     4055.0      1000.0      4110.0      1000.0      4210.0      1004.0      4280.0
 GR    1004.  4310.0     1000.0     4320.0       988.0      4420.0       988.0      4490.0       984.0      4890.0
 GR     980.  5000.0      980.0     5020.0       968.0      5060.0       964.0      5100.0       960.0      5270.0
 GR     984.  5300.0      988.0     5460.0       988.0      5525.0      1020.0      5610.0
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 ET                         7.1        9.1         9.1         9.1      4943.6      5235.0
        PIT IS ASSUMED FULL TO ELEV 988.0
 X1    79955    15.0     4930.0     5235.0      1000.0       930.0      1000.0
 X3            988.0
 GR    1020.  3810.0     1016.0     4035.0      1012.0      4245.0      1008.0      4410.0      1004.0      4590.0
 GR    1000.  4725.0      996.0     4930.0       968.0      4965.0       966.5      5000.0       968.0      5025.0
 GR    972.0  5180.0      984.0     5205.0       992.0      5235.0      1000.0      5260.0      1020.0      5320.0

 NC    0.045   0.045       0.05        0.1         0.3
 ET                         7.1        9.1         9.1         9.1      4690.0      5080.0
        PIT IS ASSUMED FULL TO ELEV 996.0
 X1    80955    10.0     4690.0     5080.0      1050.0       830.0      1000.0
 X3            996.0
 GR    1040.  4265.0     1008.0     4340.0      1004.0      4525.0      1000.0      4690.0       960.0      4730.0
 GR    960.0  5000.0      960.0     5050.0       1000.      5080.0      1004.0      5095.0      1040.0      5200.0

 NC    0.050   0.050       0.05        0.1         0.3
 ET                         7.1                                         4845.0      5112.0
 X1    81615    12.0     4895.0     5100.0       660.0       660.0       660.0
 GR    1028.  4510.0     1020.0     4545.0      1016.0      4560.0      1012.0      4590.0      1008.2      4835.0
 GR    1008.  4835.0     1004.0     4895.0       999.0      5000.0      1000.0      5020.0      1004.0      5100.0
 GR    1020.  5155.0     1028.0     5170.0

 QT      2.0 12500.0     12500.
 ET              9.1        7.1        9.1         9.1         9.1      4550.0      5046.0      4450.0      5095.0
 X1    82355    14.0     4550.0     5060.0       700.0       700.0       740.0
 GR    1040.  4170.0     1032.0     4210.0      1028.0      4250.0      1024.0      4360.0      1020.0      4390.0
 GR    1016.  4430.0     1012.0     4485.0      1011.7      4550.0      1009.5      4800.0      1008.0      4975.0
 GR   1004.0  5000.0     1008.0     5030.0       1020.      5060.0      1040.0      5095.0

 NC     0.07    0.07       0.07        0.1         0.3
 ET              9.1        7.1        9.1         9.1         9.1      4581.0      5110.0      4580.0      5570.0
 X1    83505    16.0     4780.0     5110.0      1200.0      1100.0      1150.0
 GR    1060.  4155.0     1040.0     4185.0      1028.0      4210.0      1024.0      4230.0      1024.0      4375.0
 GR    1020.  4680.0     1020.0     4705.0      1020.0      4735.0      1023.0      4780.0      1020.0      5000.0
 GR    1024.  5110.0     1024.0     5405.0      1028.0      5515.0      1032.0      5590.0      1036.0      5685.0
 GR    1060.  6145.0
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 ET               9.1       7.1       9.1        9.1        9.1       4895.0     5359.0     4760.0     5470.0
 X1    84655      11.0    4895.0    5200.0     1150.0     1050.0     1150.0
 GR    1060.    4695.0    1040.0    4760.0     1036.0     4780.0     1032.0     4895.0     1032.0     4955.0
 GR    1028.    5000.0    1032.0    5030.0     1032.0     5200.0     1032.0     5490.0     1040.0     5500.0
 GR   1060.0    5545.0

 NC     0.05      0.05      0.07       0.1        0.3
 ET                          7.1       9.1        9.1        9.1       4880.0     5214.0
 X1    85655       6.0    4880.0    5195.0     1000.0      950.0     1000.0
 GR    1080.    4830.0    1044.0    4880.0     1040.0     5000.0     1044.0     5195.0     1048.0     5240.0
 GR    1080.    5315.0
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 ET                          7.1       9.1        9.1        9.1       4755.0     5170.0
 X1    86895      12.0    4755.0    5170.0     1225.0     1245.0     1240.0
 GR    1100.    4660.0    1080.0    4710.0     1060.0     4730.0     1056.0     4755.0     1052.0     4990.0
 GR    1048.    5000.0    1052.0    5050.0     1052.0     5120.0     1056.0     5170.0     1060.0     5190.0
 GR    1080.    5255.0    1100.0    5295.0

 ET                          7.1       9.1        9.1        9.1       4823.7     5372.5
 X1    88145       8.0    4805.0    5410.0      925.0     1300.0     1250.0
 GR    1100.    4770.0    1080.0    4805.0     1068.0     4835.0     1068.2     5000.0     1072.0     5225.0
 GR    1072.    5370.0     1080.    5410.0     1100.0     5515.0

 ET                          7.1       9.1        9.1        9.1       4892.6     5194.9
 X1    89095       9.0    4870.0    5210.0      875.0     1200.0      950.0
 GR    1120.    4815.0    1100.0    4870.0     1088.0     4900.0     1084.0     4935.0     1080.0     5000.0
 GR   1084.0    5030.0    1088.0    5190.0      1100.     5210.0     1120.0     5260.0

 QT      2.0   10450.0   10450.0
 ET                          7.1       9.1        9.1        9.1       4485.0     5021.0
 X1    90395       9.0    4880.0    5080.0     1350.0     1250.0     1300.0
 GR    1140.    4405.0    1120.0    4440.0     1108.0     4485.0     1108.0     4880.0     1104.0     4945.0
 GR    1100.    5000.0    1104.0    5010.0     1120.0     5040.0     1140.0     5080.0

 ET               9.1       7.1       9.1        9.1        9.1       4611.0     5044.0     4580.0     5070.0
 X1    90670      9.0     4580.0    5050.0      700.0      180.0      275.0
 GR    1140.    4400.0    1120.0    4580.0     1116.0     4630.0     1112.0     4960.0     1110.0     5000.0
 GR    1112.    5030.0    1120.0    5050.0     1140.0     5110.0     1160.0     5150.0

 ET                          7.1       9.1        9.1        9.1       4803.0     5015.6
 X1    90745      10.0    4290.0    5040.0      200.0       75.0       75.0
 GR    1140.    4290.0    1132.0    4310.0     1128.0     4320.0     1128.0     4620.0     1124.0     4760.0
 GR    1120.    4800.0    1116.0    4885.0     1112.0     5000.0     1120.0     5015.0     1140.0     5040.0
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *PROF 1
0

 CCHV=     .100 CEHV=     .300
 *SECNO 34400.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=     3940.0    5039.5  TYPE=      1  TARGET=     1099.480
         STARTING WSEL OBTAINED FROM HEC-2 RUN D/S
  34400.000      6.32    678.32    678.32       .00    679.69      1.37       .00       .00    680.00
    24400.0   23036.9    1363.1        .0    2413.0     224.7        .0        .0        .0 100000.00
        .00      9.55      6.07       .00      .035      .060      .000      .000    672.00   3940.00
    .013210        0.        0.        0.         0         4         0       .00   1001.48   5039.48


 FLOW DISTRIBUTION FOR SECNO=  34400.00          CWSEL=    678.32

 STA=    3940.    4120.    4235.    4640.    4870.    5050.
   PER Q=      8.6      9.4     59.8     16.6      5.6
    AREA=    303.9    266.8   1344.6    497.7    224.7
     VEL=      6.9      8.6     10.9      8.2      6.1
   DEPTH=      1.7      2.3      3.3      2.2      3.2

 *SECNO 35425.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.36


 3470 ENCROACHMENT STATIONS=     4370.0    5570.0  TYPE=      1  TARGET=     1200.000
  35425.000      6.82    682.82       .00       .00    683.16       .34      3.37       .10    680.00
    24400.0   11977.6   12408.7      13.7    2236.8    3225.0       6.0      72.7      18.1    680.00
        .04      5.35      3.85      2.30      .035      .060      .035      .000    676.00   4370.00
    .002367      600.     1025.      950.         6         0         0       .00   1174.23   5544.23


 FLOW DISTRIBUTION FOR SECNO=  35425.00          CWSEL=    682.82
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
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     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 STA=    4370.    4580.    4610.    4705.    4750.    4950.    4975.    5540.    5544.
   PER Q=      9.9      3.5     19.7      5.2      9.5      1.2     50.9       .1
    AREA=    592.5    144.6    648.0    217.0    564.2     70.5   3225.0      6.0
     VEL=      4.1      5.9      7.4      5.9      4.1      4.1      3.8      2.3
   DEPTH=      2.8      4.8      6.8      4.8      2.8      2.8      5.7      1.4

 *SECNO 36325.000

 3470 ENCROACHMENT STATIONS=     4585.0    5700.0  TYPE=      1  TARGET=     1115.000
         PIT IS ASSUMED FULL TO ELEV 680.0
  36325.000      5.42    685.42       .00       .00    686.10       .68      2.84       .10    684.00
    24400.0      20.3    6572.6   17807.1      10.0    1739.0    2404.4     177.6      41.8    684.00
        .09      2.02      3.78      7.41      .035      .060      .035      .000    680.00   4700.84
    .003625      830.      900.     1165.         4         0         0       .00    999.16   5700.00


 FLOW DISTRIBUTION FOR SECNO=  36325.00          CWSEL=    685.42

 STA=    4701.    4715.    5145.    5225.    5285.    5305.    5695.    5700.
   PER Q=       .1     26.9      1.5      1.1      1.6     68.3       .5
    AREA=     10.0   1739.0    113.3     85.0     68.3   2112.4     25.4
     VEL=      2.0      3.8      3.2      3.2      5.7      7.9      4.8
   DEPTH=       .7      4.0      1.4      1.4      3.4      5.4      5.1

 CCHV=     .300 CEHV=     .500
 *SECNO 36461.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4675.0    5290.0  TYPE=      1  TARGET=      615.000
  36461.000     12.61    686.61    686.61       .00    689.22      2.62       .83       .97    680.00
    24400.0    4534.1   19514.3     351.5     746.0    1373.3     109.6     194.9      45.9    684.00
        .09      6.08     14.21      3.21      .035      .025      .035      .000    674.00   4733.48
    .003564      100.      136.      400.        20        20         0       .00    465.63   5290.00
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 FLOW DISTRIBUTION FOR SECNO=  36461.00          CWSEL=    686.61

 STA=    4733.    4740.    4795.    4855.    4950.    5120.    5127.    5250.    5285.    5290.
   PER Q=       .1      2.8      3.1     12.6     80.0       .1       .5       .8       .0
    AREA=      8.5    143.4    156.4    437.7   1373.3      8.5     42.5     56.3      2.3
     VEL=      2.9      4.8      4.8      7.0     14.2      2.9      3.0      3.5      1.5
   DEPTH=      1.3      2.6      2.6      4.6      8.1      1.3       .3      1.6       .5

 *SECNO 36486.000
 BTCARD, BRIDGE STENCL=    4675.00   STENCR=    5290.00

 3370 NORMAL BRIDGE, NRD=   7 MIN ELTRD=   684.00 MAX ELLC=   682.50

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4675.0    5290.0  TYPE=      1  TARGET=      615.000
         ROAD X-ING NR. CAJALCO ST. - NORMAL BRD.
  36486.000     14.88    688.88    688.88       .00    691.24      2.36       .13       .08    682.50
    24400.0   14576.8    4207.5    5615.6    1060.1     380.0     633.4     196.1      46.1    681.50
        .09     13.75     11.07      8.87      .035      .025      .035      .000    674.00   4795.61
    .009055       25.       25.       25.        20        15         0   -350.00    494.39   5290.00


 FLOW DISTRIBUTION FOR SECNO=  36486.00          CWSEL=    688.88

 STA=    4796.    4800.    4820.    4895.    4950.    4978.    5023.    5105.    5160.    5290.
   PER Q=       .0      1.9     30.9     22.6      4.3     17.2     16.0      5.3      1.7
    AREA=      1.9     57.5    515.8    378.2    106.6    380.0    361.1    158.2    114.0
     VEL=      2.3      8.1     14.6     14.6     10.0     11.1     10.8      8.2      3.7
   DEPTH=       .4      2.9      6.9      6.9      3.9      8.4      4.4      2.9       .9

 *SECNO 36518.000
 BTCARD, BRIDGE STENCL=    4738.00   STENCR=    5345.00

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.75
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
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     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 3370 NORMAL BRIDGE, NRD=   7 MIN ELTRD=   684.00 MAX ELLC=   682.50

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL

 3470 ENCROACHMENT STATIONS=     4738.0    5345.0  TYPE=      1  TARGET=      607.000
  36518.000     16.78    690.78    689.06       .00    691.80      1.02       .15       .40    682.50
    24400.0   12961.1    3361.3    8077.5    1399.8     465.4    1293.6     198.0      46.5    681.50
        .09      9.26      7.22      6.24      .035      .025      .035      .000    674.00   4796.53
    .002940       32.       32.       32.        26        16         0   -350.00    548.47   5345.00


 FLOW DISTRIBUTION FOR SECNO=  36518.00          CWSEL=    690.78

 STA=    4797.    4800.    4820.    4895.    4950.    4978.    5023.    5105.    5160.    5290.    5345.
   PER Q=       .0      2.5     26.4     19.3      4.8     13.8     16.6      7.0      6.7      2.8
    AREA=      4.8     95.5    658.1    482.6    158.8    465.4    517.7    262.6    360.7    152.6
     VEL=      2.4      6.4      9.8      9.8      7.4      7.2      7.8      6.5      4.5      4.4
   DEPTH=      1.4      4.8      8.8      8.8      5.8     10.3      6.3      4.8      2.8      2.8

 CCHV=     .300 CEHV=     .500
 *SECNO 36519.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.32


 3470 ENCROACHMENT STATIONS=     4738.0    5345.0  TYPE=      1  TARGET=      607.000
  36519.000     19.71    691.71       .00       .00    692.01       .31       .00       .21    684.00
    24400.0    8382.7   13394.0    2623.3    1374.1    4021.5     941.0     198.1      46.5    684.00
        .09      6.10      3.33      2.79      .035      .060      .035      .000    672.00   4760.18
    .000546        1.        1.        1.         2         0         0       .00    584.82   5345.00


 FLOW DISTRIBUTION FOR SECNO=  36519.00          CWSEL=    691.71

 STA=    4760.    4770.    4820.    4850.    5140.    5230.    5345.
   PER Q=       .8     24.4      9.1     54.9      6.7      4.1
    AREA=     77.1    885.6    411.4   4021.5    514.1    426.9
     VEL=      2.6      6.7      5.4      3.3      3.2      2.3
   DEPTH=      7.9     17.7     13.7     13.9      5.7      3.7
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .300 CEHV=     .500
 *SECNO 36669.000

 3470 ENCROACHMENT STATIONS=     4715.0    5215.0  TYPE=      1  TARGET=      500.000
  36669.000     16.32    691.72       .00       .00    692.13       .41       .07       .05    692.00
    24400.0        .0   24400.0        .0        .0    4740.4        .0     216.4      48.1 100000.00
        .10       .00      5.15       .00      .000      .030      .000      .000    675.40   4795.35
    .000424      150.      150.       80.         2         0         0       .00    413.15   5208.49


 FLOW DISTRIBUTION FOR SECNO=  36669.00          CWSEL=    691.72

 STA=    4795.    5215.
   PER Q=    100.0
    AREA=   4740.4
     VEL=      5.1
   DEPTH=     11.5

 *SECNO 36670.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .38


 3370 NORMAL BRIDGE, NRD=  67 MIN ELTRD=   692.50 MAX ELLC=   694.00


 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       692.00 ELREA=       694.00

         RR BRIDGE NR. CAJALCO ST. -  NORMAL BRD.
  36670.000     16.19    691.59       .00       .00    692.27       .67       .00       .13    692.00
    24400.0        .0   24400.0        .0        .0    3703.9        .0     216.5      48.1    694.00
        .10       .00      6.59       .00      .000      .030      .000      .000    675.40   4795.51
    .002968        1.        1.        1.         2         0         0   -709.78    412.85   5208.36


 FLOW DISTRIBUTION FOR SECNO=  36670.00          CWSEL=    691.59

 STA=    4796.    5215.
   PER Q=    100.0
    AREA=   3703.9
     VEL=      6.6
   DEPTH=      9.0
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 36690.000

 3370 NORMAL BRIDGE, NRD=  67 MIN ELTRD=   692.50 MAX ELLC=   694.00


 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       692.00 ELREA=       694.00

  36690.000     16.25    691.65       .00       .00    692.33       .67       .06       .00    692.00
    24400.0        .0   24400.0        .0        .0    3704.3        .0     218.2      48.3    694.00
        .10       .00      6.59       .00      .000      .030      .000      .000    675.40   4795.44
    .002970       20.       20.       20.         2         0         0   -733.98    413.09   5208.53


 FLOW DISTRIBUTION FOR SECNO=  36690.00          CWSEL=    691.65

 STA=    4795.    5215.
   PER Q=    100.0
    AREA=   3704.3
     VEL=      6.6
   DEPTH=      9.0

 CCHV=     .300 CEHV=     .500
 *SECNO 36691.000

 3470 ENCROACHMENT STATIONS=     4740.0    5215.0  TYPE=      1  TARGET=      475.000
  36691.000     16.62    692.02       .00       .00    692.41       .39       .00       .08    692.00
    24400.0        .0   24400.0        .0        .0    4864.6        .0     218.3      48.3 100000.00
        .10       .02      5.02       .00      .000      .060      .000      .000    675.40   4794.72
    .001561        1.        1.        1.         2         0         0       .00    414.63   5209.35


 FLOW DISTRIBUTION FOR SECNO=  36691.00          CWSEL=    692.02

 STA=    4795.    5215.
   PER Q=    100.0
    AREA=   4864.6
     VEL=      5.0
   DEPTH=     11.7

 CCHV=     .100 CEHV=     .300
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 36941.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .43


 3470 ENCROACHMENT STATIONS=     4720.0    5100.0  TYPE=      1  TARGET=      380.000
  36941.000     12.08    692.08       .00       .00    693.47      1.40       .76       .30    700.00
    24400.0        .0   24400.0        .0        .0    2573.8        .1     239.7      50.3    692.00
        .11       .00      9.48       .04      .000      .060      .035      .000    680.00   4769.80
    .008256      380.      250.       90.         2         0         0       .00    296.48   5066.28


 FLOW DISTRIBUTION FOR SECNO=  36941.00          CWSEL=    692.08

 STA=    4770.    5065.
   PER Q=    100.0
    AREA=   2573.8
     VEL=      9.5
   DEPTH=      8.7

 *SECNO 37166.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.10


 3470 ENCROACHMENT STATIONS=     4590.0    5080.0  TYPE=      1  TARGET=      490.000
  37166.000     13.89    693.89       .00       .00    694.34       .45       .77       .09    700.00
    24400.0        .0   24400.0        .0        .0    4527.0        .0     258.0      52.1 100000.00
        .12       .00      5.39       .00      .000      .060      .000      .000    680.00   4677.93
    .001864      230.      225.      200.         2         0         0       .00    396.04   5073.97


 FLOW DISTRIBUTION FOR SECNO=  37166.00          CWSEL=    693.89

 STA=    4678.    5080.
   PER Q=    100.0
    AREA=   4527.0
     VEL=      5.4
   DEPTH=     11.4
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 38166.000
  38166.000     11.45    696.15       .00       .00    696.64       .49      2.29       .01    688.00
    24400.0    3285.8   21114.2        .0     561.8    3762.2        .0     359.9      63.4    700.00
        .17      5.85      5.61       .00      .035      .060      .000      .000    684.70   4604.62
    .002865     1050.     1000.      925.         3         0         0       .00    576.88   5181.50


 FLOW DISTRIBUTION FOR SECNO=  38166.00          CWSEL=    696.15

 STA=    4605.    4640.    4735.    4750.    5220.
   PER Q=      1.2      9.5      2.8     86.5
    AREA=     75.3    394.3     92.3   3762.2
     VEL=      3.8      5.9      7.5      5.6
   DEPTH=      2.1      4.2      6.2      8.7

 *SECNO 39116.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.45

         PIT IS ASSUMED FULL TO ELEV 690.0
  39116.000      8.12    698.12       .00       .00    698.48       .36      1.82       .01    690.00
    24400.0    5519.3   10826.3    8054.4    1093.4    2922.3    1377.3     466.5      78.7    690.00
        .23      5.05      3.70      5.85      .035      .060      .035      .000    690.00   4644.71
    .001371     1250.      950.      625.         2         0         0       .00    788.23   5432.94


 FLOW DISTRIBUTION FOR SECNO=  39116.00          CWSEL=    698.12

 STA=    4645.    4650.    4790.    4806.    4855.    5215.    5250.    5340.    5351.    5355.    5396.    5425.    5433.
   PER Q=       .0      9.5      2.7     10.3     44.4      7.4     19.0      2.4       .6      2.9       .7       .1
    AREA=      5.6    576.4    115.7    395.7   2922.3    284.1    730.6     91.3     26.7    170.8     65.4      8.4
     VEL=      1.6      4.0      5.8      6.4      3.7      6.4      6.4      6.4      5.4      4.1      2.7      1.6
   DEPTH=      1.1      4.1      7.1      8.1      8.1      8.1      8.1      8.1      7.1      4.2      2.2      1.1

 *SECNO 40116.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
1
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


  40116.000      9.76    705.26    705.26       .00    708.29      3.03      3.52       .80    700.00
    24400.0    2297.5   21167.2     935.4     170.2    1501.4      78.4     548.5      91.1    700.00
        .25     13.50     14.10     11.93      .035      .060      .035      .000    695.50   4828.94
    .022175     1000.     1000.     1000.        20        11         0       .00    290.85   5119.79


 FLOW DISTRIBUTION FOR SECNO=  40116.00          CWSEL=    705.26

 STA=    4829.    4840.    4890.    5090.    5120.
   PER Q=       .1      9.3     86.8      3.8
    AREA=      7.0    163.2   1501.4     78.4
     VEL=      4.6     13.9     14.1     11.9
   DEPTH=       .6      3.3      7.5      2.6

 *SECNO 41116.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.55

  41116.000     10.91    714.91       .00       .00    715.58       .67      7.05       .24    708.00
    24400.0    2321.7   18509.9    3568.4     332.4    2892.1     494.5     611.5     100.0    708.00
        .29      6.98      6.40      7.22      .035      .060      .035      .000    704.00   4760.91
    .003403      960.     1000.     1075.         6         0         0       .00    486.37   5247.28


 FLOW DISTRIBUTION FOR SECNO=  41116.00          CWSEL=    714.91

 STA=    4761.    4770.    4835.    5145.    5165.    5180.    5240.    5247.
   PER Q=       .2      9.3     75.9      3.4      2.5      8.6       .1
    AREA=     13.2    319.2   2892.1    108.2     81.2    294.6     10.6
     VEL=      3.1      7.1      6.4      7.6      7.5      7.1      3.0
   DEPTH=      1.5      4.9      9.3      5.4      5.4      4.9      1.5

 *SECNO 42091.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
1
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
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    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3720 CRITICAL DEPTH ASSUMED
 42091.000     14.39    725.59    725.59       .00    727.69      2.10      5.52       .43    740.00
   24400.0        .0   21251.7    3148.3        .0    1735.3     517.3     678.7     111.3    724.00
       .31       .00     12.25      6.09      .000      .060      .035      .000    711.20   4933.23
   .011096      850.      975.     1050.        20        12         0       .00    492.65   5425.88


FLOW DISTRIBUTION FOR SECNO=  42091.00          CWSEL=    725.59

STA=    4933.    5100.    5250.    5425.    5426.
  PER Q=     87.1      6.0      6.9       .0
   AREA=   1735.3    238.4    278.2       .7
    VEL=     12.2      6.1      6.1      2.4
  DEPTH=     10.4      1.6      1.6       .8

*SECNO 42641.000

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     4630.0    5360.0  TYPE=      1  TARGET=      730.000
 42641.000     16.38    730.98       .00       .00    732.08      1.11      4.29       .10    728.50
   24400.0     121.8   23203.0    1075.3      32.7    2711.1     187.6     711.2     116.7    728.00
       .33      3.73      8.56      5.73      .035      .060      .035      .000    714.60   4853.60
   .005827      550.      550.      525.         2         0         0       .00    380.49   5360.00


FLOW DISTRIBUTION FOR SECNO=  42641.00          CWSEL=    730.98

STA=    4854.    4880.    5160.    5190.    5325.    5360.
  PER Q=       .5     95.1      2.3       .6      1.5
   AREA=     32.7   2711.1     89.3     26.8     71.5
    VEL=      3.7      8.6      6.3      5.5      5.1
  DEPTH=      1.2      9.7      3.0       .2      2.0

*SECNO 42956.000
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     4705.0    5315.0  TYPE=      1  TARGET=      610.000
 42956.000     15.21    732.71       .00       .00    734.04      1.33      1.89       .07    732.00
   24400.0      96.9   22505.4    1797.7      36.3    2363.4     330.5     731.4     119.5    728.80
       .34      2.67      9.52      5.44      .035      .060      .035      .000    717.50   4827.78
   .006333      350.      315.      250.         3         0         0       .00    436.48   5315.00


FLOW DISTRIBUTION FOR SECNO=  42956.00          CWSEL=    732.71

STA=    4828.    4880.    5100.    5120.    5205.    5315.
  PER Q=       .4     92.2      1.8      3.6      1.9
   AREA=     36.3   2363.4     62.7    166.6    101.1
    VEL=      2.7      9.5      7.1      5.3      4.6
  DEPTH=       .7     10.8      3.1      2.0       .9

CCHV=     .300 CEHV=     .500
*SECNO 42991.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.70

        ROAD X-ING NR. 3M MAIN OFFICE -  SPECIAL BRD.
 42991.000     14.08    732.58       .00       .00    734.30      1.72       .06       .20    730.00
   24400.0      84.8   23526.2     789.0      54.8    2193.6     416.4     733.5     119.8    728.80
       .34      1.55     10.72      1.89      .035      .020      .035      .000    718.50   4857.72
   .000871       35.       35.       35.         2         0         0       .00    472.36   5330.08


FLOW DISTRIBUTION FOR SECNO=  42991.00          CWSEL=    732.58

STA=    4858.    4900.    5100.    5130.    5280.    5330.
  PER Q=       .3     96.4       .9      1.8       .5
   AREA=     54.8   2193.6     84.9    252.3     79.1
    VEL=      1.5     10.7      2.5      1.8      1.7
  DEPTH=      1.3     11.0      2.8      1.7      1.6
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



SPECIAL BRIDGE
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SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.05      1.32      2.50       .00    140.00     18.00   1393.00      1.75    720.00    719.80

*SECNO 43011.000
BTCARD, BRIDGE STENCL=    4745.00   STENCR=    5300.00

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape


 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD     WEIRLN
                                                                AREA
    738.87    735.04       .74     7666.    16734.     1393.     1395.      730.00    731.80      420.



3470 ENCROACHMENT STATIONS=     4745.0    5300.0  TYPE=      1  TARGET=      555.000
 43011.000     15.93    734.43       .00       .00    735.54      1.11      1.23       .00    730.00
   24400.0     281.4   22491.9    1626.7     153.4    2563.4     739.5     734.9     120.0    728.80
       .34      1.83      8.77      2.20      .035      .020      .035      .000    718.50   4834.61
   .000474       20.       20.       20.         3         0         2       .00    465.39   5300.00


FLOW DISTRIBUTION FOR SECNO=  43011.00          CWSEL=    734.43

STA=    4835.    4860.    4900.    5100.    5130.    5280.    5300.
  PER Q=       .1      1.1     92.2      1.5      4.7       .5
   AREA=     25.8    127.6   2563.4    141.3    529.7     68.6
    VEL=       .9      2.0      8.8      2.6      2.1      1.9
  DEPTH=      1.0      3.2     12.8      4.6      3.5      3.4

CCHV=     .100 CEHV=     .300
*SECNO 43051.000

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .32

 43051.000     16.07    734.47       .00       .00    735.58      1.11       .04       .00    732.00
   24400.0     564.1   20768.4    3067.5     142.0    2351.9     486.4     737.9     120.5    728.00
       .34      3.97      8.83      6.31      .035      .060      .035      .000    718.40   4795.06
   .004508       40.       40.       40.         1         0         0       .00    439.74   5275.10
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


FLOW DISTRIBUTION FOR SECNO=  43051.00          CWSEL=    734.47

STA=    4795.    4835.    4895.    5085.    5110.    5205.    5275.    5275.
  PER Q=       .2      2.1     85.1      3.8      6.8      1.9       .0
   AREA=     27.2    114.8   2351.9    117.8    281.5     87.0       .2
    VEL=      2.2      4.4      8.8      8.0      5.9      5.5       .4
  DEPTH=       .7      1.9     12.4      4.7      3.0      1.2      1.5

*SECNO 43341.000
 43341.000     16.66    735.86       .00       .00    737.35      1.49      1.65       .11    732.00
   24400.0    1183.0   23216.8        .1     210.5    2327.2        .4     756.4     123.1    735.80
       .35      5.62      9.98       .36      .035      .060      .035      .000    719.20   4796.04
   .007291      250.      290.      350.         2         0         0       .00    346.61   5142.65


FLOW DISTRIBUTION FOR SECNO=  43341.00          CWSEL=    735.86

STA=    4796.    4905.    5130.    5143.
  PER Q=      4.8     95.2       .0
   AREA=    210.5   2327.2       .4
    VEL=      5.6     10.0       .4
  DEPTH=      1.9     10.3       .0

CCHV=     .100 CEHV=     .300
*SECNO 44016.000

3301 HV CHANGED MORE THAN HVINS

 44016.000     14.78    741.08       .00       .00    741.96       .88      4.55       .06    740.00
   24400.0      35.2   24352.0      12.8      15.9    3231.5       5.8     801.2     128.2    740.00
       .38      2.22      7.54      2.21      .035      .080      .035      .000    726.30   4855.45
   .006264      650.      675.      750.         2         0         0       .00    315.30   5170.75


FLOW DISTRIBUTION FOR SECNO=  44016.00          CWSEL=    741.08

STA=    4855.    4885.    5160.    5171.
  PER Q=       .1     99.8       .1
   AREA=     15.9   3231.5      5.8
    VEL=      2.2      7.5      2.2
  DEPTH=       .5     11.8       .5
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
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     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 45016.000
  45016.000     11.97    746.97       .00       .00    747.85       .88      5.89       .00    740.00
    24400.0    4033.4   19874.9     491.7     368.1    2997.7      69.5     877.4     136.0    740.00
        .41     10.96      6.63      7.07      .035      .080      .035      .000    735.00   4869.33
    .005670      850.     1000.     1100.         2         0         0       .00    370.64   5239.97


 FLOW DISTRIBUTION FOR SECNO=  45016.00          CWSEL=    746.97

 STA=    4869.    4885.    4930.    5220.    5240.
   PER Q=      1.5     15.0     81.5      2.0
    AREA=     54.6    313.5   2997.7     69.5
     VEL=      6.9     11.7      6.6      7.1
   DEPTH=      3.5      7.0     10.3      3.5

 *SECNO 46166.000
  46166.000     10.48    753.58       .00       .00    754.01       .42      6.11       .05    748.00
    24400.0     413.7   23688.6     297.6      72.7    4544.6      52.0     985.1     149.2    748.00
        .47      5.69      5.21      5.72      .035      .080      .035      .000    743.10   4476.20
    .004888     1300.     1150.     1100.         2         0         0       .00    622.43   5098.62


 FLOW DISTRIBUTION FOR SECNO=  46166.00          CWSEL=    753.58

 STA=    4476.    4500.    4515.    5080.    5099.
   PER Q=       .2      1.5     97.1      1.2
    AREA=     18.9     53.8   4544.6     52.0
     VEL=      2.5      6.8      5.2      5.7
   DEPTH=       .8      3.6      8.0      2.8

 *SECNO 47166.000
  47166.000      9.18    759.98       .00       .00    760.87       .89      6.72       .14    760.00
    24400.0        .0   17703.3    6696.7        .0    2637.0     704.6    1077.1     163.3    756.00
        .51       .00      6.71      9.50      .000      .080      .035      .000    750.80   4900.03
    .009792     1100.     1000.     1000.         3         0         0       .00    599.40   5499.43


 FLOW DISTRIBUTION FOR SECNO=  47166.00          CWSEL=    759.98

 STA=    4900.    5275.    5405.    5499.
   PER Q=     72.6     22.3      5.1
    AREA=   2637.0    516.9    187.7
     VEL=      6.7     10.5      6.6
   DEPTH=      7.0      4.0      2.0

1
    16APR20      10:01:22                                                                                 PAGE   31


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .100 CEHV=     .300
 *SECNO 47916.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.62

  47916.000      8.22    764.62       .00       .00    765.25       .62      4.35       .03    760.00
    24400.0     202.4   24082.2     115.4      45.4    3789.1      26.7    1139.8     173.9    760.00
        .55      4.46      6.36      4.32      .035      .050      .035      .000    756.40   4950.36
    .003746      750.      750.      825.         2         0         0       .00    611.19   5561.55


 FLOW DISTRIBUTION FOR SECNO=  47916.00          CWSEL=    764.62

 STA=    4950.    4970.    5550.    5562.
   PER Q=       .8     98.7       .5
    AREA=     45.4   3789.1     26.7
     VEL=      4.5      6.4      4.3
   DEPTH=      2.3      6.5      2.3

 *SECNO 49016.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .54

  49016.000      7.19    771.19       .00       .00    772.38      1.19      6.96       .17    768.00
    24400.0     137.0   24263.0        .0      21.2    2767.9        .0    1223.8     190.1    780.00
        .58      6.46      8.77       .00      .035      .050      .000      .000    764.00   4971.71
    .012908     1050.     1100.     1375.         3         0         0       .00    673.61   5645.32


 FLOW DISTRIBUTION FOR SECNO=  49016.00          CWSEL=    771.19

 STA=    4972.    4985.    5660.
   PER Q=       .6     99.4
    AREA=     21.2   2767.9
     VEL=      6.5      8.8
   DEPTH=      1.6      4.2

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    16APR20      10:01:22                                                                                 PAGE   32


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
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     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 49916.000
  49916.000      8.50    781.70       .00       .00    783.27      1.57     10.78       .11    780.00
    24400.0      28.8   22751.5    1619.7       7.2    2267.2     155.1    1277.4     201.7    776.00
        .60      3.99     10.03     10.44      .035      .050      .035      .000    773.20   4901.51
    .011294      925.      900.      700.         4         0         0       .00    456.98   5358.49


 FLOW DISTRIBUTION FOR SECNO=  49916.00          CWSEL=    781.70

 STA=    4902.    4910.    5310.    5350.    5358.
   PER Q=       .1     93.2      6.5       .1
    AREA=      7.2   2267.2    147.9      7.2
     VEL=      4.0     10.0     10.8      4.0
   DEPTH=       .8      5.7      3.7       .8

 *SECNO 50376.000

 3301 HV CHANGED MORE THAN HVINS

  50376.000     11.80    786.90       .00       .00    789.40      2.51      5.85       .28    788.00
    24400.0        .0   24400.0        .0        .0    1920.6        .0    1300.2     205.6    792.00
        .61       .00     12.70       .00      .000      .050      .000      .000    775.10   4916.54
    .014579      510.      460.      400.         2         0         0       .00    286.69   5203.23


 FLOW DISTRIBUTION FOR SECNO=  50376.00          CWSEL=    786.90

 STA=    4917.    5250.
   PER Q=    100.0
    AREA=   1920.6
     VEL=     12.7
   DEPTH=      6.7

 *SECNO 51226.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.15
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



 3470 ENCROACHMENT STATIONS=     4530.0    5135.0  TYPE=      1  TARGET=      605.000
  51226.000     13.88    793.88       .00       .00    794.60       .72      5.02       .18    788.00
    24400.0     853.7   23546.3        .0     189.5    3419.0        .0    1354.3     213.5    800.00
        .65      4.51      6.89       .00      .035      .050      .000      .000    780.00   4530.00
    .003168      900.      850.      725.         4         0         0       .00    511.60   5041.60


 FLOW DISTRIBUTION FOR SECNO=  51226.00          CWSEL=    793.88

 STA=    4530.    4605.    4635.    5055.
   PER Q=       .7      2.8     96.5
    AREA=     73.2    116.3   3419.0
     VEL=      2.3      5.9      6.9
   DEPTH=      1.0      3.9      8.4

 *SECNO 51776.000

 3470 ENCROACHMENT STATIONS=     4370.0    5285.0  TYPE=      1  TARGET=      915.000
  51776.000     10.10    795.90       .00       .00    796.71       .82      2.09       .03    792.00
    24400.0    3994.3   20405.7        .0     654.8    2733.2        .0    1394.7     219.4    800.00
        .67      6.10      7.47       .00      .035      .050      .000      .000    785.80   4370.00
    .005461      160.      550.      600.         3         0         0       .00    674.69   5044.69


 FLOW DISTRIBUTION FOR SECNO=  51776.00          CWSEL=    795.90

 STA=    4370.    4610.    5085.
   PER Q=     16.4     83.6
    AREA=    654.8   2733.2
     VEL=      6.1      7.5
   DEPTH=      2.7      6.3

 CCHV=     .300 CEHV=     .500
 *SECNO 52081.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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3470 ENCROACHMENT STATIONS=     4914.1    5099.0  TYPE=      1  TARGET=      184.900
        ROAD X-ING CAJALCO ROAD - SPECIAL BRD.
 52081.000      9.85    798.05    798.05       .00    801.49      3.44      1.27      1.31    852.30
   18580.0        .0   18580.0        .0        .0    1248.2        .0    1410.0     222.1 100000.00
       .67       .00     14.89       .00      .000      .020      .000      .000    788.20   4914.73
   .003262      180.      305.      465.        20         8         0       .00    182.40   5097.13


FLOW DISTRIBUTION FOR SECNO=  52081.00          CWSEL=    798.05

STA=    4915.    5099.
  PER Q=    100.0
   AREA=   1248.2
    VEL=     14.9
  DEPTH=      6.8


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .90      1.51      2.50       .00    190.00      6.00   1711.00      2.32    793.00    792.80

*SECNO 52121.000
BTCARD, BRIDGE STENCL=    4430.00   STENCR=    5099.00
6840, FLOW IS BY WEIR AND LOW FLOW

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.34

3420 BRIDGE W.S.=     799.82 BRIDGE VELOCITY=      14.64     CALCULATED CHANNEL AREA=      1362.

 EGPRS      EGLWC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD      WEIRLN
                                                                 AREA
    802.82    803.15      1.76     4107.    20259.     1711.     1709.     801.40    800.50      596.



3470 ENCROACHMENT STATIONS=     4430.0    5099.0  TYPE=      1  TARGET=      669.000
 52121.000     14.20    802.40       .00       .00    803.15       .75      1.65       .00    796.00
   24400.0    7275.2   17124.8        .0    2445.9    2124.4        .0    1412.6     222.5 100000.00
       .68      2.97      8.06       .00      .035      .020      .000      .000    788.20   4430.00
   .000504       40.       40.       40.         3         0         3       .00    669.00   5099.00
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


FLOW DISTRIBUTION FOR SECNO=  52121.00          CWSEL=    802.40

STA=    4430.    4540.    4645.    4914.    5099.
  PER Q=      1.8      4.8     23.2     70.2
   AREA=    263.6    461.6   1720.7   2124.4
    VEL=      1.7      2.6      3.3      8.1
  DEPTH=      2.4      4.4      6.4     11.5

CCHV=     .100 CEHV=     .300
*SECNO 52626.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4780.0    5140.0  TYPE=      1  TARGET=      360.000
 52626.000     10.02    802.72    802.72       .00    805.37      2.64       .73       .57    797.60
   24400.0        .0   23550.7     849.3        .0    1781.5     125.2    1450.4     228.2    800.00
       .69       .00     13.22      6.78      .000      .050      .035      .000    792.70   4780.00
   .016450      530.      505.      180.        20        16         0       .00    360.00   5140.00


FLOW DISTRIBUTION FOR SECNO=  52626.00          CWSEL=    802.72

STA=    4780.    5050.    5140.
  PER Q=     96.5      3.5
   AREA=   1781.5    125.2
    VEL=     13.2      6.8
  DEPTH=      6.6      1.4

*SECNO 52836.000
 52836.000     11.87    806.07       .00       .00    808.62      2.55      3.24       .01    816.00
   24400.0        .0   24400.0        .0        .0    1905.7        .0    1459.6     229.8    810.00
       .69       .00     12.80       .00      .000      .050      .000      .000    794.20   4865.68
   .014484      210.      210.      210.         2         0         0       .00    279.85   5145.54


FLOW DISTRIBUTION FOR SECNO=  52836.00          CWSEL=    806.07
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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 STA=    4866.    5185.
   PER Q=    100.0
    AREA=   1905.7
     VEL=     12.8
   DEPTH=      6.8

 *SECNO 53676.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.42

  53676.000     15.30    815.30       .00       .00    817.03      1.73      8.34       .08    820.00
    24400.0        .0   24400.0        .0        .0    2308.4        .0    1500.2     235.0    820.00
        .71       .00     10.57       .00      .000      .050      .000      .000    800.00   4919.79
    .007223      840.      840.      840.         3         0         0       .00    266.71   5186.50


 FLOW DISTRIBUTION FOR SECNO=  53676.00          CWSEL=    815.30

 STA=    4920.    5200.
   PER Q=    100.0
    AREA=   2308.4
     VEL=     10.6
   DEPTH=      8.7

 *SECNO 54676.000
  54676.000     14.00    822.00       .00       .00    823.93      1.92      6.83       .06    820.00
    24400.0      14.5   21192.3    3193.1       4.5    1910.3     280.1    1551.8     241.0    813.50
        .74      3.23     11.09     11.40      .035      .050      .035      .000    808.00   4895.50
    .006517     1000.     1000.      950.         4         0         0       .00    257.02   5152.52


 FLOW DISTRIBUTION FOR SECNO=  54676.00          CWSEL=    822.00

 STA=    4895.    4900.    5090.    5120.    5130.    5153.
   PER Q=       .1     86.9     11.4      1.3       .3
    AREA=      4.5   1910.3    217.5     40.0     22.5
     VEL=      3.2     11.1     12.8      8.2      3.4
   DEPTH=      1.0     10.1      7.3      4.0      1.0

1
    16APR20      10:01:22                                                                                      PAGE   37


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 55576.000

 3301 HV CHANGED MORE THAN HVINS

  55576.000     12.57    828.57       .00       .00    829.69      1.11      5.68       .08    840.00
    24400.0        .0   22897.6    1502.4        .0    2661.2     246.3    1605.4     248.7    824.00
        .77       .00      8.60      6.10      .000      .050      .035      .000    816.00   4912.85
    .005929      800.      900.     1050.         2         0         0       .00    463.59   5376.45


 FLOW DISTRIBUTION FOR SECNO=  55576.00          CWSEL=    828.57

 STA=    4913.    5275.    5370.    5376.
   PER Q=     93.8      6.1       .0
    AREA=   2661.2    244.4      1.8
     VEL=      8.6      6.1      1.4
   DEPTH=      7.3      2.6       .3

 *SECNO 56276.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4825.0    5070.0  TYPE=      1  TARGET=      245.000
  56276.000     12.03    836.03    836.03       .00    840.34      4.30      6.83       .96    910.00
    24400.0        .0   24400.0        .0        .0    1465.9        .0    1641.4     254.2 100000.00
        .78       .00     16.64       .00      .000      .050      .000      .000    824.00   4866.56
    .018267      750.      700.     1000.        20         8         0       .00    170.17   5036.74


 FLOW DISTRIBUTION FOR SECNO=  56276.00          CWSEL=    836.03

 STA=    4867.    5070.
   PER Q=    100.0
    AREA=   1465.9
     VEL=     16.6
   DEPTH=      8.6

1
    16APR20      10:01:22                                                                                      PAGE   38


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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 *SECNO 56381.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4815.0    5085.0  TYPE=      1  TARGET=      270.000
  56381.000     12.93    838.93       .00       .00    841.99      3.06      1.53       .12    860.00
    24400.0        .0   24400.0        .0        .0    1737.9        .0    1645.2     254.6 100000.00
        .78       .00     14.04       .00      .000      .050      .000      .000    826.00   4859.91
    .011873      105.      105.      105.         4         0         0       .00    189.41   5049.32


 FLOW DISTRIBUTION FOR SECNO=  56381.00          CWSEL=    838.93

 STA=    4860.    5085.
   PER Q=    100.0
    AREA=   1737.9
     VEL=     14.0
   DEPTH=      9.2

 *SECNO 57601.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.93

         PIT IS ASSUMED FULL TO ELEV 830.0
  57601.000     17.67    847.67       .00       .00    848.90      1.23      6.73       .18    856.00
    24400.0        .0   24400.0        .0        .0    2743.8        .0    1708.0     260.3    860.00
        .82       .00      8.89       .00      .000      .050      .000      .000    830.00   4890.42
    .003171     1245.     1220.     1145.         4         0         0       .00    219.51   5109.94


 FLOW DISTRIBUTION FOR SECNO=  57601.00          CWSEL=    847.67

 STA=    4890.    5150.
   PER Q=    100.0
    AREA=   2743.8
     VEL=      8.9
   DEPTH=     12.5

1
    16APR20      10:01:22                                                                                 PAGE   39


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .300 CEHV=     .500
 *SECNO 57901.000
 3280 CROSS SECTION  57901.00 EXTENDED      9.01 FEET


 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.27


 3470 ENCROACHMENT STATIONS=     4875.0    5190.0  TYPE=      1  TARGET=      315.000
  57901.000     18.00    849.00       .00       .00    849.43       .42       .29       .24    844.60
    19400.0        .0   16313.9    3086.1        .0    2963.0     900.7    1731.0     262.2    840.00
        .84       .00      5.51      3.43      .000      .030      .035      .000    831.00   4875.00
    .000390      280.      300.      330.         2         0         0       .00    315.00   5190.00


 FLOW DISTRIBUTION FOR SECNO=  57901.00          CWSEL=    849.00

 STA=    4875.    5090.    5190.
   PER Q=     84.1     15.9
    AREA=   2963.0    900.7
     VEL=      5.5      3.4
   DEPTH=     13.8      9.0

 *SECNO 57902.000
 BTCARD, BRIDGE STENCL=    4890.00   STENCR=    5235.00
 3280 CROSS SECTION  57902.00 EXTENDED      8.76 FEET


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .24


 3370 NORMAL BRIDGE, NRD=  22 MIN ELTRD=   840.00 MAX ELLC=   842.50


 3470 ENCROACHMENT STATIONS=     4890.0    5235.0  TYPE=      1  TARGET=      345.000
         ABANDONED RAIL ROAD BRIDGE - NORMAL BRD.
  57902.000     17.56    848.76       .00       .00    849.68       .92       .00       .25    842.50
    19400.0      32.3   11829.5    7538.2      15.7    1429.4    1116.8    1731.1     262.2    836.00
        .84      2.06      8.28      6.75      .035      .030      .035      .000    831.20   4890.00
    .006794        1.        1.        1.         8         0         0  -1164.00    345.00   5235.00

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    16APR20      10:01:22                                                                                 PAGE   40


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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 FLOW DISTRIBUTION FOR SECNO=  57902.00          CWSEL=    848.76

 STA=    4890.    4924.    4925.    5075.    5076.    5100.    5235.
   PER Q=       .2       .0     61.0       .1      7.3     31.4
    AREA=     14.9       .8   1429.4      6.2    131.0    979.6
     VEL=      2.0      2.9      8.3      4.5     10.8      6.2
   DEPTH=       .4       .8      9.5      6.2      5.5      7.3

 *SECNO 57922.000
 BTCARD, BRIDGE STENCL=    4892.00   STENCR=    5250.00
 3280 CROSS SECTION  57922.00 EXTENDED      8.84 FEET


 3370 NORMAL BRIDGE, NRD=  21 MIN ELTRD=   840.00 MAX ELLC=   842.50


 3470 ENCROACHMENT STATIONS=     4892.0    5250.0  TYPE=      1  TARGET=      358.000
  57922.000     17.64    848.84       .00       .00    849.79       .94       .10       .01    842.50
    19400.0      31.2    8403.4   10965.5      18.2    1412.4    1221.9    1732.3     262.4    838.10
        .84      1.71      5.95      8.97      .035      .030      .035      .000    831.20   4892.00
    .003572       20.       20.       20.        13         0         0   -830.50    358.00   5250.00


 FLOW DISTRIBUTION FOR SECNO=  57922.00          CWSEL=    848.84

 STA=    4892.    4924.    4925.    5075.    5076.    5250.
   PER Q=       .2       .0     43.3       .2     56.3
    AREA=     17.4       .8   1412.4      5.2   1216.7
     VEL=      1.7      2.3      5.9      7.7      9.0
   DEPTH=       .5       .8      9.4      5.2      7.0

 CCHV=     .100 CEHV=     .300
 *SECNO 57923.000
 3280 CROSS SECTION  57923.00 EXTENDED      5.26 FEET


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.52


 3470 ENCROACHMENT STATIONS=     4890.0    5260.0  TYPE=      1  TARGET=      370.000
  57923.000     17.46    849.26       .00       .00    849.83       .57       .00       .04    848.00
    19400.0      53.2   15991.5    3355.2      35.1    2546.9     683.7    1732.4     262.4    844.00
        .84      1.52      6.28      4.91      .035      .050      .035      .000    831.80   4890.00
    .001540        1.        1.        1.         2         0         0       .00    370.00   5260.00
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 FLOW DISTRIBUTION FOR SECNO=  57923.00          CWSEL=    849.26

 STA=    4890.    4930.    5130.    5260.
   PER Q=       .3     82.4     17.3
    AREA=     35.1   2546.9    683.7
     VEL=      1.5      6.3      4.9
   DEPTH=       .9     12.7      5.3

 *SECNO 58573.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .42

  58573.000     13.83    849.83       .00       .00    852.41      2.58      1.98       .60    860.00
    19400.0        .0   19400.0        .0        .0    1506.4        .0    1767.6     266.2    860.00
        .85       .00     12.88       .00      .000      .050      .000      .000    836.00   4885.88
    .008864      700.      650.      600.         3         0         0       .00    146.41   5032.29


 FLOW DISTRIBUTION FOR SECNO=  58573.00          CWSEL=    849.83

 STA=    4886.    5045.
   PER Q=    100.0
    AREA=   1506.4
     VEL=     12.9
   DEPTH=     10.3

 *SECNO 59723.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.60


 3470 ENCROACHMENT STATIONS=     4850.0    5240.0  TYPE=      1  TARGET=      390.000
  59723.000     10.99    857.89       .00       .00    858.63       .74      6.03       .18    870.00
    19400.0        .0   19400.0        .0        .0    2814.2        .0    1824.6     272.8 100000.00
        .90       .00      6.89       .00      .000      .050      .000      .000    846.90   4850.67
    .003464     1250.     1150.     1100.         4         0         0       .00    352.48   5203.15
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


FLOW DISTRIBUTION FOR SECNO=  59723.00          CWSEL=    857.89

STA=    4851.    5240.
  PER Q=    100.0
   AREA=   2814.2
    VEL=      6.9
  DEPTH=      8.0

*SECNO 60873.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4250.0    5200.0  TYPE=      1  TARGET=      950.000
 60873.000      8.71    868.71    868.71       .00    869.89      1.18      6.61       .13    867.60
   19400.0    2049.0   17351.0        .0     482.0    1905.6        .0    1894.1     290.3 100000.00
       .94      4.25      9.11       .00      .035      .050      .000      .000    860.00   4250.00
   .011116     1300.     1150.     1100.        20        14         0       .00    903.73   5153.73


FLOW DISTRIBUTION FOR SECNO=  60873.00          CWSEL=    868.71

STA=    4250.    4770.    5200.
  PER Q=     10.6     89.4
   AREA=    482.0   1905.6
    VEL=      4.3      9.1
  DEPTH=       .9      5.0

*SECNO 61013.000

3470 ENCROACHMENT STATIONS=     4215.0    5185.0  TYPE=      1  TARGET=      970.000
 61013.000      9.33    870.33       .00       .00    871.04       .71      1.10       .05    868.00
   19400.0    6562.7   12837.3        .0    1206.7    1749.8        .0    1902.6     293.1    880.00
       .94      5.44      7.34       .00      .035      .050      .000      .000    861.00   4215.00
   .005951      135.      140.      130.         2         0         0       .00    896.87   5111.87


FLOW DISTRIBUTION FOR SECNO=  61013.00          CWSEL=    870.33

STA=    4215.    4370.    4808.    5130.
  PER Q=      3.6     30.3     66.2
   AREA=    186.4   1020.3   1749.8
    VEL=      3.7      5.8      7.3
  DEPTH=      1.2      2.3      5.8
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 62073.000

3470 ENCROACHMENT STATIONS=     4580.0    5370.0  TYPE=      1  TARGET=      790.000
 62073.000      8.59    876.59       .00       .00    877.54       .94      6.43       .07    876.00
   19400.0     448.3   13938.1    5013.6     187.0    1735.9     676.8    1969.2     312.6    872.00
       .98      2.40      8.03      7.41      .035      .050      .035      .000    868.00   4580.00
   .006272      940.     1060.     1170.         3         0         0       .00    790.00   5370.00


FLOW DISTRIBUTION FOR SECNO=  62073.00          CWSEL=    876.59

STA=    4580.    4890.    5165.    5370.
  PER Q=      2.3     71.8     25.8
   AREA=    187.0   1735.9    676.8
    VEL=      2.4      8.0      7.4
  DEPTH=       .6      6.3      3.3

*SECNO 63173.000
        PIT IS ASSUMED FULL TO ELEV 871.0
 63173.000     10.71    881.71       .00       .00    882.75      1.04      5.18       .03    876.00
   19400.0    1417.6   17965.6      16.8     241.0    2155.4       7.3    2032.2     326.6    880.00
      1.02      5.88      8.34      2.30      .035      .050      .035      .000    871.00   4788.61
   .003694     1150.     1100.     1050.         3         0         0       .00    304.94   5093.55


FLOW DISTRIBUTION FOR SECNO=  63173.00          CWSEL=    881.71

STA=    4789.    4810.    4870.    5085.    5094.
  PER Q=       .2      7.1     92.6       .1
   AREA=     18.3    222.7   2155.4      7.3
    VEL=      2.3      6.2      8.3      2.3
  DEPTH=       .9      3.7     10.0       .9

*SECNO 64323.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.47
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



3470 ENCROACHMENT STATIONS=     4710.0    5410.0  TYPE=      1  TARGET=      700.000
        PIT IS ASSUMED FULL TO ELEV 875.0
 64323.000      9.11    884.11       .00       .00    884.29       .19      1.46       .08    875.00
   19400.0       8.9   12771.0    6620.1       9.1    3997.2    1652.4    2143.0     340.4    875.00
      1.11       .98      3.19      4.01      .035      .050      .035      .000    875.00   4710.00
   .000608     1000.     1150.     1400.         4         0         0       .00    700.00   5410.00


FLOW DISTRIBUTION FOR SECNO=  64323.00          CWSEL=    884.11

STA=    4710.    4711.    5150.    5240.    5270.    5340.    5410.
  PER Q=       .0     65.8     19.3      5.8      7.7      1.3
   AREA=      9.1   3997.2    819.5    258.2    427.4    147.4
    VEL=      1.0      3.2      4.6      4.4      3.5      1.7
  DEPTH=      9.1      9.1      9.1      8.6      6.1      2.1

*SECNO 65323.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 65323.000     10.51    888.51    888.51       .00    891.11      2.60      1.78       .72    892.00
   19400.0        .0   19400.0        .0        .0    1499.1        .0    2225.1     351.8    900.00
      1.13       .00     12.94       .00      .000      .050      .000      .000    878.00   4798.60
   .021115     1100.     1000.     1000.        20         8         0       .00    288.07   5086.67


FLOW DISTRIBUTION FOR SECNO=  65323.00          CWSEL=    888.51

STA=    4799.    5170.
  PER Q=    100.0
   AREA=   1499.1
    VEL=     12.9
  DEPTH=      5.2

*SECNO 65463.000
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.88

 65463.000     12.43    891.43       .00       .00    892.67      1.24      1.43       .14    888.00
   19400.0     641.5   18758.5        .0     136.5    2071.2        .0    2231.1     352.8    900.00
      1.14      4.70      9.06       .00      .035      .050      .000      .000    879.00   4775.33
   .005982      140.      140.      140.         2         0         0       .00    342.52   5117.85


FLOW DISTRIBUTION FOR SECNO=  65463.00          CWSEL=    891.43

STA=    4775.    4855.    5170.
  PER Q=      3.3     96.7
   AREA=    136.5   2071.2
    VEL=      4.7      9.1
  DEPTH=      1.7      7.9

*SECNO 66473.000

3470 ENCROACHMENT STATIONS=     4285.0    5400.0  TYPE=      1  TARGET=     1115.000
 66473.000      7.73    899.73       .00       .00    900.58       .86      7.88       .04    896.00
   19400.0    1266.0   18134.0        .0     191.2    2426.3        .0    2286.9     365.3    900.00
      1.18      6.62      7.47       .00      .035      .050      .000      .000    892.00   4462.46
   .010611      990.     1010.      940.         4         0         0       .00    738.39   5200.85


FLOW DISTRIBUTION FOR SECNO=  66473.00          CWSEL=    899.73

STA=    4462.    4565.    5210.
  PER Q=      6.5     93.5
   AREA=    191.2   2426.3
    VEL=      6.6      7.5
  DEPTH=      1.9      3.8

*SECNO 66998.000

3265 DIVIDED FLOW
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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  66998.000      8.16    904.16       .00       .00    904.78       .63      4.18       .02    904.00
    19400.0        .0   19400.0        .0        .0    3054.1        .0    2321.2     373.9    904.00
       1.20       .03      6.35       .03      .035      .050      .035      .000    896.00   4319.61
    .006174      540.      525.      520.         2         0         0       .00    680.38   5080.52


 FLOW DISTRIBUTION FOR SECNO=  66998.00          CWSEL=    904.16

 STA=    4320.    5080.
   PER Q=    100.0
    AREA=   3054.1
     VEL=      6.4
   DEPTH=      4.5

 *SECNO 67548.000

 3470 ENCROACHMENT STATIONS=     4660.0    5375.0  TYPE=      1  TARGET=      715.000
         PIT IS ASSUMED FULL TO ELEV 900.0
  67548.000      7.55    907.55       .00       .00    908.44       .89      3.58       .08 100000.00
    19400.0        .0   19400.0        .0        .0    2559.2        .0    2356.6     381.1    908.00
       1.22       .00      7.58       .00      .000      .050      .000      .000    900.00   4660.00
    .006863      590.      550.      560.         3         0         0       .00    465.49   5125.49


 FLOW DISTRIBUTION FOR SECNO=  67548.00          CWSEL=    907.55

 STA=    4660.    5130.
   PER Q=    100.0
    AREA=   2559.2
     VEL=      7.6
   DEPTH=      5.5

 *SECNO 68448.000

 3301 HV CHANGED MORE THAN HVINS

  68448.000      8.78    914.28       .00       .00    915.76      1.48      7.14       .18    916.00
    19400.0        .0   19400.0        .0        .0    1988.7        .0    2403.6     389.2    924.00
       1.24       .00      9.76       .00      .000      .050      .000      .000    905.50   4821.39
    .009289     1050.      900.      850.         2         0         0       .00    315.28   5136.67
```



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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 FLOW DISTRIBUTION FOR SECNO=  68448.00          CWSEL=    914.28

 STA=    4821.    5165.
   PER Q=    100.0
    AREA=   1988.7
     VEL=      9.8
   DEPTH=      6.3

 *SECNO 69198.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4625.0    5200.0  TYPE=      1  TARGET=      575.000
  69198.000      9.97    919.57       .00       .00    920.22       .65      4.37       .08    920.00
    15900.0        .0   15900.0        .0        .0    2455.7        .0    2441.8     395.0    920.00
       1.28       .00      6.47       .00      .000      .050      .000      .000    909.60   4776.64
    .003710      700.      750.      730.         2         0         0       .00    361.18   5137.82


 FLOW DISTRIBUTION FOR SECNO=  69198.00          CWSEL=    919.57

 STA=    4777.    5140.
   PER Q=    100.0
    AREA=   2455.7
     VEL=      6.5
   DEPTH=      6.8

 CCHV=     .300 CEHV=     .500
 *SECNO 69733.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4912.0    5087.0  TYPE=      1  TARGET=      175.000
         NR. EL SOBRANTE LANDFILL - SPECIAL BRD
  69733.000      7.19    925.09    925.09       .00    927.99      2.90      1.89      1.12    979.50
    13220.0        .0   13220.0        .0        .0     967.6        .0    2462.9     398.2 100000.00
       1.29       .00     13.66       .00      .000      .020      .000      .000    917.90   4913.21
    .003317      540.      535.      550.        20        15         0       .00    167.11   5080.32
```



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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
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    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


FLOW DISTRIBUTION FOR SECNO=  69733.00          CWSEL=    925.09

STA=    4913.    5087.
  PER Q=    100.0
   AREA=    967.6
    VEL=     13.7
  DEPTH=      5.8


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .90      1.55      2.50       .00    130.00      5.40   1425.00      1.47    920.00    919.80

*SECNO 69773.000
BTCARD, BRIDGE STENCL=    4440.00   STENCR=    5087.00
6840, FLOW IS BY WEIR AND LOW FLOW

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.15

3420 BRIDGE W.S.=     926.27 BRIDGE VELOCITY=      15.49     CALCULATED CHANNEL AREA=       839.

 EGPRS      EGLWC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD     WEIRLN
                                                                 AREA
    930.20    930.00      1.18     2721.    13227.     1425.     1424.      930.20    928.00      519.



3470 ENCROACHMENT STATIONS=     4440.0    5087.0  TYPE=      1  TARGET=      647.000
 69773.000     11.47    929.37       .00       .00    930.00       .63      2.01       .00    928.00
   15900.0     558.9  15341.1        .0     483.8    2372.8        .0    2464.6     398.6 100000.00
      1.29      1.16      6.47       .00      .035      .020      .000      .000    917.90   4440.00
   .000483       40.       40.       40.         2         0         0       .00    647.00   5087.00


FLOW DISTRIBUTION FOR SECNO=  69773.00          CWSEL=    929.37

STA=    4440.    4500.    4730.    4790.    5087.
  PER Q=       .6      2.3       .6     96.5
   AREA=     82.9    317.9     82.9   2372.8
    VEL=      1.1      1.2      1.2      6.5
  DEPTH=      1.4      1.4      1.4      8.0
```



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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


CCHV=     .100 CEHV=     .300
*SECNO 69813.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .43


3470 ENCROACHMENT STATIONS=     4435.0    5080.0  TYPE=      1  TARGET=      645.000
 69813.000     11.53    929.53       .00       .00    930.05       .52       .04       .01    928.00
   15900.0    1538.4  14361.6        .0     542.0    2382.8        .0    2467.3     399.2 100000.00
      1.29      2.84      6.03       .00      .035      .050      .000      .000    918.00   4435.00
   .002556       40.       40.       40.         2         0         0       .00    645.00   5080.00


FLOW DISTRIBUTION FOR SECNO=  69813.00          CWSEL=    929.53

STA=    4435.    4790.    5080.
  PER Q=      9.7     90.3
   AREA=    542.0   2382.8
    VEL=      2.8      6.0
  DEPTH=      1.5      8.2

*SECNO 70193.000

3470 ENCROACHMENT STATIONS=     4470.0    5240.0  TYPE=      1  TARGET=      770.000
 70193.000     14.93    930.43       .00       .00    930.75       .32       .68       .02    928.00
   15900.0     404.6  15495.4        .0     229.0    3370.4        .0    2495.7     404.5    932.00
      1.31      1.77      4.60       .00      .035      .050      .000      .000    915.50   4641.61
   .001335      380.      380.      360.         2         0         0       .00    573.58   5215.19


FLOW DISTRIBUTION FOR SECNO=  70193.00          CWSEL=    930.43

STA=    4642.    4830.    5225.
  PER Q=      2.5     97.5
   AREA=    229.0   3370.4
    VEL=      1.8      4.6
  DEPTH=      1.2      8.7

*SECNO 70743.000
 70743.000     15.16    931.16       .00       .00    931.58       .42       .80       .03    936.00
   15900.0        .0  15900.0        .0        .0    3044.7        .0    2538.0     410.4    936.00
      1.34       .00      5.22       .00      .000      .050      .000      .000    916.00   4912.81
   .001576      670.      550.      400.         2         0         0       .00    324.04   5236.84
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 FLOW DISTRIBUTION FOR SECNO=  70743.00          CWSEL=    931.16

 STA=    4913.    5280.
   PER Q=    100.0
    AREA=   3044.7
     VEL=      5.2
   DEPTH=      9.4

 *SECNO 71893.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  71893.000      6.74    934.74    934.74       .00    937.03      2.29      4.54       .56    936.00
    15900.0        .0   15900.0        .0        .0    1308.8        .0    2595.5     418.5    940.00
       1.37       .00     12.15       .00      .000      .050      .000      .000    928.00   4952.86
    .022612     1150.     1150.     1000.         4        12         0       .00    290.57   5243.43


 FLOW DISTRIBUTION FOR SECNO=  71893.00          CWSEL=    934.74

 STA=    4953.    5250.
   PER Q=    100.0
    AREA=   1308.8
     VEL=     12.1
   DEPTH=      4.5

 *SECNO 72643.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.19


 3470 ENCROACHMENT STATIONS=     4485.0    5130.0  TYPE=      1  TARGET=      645.000
  72643.000     10.65    943.05       .00       .00    943.75       .69      6.55       .16    940.00
    15900.0    1824.7   14075.3        .0     335.6    2060.3        .0    2626.5     424.8    960.00
       1.40      5.44      6.83       .00      .035      .050      .000      .000    932.40   4485.00
    .004714      530.      750.      730.         5         0         0       .00    483.10   5034.14
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 FLOW DISTRIBUTION FOR SECNO=  72643.00          CWSEL=    943.05

 STA=    4485.    4508.    4620.    4700.    5110.
   PER Q=       .4      1.7      9.4     88.5
    AREA=     21.5     69.9    244.2   2060.3
     VEL=      2.6      3.9      6.1      6.8
   DEPTH=       .9       .6      3.1      6.2

 *SECNO 73193.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .69


 3470 ENCROACHMENT STATIONS=     4605.0    5101.0  TYPE=      1  TARGET=      496.000
  73193.000      6.86    944.41    944.36       .00    946.06      1.65      2.02       .29    940.00
    15900.0   13452.6    2447.4        .0    1223.3     476.3        .0    2643.2     428.4 100000.00
       1.41     11.00      5.14       .00      .035      .050      .000      .000    937.55   4605.00
    .010020       40.      550.      600.         7        14         0       .00    496.00   5101.00


 FLOW DISTRIBUTION FOR SECNO=  73193.00          CWSEL=    944.41

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     15.1     15.8     15.8     15.8     22.1     15.4
    AREA=    255.1    220.1    220.1    220.1    308.1    476.3
     VEL=      9.4     11.4     11.4     11.4     11.4      5.1
   DEPTH=      3.4      4.4      4.4      4.4      4.4      2.4

 CCHV=     .300 CEHV=     .500
 *SECNO 73194.000
 BTCARD, BRIDGE STENCL=    4605.00   STENCR=    5101.00

 3370 NORMAL BRIDGE, NRD=  32 MIN ELTRD=   943.00 MAX ELLC=   947.64

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
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 3720 CRITICAL DEPTH ASSUMED
1
   16APR20      10:01:22                                                                                                         PAGE   52


     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



 3470 ENCROACHMENT STATIONS=     4605.0    5101.0  TYPE=      1  TARGET=      496.000
         PARK CANYON DRIVE - 2 RCP'S
  73194.000      9.80    947.35    947.35       .00    949.21      1.85       .01       .10    940.00
    15900.0   13304.8    2595.2        .0    1229.7     226.6        .0    2643.3     428.4 100000.00
       1.41     10.82     11.45       .00      .035      .015      .000      .000    937.55   4605.00
    .008844        1.        1.        1.        20         9         0  -1708.37    496.00   5101.00


 FLOW DISTRIBUTION FOR SECNO=  73194.00          CWSEL=    947.35

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     40.3      9.4     11.9     11.9     10.1     16.3
    AREA=    476.6    167.7    192.7    192.7    199.8    226.6
     VEL=     13.5      8.9      9.8      9.8      8.0     11.5
   DEPTH=      6.4      3.4      3.9      3.9      2.9      1.1

 *SECNO 73234.000
 BTCARD, BRIDGE STENCL=    4605.00   STENCR=    5101.00

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.73


 3370 NORMAL BRIDGE, NRD=  32 MIN ELTRD=   943.00 MAX ELLC=   947.64


 3470 ENCROACHMENT STATIONS=     4605.0    5101.0  TYPE=      1  TARGET=      496.000
  73234.000     11.23    948.78       .00       .00    949.68       .90       .19       .29    944.00
    15900.0   12313.5    3586.5        .0    1651.6     441.0        .0    2644.9     428.9 100000.00
       1.41      7.46      8.13       .00      .035      .015      .000      .000    937.55   4605.00
    .002964       40.       40.       40.        15         0         0  -1399.43    496.00   5101.00


 FLOW DISTRIBUTION FOR SECNO=  73234.00          CWSEL=    948.78

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     32.8      9.9     11.7     11.7     11.5     22.6
    AREA=    583.9    239.3    264.3    264.3    300.0    441.0
     VEL=      8.9      6.6      7.0      7.0      6.1      8.1
   DEPTH=      7.8      4.8      5.3      5.3      4.3      2.2

1
   16APR20      10:01:22                                                                                                         PAGE   53


     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .100 CEHV=     .300
 *SECNO 73235.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.90


 3470 ENCROACHMENT STATIONS=     4605.0    5101.0  TYPE=      1  TARGET=      496.000
  73235.000     11.89    949.44       .00       .00    949.75       .30       .00       .06    944.00
    15900.0   11315.8    4584.2        .0    2332.2    1488.7        .0    2645.0     428.9 100000.00
       1.41      4.85      3.08       .00      .035      .050      .000      .000    937.55   4605.00
    .000823        1.        1.        1.         2         0         0       .00    496.00   5101.00


 FLOW DISTRIBUTION FOR SECNO=  73235.00          CWSEL=    949.44

 STA=    4605.    4680.    4730.    4780.    4830.    4900.    5101.
   PER Q=     18.9     16.2     16.2     10.9      9.0     28.8
    AREA=    633.6    472.4    472.4    372.4    381.4   1488.7
     VEL=      4.7      5.4      5.4      4.6      3.8      3.1
   DEPTH=      8.4      9.4      9.4      7.4      5.4      7.4

 CCHV=     .100 CEHV=     .300
 *SECNO 73335.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .57


 3470 ENCROACHMENT STATIONS=     4630.0    5130.0  TYPE=      1  TARGET=      500.000
  73335.000      7.00    949.50       .00       .00    949.90       .40       .13       .03    943.70
    15900.0    1286.1   14421.8     192.1     287.1    2799.2      55.0    2652.6     430.0    944.00
       1.42      4.48      5.15      3.49      .050      .050      .050      .000    942.50   4630.00
    .002549       90.      100.       70.         2         0         0       .00    500.00   5130.00


 FLOW DISTRIBUTION FOR SECNO=  73335.00          CWSEL=    949.50

 STA=    4630.    4680.    5120.    5130.
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```
   PER Q=      8.1     90.7      1.2
    AREA=    287.1   2799.2     55.0
     VEL=      4.5      5.2      3.5
   DEPTH=      5.7      6.4      5.5
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      SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
      Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
      TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
      SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 73555.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .40


 3470 ENCROACHMENT STATIONS=     4920.0    5205.0  TYPE=      1  TARGET=      285.000
  73555.000      5.82    949.62       .00       .00    951.52      1.90      1.16       .45    948.00
    15900.0       2.6   15897.4        .0       1.1    1437.0        .0    2664.6     432.0 100000.00
       1.42      2.40     11.06       .00      .050      .050      .000      .000    943.80   4928.65
    .015607      360.      220.      100.         2         0         0       .00    276.35   5205.00


 FLOW DISTRIBUTION FOR SECNO=  73555.00          CWSEL=    949.62

 STA=    4929.    4930.    5205.
   PER Q=       .0    100.0
    AREA=      1.1   1437.0
     VEL=      2.4     11.1
   DEPTH=       .8      5.2

 *SECNO 74155.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50


 3470 ENCROACHMENT STATIONS=     4820.0    5330.0  TYPE=      1  TARGET=      510.000
  74155.000      9.90    956.50       .00       .00    957.58      1.08      5.98       .08    960.00
    15900.0        .0   14060.6    1839.4        .0    1613.7     407.1    2688.2     436.8    952.00
       1.44       .00      8.71      4.52      .000      .050      .050      .000    946.60   4891.55
    .006965      600.      600.      560.         4         0         0       .00    428.69   5320.24


 FLOW DISTRIBUTION FOR SECNO=  74155.00          CWSEL=    956.50

 STA=    4892.    5135.    5295.    5320.
   PER Q=     88.4     11.5       .0
    AREA=   1613.7    400.8      6.4
     VEL=      8.7      4.6      1.0
   DEPTH=      6.6      2.5       .3
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      SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
      Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
      TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
      SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 75005.000

 3301 HV CHANGED MORE THAN HVINS

         ABANDONED RAIL ROAD BRIDGE
  75005.000     11.04    963.04       .00       .00    965.50      2.47      7.50       .42    964.00
    15900.0        .0   15900.0        .0        .0    1261.3        .0    2719.5     442.2    967.50
       1.46       .00     12.61       .00      .000      .050      .000      .000    952.00   4942.41
    .011827      950.      850.      700.         3         0         0       .00    159.74   5102.15


 FLOW DISTRIBUTION FOR SECNO=  75005.00          CWSEL=    963.04

 STA=    4942.    5120.
   PER Q=    100.0
    AREA=   1261.3
     VEL=     12.6
   DEPTH=      7.9

 *SECNO 75255.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.20


 3470 ENCROACHMENT STATIONS=     4870.0    5280.0  TYPE=      1  TARGET=      410.000
  75255.000     14.07    966.07       .00       .00    966.42       .35       .70       .21    967.60
    15900.0        .0    8025.4    7874.6        .0    1642.7    1728.8    2733.8     443.8    956.00
       1.48       .00      4.89      4.55      .000      .050      .050      .000    952.00   4919.29
    .001153      200.      250.      300.         2         0         0       .00    346.24   5265.53
```

```
 FLOW DISTRIBUTION FOR SECNO=  75255.00          CWSEL=    966.07

 STA=    4919.    5070.    5220.    5240.    5250.    5266.
   PER Q=     50.5     44.7      4.1       .6       .1
    AREA=   1642.7   1510.6    161.4     40.7     16.1
     VEL=      4.9      4.7      4.0      2.4      1.0
   DEPTH=     10.9     10.1      8.1      4.1      1.0
```



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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 75605.000

 3470 ENCROACHMENT STATIONS=     4840.0    5620.0  TYPE=      1  TARGET=      780.000
  75605.000     10.63    966.63       .00       .00    966.89       .26       .47       .01    968.00
    15900.0        .0   12668.5    3231.5        .0    2902.6    1125.4    2765.8     448.2    960.00
       1.50       .00      4.36      2.87      .000      .050      .050      .000    956.00   4858.50
    .001344      360.      350.      420.         2         0         0       .00    660.71   5519.20


 FLOW DISTRIBUTION FOR SECNO=  75605.00          CWSEL=    966.63

 STA=    4858.    5220.    5440.    5519.
   PER Q=     79.7     19.5       .9
    AREA=   2902.6   1020.8    104.6
     VEL=      4.4      3.0      1.3
   DEPTH=      8.0      4.6      1.3

 *SECNO 76855.000
  76855.000      5.05    968.75       .00       .00    968.96       .21      2.06       .01    968.00
    15900.0       3.9    5291.3   10604.8       5.6    1490.2    2862.6    2886.2     472.2    964.00
       1.60       .70      3.55      3.70      .050      .050      .050      .000    963.70   4875.07
    .002069     1250.     1250.     1250.         2         0         0       .00   1013.08   5888.15


 FLOW DISTRIBUTION FOR SECNO=  76855.00          CWSEL=    968.75

 STA=    4875.    4890.    5240.    5785.    5885.    5888.
   PER Q=       .0     33.3     62.1      4.6       .0
    AREA=      5.6   1490.2   2586.8    274.6      1.2
     VEL=       .7      3.6      3.8      2.6       .7
   DEPTH=       .4      4.3      4.7      2.7       .4

 CCHV=     .100 CEHV=     .300
 *SECNO 78055.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
```



```
     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  78055.000      7.51    979.51    979.51       .00    981.27      1.76      4.58       .46    980.00
    15900.0        .0   14225.2    1674.8        .0    1289.5     265.0    2970.3     493.9    976.00
       1.63       .00     11.03      6.32      .000      .030      .030      .000    972.00   4878.51
    .008616     1200.     1200.     1275.        20        14         0       .00    511.40   5670.14


 FLOW DISTRIBUTION FOR SECNO=  78055.00          CWSEL=    979.51

 STA=    4879.    5225.    5291.    5640.    5670.
   PER Q=     89.5      4.9      3.9      1.7
    AREA=   1289.5    115.8    103.8     45.4
     VEL=     11.0      6.7      6.0      6.0
   DEPTH=      3.7      1.8       .3      1.5

 *SECNO 78955.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.52

         PIT IS ASSUMED FULL TO ELEV 980.0
  78955.000      5.16    985.16       .00       .00    986.22      1.06      4.88       .07    984.00
    15900.0     141.2   15702.4      56.5      67.3    1885.5      26.9    3006.9     505.1    984.00
       1.66      2.10      8.33      2.10      .030      .030      .030      .000    980.00   4774.02
    .003714      750.      900.      950.         3         0         0       .00    572.37   5346.39


 FLOW DISTRIBUTION FOR SECNO=  78955.00          CWSEL=    985.16

 STA=    4774.    4890.    5300.    5346.
   PER Q=       .9     98.8       .4
    AREA=     67.3   1885.5     26.9
     VEL=      2.1      8.3      2.1
```

```
  DEPTH=       .6      4.6       .6

 *SECNO 79955.000
1
   16APR20     10:01:22                                                                                                   PAGE   58

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
         PIT IS ASSUMED FULL TO ELEV 988.0
  79955.000      4.56    992.56    992.56       .00    994.78      2.23      5.29       .35    996.00
    15900.0        .0   15899.1        .9        .0    1327.7        .5    3044.8     515.1    992.00
       1.68       .00     11.97      1.85      .000      .030      .030      .000    988.00   4934.30
    .008143     1000.     1000.      930.        20        11         0       .00    302.44   5236.75

 FLOW DISTRIBUTION FOR SECNO=  79955.00          CWSEL=    992.56

 STA=    4934.    5235.    5237.
   PER Q=    100.0       .0
    AREA=   1327.7       .5
     VEL=     12.0      1.8
   DEPTH=      4.4       .3

 CCHV=     .100 CEHV=     .300
 *SECNO 80955.000

 3301 HV CHANGED MORE THAN HVINS

         PIT IS ASSUMED FULL TO ELEV 996.0
  80955.000      5.45   1001.45       .00       .00   1002.31       .86      7.39       .14   1000.00
    15900.0      95.1   15796.4       8.5      43.5    2112.1       4.0    3084.9     523.8   1000.00
       1.72      2.19      7.48      2.14      .045      .050      .045      .000    996.00   4630.13
    .006742     1050.     1000.      830.         4         0         0       .00    455.32   5085.44

 FLOW DISTRIBUTION FOR SECNO=  80955.00          CWSEL=   1001.45

 STA=    4630.    4690.    5080.    5085.
   PER Q=       .6     99.3       .1
    AREA=     43.5   2112.1      4.0
     VEL=      2.2      7.5      2.1
   DEPTH=       .7      5.4       .7

1
   16APR20     10:01:22                                                                                                   PAGE   59

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 CCHV=     .100 CEHV=     .300
 *SECNO 81615.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  81615.000      8.23   1007.23   1007.23       .00   1009.81      2.58      6.98       .52   1004.00
    15900.0     439.2   15362.7      98.1      78.2    1174.3      17.9    3110.9     529.2   1004.00
       1.73      5.62     13.08      5.48      .050      .050      .050      .000    999.00   4846.57
    .018931      660.      660.      660.         2        14         0       .00    264.52   5111.10

 FLOW DISTRIBUTION FOR SECNO=  81615.00          CWSEL=   1007.23

 STA=    4847.    4895.    5100.    5111.
   PER Q=      2.8     96.6       .6
    AREA=     78.2   1174.3     17.9
     VEL=      5.6     13.1      5.5
   DEPTH=      1.6      5.7      1.6

 *SECNO 82355.000

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.03

 3470 ENCROACHMENT STATIONS=     4450.0    5095.0  TYPE=      1  TARGET=      645.000
  82355.000     10.57   1014.57       .00       .00   1014.90       .33      4.86       .23   1011.70
    12500.0     629.0   11871.0        .0     221.7    2533.9        .0    3144.9     536.5   1020.00
       1.78      2.84      4.68       .00      .050      .050      .000      .000   1004.00   4450.00
    .002841      700.      740.      700.         5         0         0       .00    596.41   5046.41

 FLOW DISTRIBUTION FOR SECNO=  82355.00          CWSEL=   1014.57

 STA=    4450.    4485.    4550.    5060.
   PER Q=       .7      4.4     95.0
    AREA=     45.2    176.5   2533.9
```

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    VEL=      1.9      3.1      4.7
  DEPTH=      1.3      2.7      5.1
```



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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .100 CEHV=     .300
 *SECNO 83505.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4580.0    5570.0  TYPE=      1  TARGET=      990.000
  83505.000      3.93   1023.93   1023.93       .00   1025.22      1.30      8.50       .29   1023.00
    12500.0    6599.2    5900.8        .0     652.7     746.6        .0    3200.3     551.5   1024.00
       1.81     10.11      7.90       .00      .070      .070      .000      .000   1020.00   4580.00
    .046307     1200.     1150.     1100.         5        15         0       .00    528.05   5108.05


 FLOW DISTRIBUTION FOR SECNO=  83505.00          CWSEL=   1023.93

 STA=    4580.    4680.    4705.    4735.    4780.    5110.
   PER Q=     25.9      8.9     10.7      7.2     47.2
    AREA=    327.3     98.2    117.9    109.3    746.6
     VEL=      9.9     11.4     11.4      8.2      7.9
   DEPTH=      3.3      3.9      3.9      2.4      2.3

 *SECNO 84655.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.24


 3470 ENCROACHMENT STATIONS=     4760.0    5470.0  TYPE=      1  TARGET=      710.000
  84655.000      8.70   1036.70       .00       .00   1036.95       .25     11.62       .10   1032.00
    12500.0     850.1    6687.0    4962.8     312.1    1584.6    1269.9    3259.1     567.3   1032.00
       1.89      2.72      4.22      3.91      .070      .070      .070      .000   1028.00   4776.48
    .004400     1150.     1150.     1050.         7         0         0       .00    693.52   5470.00


 FLOW DISTRIBUTION FOR SECNO=  84655.00          CWSEL=   1036.70

 STA=    4776.    4895.    5200.    5470.
   PER Q=      6.8     53.5     39.7
    AREA=    312.1   1584.6   1269.9
     VEL=      2.7      4.2      3.9
   DEPTH=      2.6      5.2      4.7
```



```
     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .100 CEHV=     .300
 *SECNO 85655.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .32

  85655.000      5.70   1045.70   1045.66       .00   1047.45      1.75     10.05       .45   1044.00
    12500.0       9.8   12399.5      90.8       2.0    1166.0      16.3    3308.3     579.0   1044.00
       1.92      4.86     10.63      5.57      .050      .070      .050      .000   1040.00   4877.64
    .043843     1000.     1000.      950.         8        14         0       .00    336.51   5214.14


 FLOW DISTRIBUTION FOR SECNO=  85655.00          CWSEL=   1045.70

 STA=    4878.    4880.    5195.    5214.
   PER Q=       .1     99.2       .7
    AREA=      2.0   1166.0     16.3
     VEL=      4.9     10.6      5.6
   DEPTH=       .9      3.7       .9

 *SECNO 86895.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.23

  86895.000     11.41   1059.41       .00       .00   1059.75       .34     12.16       .14   1056.00
    12500.0      98.7   12322.7      78.6      36.2    2622.9      29.0    3363.4     590.2   1056.00
       1.99      2.72      4.70      2.71      .050      .070      .050      .000   1048.00   4733.72
    .004206     1225.     1240.     1245.         7         0         0       .00    453.30   5187.02


 FLOW DISTRIBUTION FOR SECNO=  86895.00          CWSEL=   1059.41
```

```
 STA=    4734.    4755.    5170.    5187.
   PER Q=       .8     98.6       .6
    AREA=     36.2   2622.9     29.0
     VEL=      2.7      4.7      2.7
   DEPTH=      1.7      6.3      1.7
```



```
     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 88145.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  88145.000      4.51   1072.51   1072.51       .00   1073.80      1.29     12.88       .29   1080.00
    12500.0        .0   12500.0        .0        .0    1369.0        .0    3421.5     604.5   1080.00
       2.03       .00      9.13       .00      .000      .070      .000      .000   1068.00   4823.73
    .054807      925.     1250.     1300.         5        18         0       .00    548.81   5372.54


 FLOW DISTRIBUTION FOR SECNO=  88145.00          CWSEL=   1072.51

 STA=    4824.    5410.
   PER Q=    100.0
    AREA=   1369.0
     VEL=      9.1
   DEPTH=      2.5

 *SECNO 89095.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.42

  89095.000     10.96   1090.96       .00       .00   1091.68       .72     17.81       .06   1100.00
    12500.0        .0   12500.0        .0        .0    1836.1        .0    3456.4     613.8   1100.00
       2.07       .00      6.81       .00      .000      .070      .000      .000   1080.00   4892.60
    .009365      875.      950.     1200.         7         0         0       .00    302.33   5194.93


 FLOW DISTRIBUTION FOR SECNO=  89095.00          CWSEL=   1090.96

 STA=    4893.    5210.
   PER Q=    100.0
    AREA=   1836.1
     VEL=      6.8
   DEPTH=      6.1
```



```
     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 90395.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
  90395.000      9.55   1109.55   1109.55       .00   1110.60      1.05     16.95       .10   1108.00
    10450.0    3517.0    6933.0        .0     615.5     749.9        .0    3504.6     626.6   1140.00
       2.11      5.71      9.24       .00      .050      .070      .000      .000   1100.00   4479.20
    .020778     1350.     1300.     1250.         6         9         0       .00    541.20   5020.40


 FLOW DISTRIBUTION FOR SECNO=  90395.00          CWSEL=   1109.55

 STA=    4479.    4485.    4880.    5080.
   PER Q=       .2     33.5     66.3
    AREA=      4.5    611.0    749.9
     VEL=      3.5      5.7      9.2
   DEPTH=       .8      1.5      5.3

 *SECNO 90670.000

 3470 ENCROACHMENT STATIONS=     4580.0    5070.0  TYPE=      1  TARGET=      490.000
  90670.000      7.08   1117.08       .00       .00   1117.85       .77      7.22       .03   1120.00
    10450.0        .0   10450.0        .0        .0    1484.2        .0    3516.6     631.6   1120.00
       2.13       .00      7.04       .00      .000      .070      .000      .000   1110.00   4616.42
    .020919      700.      275.      180.         3         0         0       .00    426.29   5042.72


 FLOW DISTRIBUTION FOR SECNO=  90670.00          CWSEL=   1117.08

 STA=    4616.    5050.
   PER Q=    100.0
    AREA=   1484.2
     VEL=      7.0
   DEPTH=      3.5

 *SECNO 90745.000

 3301 HV CHANGED MORE THAN HVINS
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 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
1
    16APR20      10:01:22                                                                                 PAGE   64


     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


  90745.000      7.87   1119.87   1119.87       .00   1122.00      2.13      2.23       .41   1140.00
    10450.0        .0   10450.0        .0        .0     892.3        .0    3518.6     632.2   1140.00
       2.13       .00     11.71       .00      .000      .070      .000      .000   1112.00   4802.75
    .045375      200.       75.       75.        20         8         0       .00    212.00   5014.76


 FLOW DISTRIBUTION FOR SECNO=  90745.00          CWSEL=   1119.87

 STA=    4803.    5040.
   PER Q=    100.0
    AREA=    892.3
     VEL=     11.7
   DEPTH=      4.2

1
    16APR20      10:01:22                                                                                 PAGE   65


 T1      SCHAAF & WHEELER, CONSULTING CIVIL ENGINEERS
 T2      RIVERSIDE COUNTY FIS, FEMA0590
 T3      TEMESCAL WASH            FILE : FLWY-FL1.HEC

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

              3.0                 0.0                                              678.32

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN       ALLDC     IBW       CHNIM     ITRACE

    15.0                -1.0




1
    16APR20      10:01:22                                                                                 PAGE   66


     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *PROF 2
0

 CCHV=     .100 CEHV=     .300
 *SECNO 34400.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=     3940.9    5039.1  TYPE=      1  TARGET=     1098.200
         STARTING WSEL OBTAINED FROM HEC-2 RUN D/S
  34400.000      6.32    678.32    678.32    678.32    679.69      1.37       .00       .00    680.00
    24400.0   23032.9    1367.1        .0    2412.0     224.7        .0        .0        .0 100000.00
        .00      9.55      6.08       .00      .035      .060      .000      .000    672.00   3940.90
    .013210        0.        0.        0.         0         4         0       .00   1000.20   5039.10


 *SECNO 35425.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.25


 3470 ENCROACHMENT STATIONS=     4580.0    5540.0  TYPE=      1  TARGET=      960.000
  35425.000      7.02    683.02       .00    682.82    683.43       .41      3.65       .10    680.00
    24400.0   10684.9   13715.1        .0    1722.8    3337.1        .0      70.4      16.6 100000.00
        .04      6.20      4.11       .00      .035      .060      .000      .000    676.00   4580.00
    .002598      600.     1025.      950.         5         0         0       .00    960.00   5540.00


 *SECNO 36325.000

 3470 ENCROACHMENT STATIONS=     4700.8    5700.0  TYPE=      1  TARGET=      999.200
         PIT IS ASSUMED FULL TO ELEV 680.0
  36325.000      5.65    685.65       .00    685.42    686.26       .61      2.76       .06    684.00
    24400.0      29.8    6643.5   17726.7      13.4    1840.1    2534.8     174.3      38.2    684.00
        .09      2.23      3.61      6.99      .035      .060      .035      .000    680.00   4700.80
    .003068      830.      900.     1165.         4         0         0       .00    999.20   5700.00


1
    16APR20      10:01:22                                                                                 PAGE   67


     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
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    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


CCHV=     .300 CEHV=     .500
*SECNO 36461.000

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4733.5    5290.0  TYPE=      1  TARGET=      556.500
 36461.000     12.62    686.62    686.62    686.61    689.22      2.61       .76      1.00    680.00
   24400.0    4541.0   19505.3     353.7     747.8    1374.6     110.2     192.3      42.3    684.00
       .09      6.07     14.19      3.21      .035      .025      .035      .000    674.00   4733.50
   .003549      100.      136.      400.        20        17         0       .00    465.73   5290.00


*SECNO 36486.000

3370 NORMAL BRIDGE, NRD=   7 MIN ELTRD=   684.00 MAX ELLC=   682.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     4795.6    5290.0  TYPE=      1  TARGET=      494.400
        ROAD X-ING NR. CAJALCO ST. - NORMAL BRD.
 36486.000     15.02    689.02    689.02    688.88    691.23      2.21       .13       .12    682.50
   24400.0   14473.0    4136.8    5790.3    1085.9     386.4     671.3     193.6      42.6    681.50
       .09     13.33     10.71      8.63      .035      .025      .035      .000    674.00   4795.60
   .008281       25.       25.       25.        20        16         0   -350.00    494.40   5290.00


*SECNO 36518.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.63

1
   16APR20      10:01:22                                                                                      PAGE   68


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



3370 NORMAL BRIDGE, NRD=   7 MIN ELTRD=   684.00 MAX ELLC=   682.50


3470 ENCROACHMENT STATIONS=     4797.0    5345.0  TYPE=      1  TARGET=      548.000
 36518.000     16.67    690.67    689.06    690.78    691.73      1.06       .15       .35    682.50
   24400.0   13033.4    3397.3    7969.3    1380.0     460.4    1258.3     195.5      43.0    681.50
       .09      9.44      7.38      6.33      .035      .025      .035      .000    674.00   4797.00
   .003112       32.       32.       32.        18        16         0   -350.00    548.00   5345.00


CCHV=     .300 CEHV=     .500
*SECNO 36519.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.29


3470 ENCROACHMENT STATIONS=     4765.1    5275.4  TYPE=      1  TARGET=      510.300
 36519.000     19.61    691.61       .00    691.71    691.95       .34       .00       .22    684.00
   24400.0    8576.9   13793.3    2029.7    1346.6    3993.6     669.6     195.6      43.0    684.00
       .09      6.37      3.45      3.03      .035      .060      .035      .000    672.00   4765.10
   .000593        1.        1.        1.         2         0         0       .00    510.30   5275.40


CCHV=     .300 CEHV=     .500
*SECNO 36669.000

3470 ENCROACHMENT STATIONS=     4795.4    5208.3  TYPE=      1  TARGET=      412.900
 36669.000     16.24    691.64       .00    691.72    692.06       .42       .07       .04 100000.00
   24400.0        .0   24400.0        .0        .0    4708.0        .0     213.5      44.5 100000.00
       .10       .00      5.18       .00      .000      .030      .000      .000    675.40   4795.44
   .000433      150.      150.       80.         2         0         0       .00    412.82   5208.27


*SECNO 36670.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .38

1
   16APR20      10:01:22                                                                                      PAGE   69


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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 3370 NORMAL BRIDGE, NRD=  67 MIN ELTRD=   692.50 MAX ELLC=   694.00


 3470 ENCROACHMENT STATIONS=     4795.0    5208.2  TYPE=      1  TARGET=      413.200

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       692.00 ELREA=    100000.00

         RR BRIDGE NR. CAJALCO ST. -  NORMAL BRD.
  36670.000     16.12    691.52       .00    691.59    692.19       .67       .00       .13    692.00
    24400.0        .0   24400.0        .0        .0    3703.3        .0     213.6      44.5 100000.00
        .10       .00      6.59       .00      .000      .030      .000      .000    675.40   4795.60
    .002966        1.        1.        1.         2         0         0   -679.16    412.55   5208.15


 *SECNO 36690.000

 3370 NORMAL BRIDGE, NRD=  67 MIN ELTRD=   692.50 MAX ELLC=   694.00


 3470 ENCROACHMENT STATIONS=     4795.5    5208.3  TYPE=      1  TARGET=      412.800

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  36690.000     16.18    691.58       .00    691.65    692.25       .67       .06       .00 100000.00
    24400.0        .0   24400.0        .0        .0    3703.7        .0     215.3      44.7 100000.00
        .10       .00      6.59       .00      .000      .030      .000      .000    675.40   4795.53
    .002968       20.       20.       20.         2         0         0   -703.22    412.77   5208.30


 CCHV=     .300 CEHV=     .500
 *SECNO 36691.000

 3470 ENCROACHMENT STATIONS=     4795.1    5209.1  TYPE=      1  TARGET=      414.000
  36691.000     16.54    691.94       .00    692.02    692.34       .40       .00       .08 100000.00
    24400.0        .0   24400.0        .0        .0    4830.3        .0     215.4      44.7 100000.00
        .10       .00      5.05       .00      .000      .060      .000      .000    675.40   4795.10
    .001597        1.        1.        1.         2         0         0       .00    414.00   5209.10


 CCHV=     .100 CEHV=     .300
 *SECNO 36941.000
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     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .43


 3470 ENCROACHMENT STATIONS=     4770.0    5065.0  TYPE=      1  TARGET=      295.000
  36941.000     12.00    692.00       .00    692.08    693.42      1.42       .78       .31 100000.00
    24400.0        .0   24400.0        .0        .0    2550.9        .0     236.6      46.7 100000.00
        .11       .00      9.57       .00      .000      .060      .000      .000    680.00   4770.00
    .008497      380.      250.       90.         2         0         0       .00    295.00   5065.00


 *SECNO 37166.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.12


 3470 ENCROACHMENT STATIONS=     4678.1    5073.7  TYPE=      1  TARGET=      395.600
  37166.000     13.85    693.85       .00    693.89    694.30       .45       .78       .10 100000.00
    24400.0        .0   24400.0        .0        .0    4510.8        .0     254.9      48.5 100000.00
        .12       .00      5.41       .00      .000      .060      .000      .000    680.00   4678.10
    .001883      230.      225.      200.         2         0         0       .00    395.56   5073.66


 *SECNO 38166.000

 3470 ENCROACHMENT STATIONS=     4640.0    5183.0  TYPE=      1  TARGET=      543.000
  38166.000     11.44    696.14       .00    696.15    696.66       .51      2.34       .02    688.00
    24400.0    2975.8   21424.2        .0     485.7    3758.9        .0     355.6      59.3 100000.00
        .17      6.13      5.70       .00      .035      .060      .000      .000    684.70   4640.00
    .002958     1050.     1000.      925.         3         0         0       .00    541.42   5181.42


 *SECNO 39116.000

 3470 ENCROACHMENT STATIONS=     4779.5    5355.0  TYPE=      1  TARGET=      575.500
         PIT IS ASSUMED FULL TO ELEV 690.0
  39116.000      8.22    698.22       .00    698.12    698.73       .51      2.08       .00    690.00
    24400.0    3915.6   12369.4    8115.0     581.9    2959.8    1147.3     452.4      71.6    690.00
        .22      6.73      4.18      7.07      .035      .060      .035      .000    690.00   4779.50
    .001716     1250.      950.      625.         2         0         0       .00    575.50   5355.00
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 40116.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4840.0    5120.0  TYPE=      1  TARGET=      280.000
  40116.000      9.70    705.20    705.20    705.26    708.32      3.12      4.24       .78    700.00
    24400.0    2199.6   21277.4     923.0     160.0    1488.6      76.5     526.1      81.4    700.00
        .23     13.75     14.29     12.07      .035      .060      .035      .000    695.50   4840.00
    .023058     1000.     1000.     1000.        20        11         0       .00    279.43   5119.43


 *SECNO 41116.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.62


 3470 ENCROACHMENT STATIONS=     4770.0    5240.0  TYPE=      1  TARGET=      470.000
  41116.000     10.97    714.97       .00    714.91    715.64       .67      7.07       .24    708.00
    24400.0    2250.6   18625.2    3524.1     323.3    2911.9     490.0     588.9      90.1    708.00
        .28      6.96      6.40      7.19      .035      .060      .035      .000    704.00   4770.00
    .003369      960.     1000.     1075.         6         0         0       .00    470.00   5240.00


 *SECNO 42091.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4933.0    5425.0  TYPE=      1  TARGET=      492.000
  42091.000     14.37    725.57    725.57    725.59    727.70      2.13      5.51       .44 100000.00
    24400.0        .0   21313.5    3086.5        .0    1731.8     509.8     656.1     101.1    724.00
        .30       .00     12.31      6.05      .000      .060      .035      .000    711.20   4933.29
    .011230      850.      975.     1050.        20        12         0       .00    491.70   5425.00
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 42641.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4880.0    5360.0  TYPE=      1  TARGET=      480.000
  42641.000     16.42    731.02       .00    730.98    732.13      1.11      4.33       .10    728.50
    24400.0        .0   23295.3    1104.7        .0    2721.9     190.5     688.4     106.3    728.00
        .32       .00      8.56      5.80      .000      .060      .035      .000    714.60   4880.00
    .005866      550.      550.      525.         2         0         0       .00    354.08   5360.00


 *SECNO 42956.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=     4880.0    5315.0  TYPE=      1  TARGET=      435.000
  42956.000     15.25    732.75       .00    732.71    734.08      1.33      1.89       .07    732.00
    24400.0        .0   22544.6    1855.4        .0    2372.9     337.7     708.3     108.8    728.80
        .33       .00      9.50      5.50      .000      .060      .035      .000    717.50   4880.00
    .006299      350.      315.      250.         3         0         0       .00    384.27   5315.00


 CCHV=     .300 CEHV=     .500
 *SECNO 42991.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.72


 3470 ENCROACHMENT STATIONS=     4858.0    5330.0  TYPE=      1  TARGET=      472.000
         ROAD X-ING NR. 3M MAIN OFFICE -  SPECIAL BRD.
  42991.000     14.13    732.63       .00    732.58    734.33      1.70       .06       .18    730.00
    24400.0      89.5   23491.7     818.8      57.0    2204.2     428.5     710.5     109.2    728.80
        .33      1.57     10.66      1.91      .035      .020      .035      .000    718.50   4858.00
    .000854       35.       35.       35.         2         0         0       .00    472.00   5330.00
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      1.05      1.32      2.50       .00    140.00     18.00   1393.00      1.75    720.00    719.80

 *SECNO 43011.000

 3301 HV CHANGED MORE THAN HVINS

 PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape


  EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD     WEIRLN
                                                                 AREA
    738.92    735.05       .72     7743.     16656.     1393.     1395.     730.00    731.80      420.



 3470 ENCROACHMENT STATIONS=     4834.4    5300.0  TYPE=      1  TARGET=      465.600
  43011.000     15.96    734.46       .00    734.43    735.56      1.10      1.23       .00    730.00
    24400.0     285.7   22471.5    1642.8     155.6    2570.3     746.4     711.9     109.4    728.80
        .33      1.84      8.74      2.20      .035      .020      .035      .000    718.50   4834.40
    .000468       20.       20.       20.         3         0         2       .00    465.60   5300.00


 CCHV=     .100 CEHV=     .300
 *SECNO 43051.000

 3265 DIVIDED FLOW


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .32


 3470 ENCROACHMENT STATIONS=     4850.0    5275.0  TYPE=      1  TARGET=      425.000
  43051.000     16.09    734.49       .00    734.47    735.61      1.13       .04       .01    732.00
    24400.0     424.2   20862.8    3113.0      93.5    2357.3     490.5     714.9     109.8    728.00
        .33      4.53      8.85      6.35      .035      .060      .035      .000    718.40   4850.00
    .004514       40.       40.       40.         0         0         0       .00    384.70   5275.00


 *SECNO 43341.000

 3470 ENCROACHMENT STATIONS=     4796.0    5130.0  TYPE=      1  TARGET=      334.000
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


  43341.000     16.69    735.89       .00    735.86    737.37      1.48      1.65       .11    732.00
    24400.0    1207.0   23193.0        .0     213.8    2334.1        .0     733.3     112.2 100000.00
        .34      5.65      9.94       .00      .035      .060      .000      .000    719.20   4796.00
    .007210      250.      290.      350.         2         0         0       .00    334.00   5130.00


 CCHV=     .100 CEHV=     .300
 *SECNO 44016.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4885.0    5160.0  TYPE=      1  TARGET=      275.000
  44016.000     14.80    741.10       .00    741.08    741.98       .88      4.55       .06    740.00
    24400.0        .0   24400.0        .0        .0    3234.8        .0     778.1     116.9 100000.00
        .36       .00      7.54       .00      .000      .080      .000      .000    726.30   4885.00
    .006333      650.      675.      750.         2         0         0       .00    275.00   5160.00


 *SECNO 45016.000

 3470 ENCROACHMENT STATIONS=     4869.0    5240.0  TYPE=      1  TARGET=      371.000
  45016.000     12.00    747.00       .00    746.97    747.87       .88      5.89       .00    740.00
    24400.0    4040.8   19864.4     494.7     369.7    3005.3      70.1     854.2     124.2    740.00
        .40     10.93      6.61      7.06      .035      .080      .035      .000    735.00   4869.27
    .005617      850.     1000.     1100.         2         0         0       .00    370.73   5240.00


 *SECNO 46166.000

 3470 ENCROACHMENT STATIONS=     4500.0    5099.0  TYPE=      1  TARGET=      599.000
  46166.000     10.49    753.59       .00    753.58    754.01       .43      6.10       .04    748.00
    24400.0     344.0   23757.4     298.7      53.8    4546.0      52.1     961.7     137.1    748.00
        .46      6.39      5.23      5.74      .035      .080      .035      .000    743.10   4500.00
    .004911     1300.     1150.     1100.         2         0         0       .00    598.63   5098.63


 *SECNO 47166.000

 3470 ENCROACHMENT STATIONS=     4900.0    5500.0  TYPE=      1  TARGET=      600.000
  47166.000      9.19    759.99       .00    759.98    760.88       .89      6.72       .14    760.00
    24400.0        .0   17692.8    6707.2        .0    2640.5     706.7    1053.6     150.9    756.00
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       .50       .00      6.70      9.49      .000      .080      .035      .000    750.80   4900.02
    .009738     1100.     1000.     1000.         3         0         0       .00    599.63   5499.65
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      SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
      Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
      TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
      SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .100 CEHV=     .300
 *SECNO 47916.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.59


 3470 ENCROACHMENT STATIONS=     4970.0    5550.0  TYPE=      1  TARGET=      580.000
  47916.000      8.27    764.67       .00    764.62    765.30       .63      4.40       .03    760.00
    24400.0        .0   24400.0        .0        .0    3816.0        .0    1115.9     161.2 100000.00
        .53       .00      6.39       .00      .000      .050      .000      .000    756.40   4970.00
    .003837      750.      750.      825.         2         0         0       .00    580.00   5550.00


 *SECNO 49016.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .56


 3470 ENCROACHMENT STATIONS=     4972.0    5645.0  TYPE=      1  TARGET=      673.000
  49016.000      7.25    771.25       .00    771.19    772.41      1.16      6.95       .16    768.00
    24400.0     143.3   24256.7        .0      22.0    2808.9        .0    1199.8     177.1 100000.00
        .57      6.51      8.64       .00      .035      .050      .000      .000    764.00   4972.00
    .012281     1050.     1100.     1375.         3         0         0       .00    673.00   5645.00


 *SECNO 49916.000

 3470 ENCROACHMENT STATIONS=     4910.0    5350.0  TYPE=      1  TARGET=      440.000
  49916.000      8.46    781.66       .00    781.70    783.27      1.61     10.72       .14    780.00
    24400.0        .0   22850.2    1549.8        .0    2251.3     146.3    1253.5     188.5    776.00
        .59       .00     10.15     10.59      .000      .050      .035      .000    773.20   4910.00
    .011728      925.      900.      700.         4         0         0       .00    440.00   5350.00


 *SECNO 50376.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4914.3    5204.6  TYPE=      1  TARGET=      290.300
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      SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
      Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
      TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
      SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


  50376.000     11.86    786.96       .00    786.90    789.42      2.46      5.90       .25 100000.00
    24400.0        .0   24400.0        .0        .0    1940.5        .0    1276.3     192.3 100000.00
        .60       .00     12.57       .00      .000      .050      .000      .000    775.10   4915.50
    .014195      510.      460.      400.         2         0         0       .00    288.36   5203.86


 *SECNO 51226.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.10


 3470 ENCROACHMENT STATIONS=     4605.0    5041.8  TYPE=      1  TARGET=      436.800
  51226.000     13.88    793.88       .00    793.88    794.62       .74      5.03       .17    788.00
    24400.0     660.3   23739.7        .0     116.3    3418.9        .0    1329.8     199.4 100000.00
        .64      5.68      6.94       .00      .035      .050      .000      .000    780.00   4605.00
    .003221      900.      850.      725.         4         0         0       .00    436.60   5041.60


 *SECNO 51776.000

 3470 ENCROACHMENT STATIONS=     4370.0    5047.5  TYPE=      1  TARGET=      677.500
  51776.000     10.12    795.92       .00    795.90    796.73       .81      2.10       .02    792.00
    24400.0    4027.1   20372.9        .0     661.6    2745.5        .0    1370.1     205.2 100000.00
        .66      6.09      7.42       .00      .035      .050      .000      .000    785.80   4370.00
    .005364      160.      550.      600.         3         0         0       .00    674.77   5044.77


 CCHV=     .300 CEHV=     .500
 *SECNO 52081.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
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 3470 ENCROACHMENT STATIONS=     4914.2    5097.9  TYPE=      1  TARGET=      183.700
         ROAD X-ING CAJALCO ROAD - SPECIAL BRD.
  52081.000       9.86    798.06    798.06    798.05    801.49      3.44      1.25      1.31 100000.00
    18580.0         .0   18580.0        .0        .0    1249.0        .0    1385.5     207.8 100000.00
        .66        .00     14.88       .00      .000      .020      .000      .000    788.20   4914.73
    .003256       180.      305.      465.        20         8         0       .00    182.41   5097.14
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .90      1.51      2.50       .00    190.00      6.00   1711.00      2.32    793.00    792.80

 *SECNO 52121.000
 6840, FLOW IS BY WEIR AND LOW FLOW

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.81

 3420 BRIDGE W.S.=     799.31 BRIDGE VELOCITY=      14.57     CALCULATED CHANNEL AREA=      1254.

  EGPRS      EGLWC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD      WEIRLN
                                                                  AREA
    802.83    802.61      1.26     5782.    18579.     1711.     1709.      801.40    800.50       866.



 3470 ENCROACHMENT STATIONS=     4558.0    5099.0  TYPE=      1  TARGET=      541.000
  52121.000      13.40    801.60       .00    802.40    802.61      1.01      1.11       .00    796.00
    24400.0     6325.4   18074.6        .0    1849.8    1977.2        .0    1387.8     208.2 100000.00
        .66       3.42      9.14       .00      .035      .020      .000      .000    788.20   4558.00
    .000709        40.       40.       40.         3         0         2       .00    541.00   5099.00


 CCHV=      .100 CEHV=      .300
 *SECNO 52626.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4780.0    5137.0  TYPE=      1  TARGET=      357.000
  52626.000      10.00    802.70    802.70    802.72    805.37      2.67       .98       .50    797.60
    24400.0         .0   23556.4     843.6        .0    1774.2     122.6    1421.1     213.1    800.00
        .68        .00     13.28      6.88      .000      .050      .035      .000    792.70   4780.00
    .016683       530.      505.      180.        20        19         0       .00    357.00   5137.00
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 52836.000

 3470 ENCROACHMENT STATIONS=     4864.0    5150.5  TYPE=      1  TARGET=      286.500
  52836.000      11.89    806.09       .00    806.07    808.62      2.53      3.24       .01 100000.00
    24400.0         .0   24400.0        .0        .0    1912.2        .0    1430.2     214.7 100000.00
        .68        .00     12.76       .00      .000      .050      .000      .000    794.20   4865.64
    .014335       210.      210.      210.         2         0         0       .00    280.07   5145.71


 *SECNO 53676.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41


 3470 ENCROACHMENT STATIONS=     4919.3    5187.8  TYPE=      1  TARGET=      268.500
  53676.000      15.29    815.29       .00    815.30    817.03      1.74      8.33       .08 100000.00
    24400.0         .0   24400.0        .0        .0    2304.7        .0    1470.9     220.0 100000.00
        .70        .00     10.59       .00      .000      .050      .000      .000    800.00   4919.82
    .007258       840.      840.      840.         3         0         0       .00    266.61   5186.43


 *SECNO 54676.000

 3470 ENCROACHMENT STATIONS=     4900.0    5130.0  TYPE=      1  TARGET=      230.000
  54676.000      14.03    822.03       .00    822.00    823.99      1.96      6.90       .07    820.00
    24400.0         .0   21278.5    3121.5        .0    1915.5     258.6    1522.2     225.6    813.50
        .73        .00     11.11     12.07      .000      .050      .035      .000    808.00   4900.00
    .006603      1000.     1000.      950.         4         0         0       .00    230.00   5130.00
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 *SECNO 55576.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4913.0    5370.0  TYPE=      1  TARGET=      457.000
  55576.000     12.62    828.62       .00    828.57    829.72      1.10      5.64       .09 100000.00
    24400.0        .0   22877.0    1523.0        .0    2679.2     249.2    1575.7     233.0    824.00
        .76       .00      8.54      6.11      .000      .050      .035      .000    816.00   4913.00
    .005786      800.      900.     1050.         2         0         0       .00    457.00   5370.00
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 56276.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4866.7    5036.6  TYPE=      1  TARGET=      169.900
  56276.000     11.97    835.97    835.97    836.03    840.34      4.37      6.78       .98 100000.00
    24400.0        .0   24400.0        .0        .0    1454.5        .0    1611.8     238.3 100000.00
        .77       .00     16.78       .00      .000      .050      .000      .000    824.00   4866.76
    .018698      750.      700.     1000.        20        11         0       .00    169.84   5036.60


 *SECNO 56381.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4859.8    5049.4  TYPE=      1  TARGET=      189.600
  56381.000     12.97    838.97       .00    838.93    842.00      3.03      1.53       .13 100000.00
    24400.0        .0   24400.0        .0        .0    1745.5        .0    1615.7     238.8 100000.00
        .77       .00     13.98       .00      .000      .050      .000      .000    826.00   4859.80
    .011719      105.      105.      105.         4         0         0       .00    189.60   5049.40


 *SECNO 57601.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.92


 3470 ENCROACHMENT STATIONS=     4890.5    5109.9  TYPE=      1  TARGET=      219.400
         PIT IS ASSUMED FULL TO ELEV 830.0
  57601.000     17.66    847.66       .00    847.67    848.89      1.23      6.71       .18 100000.00
    24400.0        .0   24400.0        .0        .0    2740.9        .0    1678.5     244.5 100000.00
        .81       .00      8.90       .00      .000      .050      .000      .000    830.00   4890.50
    .003181     1245.     1220.     1145.         4         0         0       .00    219.39   5109.89
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .300 CEHV=     .500
 *SECNO 57901.000
 3280 CROSS SECTION  57901.00 EXTENDED      8.82 FEET


 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.94


 3470 ENCROACHMENT STATIONS=     4875.0    5114.6  TYPE=      1  TARGET=      239.600
  57901.000     17.82    848.82       .00    849.00    849.43       .62       .36       .18    844.60
    19400.0        .0   18659.6     740.4        .0    2923.5     217.0    1698.8     246.1    840.00
        .82       .00      6.38      3.41      .000      .030      .035      .000    831.00   4875.00
    .000533      280.      300.      330.         2         0         0       .00    239.60   5114.60


 *SECNO 57902.000
 3280 CROSS SECTION  57902.00 EXTENDED      8.60 FEET


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .35


 3370 NORMAL BRIDGE, NRD=  22 MIN ELTRD=   840.00 MAX ELLC=   842.50
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 3470 ENCROACHMENT STATIONS=     4891.0    5235.0  TYPE=      1  TARGET=      344.020
        ABANDONED RAIL ROAD BRIDGE - NORMAL BRD.
  57902.000     17.40    848.60       .00    848.76    849.66      1.06       .00       .22    842.50
    19400.0      13.1    9195.6   10191.3      10.1    1405.5    1065.2    1698.9     246.1    836.00
        .82      1.29      6.54      9.57      .035      .030      .035      .000    831.20   4892.04
    .004343        1.        1.        1.         2         0         0  -1190.13    342.96   5235.00


 *SECNO 57922.000
 3280 CROSS SECTION  57922.00 EXTENDED      8.82 FEET


 3370 NORMAL BRIDGE, NRD=  21 MIN ELTRD=   840.00 MAX ELLC=   842.50
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



 3470 ENCROACHMENT STATIONS=     4892.9    5250.0  TYPE=      1  TARGET=      357.100
  57922.000     17.62    848.82       .00    848.84    849.77       .95       .08       .03    842.50
    19400.0      29.4    8409.8   10960.8      17.4    1409.3    1218.4    1700.1     246.2    838.10
        .82      1.69      5.97      9.00      .035      .030      .035      .000    831.20   4892.90
    .003603       20.       20.       20.         2         0         0   -830.50    357.10   5250.00


 CCHV=     .100 CEHV=     .300
 *SECNO 57923.000
 3280 CROSS SECTION  57923.00 EXTENDED      5.23 FEET


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.51


 3470 ENCROACHMENT STATIONS=     4930.0    5259.0  TYPE=      1  TARGET=      329.000
  57923.000     17.43    849.23       .00    849.26    849.81       .58       .00       .04    848.00
    19400.0        .0   16058.8    3341.2        .0    2541.9     675.3    1700.1     246.3    844.00
        .82       .00      6.32      4.95      .000      .050      .035      .000    831.80   4930.00
    .001576        1.        1.        1.         2         0         0       .00    329.00   5259.00


 *SECNO 58573.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .42


 3470 ENCROACHMENT STATIONS=     4885.1    5032.9  TYPE=      1  TARGET=      147.800
  58573.000     13.85    849.85       .00    849.83    852.42      2.57      2.01       .60 100000.00
    19400.0        .0   19400.0        .0        .0    1508.8        .0    1735.0     249.7 100000.00
        .84       .00     12.86       .00      .000      .050      .000      .000    836.00   4885.86
    .008820      700.      650.      600.         3         0         0       .00    146.46   5032.31


 *SECNO 59723.000

 3301 HV CHANGED MORE THAN HVINS
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.60


 3470 ENCROACHMENT STATIONS=     4850.7    5203.1  TYPE=      1  TARGET=      352.400
  59723.000     10.99    857.89       .00    857.89    858.63       .74      6.02       .18 100000.00
    19400.0        .0   19400.0        .0        .0    2813.5        .0    1792.1     256.3 100000.00
        .88       .00      6.90       .00      .000      .050      .000      .000    846.90   4850.70
    .003466     1250.     1150.     1100.         4         0         0       .00    352.40   5203.10


 *SECNO 60873.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4450.0    5151.6  TYPE=      1  TARGET=      701.600
  60873.000      8.52    868.52    868.52    868.71    869.99      1.47      7.12       .22    867.60
    19400.0    1126.6   18273.4        .0     259.2    1833.8        .0    1857.3     270.8 100000.00
        .92      4.35      9.96       .00      .035      .050      .000      .000    860.00   4450.00
    .013929     1300.     1150.     1100.        20        16         0       .00    701.60   5151.60


 *SECNO 61013.000

 3301 HV CHANGED MORE THAN HVINS
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 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.59


 3470 ENCROACHMENT STATIONS=     4370.0    5112.9  TYPE=      1  TARGET=      742.900
  61013.000      9.51    870.51       .00    870.33    871.22       .71      1.16       .08    868.00
    19400.0    6382.4   13017.6        .0    1098.6    1804.1        .0    1865.2     273.1 100000.00
        .92      5.81      7.22       .00      .035      .050      .000      .000    861.00   4370.00
    .005535      135.      140.      130.         2         0         0       .00    742.20   5112.20


 *SECNO 62073.000
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



 3470 ENCROACHMENT STATIONS=     4890.0    5370.0  TYPE=      1  TARGET=      480.000
  62073.000      8.62    876.62       .00    876.59    877.62      1.00      6.31       .09    876.00
    19400.0        .0   14241.6    5158.4        .0    1742.2     681.5    1929.4     287.6    872.00
        .96       .00      8.17      7.57      .000      .050      .035      .000    868.00   4890.00
    .006489      940.     1060.     1170.         3         0         0       .00    480.00   5370.00


 *SECNO 63173.000

 3470 ENCROACHMENT STATIONS=     4816.0    5085.0  TYPE=      1  TARGET=      269.000
         PIT IS ASSUMED FULL TO ELEV 871.0
  63173.000     10.81    881.81       .00    881.71    882.84      1.03      5.21       .01    876.00
    19400.0    1362.4   18037.6        .0     216.6    2177.0        .0    1989.9     296.9 100000.00
       1.00      6.29      8.29       .00      .035      .050      .000      .000    871.00   4816.00
    .003641     1150.     1100.     1050.         3         0         0       .00    269.00   5085.00


 *SECNO 64323.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.19


 3470 ENCROACHMENT STATIONS=     4711.0    5247.9  TYPE=      1  TARGET=      536.900
         PIT IS ASSUMED FULL TO ELEV 875.0
  64323.000      9.36    884.36       .00    884.11    884.61       .25      1.68       .08    875.00
    19400.0        .0   14783.3    4616.7        .0    4113.1     916.2    2090.2     307.8    875.00
       1.08       .00      3.59      5.04      .000      .050      .035      .000    875.00   4711.00
    .000761     1000.     1150.     1400.         3         0         0       .00    536.90   5247.90


 *SECNO 65323.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4799.4    5086.4  TYPE=      1  TARGET=      287.000
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


  65323.000     10.47    888.47    888.47    888.51    891.11      2.64      2.16       .72 100000.00
    19400.0        .0   19400.0        .0        .0    1487.4        .0    2165.0     317.2 100000.00
       1.10       .00     13.04       .00      .000      .050      .000      .000    878.00   4799.52
    .021553     1100.     1000.     1000.        20         8         0       .00    286.86   5086.38


 *SECNO 65463.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.81


 3470 ENCROACHMENT STATIONS=     4855.0    5117.7  TYPE=      1  TARGET=      262.700
  65463.000     12.39    891.39       .00    891.43    892.77      1.37      1.53       .13    888.00
    19400.0        .0   19400.0        .0        .0    2061.9        .0    2170.7     318.1 100000.00
       1.10       .00      9.41       .00      .000      .050      .000      .000    879.00   4855.00
    .006601      140.      140.      140.         2         0         0       .00    262.70   5117.70


 *SECNO 66473.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4463.0    5210.0  TYPE=      1  TARGET=      747.000
  66473.000      7.88    899.88       .00    899.73    900.66       .78      7.84       .06    896.00
    19400.0    1358.2   18041.8        .0     207.4    2527.9        .0    2226.3     329.8 100000.00
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      1.14      6.55      7.14       .00      .035      .050      .000      .000    892.00   4463.00
    .009264      990.     1010.      940.         3         0         0       .00    743.21   5206.21


 *SECNO 66998.000

 3265 DIVIDED FLOW


 3470 ENCROACHMENT STATIONS=     4320.0    5080.0  TYPE=      1  TARGET=      760.000
  66998.000      8.08    904.08       .00    904.16    904.73       .65      4.05       .01    904.00
    19400.0        .0   19400.0        .0        .0    3001.6        .0    2260.9     338.3 100000.00
      1.17       .00      6.46       .00      .000      .050      .000      .000    896.00   4320.00
    .006516      540.      525.      520.         1         0         0       .00    677.27   5080.00
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 67548.000

 3470 ENCROACHMENT STATIONS=     4660.6    5125.3  TYPE=      1  TARGET=      464.700
         PIT IS ASSUMED FULL TO ELEV 900.0
  67548.000      7.57    907.57       .00    907.55    908.46       .89      3.66       .07 100000.00
    19400.0        .0   19400.0        .0        .0    2564.6        .0    2296.0     345.5 100000.00
      1.19       .00      7.56       .00      .000      .050      .000      .000    900.00   4660.60
    .006800      590.      550.      560.         3         0         0       .00    464.70   5125.30


 *SECNO 68448.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4821.1    5136.7  TYPE=      1  TARGET=      315.600
  68448.000      8.78    914.28       .00    914.28    915.76      1.48      7.13       .18 100000.00
    19400.0        .0   19400.0        .0        .0    1985.4        .0    2343.0     353.6 100000.00
      1.21       .00      9.77       .00      .000      .050      .000      .000    905.50   4821.52
    .009334     1050.      900.      850.         2         0         0       .00    315.12   5136.64


 *SECNO 69198.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4776.7    5137.8  TYPE=      1  TARGET=      361.100
  69198.000      9.97    919.57       .00    919.57    920.22       .65      4.38       .08 100000.00
    15900.0        .0   15900.0        .0        .0    2457.4        .0    2381.3     359.4 100000.00
      1.24       .00      6.47       .00      .000      .050      .000      .000    909.60   4776.70
    .003700      700.      750.      730.         2         0         0       .00    361.10   5137.80


 CCHV=     .300 CEHV=     .500
 *SECNO 69733.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 3470 ENCROACHMENT STATIONS=     4913.2    5080.3  TYPE=      1  TARGET=      167.100
         NR. EL SOBRANTE LANDFILL - SPECIAL BRD
  69733.000      7.16    925.06    925.06    925.09    927.99      2.93      1.90      1.14 100000.00
    13220.0        .0   13220.0        .0        .0     962.7        .0    2402.3     362.7 100000.00
      1.26       .00     13.73       .00      .000      .020      .000      .000    917.90   4913.26
    .003369      540.      535.      550.        20        19         0       .00    166.94   5080.20



 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .90      1.55      2.50       .00    130.00      5.40   1425.00      1.47    920.00    919.80

 *SECNO 69773.000
 BTCARD, BRIDGE STENCL=    4790.00   STENCR=    5094.20
 **ERROR** ELTRD .LT. MIN ROAD ELEV, ELTRD SET EQUAL TO MIN ROAD ELEV

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50

 3420 BRIDGE W.S.=     925.58 BRIDGE VELOCITY=      17.51     CALCULATED CHANNEL AREA=       741.

  EGPRS      EGLWC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC     ELTRD     WEIRLN
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                                                                    AREA
       .00    928.08       .34        0.     9423.     1425.     1424.      930.20    928.50        0.



 3470 ENCROACHMENT STATIONS=     4790.0    5094.2  TYPE=      1  TARGET=      304.200
  69773.000      8.37    926.27       .00    929.37    928.08      1.80       .09       .00    928.00
    15900.0        .0   15899.5        .5        .0    1475.8       1.0    2403.4     362.9    926.00
       1.26       .00     10.77       .53      .000      .020      .035      .000    917.90   4820.20
    .002159       40.       40.       40.         0         0         0       .00    274.00   5094.20


 CCHV=     .100 CEHV=     .300
 *SECNO 69813.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .44
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST



 3470 ENCROACHMENT STATIONS=     4790.0    5080.0  TYPE=      1  TARGET=      290.000
  69813.000      8.67    926.67       .00    929.53    928.26      1.59       .17       .02    928.00
    15900.0        .0   15900.0        .0        .0    1569.8        .0    2404.8     363.1 100000.00
       1.26       .00     10.13       .00      .000      .050      .000      .000    918.00   4813.28
    .011134       40.       40.       40.         3         0         0       .00    266.72   5080.00


 *SECNO 70193.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.34


 3470 ENCROACHMENT STATIONS=     4830.0    5209.1  TYPE=      1  TARGET=      379.100
  70193.000     13.96    929.46       .00    930.43    929.90       .44      1.52       .12    928.00
    15900.0        .0   15900.0        .0        .0    3000.1        .0    2424.7     365.9 100000.00
       1.28       .00      5.30       .00      .000      .050      .000      .000    915.50   4830.00
    .002039      380.      380.      360.         2         0         0       .00    379.10   5209.10


 *SECNO 70743.000

 3470 ENCROACHMENT STATIONS=     4914.9    5234.5  TYPE=      1  TARGET=      319.600
  70743.000     14.52    930.52       .00    931.16    931.01       .49      1.10       .02 100000.00
    15900.0        .0   15900.0        .0        .0    2840.9        .0    2461.6     370.3 100000.00
       1.30       .00      5.60       .00      .000      .050      .000      .000    916.00   4914.92
    .001948      670.      550.      400.         3         0         0       .00    319.55   5234.47


 *SECNO 71893.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4952.9    5243.4  TYPE=      1  TARGET=      290.500
  71893.000      6.73    934.73    934.73    934.74    937.03      2.30      5.37       .55 100000.00
    15900.0        .0   15900.0        .0        .0    1305.2        .0    2516.3     378.4 100000.00
       1.33       .00     12.18       .00      .000      .050      .000      .000    928.00   4952.93
    .022808     1150.     1150.     1000.         4        14         0       .00    290.47   5243.40
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 72643.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.21


 3470 ENCROACHMENT STATIONS=     4480.0    5035.3  TYPE=      1  TARGET=      555.300
  72643.000     10.65    943.05       .00    943.05    943.74       .69      6.55       .16    940.00
    15900.0    1858.9   14041.1        .0     345.9    2060.4        .0    2547.4     384.7 100000.00
       1.36      5.37      6.81       .00      .035      .050      .000      .000    932.40   4480.00
    .004691      530.      750.      730.         5         0         0       .00    488.11   5034.14


 *SECNO 73193.000

 3301 HV CHANGED MORE THAN HVINS
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 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4606.0    5310.0  TYPE=      1  TARGET=      704.000
  73193.000      6.98    944.53    944.53    944.41    945.99      1.46      1.93       .23    940.00
    15900.0   13127.6    2486.7     285.6    1258.7     502.1     110.7    2565.1     389.7    944.00
       1.37     10.43      4.95      2.58      .035      .050      .035      .000    937.55   4606.00
    .008654       40.      550.      600.         3        14         0       .00    704.00   5310.00


 CCHV=     .300 CEHV=     .500
 *SECNO 73194.000
 BTCARD, BRIDGE STENCL=    4605.00   STENCR=    5310.00

 3370 NORMAL BRIDGE, NRD=  32 MIN ELTRD=   943.00 MAX ELLC=   947.64

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4605.0    5310.0  TYPE=      1  TARGET=      705.000
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        PARK CANYON DRIVE - 2 RCP'S
  73194.000      9.69    947.24    947.24    947.35    948.98      1.74       .01       .14    940.00
    15900.0   12722.0    2451.9     726.1    1194.5     211.6     164.5    2565.1     389.7    944.00
       1.37     10.65     11.59      4.41      .035      .015      .035      .000    937.55   4605.00
    .008854        1.        1.        1.        20        15         0  -2211.22    705.00   5310.00


 *SECNO 73234.000
 BTCARD, BRIDGE STENCL=    4605.00   STENCR=    5325.00

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.60


 3370 NORMAL BRIDGE, NRD=  32 MIN ELTRD=   943.00 MAX ELLC=   947.64


 3470 ENCROACHMENT STATIONS=     4605.0    5325.0  TYPE=      1  TARGET=      720.000
  73234.000     10.92    948.47       .00    948.78    949.43       .96       .21       .24    944.00
    15900.0   12110.5    3317.6     471.9    1558.5     384.5     211.5    2566.8     390.4    944.00
       1.37      7.77      8.63      2.23      .035      .015      .035      .000    937.55   4605.00
    .003454       40.       40.       40.        16         0         0  -2182.29    720.00   5325.00


 CCHV=     .100 CEHV=     .300
 *SECNO 73235.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.57


 3470 ENCROACHMENT STATIONS=     4605.0    5325.0  TYPE=      1  TARGET=      720.000
  73235.000     11.78    949.33       .00    949.44    949.51       .18       .00       .08    944.00
    15900.0    8798.9    3616.6    3484.5    2299.2    1466.2    1195.3    2566.9     390.4    944.00
       1.37      3.83      2.47      2.92      .035      .050      .035      .000    937.55   4605.00
    .000521        1.        1.        1.         2         0         0       .00    720.00   5325.00


 CCHV=     .100 CEHV=     .300
 *SECNO 73335.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .47


 3470 ENCROACHMENT STATIONS=     4680.0    5250.0  TYPE=      1  TARGET=      570.000
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     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


  73335.000      6.80    949.30       .00    949.50    949.64       .35       .09       .05    943.70
    15900.0        .0   13075.3    2824.7        .0    2709.2     667.5    2575.6     391.7    944.00
       1.38       .00      4.83      4.23      .000      .050      .050      .000    942.50   4680.00
    .002376       90.      100.       70.         2         0         0       .00    570.00   5250.00


 *SECNO 73555.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4930.0    5205.0  TYPE=      1  TARGET=      275.000
  73555.000      5.27    949.07    949.07    949.62    951.45      2.37      1.14       .61    948.00
    15900.0        .0   15900.0        .0        .0    1286.3        .0    2586.4     393.7 100000.00
       1.38       .00     12.36       .00      .000      .050      .000      .000    943.80   4930.00
    .022641      360.      220.      100.         3        15         0       .00    275.00   5205.00


 *SECNO 74155.000
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 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.82


 3470 ENCROACHMENT STATIONS=     4892.0     5135.0  TYPE=      1  TARGET=      243.000
  74155.000     10.52    957.12       .00    956.50    958.38      1.26      6.83       .11 100000.00
    15900.0        .0   15900.0        .0        .0    1763.4        .0    2607.4     397.3 100000.00
       1.40       .00      9.02       .00      .000      .050      .000      .000    946.60   4892.00
    .006823      600.      600.      560.         4         0         0       .00    243.00   5135.00


 *SECNO 75005.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4940.7     5104.8  TYPE=      1  TARGET=      164.100
         ABANDONED RAIL ROAD BRIDGE
  75005.000     11.46    963.46       .00    963.04    965.68      2.22      7.01       .29 100000.00
    15900.0        .0   15900.0        .0        .0    1328.5        .0    2637.6     401.2 100000.00
       1.42       .00     11.97       .00      .000      .050      .000      .000    952.00   4941.37
    .010179      950.      850.      700.         3         0         0       .00    162.45   5103.81
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      SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
      Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
      TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
      SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 75255.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.67


 3470 ENCROACHMENT STATIONS=     4917.0     5202.6  TYPE=      1  TARGET=      285.610
  75255.000     14.22    966.22       .00    966.07    966.65       .43       .79       .18 100000.00
    15900.0        .0    9077.6    6822.4        .0    1665.1    1355.1    2650.9     402.6    956.00
       1.43       .00      5.45      5.03      .000      .050      .050      .000    952.00   4917.81
    .001429      200.      250.      300.         2         0         0       .00    284.79   5202.60


 *SECNO 75605.000

 3470 ENCROACHMENT STATIONS=     4856.8     5243.1  TYPE=      1  TARGET=      386.300
  75605.000     10.84    966.84       .00    966.63    967.24       .40       .59       .00 100000.00
    15900.0        .0   15318.2     581.8        .0    2976.4     153.2    2676.8     405.4    960.00
       1.45       .00      5.15      3.80      .000      .050      .050      .000    956.00   4857.23
    .001816      360.      350.      420.         2         0         0       .00    385.87   5243.10


 *SECNO 76855.000

 3470 ENCROACHMENT STATIONS=     4890.0     5579.3  TYPE=      1  TARGET=      689.300
  76855.000      5.84    969.54       .00    968.75    969.84       .30      2.58       .01    968.00
    15900.0        .0    7492.1    8407.9        .0    1765.7    1877.5    2773.9     420.8    964.00
       1.53       .00      4.24      4.48      .000      .050      .050      .000    963.70   4890.00
    .002370     1250.     1250.     1250.         2         0         0       .00    689.30   5579.30


 CCHV=     .100 CEHV=     .300
 *SECNO 78055.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
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      SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
      Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
      TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
      SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4878.0     5670.0  TYPE=      1  TARGET=      792.000
  78055.000      7.55    979.55    979.55    979.51    981.26      1.71      4.93       .42 100000.00
    15900.0        .0   14199.7    1700.3        .0    1302.7     271.3    2847.7     437.8    976.00
       1.57       .00     10.90      6.27      .000      .030      .030      .000    972.00   4878.00
    .008315     1200.     1200.     1275.        20        11         0       .00    513.36   5670.00


 *SECNO 78955.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.47
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 3470 ENCROACHMENT STATIONS=     4890.0    5300.0  TYPE=      1  TARGET=      410.000
         PIT IS ASSUMED FULL TO ELEV 980.0
  78955.000      5.15    985.15       .00    985.16    986.26      1.11      4.93       .06    984.00
    15900.0        .0   15900.0        .0        .0    1881.5        .0    2883.5     447.5 100000.00
       1.60       .00      8.45       .00      .000      .030      .000      .000    980.00   4890.00
    .003864      750.      900.      950.         3         0         0       .00    410.00   5300.00


 *SECNO 79955.000

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4943.6    5235.0  TYPE=      1  TARGET=      291.400
         PIT IS ASSUMED FULL TO ELEV 988.0
  79955.000      4.61    992.61    992.61    992.56    994.89      2.28      5.45       .35 100000.00
    15900.0        .0   15900.0        .0        .0    1312.6        .0    2920.2     455.5 100000.00
       1.62       .00     12.11       .00      .000      .030      .000      .000    988.00   4943.60
    .008250     1000.     1000.      930.        20        11         0       .00    291.40   5235.00


 CCHV=     .100 CEHV=     .300
1
    16APR20      10:01:22                                                                                     PAGE   93


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 80955.000

 3301 HV CHANGED MORE THAN HVINS


 3470 ENCROACHMENT STATIONS=     4690.0    5080.0  TYPE=      1  TARGET=      390.000
         PIT IS ASSUMED FULL TO ELEV 996.0
  80955.000      5.53   1001.53       .00   1001.45   1002.38       .86      7.35       .14   1000.00
    15900.0        .0   15900.0        .0        .0    2140.9        .0    2959.8     463.3 100000.00
       1.66       .00      7.43       .00      .000      .050      .000      .000    996.00   4690.00
    .006596     1050.     1000.      830.         4         0         0       .00    390.00   5080.00


 CCHV=     .100 CEHV=     .300
 *SECNO 81615.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4845.0    5112.0  TYPE=      1  TARGET=      267.000
  81615.000      8.31   1007.31   1007.31   1007.23   1009.81      2.50      6.75       .49   1004.00
    15900.0     458.9   15338.6     102.5      82.4    1192.0      18.9    2985.8     468.3   1004.00
       1.67      5.57     12.87      5.43      .050      .050      .050      .000    999.00   4845.28
    .017955      660.      660.      660.         2        14         0       .00    266.11   5111.39


 *SECNO 82355.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.92


 3470 ENCROACHMENT STATIONS=     4550.0    5046.0  TYPE=      1  TARGET=      496.000
  82355.000     10.64   1014.64       .00   1014.57   1015.01       .37      4.98       .21   1011.70
    12500.0        .0   12500.0        .0        .0    2570.7        .0    3018.6     474.7 100000.00
       1.71       .00      4.86       .00      .000      .050      .000      .000   1004.00   4550.00
    .003024      700.      740.      700.         5         0         0       .00    496.00   5046.00


1
    16APR20      10:01:22                                                                                     PAGE   94


     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 CCHV=     .100 CEHV=     .300
 *SECNO 83505.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4581.0    5110.0  TYPE=      1  TARGET=      529.000
  83505.000      3.93   1023.93   1023.93   1023.93   1025.23      1.30      8.94       .28   1023.00
    12500.0    6589.7    5910.3        .0     649.7     746.0        .0    3071.3     488.4 100000.00
       1.75     10.14      7.92       .00      .070      .070      .000      .000   1020.00   4581.00
    .046581     1200.     1150.     1100.         3        22         0       .00    526.99   5107.99
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 *SECNO 84655.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.12


 3470 ENCROACHMENT STATIONS=     4895.0    5359.0  TYPE=      1  TARGET=      464.000
  84655.000      9.46   1037.46       .00   1036.70   1037.79       .34     12.47       .10   1032.00
    12500.0        .0    8638.1    3861.9        .0    1813.7     867.3    3124.2     501.3   1032.00
       1.82       .00      4.76      4.45      .000      .070      .070      .000   1028.00   4895.00
    .004792     1150.     1150.     1050.         8         0         0       .00    464.00   5359.00


 CCHV=     .100 CEHV=     .300
 *SECNO 85655.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .42


 3470 ENCROACHMENT STATIONS=     4880.0    5214.0  TYPE=      1  TARGET=      334.000
  85655.000      6.25   1046.25       .00   1045.70   1047.56      1.31      9.47       .29   1044.00
    12500.0        .0   12337.7     162.3        .0    1339.4      26.7    3170.1     510.3   1044.00
       1.85       .00      9.21      6.07      .000      .070      .050      .000   1040.00   4880.00
    .027603     1000.     1000.      950.         4         0         0       .00    334.00   5214.00
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     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 86895.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.39


 3470 ENCROACHMENT STATIONS=     4755.0    5170.0  TYPE=      1  TARGET=      415.000
  86895.000     11.23   1059.23       .00   1059.41   1059.60       .37     11.95       .09   1056.00
    12500.0        .0   12500.0        .0        .0    2550.2        .0    3225.8     521.0 100000.00
       1.92       .00      4.90       .00      .000      .070      .000      .000   1048.00   4755.00
    .004851     1225.     1240.     1245.         6         0         0       .00    415.00   5170.00


 *SECNO 88145.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .32


 3470 ENCROACHMENT STATIONS=     4823.7    5372.5  TYPE=      1  TARGET=      548.800
  88145.000      4.61   1072.61       .00   1072.51   1073.80      1.19     13.95       .25 100000.00
    12500.0        .0   12500.0        .0        .0    1426.3        .0    3282.9     534.8 100000.00
       1.96       .00      8.76       .00      .000      .070      .000      .000   1068.00   4823.70
    .047831      925.     1250.     1300.         3         0         0       .00    548.80   5372.50


 *SECNO 89095.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.20


 3470 ENCROACHMENT STATIONS=     4892.6    5194.9  TYPE=      1  TARGET=      302.300
  89095.000     10.85   1090.85       .00   1090.96   1091.60       .74     17.75       .04 100000.00
    12500.0        .0   12500.0        .0        .0    1805.4        .0    3318.1     544.1 100000.00
       1.99       .00      6.92       .00      .000      .070      .000      .000   1080.00   4892.86
    .009885      875.      950.     1200.         6         0         0       .00    301.90   5194.76
```



```
     SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q          QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME       VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 90395.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     4485.0    5021.0  TYPE=      1  TARGET=      536.000
  90395.000      9.51   1109.51   1109.51   1109.55   1110.60      1.10     17.87       .11   1108.00
    10450.0    3424.3    7025.7        .0     594.5     744.1        .0    3365.4     556.8 100000.00
       2.04      5.76      9.44       .00      .050      .070      .000      .000   1100.00   4485.00
    .021885     1350.     1300.     1250.         5        13         0       .00    535.32   5020.32


 *SECNO 90670.000
```

```
3470 ENCROACHMENT STATIONS=     4611.0     5044.0  TYPE=      1  TARGET=      433.000
 90670.000      7.13   1117.13       .00   1117.08   1117.88       .75      7.24       .03 100000.00
   10450.0        .0   10450.0        .0        .0    1501.2        .0    3377.3     561.8 100000.00
      2.05       .00      6.96       .00      .000      .070      .000      .000   1110.00   4615.92
   .020179      700.      275.      180.         4         0         0       .00    426.89   5042.81
```

*SECNO 90745.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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3470 ENCROACHMENT STATIONS=     4803.0     5015.6  TYPE=      1  TARGET=      212.600
 90745.000      7.85   1119.85   1119.85   1119.87   1122.00      2.15      2.19       .42 100000.00
   10450.0        .0   10450.0        .0        .0     888.5        .0    3379.3     562.3 100000.00
      2.05       .00     11.76       .00      .000      .070      .000      .000   1112.00   4803.13
   .045908      200.       75.       75.        20         8         0       .00    211.59   5014.72
```


THIS RUN EXECUTED 16APR20 10:01:56

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

TEMESCAL WASH

SUMMARY PRINTOUT

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
	34400.000	.00	24400.00	678.32	679.69	6.07	1001.48	2637.66	6.32	3940.00	5039.48	.00	.00
	34400.000	.00	24400.00	678.32	679.69	6.08	1000.20	2636.69	6.32	3940.90	5039.10	.00	.00
*	35425.000	1025.00	24400.00	682.82	683.16	3.85	1174.23	5467.80	6.82	4370.00	5544.23	.00	.00
*	35425.000	1025.00	24400.00	683.02	683.43	4.11	960.00	5059.92	7.02	4580.00	5540.00	.20	.28
	36325.000	900.00	24400.00	685.42	686.10	3.78	999.16	4153.43	5.42	4700.84	5700.00	.00	.00
	36325.000	900.00	24400.00	685.65	686.26	3.61	999.20	4388.29	5.65	4700.80	5700.00	.23	.16
*	36461.000	136.00	24400.00	686.61	689.22	14.21	465.63	2228.86	12.61	4733.48	5290.00	.00	.00
*	36461.000	136.00	24400.00	686.62	689.22	14.19	465.73	2232.56	12.62	4733.50	5290.00	.01	.00
*	36486.000	25.00	24400.00	688.88	691.24	11.07	494.39	2073.53	14.88	4795.61	5290.00	.00	.00
*	36486.000	25.00	24400.00	689.02	691.23	10.71	494.40	2143.57	15.02	4795.60	5290.00	.14	-.01
*	36518.000	32.00	24400.00	690.78	691.80	7.22	548.47	3158.85	16.78	4796.53	5345.00	.00	.00
*	36518.000	32.00	24400.00	690.67	691.73	7.38	548.00	3098.79	16.67	4797.00	5345.00	-.11	-.07
*	36519.000	1.00	24400.00	691.71	692.01	3.33	584.82	6336.60	19.71	4760.18	5345.00	.00	.00
*	36519.000	1.00	24400.00	691.61	691.95	3.45	510.30	6009.82	19.61	4765.10	5275.40	-.10	-.06
	36669.000	150.00	24400.00	691.72	692.13	5.15	413.15	4740.45	16.32	4795.35	5208.49	.00	.00
	36669.000	150.00	24400.00	691.64	692.06	5.18	412.82	4708.03	16.24	4795.44	5208.27	-.08	-.07
*	36670.000	1.00	24400.00	691.59	692.27	6.59	412.85	3703.88	16.19	4795.51	5208.36	.00	.00
*	36670.000	1.00	24400.00	691.52	692.19	6.59	412.55	3703.28	16.12	4795.60	5208.15	-.08	-.08
	36690.000	20.00	24400.00	691.65	692.33	6.59	413.09	3704.33	16.25	4795.44	5208.53	.00	.00
	36690.000	20.00	24400.00	691.58	692.25	6.59	412.77	3703.75	16.18	4795.53	5208.30	-.08	-.08
	36691.000	1.00	24400.00	692.02	692.41	5.02	414.63	4864.62	16.62	4794.72	5209.35	.00	.00
	36691.000	1.00	24400.00	691.94	692.34	5.05	414.00	4830.26	16.54	4795.10	5209.10	-.08	-.08

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
*	36941.000	250.00	24400.00	692.08	693.47	9.48	296.48	2573.81	12.08	4769.80	5066.28	.00	.00
*	36941.000	250.00	24400.00	692.00	693.42	9.57	295.00	2550.86	12.00	4770.00	5065.00	-.08	-.05
*	37166.000	225.00	24400.00	693.89	694.34	5.39	396.04	4526.99	13.89	4677.93	5073.97	.00	.00
*	37166.000	225.00	24400.00	693.85	694.30	5.41	395.56	4510.76	13.85	4678.10	5073.66	-.04	-.04
	38166.000	1000.00	24400.00	696.15	696.64	5.61	576.88	4324.01	11.45	4604.62	5181.50	.00	.00
	38166.000	1000.00	24400.00	696.14	696.66	5.70	541.42	4244.59	11.44	4640.00	5181.42	-.01	.01
*	39116.000	950.00	24400.00	698.12	698.48	3.70	788.23	5393.02	8.12	4644.71	5432.94	.00	.00
	39116.000	950.00	24400.00	698.22	698.73	4.18	575.50	4688.92	8.22	4779.50	5355.00	.10	.25
*	40116.000	1000.00	24400.00	705.26	708.29	14.10	290.85	1750.02	9.76	4828.94	5119.79	.00	.00
*	40116.000	1000.00	24400.00	705.20	708.32	14.29	279.43	1725.08	9.70	4840.00	5119.43	-.06	.02
*	41116.000	1000.00	24400.00	714.91	715.58	6.40	486.37	3719.06	10.91	4760.91	5247.28	.00	.00
*	41116.000	1000.00	24400.00	714.97	715.64	6.40	470.00	3725.27	10.97	4770.00	5240.00	.06	.06
*	42091.000	975.00	24400.00	725.59	727.69	12.25	492.65	2252.57	14.39	4933.23	5425.88	.00	.00

*	42091.000	975.00	24400.00	725.57	727.70	12.31	491.70	2241.57	14.37	4933.29	5425.00	-.02	.00
	42641.000	550.00	24400.00	730.98	732.08	8.56	380.49	2931.45	16.38	4853.60	5360.00	.00	.00
	42641.000	550.00	24400.00	731.02	732.13	8.56	354.08	2912.36	16.42	4880.00	5360.00	.04	.04
	42956.000	315.00	24400.00	732.71	734.04	9.52	436.48	2730.22	15.21	4827.78	5315.00	.00	.00
	42956.000	315.00	24400.00	732.75	734.08	9.50	384.27	2710.51	15.25	4880.00	5315.00	.04	.04
*	42991.000	35.00	24400.00	732.58	734.30	10.72	472.36	2664.79	14.08	4857.72	5330.08	.00	.00
*	42991.000	35.00	24400.00	732.63	734.33	10.66	472.00	2689.64	14.13	4858.00	5330.00	.05	.03
	43011.000	20.00	24400.00	734.43	735.54	8.77	465.39	3456.36	15.93	4834.61	5300.00	.00	.00
	43011.000	20.00	24400.00	734.46	735.56	8.74	465.60	3472.33	15.96	4834.40	5300.00	.03	.03
*	43051.000	40.00	24400.00	734.47	735.58	8.83	439.74	2980.27	16.07	4795.06	5275.10	.00	.00
*	43051.000	40.00	24400.00	734.49	735.61	8.85	384.70	2941.34	16.09	4850.00	5275.00	.02	.03
	43341.000	290.00	24400.00	735.86	737.35	9.98	346.61	2538.10	16.66	4796.04	5142.65	.00	.00
	43341.000	290.00	24400.00	735.89	737.37	9.94	334.00	2547.86	16.69	4796.00	5130.00	.03	.02
	44016.000	675.00	24400.00	741.08	741.96	7.54	315.30	3253.16	14.78	4855.45	5170.75	.00	.00
	44016.000	675.00	24400.00	741.10	741.98	7.54	275.00	3234.83	14.80	4885.00	5160.00	.01	.02
	45016.000	1000.00	24400.00	746.97	747.85	6.63	370.64	3435.29	11.97	4869.33	5239.97	.00	.00
	45016.000	1000.00	24400.00	747.00	747.87	6.61	370.73	3444.97	12.00	4869.27	5240.00	.03	.02
	46166.000	1150.00	24400.00	753.58	754.01	5.21	622.43	4669.32	10.48	4476.20	5098.62	.00	.00
	46166.000	1150.00	24400.00	753.59	754.01	5.23	598.63	4651.86	10.49	4500.00	5098.63	.00	.01
	47166.000	1000.00	24400.00	759.98	760.87	6.71	599.40	3341.58	9.18	4900.03	5499.43	.00	.00
	47166.000	1000.00	24400.00	759.99	760.88	6.70	599.63	3347.21	9.19	4900.02	5499.65	.01	.01

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
*	47916.000	750.00	24400.00	764.62	765.25	6.36	611.19	3861.12	8.22	4950.36	5561.55	.00	.00
*	47916.000	750.00	24400.00	764.67	765.30	6.39	580.00	3815.99	8.27	4970.00	5550.00	.05	.06
*	49016.000	1100.00	24400.00	771.19	772.38	8.77	673.61	2789.09	7.19	4971.71	5645.32	.00	.00
*	49016.000	1100.00	24400.00	771.25	772.41	8.64	673.00	2830.91	7.25	4972.00	5645.00	.06	.03
	49916.000	900.00	24400.00	781.70	783.27	10.03	456.98	2429.59	8.50	4901.51	5358.49	.00	.00
	49916.000	900.00	24400.00	781.66	783.27	10.15	440.00	2397.63	8.46	4910.00	5350.00	-.04	.00
	50376.000	460.00	24400.00	786.90	789.40	12.70	286.69	1920.58	11.80	4916.54	5203.23	.00	.00
	50376.000	460.00	24400.00	786.96	789.42	12.57	288.36	1940.49	11.86	4915.50	5203.86	.07	.01
*	51226.000	850.00	24400.00	793.88	794.60	6.89	511.60	3608.50	13.88	4530.00	5041.60	.00	.00
*	51226.000	850.00	24400.00	793.88	794.62	6.94	436.60	3535.13	13.88	4605.00	5041.60	.00	.02
	51776.000	550.00	24400.00	795.90	796.71	7.47	674.69	3387.98	10.10	4370.00	5044.69	.00	.00
	51776.000	550.00	24400.00	795.92	796.73	7.42	674.77	3407.09	10.12	4370.00	5044.77	.03	.02
*	52081.000	305.00	18580.00	798.05	801.49	14.89	182.40	1248.23	9.85	4914.73	5097.13	.00	.00
*	52081.000	305.00	18580.00	798.06	801.49	14.88	182.41	1248.96	9.86	4914.73	5097.14	.00	.00
*	52121.000	40.00	24400.00	802.40	803.15	8.06	669.00	4570.31	14.20	4430.00	5099.00	.00	.00
*	52121.000	40.00	24400.00	801.60	802.61	9.14	541.00	3827.04	13.40	4558.00	5099.00	-.80	-.54
*	52626.000	505.00	24400.00	802.72	805.37	13.22	360.00	1906.70	10.02	4780.00	5140.00	.00	.00
*	52626.000	505.00	24400.00	802.70	805.37	13.28	357.00	1896.72	10.00	4780.00	5137.00	-.03	.00
	52836.000	210.00	24400.00	806.07	808.62	12.80	279.85	1905.68	11.87	4865.68	5145.54	.00	.00
	52836.000	210.00	24400.00	806.09	808.62	12.76	280.07	1912.19	11.89	4865.64	5145.71	.02	.01
*	53676.000	840.00	24400.00	815.30	817.03	10.57	266.71	2308.39	15.30	4919.79	5186.50	.00	.00
*	53676.000	840.00	24400.00	815.29	817.03	10.59	266.61	2304.67	15.29	4919.82	5186.43	-.01	-.01
	54676.000	1000.00	24400.00	822.00	823.93	11.09	257.02	2194.84	14.00	4895.50	5152.52	.00	.00
	54676.000	1000.00	24400.00	822.03	823.99	11.11	230.00	2174.11	14.03	4900.00	5130.00	.03	.06
	55576.000	900.00	24400.00	828.57	829.69	8.60	463.59	2907.52	12.57	4912.85	5376.45	.00	.00
	55576.000	900.00	24400.00	828.62	829.72	8.54	457.00	2928.40	12.62	4913.00	5370.00	.05	.03
*	56276.000	700.00	24400.00	836.03	840.34	16.64	170.17	1465.94	12.03	4866.56	5036.74	.00	.00
*	56276.000	700.00	24400.00	835.97	840.34	16.78	169.84	1454.51	11.97	4866.76	5036.60	-.07	.00
	56381.000	105.00	24400.00	838.93	841.99	14.04	189.41	1737.89	12.93	4859.91	5049.32	.00	.00
	56381.000	105.00	24400.00	838.97	842.00	13.98	189.60	1745.54	12.97	4859.80	5049.40	.04	.01
*	57601.000	1220.00	24400.00	847.67	848.90	8.89	219.51	2743.85	17.67	4890.42	5109.94	.00	.00
*	57601.000	1220.00	24400.00	847.66	848.89	8.90	219.39	2740.87	17.66	4890.50	5109.89	-.01	-.01
*	57901.000	300.00	19400.00	849.00	849.43	5.51	315.00	3863.70	18.00	4875.00	5190.00	.00	.00
*	57901.000	300.00	19400.00	848.82	849.43	6.38	239.60	3140.59	17.82	4875.00	5114.60	-.19	.00

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
*	57902.000	1.00	19400.00	848.76	849.68	8.28	345.00	2561.88	17.56	4890.00	5235.00	.00	.00
*	57902.000	1.00	19400.00	848.60	849.66	6.54	342.96	2480.83	17.40	4892.04	5235.00	-.16	-.02
	57922.000	20.00	19400.00	848.84	849.79	5.95	358.00	2652.56	17.64	4892.00	5250.00	.00	.00
	57922.000	20.00	19400.00	848.82	849.77	5.97	357.10	2645.05	17.62	4892.90	5250.00	-.02	-.02
*	57923.000	1.00	19400.00	849.26	849.83	6.28	370.00	3265.73	17.46	4890.00	5260.00	.00	.00
*	57923.000	1.00	19400.00	849.23	849.81	6.32	329.00	3217.18	17.43	4930.00	5259.00	-.02	-.02
*	58573.000	650.00	19400.00	849.83	852.41	12.88	146.41	1506.40	13.83	4885.88	5032.29	.00	.00

*	58573.000	650.00	19400.00	849.85	852.42	12.86	146.46	1508.85	13.85	4885.86	5032.31	.02	.01
*	59723.000	1150.00	19400.00	857.89	858.63	6.89	352.48	2814.19	10.99	4850.67	5203.15	.00	.00
*	59723.000	1150.00	19400.00	857.89	858.63	6.90	352.40	2813.51	10.99	4850.70	5203.10	.00	.00
*	60873.000	1150.00	19400.00	868.71	869.89	9.11	903.73	2387.56	8.71	4250.00	5153.73	.00	.00
*	60873.000	1150.00	19400.00	868.52	869.99	9.96	701.60	2093.00	8.52	4450.00	5151.60	-.19	.10
	61013.000	140.00	19400.00	870.33	871.04	7.34	896.87	2956.47	9.33	4215.00	5111.87	.00	.00
*	61013.000	140.00	19400.00	870.51	871.22	7.22	742.20	2902.77	9.51	4370.00	5112.20	.18	.19
	62073.000	1060.00	19400.00	876.59	877.54	8.03	790.00	2599.71	8.59	4580.00	5370.00	.00	.00
	62073.000	1060.00	19400.00	876.62	877.62	8.17	480.00	2423.73	8.62	4890.00	5370.00	.03	.08
	63173.000	1100.00	19400.00	881.71	882.75	8.34	304.94	2403.62	10.71	4788.61	5093.55	.00	.00
	63173.000	1100.00	19400.00	881.81	882.84	8.29	269.00	2393.61	10.81	4816.00	5085.00	.10	.10
*	64323.000	1150.00	19400.00	884.11	884.29	3.19	700.00	5658.66	9.11	4710.00	5410.00	.00	.00
*	64323.000	1150.00	19400.00	884.36	884.61	3.59	536.90	5029.27	9.36	4711.00	5247.90	.26	.31
*	65323.000	1000.00	19400.00	888.51	891.11	12.94	288.07	1499.14	10.51	4798.60	5086.67	.00	.00
*	65323.000	1000.00	19400.00	888.47	891.11	13.04	286.86	1487.43	10.47	4799.52	5086.38	-.04	.00
*	65463.000	140.00	19400.00	891.43	892.67	9.06	342.52	2207.72	12.43	4775.33	5117.85	.00	.00
*	65463.000	140.00	19400.00	891.39	892.77	9.41	262.70	2061.92	12.39	4855.00	5117.70	-.04	.10
	66473.000	1010.00	19400.00	899.73	900.58	7.47	738.39	2617.51	7.73	4462.46	5200.85	.00	.00
	66473.000	1010.00	19400.00	899.88	900.66	7.14	743.21	2735.29	7.88	4463.00	5206.21	.15	.08
	66998.000	525.00	19400.00	904.16	904.78	6.35	680.38	3054.22	8.16	4319.61	5080.52	.00	.00
	66998.000	525.00	19400.00	904.08	904.73	6.46	677.27	3001.64	8.08	4320.00	5080.00	-.08	-.06
	67548.000	550.00	19400.00	907.55	908.44	7.58	465.49	2559.17	7.55	4660.00	5125.49	.00	.00
	67548.000	550.00	19400.00	907.57	908.46	7.56	464.70	2564.64	7.57	4660.60	5125.30	.02	.02
	68448.000	900.00	19400.00	914.28	915.76	9.76	315.28	1988.65	8.78	4821.39	5136.67	.00	.00
	68448.000	900.00	19400.00	914.28	915.76	9.77	315.12	1985.36	8.78	4821.52	5136.64	.00	.00
DS	69198.000	750.00	15900.00	919.57	920.22	6.47	361.18	2455.68	9.97	4776.64	5137.82	.00	.00
	69198.000	750.00	15900.00	919.57	920.22	6.47	361.10	2457.42	9.97	4776.70	5137.80	.01	.00

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
*	69733.000	535.00	13220.00	925.09	927.99	13.66	167.11	967.58	7.19	4913.21	5080.32	.00	.00
*	69733.000	535.00	13220.00	925.06	927.99	13.73	166.94	962.68	7.16	4913.26	5080.20	-.03	.00
US BR *	69773.000	40.00	15900.00	929.37	930.00	6.47	647.00	2856.55	11.47	4440.00	5087.00	.00	.00
*	69773.000	40.00	15900.00	926.27	928.08	10.77	274.00	1476.76	8.37	4820.20	5094.20	-3.10	-1.92
US *	69813.000	40.00	15900.00	929.53	930.05	6.03	645.00	2924.81	11.53	4435.00	5080.00	.00	.00
*	69813.000	40.00	15900.00	926.67	928.26	10.13	266.72	1569.75	8.67	4813.28	5080.00	-2.86	-1.78
	70193.000	380.00	15900.00	930.43	930.75	4.60	573.58	3599.35	14.93	4641.61	5215.19	.00	.00
*	70193.000	380.00	15900.00	929.46	929.90	5.30	379.10	3000.08	13.96	4830.00	5209.10	-.97	-.85
	70743.000	550.00	15900.00	931.16	931.58	5.22	324.04	3044.66	15.16	4912.81	5236.84	.00	.00
	70743.000	550.00	15900.00	930.52	931.01	5.60	319.55	2840.88	14.52	4914.92	5234.47	-.63	-.57
*	71893.000	1150.00	15900.00	934.74	937.03	12.15	290.57	1308.82	6.74	4952.86	5243.43	.00	.00
*	71893.000	1150.00	15900.00	934.73	937.03	12.18	290.47	1305.24	6.73	4952.93	5243.40	-.01	.00
*	72643.000	750.00	15900.00	943.05	943.75	6.83	483.10	2395.92	10.65	4485.00	5034.14	.00	.00
*	72643.000	750.00	15900.00	943.05	943.74	6.81	488.11	2406.27	10.65	4480.00	5034.14	.00	.00
*	73193.000	550.00	15900.00	944.41	946.06	5.14	496.00	1699.61	6.86	4605.00	5101.00	.00	.00
*	73193.000	550.00	15900.00	944.53	945.99	4.95	704.00	1871.41	6.98	4606.00	5310.00	.12	-.07
*	73194.000	1.00	15900.00	947.35	949.21	11.45	496.00	1456.23	9.80	4605.00	5101.00	.00	.00
*	73194.000	1.00	15900.00	947.24	948.98	11.59	705.00	1570.59	9.69	4605.00	5310.00	-.12	-.23
*	73234.000	40.00	15900.00	948.78	949.68	8.13	496.00	2092.60	11.23	4605.00	5101.00	.00	.00
*	73234.000	40.00	15900.00	948.47	949.43	8.63	720.00	2154.45	10.92	4605.00	5325.00	-.32	-.26
*	73235.000	1.00	15900.00	949.44	949.75	3.08	496.00	3820.98	11.89	4605.00	5101.00	.00	.00
*	73235.000	1.00	15900.00	949.33	949.51	2.47	720.00	4960.63	11.78	4605.00	5325.00	-.11	-.24
*	73335.000	100.00	15900.00	949.50	949.90	5.15	500.00	3141.33	7.00	4630.00	5130.00	.00	.00
*	73335.000	100.00	15900.00	949.30	949.64	4.83	570.00	3376.63	6.80	4680.00	5250.00	-.20	-.26
*	73555.000	220.00	15900.00	949.62	951.52	11.06	276.35	1438.08	5.82	4928.65	5205.00	.00	.00
*	73555.000	220.00	15900.00	949.07	951.45	12.36	275.00	1286.32	5.27	4930.00	5205.00	-.54	-.07
*	74155.000	600.00	15900.00	956.50	957.58	8.71	428.69	2020.80	9.90	4891.55	5320.24	.00	.00
*	74155.000	600.00	15900.00	957.12	958.38	9.02	243.00	1763.43	10.52	4892.00	5135.00	.62	.80
	75005.000	850.00	15900.00	963.04	965.50	12.61	159.74	1261.29	11.04	4942.41	5102.15	.00	.00
	75005.000	850.00	15900.00	963.46	965.68	11.97	162.45	1328.50	11.46	4941.37	5103.81	.42	.18
*	75255.000	250.00	15900.00	966.07	966.42	4.89	346.24	3371.49	14.07	4919.29	5265.53	.00	.00
*	75255.000	250.00	15900.00	966.22	966.65	5.45	284.79	3020.21	14.22	4917.81	5202.60	.15	.23
	75605.000	350.00	15900.00	966.63	966.89	4.36	660.71	4028.01	10.63	4858.50	5519.20	.00	.00
	75605.000	350.00	15900.00	966.84	967.24	5.15	385.87	3129.62	10.84	4857.23	5243.10	.21	.35

	SECNO	XLCH	Q	CWSEL	EG	VCH	TOPWID	AREA	DEPTH	SSTA	ENDST	DIFWSP	DIFEG
	76855.000	1250.00	15900.00	968.75	968.96	3.55	1013.08	4358.35	5.05	4875.07	5888.15	.00	.00

	76855.000	1250.00	15900.00	969.54	969.84	4.24	689.30	3643.24	5.84	4890.00	5579.30	.79	.88
*	78055.000	1200.00	15900.00	979.51	981.27	11.03	511.40	1554.47	7.51	4878.51	5670.14	.00	.00
*	78055.000	1200.00	15900.00	979.55	981.26	10.90	513.36	1573.98	7.55	4878.00	5670.00	.04	-.01
*	78955.000	900.00	15900.00	985.16	986.22	8.33	572.37	1979.67	5.16	4774.02	5346.39	.00	.00
*	78955.000	900.00	15900.00	985.15	986.26	8.45	410.00	1881.45	5.15	4890.00	5300.00	-.01	.04
*	79955.000	1000.00	15900.00	992.56	994.78	11.97	302.44	1328.22	4.56	4934.30	5236.75	.00	.00
*	79955.000	1000.00	15900.00	992.61	994.89	12.11	291.40	1312.58	4.61	4943.60	5235.00	.05	.10
	80955.000	1000.00	15900.00	1001.45	1002.31	7.48	455.32	2159.48	5.45	4630.13	5085.44	.00	.00
	80955.000	1000.00	15900.00	1001.53	1002.38	7.43	390.00	2140.94	5.53	4690.00	5080.00	.07	.07
*	81615.000	660.00	15900.00	1007.23	1009.81	13.08	264.52	1270.42	8.23	4846.57	5111.10	.00	.00
*	81615.000	660.00	15900.00	1007.31	1009.81	12.87	266.11	1293.30	8.31	4845.28	5111.39	.09	.00
*	82355.000	740.00	12500.00	1014.57	1014.90	4.68	596.41	2755.64	10.57	4450.00	5046.41	.00	.00
*	82355.000	740.00	12500.00	1014.64	1015.01	4.86	496.00	2570.72	10.64	4550.00	5046.00	.07	.11
*	83505.000	1150.00	12500.00	1023.93	1025.22	7.90	528.05	1399.37	3.93	4580.00	5108.05	.00	.00
*	83505.000	1150.00	12500.00	1023.93	1025.23	7.92	526.99	1395.72	3.93	4581.00	5107.99	.00	.01
*	84655.000	1150.00	12500.00	1036.70	1036.95	4.22	693.52	3166.64	8.70	4776.48	5470.00	.00	.00
*	84655.000	1150.00	12500.00	1037.46	1037.79	4.76	464.00	2681.04	9.46	4895.00	5359.00	.75	.84
*	85655.000	1000.00	12500.00	1045.70	1047.45	10.63	336.51	1184.28	5.70	4877.64	5214.14	.00	.00
*	85655.000	1000.00	12500.00	1046.25	1047.56	9.21	334.00	1366.15	6.25	4880.00	5214.00	.55	.11
*	86895.000	1240.00	12500.00	1059.41	1059.75	4.70	453.30	2688.14	11.41	4733.72	5187.02	.00	.00
*	86895.000	1240.00	12500.00	1059.23	1059.60	4.90	415.00	2550.23	11.23	4755.00	5170.00	-.18	-.15
*	88145.000	1250.00	12500.00	1072.51	1073.80	9.13	548.81	1369.00	4.51	4823.73	5372.54	.00	.00
*	88145.000	1250.00	12500.00	1072.61	1073.80	8.76	548.80	1426.28	4.61	4823.70	5372.50	.10	.00
*	89095.000	950.00	12500.00	1090.96	1091.68	6.81	302.33	1836.09	10.96	4892.60	5194.93	.00	.00
*	89095.000	950.00	12500.00	1090.85	1091.60	6.92	301.90	1805.44	10.85	4892.86	5194.76	-.10	-.08
*	90395.000	1300.00	10450.00	1109.55	1110.60	9.24	541.20	1365.44	9.55	4479.20	5020.40	.00	.00
*	90395.000	1300.00	10450.00	1109.51	1110.60	9.44	535.32	1338.60	9.51	4485.00	5020.32	-.04	.01
	90670.000	275.00	10450.00	1117.08	1117.85	7.04	426.29	1484.23	7.08	4616.42	5042.72	.00	.00
	90670.000	275.00	10450.00	1117.13	1117.88	6.96	426.89	1501.21	7.13	4615.92	5042.81	.05	.03
*	90745.000	75.00	10450.00	1119.87	1122.00	11.71	212.00	892.35	7.87	4802.75	5014.76	.00	.00
*	90745.000	75.00	10450.00	1119.85	1122.00	11.76	211.59	888.52	7.85	4803.13	5014.72	-.02	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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WARNING SECNO=  35425.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  35425.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  36461.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  36461.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  36461.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=  36461.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  36461.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  36461.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=  36486.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  36486.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  36486.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=  36486.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  36486.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  36486.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=  36518.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=  36518.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  36518.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  36519.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  36519.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  36670.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  36670.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  36941.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  36941.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  37166.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  37166.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  39116.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  40116.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  40116.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  40116.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=  40116.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  40116.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  40116.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  41116.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  41116.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  42091.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  42091.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  42091.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=  42091.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
```

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 CAUTION SECNO=  42091.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  42091.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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 WARNING SECNO=  42991.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  42991.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  43051.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  43051.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  47916.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  47916.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  49016.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  49016.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  51226.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  51226.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  52081.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  52081.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  52081.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  52081.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  52081.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  52081.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  52121.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  52121.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  52626.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  52626.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  52626.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  52626.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  52626.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  52626.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  53676.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  53676.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  56276.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  56276.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  56276.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  56276.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  56276.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  56276.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  57601.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  57601.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  57901.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  57901.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  57902.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  57902.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  57923.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  57923.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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 WARNING SECNO=  58573.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  58573.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  59723.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  59723.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  60873.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  60873.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  60873.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  60873.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  60873.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  60873.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  61013.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  64323.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  64323.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  65323.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  65323.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  65323.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  65323.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  65323.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  65323.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  65463.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  65463.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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 CAUTION SECNO=  69733.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  69733.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  69733.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  69733.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  69733.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  69773.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  69773.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  69813.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  69813.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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 WARNING SECNO=  70193.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  71893.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  71893.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  71893.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  71893.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

 WARNING SECNO=  72643.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  72643.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  73193.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 CAUTION SECNO=  73193.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
```

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 CAUTION SECNO=  73193.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=  73194.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  73194.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  73194.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  73194.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  73194.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  73194.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  73234.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  73234.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  73235.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  73235.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  73335.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  73335.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  73555.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 CAUTION SECNO=  73555.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  73555.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

 WARNING SECNO=  74155.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  74155.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  75255.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  75255.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  78055.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  78055.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  78055.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  78055.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  78055.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  78055.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=  78955.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  78955.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  79955.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  79955.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  79955.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  79955.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  79955.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  79955.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 CAUTION SECNO=  81615.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  81615.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  81615.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  81615.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

 WARNING SECNO=  82355.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  82355.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  83505.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
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 CAUTION SECNO=  83505.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  83505.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  83505.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

 WARNING SECNO=  84655.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  84655.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  85655.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  85655.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  86895.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  86895.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  88145.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  88145.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
 WARNING SECNO=  88145.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=  89095.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=  89095.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=  90395.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  90395.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  90395.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  90395.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=  90745.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  90745.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=  90745.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=  90745.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=  90745.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
```

CAUTION SECNO= 90745.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

FLOODWAY DATA, TEMESCAL WASH
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WSE WITH FLOODWAY	WSE WITHOUT FLOODWAY	DIFFERENCE
34400.000	1098.	2637.	9.3	678.3	678.3	.0
35425.000	960.	5060.	4.8	683.0	682.8	.2
36325.000	999.	4388.	5.6	685.6	685.4	.2
36461.000	556.	2233.	10.9	686.6	686.6	.0
36486.000	494.	2144.	11.4	689.0	688.9	.1
36518.000	548.	3099.	7.9	690.7	690.8	-.1
36519.000	510.	6010.	4.1	691.6	691.7	-.1
36669.000	413.	4708.	5.2	691.6	691.7	-.1
36670.000	413.	3703.	6.6	691.5	691.6	-.1
36690.000	413.	3704.	6.6	691.6	691.7	-.1
36691.000	414.	4830.	5.1	691.9	692.0	-.1
36941.000	295.	2551.	9.6	692.0	692.1	-.1
37166.000	396.	4511.	5.4	693.9	693.9	.0
38166.000	541.	4245.	5.7	696.1	696.1	.0
39116.000	575.	4689.	5.2	698.2	698.1	.1
40116.000	279.	1725.	14.1	705.2	705.3	-.1
41116.000	470.	3725.	6.5	715.0	714.9	.1
42091.000	492.	2242.	10.9	725.6	725.6	.0
42641.000	480.	2912.	8.4	731.0	731.0	.0
42956.000	435.	2711.	9.0	732.7	732.7	.0
42991.000	472.	2690.	9.1	732.7	732.6	.1
43011.000	466.	3472.	7.0	734.4	734.4	.0
43051.000	425.	2941.	8.3	734.5	734.5	.0
43341.000	334.	2548.	9.6	735.9	735.9	.0
44016.000	275.	3235.	7.5	741.1	741.1	.0
45016.000	371.	3445.	7.1	747.0	747.0	.0
46166.000	599.	4652.	5.2	753.6	753.6	.0
47166.000	600.	3347.	7.3	760.0	760.0	.0
47916.000	580.	3816.	6.4	764.6	764.6	.0
49016.000	673.	2831.	8.6	771.3	771.2	.1
49916.000	440.	2398.	10.2	781.7	781.7	.0
50376.000	288.	1940.	12.6	787.0	786.9	.1
51226.000	437.	3535.	6.9	793.9	793.9	.0
51776.000	675.	3407.	7.2	795.9	795.9	.0
52081.000	182.	1249.	14.9	798.1	798.1	.0
52121.000	541.	3827.	6.4	801.6	802.4	-.8
52626.000	357.	1897.	12.9	802.7	802.7	.0
52836.000	280.	1912.	12.8	806.1	806.1	.0
53676.000	267.	2305.	10.6	815.3	815.3	.0
54676.000	230.	2174.	11.2	822.0	822.0	.0
55576.000	457.	2928.	8.3	828.6	828.6	.0
56276.000	170.	1455.	16.8	835.9	836.0	-.1

FLOODWAY DATA, TEMESCAL WASH
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WSE WITH FLOODWAY	WSE WITHOUT FLOODWAY	DIFFERENCE
56381.000	190.	1746.	14.0	838.9	838.9	.0
57601.000	219.	2741.	8.9	847.7	847.7	.0
57901.000	240.	3141.	6.2	848.8	849.0	-.2
57902.000	343.	2481.	7.8	848.6	848.8	-.2
57922.000	357.	2645.	7.3	848.8	848.8	.0
57923.000	329.	3217.	6.0	849.3	849.3	.0
58573.000	146.	1509.	12.9	849.8	849.8	.0
59723.000	352.	2814.	6.9	857.9	857.9	.0
60873.000	702.	2093.	9.3	868.5	868.7	-.2
61013.000	742.	2903.	6.7	870.5	870.3	.2
62073.000	480.	2424.	8.0	876.6	876.6	.0
63173.000	269.	2394.	8.1	881.8	881.7	.1
64323.000	537.	5029.	3.9	884.4	884.1	.3
65323.000	287.	1487.	13.0	888.5	888.5	.0
65463.000	263.	2062.	9.4	891.4	891.4	.0
66473.000	743.	2735.	7.1	899.9	899.7	.2
66998.000	760.	3002.	6.5	904.1	904.2	-.1
67548.000	465.	2565.	7.6	907.5	907.5	.0
68448.000	315.	1985.	9.8	914.3	914.3	.0
69198.000	361.	2457.	6.5	919.6	919.6	.0
69733.000	167.	963.	13.7	925.1	925.1	.0
69773.000	274.	1477.	10.8	926.3	929.4	-3.1
69813.000	267.	1570.	10.1	926.6	929.5	-2.9
70193.000	379.	3000.	5.3	929.4	930.4	-1.0
70743.000	320.	2841.	5.6	930.6	931.2	-.6
71893.000	290.	1305.	12.2	934.7	934.7	.0
72643.000	554.	2406.	6.6	943.1	943.1	.0
73193.000	704.	1871.	8.5	944.5	944.4	.1
73194.000	705.	1571.	10.1	947.3	947.4	-.1
73234.000	720.	2154.	7.4	948.5	948.8	-.3
73235.000	720.	4961.	3.2	949.3	949.4	-.1
73335.000	570.	3377.	4.7	949.3	949.5	-.2
73555.000	275.	1286.	12.4	949.1	949.6	-.5

74155.000	243.	1763.	9.0	957.1	956.5	.6
75005.000	162.	1328.	12.0	963.4	963.0	.4
75255.000	285.	3020.	5.3	966.2	966.1	.1
75605.000	386.	3130.	5.1	966.8	966.6	.2
76855.000	689.	3643.	4.4	969.6	968.8	.8
78055.000	792.	1574.	10.1	979.5	979.5	.0
78955.000	410.	1881.	8.5	985.2	985.2	.0
79955.000	291.	1313.	12.1	992.6	992.6	.0
80955.000	390.	2141.	7.4	1001.6	1001.5	.1

FLOODWAY DATA, TEMESCAL WASH
PROFILE NO. 2

	------- FLOODWAY -------			WATER SURFACE ELEVATION		
STATION	WIDTH	SECTION AREA	MEAN VELOCITY	WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
81615.000	266.	1293.	12.3	1007.3	1007.2	.1
82355.000	496.	2571.	4.9	1014.7	1014.6	.1
83505.000	527.	1396.	9.0	1023.9	1023.9	.0
84655.000	464.	2681.	4.7	1037.5	1036.7	.8
85655.000	334.	1366.	9.1	1046.2	1045.7	.5
86895.000	415.	2550.	4.9	1059.2	1059.4	-.2
88145.000	549.	1426.	8.8	1072.6	1072.5	.1
89095.000	302.	1805.	6.9	1090.9	1091.0	-.1
90395.000	535.	1339.	7.8	1109.5	1109.5	.0
90670.000	427.	1501.	7.0	1117.1	1117.1	.0
90745.000	212.	889.	11.8	1119.9	1119.9	.0

Attachment 2

TVCC CLOMR Application & Technical Backup Data

REQUEST FOR A CONDITIONAL LETTER OF MAP REVISION (CLOMR) FOR TEMESCAL WASH LOCATED WITHIN THE UNICORPORATED AREAS OF RIVERSIDE COUNTY, CALIFORNIA

Job Number 18602-A

October 6, 2021
September 29, 2022
January 20, 2023

RICK
ENGINEERING COMPANY

REQUEST FOR A CONDITIONAL LETTER OF MAP REVISION (CLOMR) FOR TEMESCAL WASH LOCATED WITHIN UNINCORPORATED AREAS IN RIVERSIDE COUNTY, CALIFORNIA

Job Number 18602-A

Brendan Hastie
R.C.E #65809
Exp. 09/23

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October 6, 2021
Revised: September 29, 2022
Revised: January 20, 2023

TABLE OF CONTENTS

INTRODUCTION 1

EXISTING TOPOGRAPHIC INFORMATION 3

PROPOSED GRADING INFORMATION 3

HYDROLOGIC INFORMATION 3

HYDRAULIC ANALYSIS 4

FEMA Effective Model 4

FEMA Duplicate Effective Model 5

Proposed Condition Model 8

HYDRAULIC RESULTS 9

REVISED FLOODPLAIN DATA 11

Parcels Affected by Changes to Floodplain 11

REVISED FLOODWAY DATA 11

List of Appendices

Appendix 1: FEMA MT-2 Forms

Appendix 2: FIS Data Information

Appendix 3: Effective and Duplicate Effective HEC-2 Analyses

Appendix 4: Corrected Effective Model HEC-RAS Analysis

Appendix 5: Existing Condition Model HEC-RAS Analysis

Appendix 6: Proposed Condition Model HEC-RAS Analysis

Appendix 7: Copy of Effective FEMA FIRM

Appendix 8: Revised FIRM

Appendix 9: Revised FIS Table

Appendix 10: HEC-RAS Workmaps

Appendix 11: Project Grading Plan

Appendix 12: Endangered Species Act Sections 9 and 10 Documentation

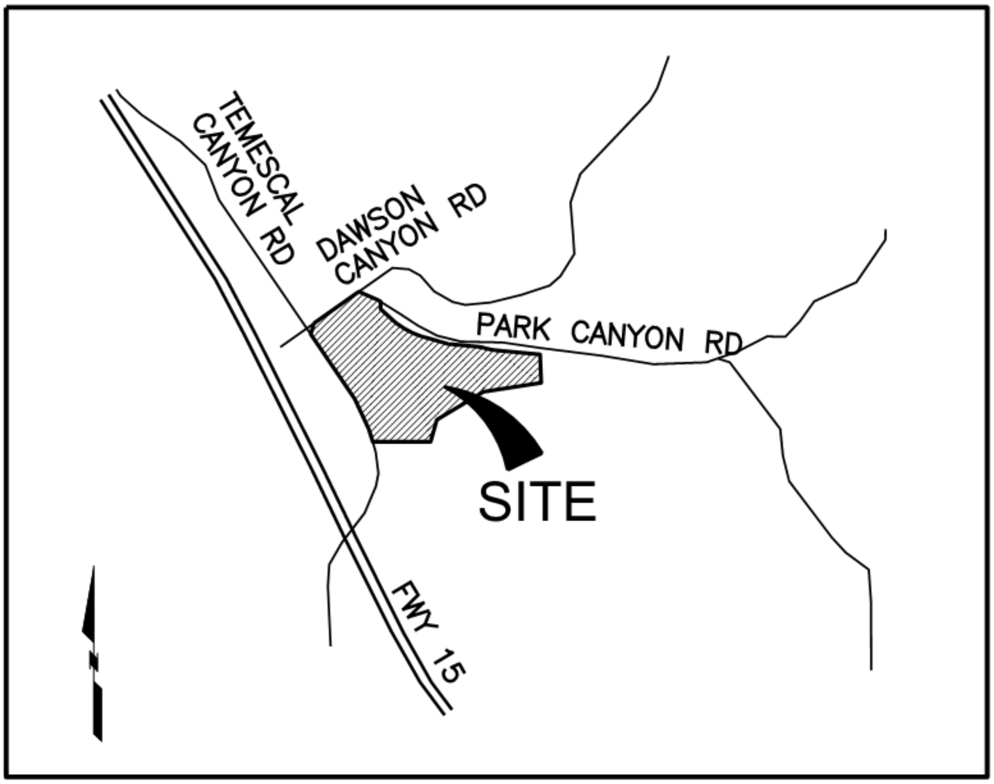
Appendix 13: CD of Digital HEC-RAS Models & Mapping Files

INTRODUCTION

The following is a request for a Conditional Letter of Map Revision (CLOMR) for a portion of Temescal Wash, located within unincorporated areas of Riverside County, California. This area is shown on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Number 06065C1390G, dated August 28, 2008. This proposed CLOMR shows revision to the FIRM and shows updates to FEMA's effective floodplain mapping and current National Flood Hazard Layer (NFHL) to reflect the proposed conditions associated with the development of the Temescal Valley Commerce Center, a planned commercial development on approximately 50-acres, which includes grading activities and the construction of asphalt parking areas and commercial buildings (see project site on Figure 1). The proposed hydraulic modeling performed as part of this proposed CLOMR is compared to a Duplicate Effective Model based on the Effective Model that was provided by FEMA on February 23, 2020. The Effective Model was based on the U.S. Army Corps of Engineers' HEC-2 program.

This CLOMR proposes to revise the FIRM to reflect the proposed conditions and proposes updates to the effective FEMA floodplain mapping delineated with the current NFHL. All applicable FEMA MT-2 forms required for this CLOMR request are located in Appendix 1.

The requested mapping revision is confined to Temescal Wash bound downstream by FEMA cross section AR, and the upstream limit of study is Park Canyon Drive, for a total distance of approximately 5,000 feet. The Effective Model, and thus the Duplicate Effective Model, extend further upstream and downstream, however the Existing Condition and Proposed Condition Models only include a portion of Temescal Wash related to this requested mapping revision. Additional upstream cross sections to include the Park Canyon Drive bridge are included in the Existing Condition and Proposed Condition Models to incorporate bridge losses in the hydraulic model.



VICINITY MAP
NO SCALE

Figure 1. Project Vicinity Map

FEMA has currently designated Temescal Wash as a Zone AE within the limits of the study area. This area is shown on FIRM Panel Number 06065C1390G, dated August 28, 2008. A copy of the effective FIRM is included in Appendix 7. This request for a CLOMR proposes to change the boundary of the currently designated Zones AE within the study area. See Appendix 8 for the proposed changes.

EXISTING TOPOGRAPHIC INFORMATION

For existing condition (i.e., pre-graded site), a field survey was conducted for the Dawson Canyon Road Bridge by Rick Engineering Company. The following is the Metadata information for the bridge survey data:

Completed By:	Rick Engineering Company
Horiz. Datum:	NAD 83
Vert. Datum:	National North American Vertical Datum of 1988 (NAVD 88)

In addition to the surveyed data, U.S. Geological Survey (USGS) topographic information was utilized for modeling of the Temescal Wash channel. The following is the Metadata information for the channel topography:

Source:	USGS
Horiz. Datum:	NAD 83
Vert. Datum:	National North American Vertical Datum of 1988 (NAVD 88)
Contour Interval:	2.0 ft

PROPOSED GRADING INFORMATION

Proposed grading information for the Proposed Condition Model hydraulic analyses is based on the grading plans, provided in Appendix 11. The Effective Model and Duplicate Effective Model HEC-2 analyses included in this report were prepared based on the National Geodetic Vertical Datum of 1929 (NGVD 29) vertical datum. The Existing Condition and Proposed Condition Model's hydraulic analyses included in this report was prepared based on the NAVD 88 vertical datum for comparison purposes with the FEMA effective water surface elevations (WSEs). A conversion factor of +2.6 feet was utilized to convert between vertical datums (from NGVD 29 to NAVD 88).

HYDROLOGIC INFORMATION

The Hydrologic Data used to model Temescal Wash was taken from the Effective Model and FIS for Riverside County, CA, dated March 6, 2018. Table 10 of the FIS shows 100-year discharges for Temescal Wash at Magnolia Avenue as 22,000 cubic feet per second (cfs). No other storm event discharges are provided for Temescal Was upstream of Magnolia Avenue, which is location approximately seven miles downstream of the project area. The Effective Model includes more detailed flow rate changes throughout Temescal Wash, which was utilized for the hydraulic analyses. The hydrologic data is summarized in Table 1.

Table 1: Summary of Discharges

Cross Section Flow Change Location	*100-year Peak Discharges (cfs)*
Effective Model Section 68448 (FIS Section AS)	19,400
Existing Model Section 69198	15,900
Existing Model Section 69733	13,220
Existing Model Section 73193	15,900

HYDRAULIC ANALYSIS

Hydraulic modeling was prepared using FEMA approved U.S. Army Corps of Engineers' HEC-RAS software to analyze the proposed changes to elevations and grades within the current floodplain limits in the requested mapping revision location.

FEMA Effective Model

An FIS data request was submitted to FEMA, and FEMA provided multiple separate models that cover the various reaches of Temescal Wash. The HEC-2 model for FIS Cross Sections AQ through AX was used as the Effective Model for this CLOMR request. The Effective Model includes data for Temescal Wash further upstream and downstream of FIS Cross Sections AQ and AX, however those portions of the model are not considered effective. The Effective Model references the National Geodetic Vertical Datum of 1929 (NGVD 29). Table 2 provides a list of the effective portion of the Effective Model cross sections along with the correlation to those listed in Table 13 of the FIS (May 16, 2012) and the Effective LOMR 18-09-1141P (effective date of June 11, 2019).

Table 2: List of Effective Model Cross Sections

Effective Model Cross Section	FIS & Effective LOMR Table 13 Cross Section
66473	AQ
66998	
67548	AR
68448	AS
69198	
69733	
Bridge	
69773	
69813	
70193	AT
70743	
71893	AU
72643	AV
73193	
73193	
Bridge	
73335	
73555	
74155	AW
75005	
75255	AX

Table 3 provides a list and brief description of the Effective Model HEC-2 files for the 100-year floodplain and 100-year floodway model analyses that are being submitted within this CLOMR request. The digital files, which include the Effective Model, are provided on the CD in Appendix 13.

Table 3: Effective Model File Names

Description	File Name
Input:	2b2_flwy-fl1.hec
Output:	2b2_flwy-fl1.out

FEMA Duplicate Effective Model

A Duplicate Effective Model was prepared in HEC-2 format based on the Effective Model. Table 4 provides a list and brief description of the Duplicate Effective Model HEC-2 files for the 100-year floodplain and 100-year floodway model analyses that are being submitted within this CLOMR request. See Appendix 3 for the hard copy of the Duplicate Effective Model HEC-2 results with input and output data. The digital files are provided in Appendix 13.

Table 4: Duplicate Effective Model File Names

Description	File Name
Input:	2b2_flwy-fl1_dup.DAT
Output:	2b2_flwy-fl1_dup.OUT

Corrected Effective Model

A Corrected Effective Model was prepared in a HEC-RAS format based on the Duplicate Effective Model. Before making any changes to the Duplicate effective model the following two revisions were made in the Corrected Effective Model:

- Converting the model from a HEC-2 format to a HEC-RAS format.
- Applying a datum conversion factor to the entire model of +2.6 feet to convert the vertical datum from NGVD 29 to NAVD 88.

From there, the Corrected Effective Model removed cross sections that were either not effective or outside of the project area. No additional cross sections were added to the Corrected Effective Model, however cross section geometries have been updated based on existing condition topography. This included updating the modeling of Dawson Canyon Road Bridge (between Effective Cross Sections 69733 and 69773) based on the survey conducted by Rick Engineering Company. More specifically, the bridge location was changed, from between Cross Sections 69733 and 69773 to between Cross Sections 69773 and 69819, and the geometry of the bridge was updated. Additionally, the Effective FIS data models a split flow scenario at the Dawson Canyon Bridge crossing, in which 2,680 cubic feet per second (cfs) overtops the south channel bank and bypasses the bridge to the south east at a low point of Dawson Canyon Road (i.e., a flow change reduction of 2,680 cfs at cross section 69733). The Corrected Effective modeling determined that flow does not overtop the south bank, in the vicinity of the Dawson Canyon Road Crossing, and thus does not model a split flow analysis at Dawson Canyon Road (i.e., removed the flow change at cross section 69733). The changes incorporated into the Corrected Effective Model are summarized in Table 5.

Table 5: Corrected Effective Model Cross Sections Summary

Cross Section[1]	Changes Incorporated Into Corrected Effective Model Cross Section Data
67548	Effective Model data
68448	Updated geometry based on existing topography
69198	"
69733	"
69773	Removed flow change (previously showed a 2,680 cfs reduction)
Bridge	Updated bridge geometry and location based on survey (previously between cross sections 69733 and 69773)
69813	Updated geometry based on existing topography
70193	"
70743	"
71893	Effective Model data
72643	"
73193	"
73193	"

[1] Cross sections not shown on this table have been removed from the Corrected Effective Model

Manning's N values for the Corrected Effective Model are consistent with the Effective Model. Table 6 provides a list and brief description of the Corrected Effective Model HEC-RAS files for the 100-year floodplain and 100-year floodway model analyses that are being submitted within this CLOMR request. See Appendix 4 for the hard copy of the Corrected Effective Model HEC-RAS results table, cross section plots, profile, and report with input and output data. The digital files are provided in Appendix 13.

Table 6: Corrected Effective Model File Names

Description	File Name
Project:	18602A_TW_CLOMR.prj
Plan:	18602A_TW_CLOMR.p01
Geometry:	18602A_TW_CLOMR.g01
Flow:	18602A_TW_CLOMR.f07

Existing Condition Model

The Existing Condition Model was prepared in HEC-RAS based on the Corrected Effective Model. No changes were made from the Corrected Effective Model to the Existing Condition Model. Table 7 provides a list and brief description of the Existing Condition Model HEC-RAS files for the 100-year floodplain and 100-year floodway models analyses that are being submitted within this CLOMR request. See Appendix 5 for the hard copy of the Existing Condition Model HEC-RAS results table, cross section plots, profile, and report with input and output data. The digital files are provided on the CD in Appendix 13.

Table 7: Existing Condition Model File Names

Description	File Name
Project:	18602A_TW_CLOMR.prj
Plan:	18602A_TW_CLOMR.p05
Geometry	18602A_TW_CLOMR.g06
Flow:	18602A_TW_CLOMR .f07

Proposed Condition Model

The Proposed Condition Model was prepared in HEC-RAS to model the proposed grading and surface improvements at the proposed site. Cross Sections 70193 and 70743 were updated with the proposed grading associated with the adjacent development and road improvements to create the Proposed Condition Model. Additionally, the project proposes a channel re-alignment of Coldwater Creek Wash, a tributary that outlets into Temescal Wash downstream of the Dawson Canyon Bridge Crossing in the existing condition. The modeling of this re-alignment included moving the flow increase in Temescal Wash from Coldwater Creek Wash (3,500 cfs), located at Cross Section 68448 in the Existing Condition, to Cross Section 70743. The changes incorporated into the Proposed Condition are summarized in Table 8.

Table 8: Proposed Condition Model Cross Sections Summary

Cross Section[1]	Changes Incorporated Into Proposed Model Cross Section Data
67548	Matches Existing Condition Model
68448	"
69198	"
69733	"
69773	"
Bridge	"
69813	"
70193	Incorporated proposed grading on southern bank
70743	Incorporated proposed grading on southern bank and flow increase of 3,500 cfs from Coldwater Creek Wash
71893	Matches Existing Condition Model
72643	"
73193	"

[1] Cross sections not shown on this table have been removed from the Proposed Condition Model

Table 9 provides a list and brief description of the Proposed Condition Model HEC-RAS files for the 100-year floodplain and 100-year floodway models analyses that are being submitted within this CLOMR request. See Appendix 6 for the hard copy of the Proposed Condition Model HEC-RAS results table, cross section plots, profile, and report with input and output data. The digital files are provided on the CD in Appendix 13.

Table 9: Proposed Condition Model File Names

Description	File Name
Project:	18602A_TW_CLOMR.prj
Plan:	18602A_TW_CLOMR.p07
Geometry	18602A_TW_CLOMR.g07
Flow:	18602A_TW_CLOMR.f06

HYDRAULIC RESULTS

A summary comparison of the Effective, Existing Condition, and Proposed Condition 100-year water surface elevations (WSE) are provided in the table below.

Cross Section	Effective WSE[1]	Existing Condition WSE[1]	Proposed Condition WSE[1]	Difference (Proposed – Existing)
67548	910.15	909.23	909.23	0.00
68448	916.88	911.20	911.20	0.00
69198	922.17	917.20	917.20	0.00
69733	927.69	920.30	922.03	1.73
69773	931.97	922.04	923.27	1.23
Bridge	-	-	-	-
69813	932.13	925.57	926.80	1.23
70193	933.03	926.95	928.27	1.32
70743	933.76	929.53	930.63	1.10
71893	937.34	938.55	938.90	0.35
72643	945.65	942.21	942.18	-0.03
73193	947.01	946.87	946.87	0.00

[1] WSE = 100-year Water Surface Elevation
Water Surface Elevations are in reference to NAVD 88.

As shown in the table, multiple cross sections experience rises in water surface elevations when comparing the Existing Condition to the Proposed Condition. However, it should be noted that, other than Cross Section 71893, the Proposed Condition water surface elevations are still lower than the Effective water surface elevations. This is due to the updated channel geometry based on the Existing Condition channel topography. Additionally, although the Proposed Condition shows a rise at Cross Section 71893 when compared to the Effective water surface elevation, the revised floodplain mapping shows a general decrease in the floodplain and floodway extents.

REVISED FLOODPLAIN DATA

The revised effective FIRM map illustrates how the 100-year floodplain will be modified as a result of the Proposed Condition. See Appendix 8 for a copy of the Revised FIRM.

As previously discussed, the modeling results indicate differences (rises) between the 100-year floodplain water surface elevation for the Existing Condition and Proposed Condition Models. However, due to updated topography information the water surface elevations in the Proposed Condition Model, aside from Cross Section 71893, show a decrease compared to the Effective water surface elevations. Furthermore, the 100-year floodplain shows a general decrease in its limits.

Digital copies of the floodplain boundary, cross section locations and topographic data are included on the CD in Appendix 13. The digital floodplain data is provided on the following datums: NAD 83 California State Plane Zone 6 Horizontal Datum and NAVD 88 vertical datum.

Parcels Affected by Changes to Floodplain

The change to the 1-percent-annual-chance floodplain is limited to the following parcels and property owners:

- Corona Clay Co. (project property owner), APNs 283190024, 283190025, 283190026
- USA Waste of California, APN 283190033
- William Tien, APN 283190030

As such, the requirement that individual legal notices be sent to property owners who are affected by any increases in width and/or shifting of the floodplain of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) will be sent to the affected property owners. An exhibit has been prepared to show the parcels affected by the change to the 1-percent-annual-chance floodplain, and is included in Appendix 10.

REVISED FLOODWAY DATA

A summary of resulting 100-year floodway WSE comparisons can be found in Appendix 6.

APPENDIX 8

REVISED FIRM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

This map may reflect more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

LEGEND:

Revised 100-Year Floodplain

Revised 100-Year Floodway

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - 23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{24}76^{000m}$N	1000-meter Universal Transverse Mercator grid values, zone 11N
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1390G

FIRM
FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1390 OF 3805
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CORONA, CITY OF	060250	1390	G
RIVERSIDE COUNTY	060245	1390	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C1390G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

APPENDIX 9

REVISED FIS TABLE

Floodway Data Table Comparison

Effective Data

Flooding Source			Floodway			1 Percent Annual Chance Flood Water Surface Elevation (Feet NAVD)			
FIS Cross Section	Cross Section	Distance[1]	Width (Feet)	Section Area (ft2)	Mean Velocity (fps)	Regulatory	Without Floodway	With Floodway	Increase
AS	68448	68,448	315	1,986	9.8	916.8	916.8	916.8	0.0
AT	70193	70,193	379	3,000	5.3	932.0	932.0	932.0	0.0
AU	71893	71,893	290	1,305	12.2	937.2	937.2	937.2	0.0
AV	72643	72,643	554	2,406	6.6	945.6	945.6	945.6	0.0

[1] Feet above confluence with Santa Ana River

Proposed Data (HEC-RAS Model)

Flooding Source			Floodway						
FIS Cross Section	Cross Section	Distance[1]	Width (Feet)	Section Area (ft2)	Mean Velocity (fps)	Regulatory	Without Floodway	With Floodway	Increase
AS	68448	68,448	251	1,573	13.5	911.2	911.2	911.1	-0.1
AT	70193	70,193	243	2,054	9.7	928.3	928.3	928.3	0.0
AU	71893	71,893	261	1,533	11.3	938.9	938.9	938.9	0.0
AV	72643	72,643	340	2,669	6.0	942.2	942.2	942.2	0.0

[1] Feet above Confluence with Santa Ana River

APPENDIX 10

HEC-RAS WORKMAPS

HYDRAULIC WORKMAP FOR TEMESCAL VALLEY COMMERCE CENTER (PRE-PROJECT)

J-18602-A

Date: January 2023

RICK ENGINEERING COMPANY
San Diego
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619-291-0707
(FAX) 619-291-4165
rickengineering.com
Riverside - Orange - Sacramento - San Luis Obispo - Phoenix - Tucson - Denver

J-18602-A

NOT FOR CONSTRUCTION - EXHIBIT FOR HYDRAULIC STUDY ONLY

HYDRAULIC WORKMAP FOR TEMESCAL VALLEY COMMERCE CENTER (POST-PROJECT)

J-18602-A

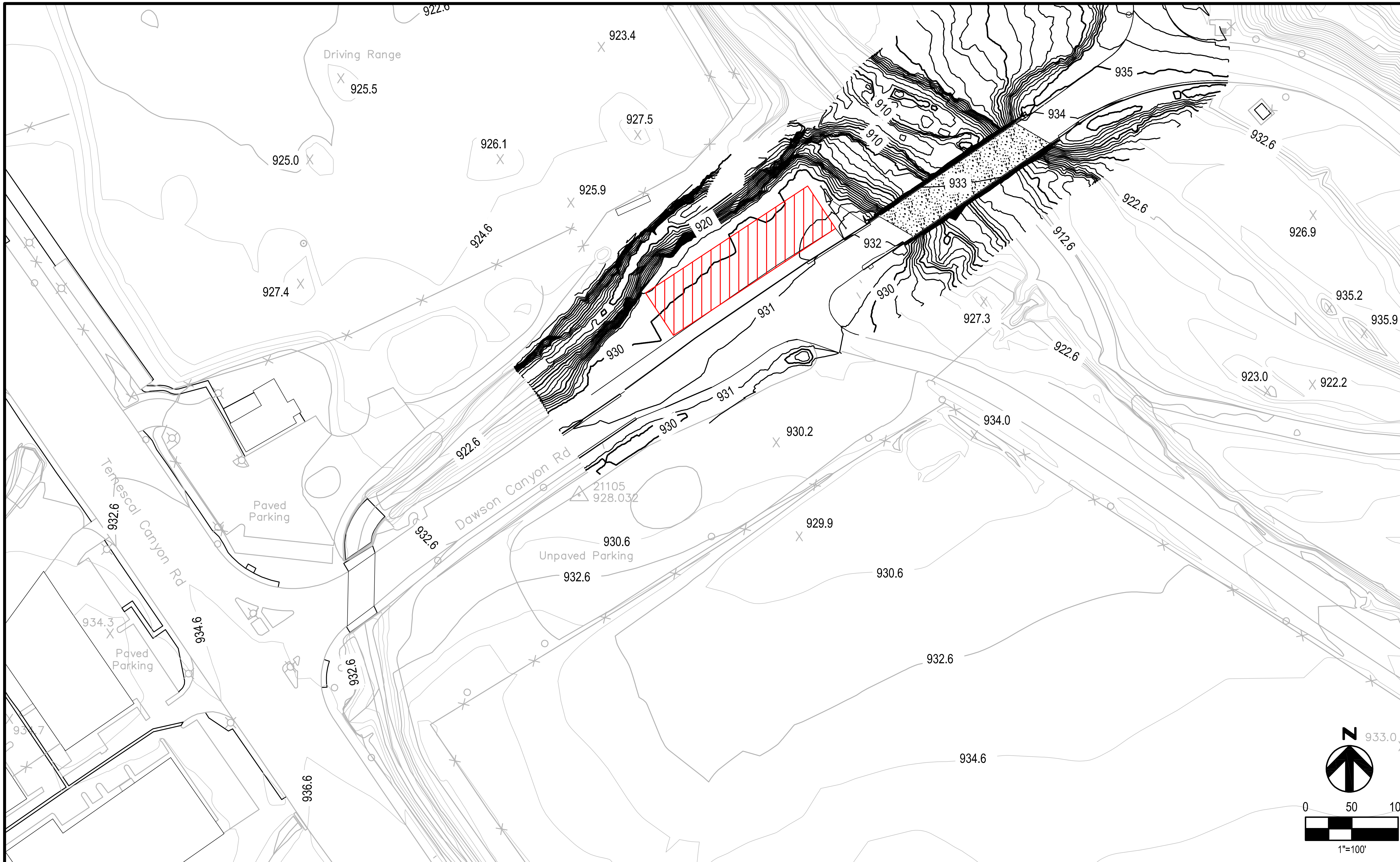
Date: January 2023

RICK ENGINEERING COMPANY
San Diego
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619-291-0707
(FAX) 619-291-4165
J-18602-A
rickengineering.com
Riverside - Orange - Sacramento - San Luis Obispo - Phoenix - Tucson - Denver

NOT FOR CONSTRUCTION - EXHIBIT FOR HYDRAULIC STUDY ONLY

Attachment 3

Existing Site Topography



BLUE OCEAN
CIVIL CONSULTING

TORO ENERGY LFG PROJECT AT ESL
EXISTING TOPOGRAPHY
MAY 2023

D:\K5073.001 Toro Energy\CAD\SHEETS\Ex TOPO.dwg 5/18/23 22:21

Attachment 4

Riverside County Flood Control Special Study Coldwater Canyon Wash Geomorphology Study

Figure 1. Project study reach vicinity map

Legend

Flood Hazard Zone Limits

Department of Water Resources Flood Awareness Zone

N E S W

0 200 400 600
Feet

JE FULLER

Coldwater Canyon Wash Geomorphology Study

Flood Hazard Zone Exhibit

Legend

Flood Hazard Zone Limits

Historical Bank Limits

- 1948
- 1952
- 1966
- 1974
- 1980
- 1995
- 2002
- 2003
- 2008
- 2011
- 2014

Stable Slope Cross-Section

- Existing Right Top
- Existing Left Top
- Existing Left Toe
- Existing Right Toe
- 1.7 Projected Top
- 3.1 Projected Top

N E S W

0 200 400 600 Feet

JE FULLER

Coldwater Canyon Wash Geomorphology Study

Flood Hazard Zone Workmap

Coldwater Canyon Wash Geomorphology Study

Task 1 – Field Reconnaissance and Geomorphic Assessment

REGISTERED PROFESSIONAL ENGINEER
NATHANAEL
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Table of Contents

1 Introduction 1

1.1 Study Limits 1

1.2 Task Objectives 1

1.3 Historical Overview 3

1.4 Reach Descriptions 3

1.4.1 CCW Reach Designations 4

1.4.2 Geomorphic Assessment Stationing 4

2 Geomorphic Assessment 7

2.1 Watershed Overview 7

2.1.1 Trilogy 7

2.2 Detailed Field Reconnaissance 7

2.3 Precipitation and Flood Records 8

2.3.1 Precipitation Records 8

2.3.2 RCFCWCD Public Flood Reports 11

2.3.3 Riverside County Transportation Department (RCTD) Roadway Closure Records 11

2.3.4 Local Information 15

2.4 Aerial Photography Analysis 15

2.5 Topography Analysis 16

2.6 Longitudinal Profile Analysis 16

2.6.1 CCW Profile 17

2.6.2 Historical Profile Comparison 18

2.7 Cross-Section Profile Analysis 21

2.8 Temporal Chronology 27

2.9 Spatial Summary 47

2.10 Comparison to Adjacent Watersheds 51

2.10.1 Indian Canyon 51

2.10.2 Unnamed Tributary 53

2.10.3 Summary 55

3 Summary and Conclusions 56

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List of Figures

Figure 1. Project study reach vicinity map 2
Figure 2. River station alignment 6
Figure 3. Precipitation gage locations 9
Figure 4. Flood complaint location map 14
Figure 5. 2015 Longitudinal Profile 18
Figure 6. Longitudinal Profile Plot 20
Figure 7. Historical slope comparison 21
Figure 8. Reference Cross-Sections 23
Figure 9. Cross-Section Plots 1-4 24
Figure 10. Cross-Section Plots 5-8 25
Figure 11. Cross-Section Plots 9-10 26
Figure 12. Field Photographs from September and October 2016 47
Figure 13. Typical left bank sediments in the reach between Temescal Canyon Rd and I-15. 48
Figure 14. Typical right bank sediments in the reach between Temescal Canyon Rd and I-15 48
Figure 15. Channel thalweg spatial summary 49
Figure 16. Channel banks spatial summary 50
Figure 17. Indian Canyon vicinity map 52
Figure 18. Upstream of the Glen Eden Resort. Note the size of the material in the channel. 53
Figure 19. Natural reach upstream of Glen Eden Resort. 53
Figure 20. IC within Glen Eden Resort. Note the vertical cutbank. 53
Figure 21. IC within Glen Eden Resort. Note the artificial boulder levee. 53
Figure 22. IC incision at Temescal Canyon Road bridge. 53
Figure 23. IC channel incision between Temescal Canyon Road and I-15. 53
Figure 24. Location of railroad trestle and unnamed tributary 54
Figure 25. Incision at railroad trestle. 55
Figure 26. Magnitude of channel incision. 55
Figure 27. Incised channel upstream of railroad trestle. 55
Figure 28. View upstream of unnamed wash from Temescal Wash. Note the perched channel. 55

List of Tables

Table 1. Precipitation event record 10
Table 2. Flood complaint records 12
Table 3. Local entities contacted within the CCW watershed 15
Table 4. Collected aerial photography 16
Table 5. Collected historical topography 16
Table 6. Temporal Chronology 28

Appendices

Appendix A – Digital Data Submittal

1 INTRODUCTION

Coldwater Canyon Wash (CCW) originates on the eastern slope of the Santa Ana Mountains at 6,000 feet elevation and flows across the Temescal Valley into Temescal Wash at 900 feet elevation. Historically, CCW was an alluvial fan landform with a topographic apex near the present Glen Ivy Hot Springs Resort. By definition, an alluvial fan is an aggrading landform which receives and deposits sediment over time, resulting in a distributary channel pattern. Anthropogenic changes to CCW downstream of the fan apex beginning in the early 20th century have been altering the geomorphic character of the system. Today, CCW can be characterized as a primarily straight, single channel system. Property owners along CCW are experiencing flood-related problems such as channel scour, bank erosion, sedimentation, and other unpredictable behavior. Riverside County Flood Control and Water Conservation District (RCFCWCD) has enlisted JE Fuller/Hydrology & Geomorphology, Inc. (JEF) to conduct a geomorphic study of CCW in an attempt to better understand its present behavior, and to aid in predicting potential future behavior.

1.1 STUDY LIMITS

The study area extends from immediately upstream of the Glen Ivy Hot Springs Resort to the confluence with Temescal Wash (Figure 1), and is approximately 2.5 river miles in length. Descriptions of CCW throughout this report are generally referenced by major geographic feature which are shown in Figure 1 for reference.

1.2 TASK OBJECTIVES

This report represents one of four tasks of the overall Coldwater Canyon Wash Geomorphology Study. The purpose of this task is the following:

- Perform a detailed field reconnaissance to identify areas of channel stability and instability, document and photograph existing conditions, and identify regional trends.
- Collect and review historical aerial photography and develop and chronology of changes to the watershed.
- Collect and review historical topography to quantify the changes to the CCW channel.
- Review flood accounts to compare with changes observed in the aerial photography.
- Synthesize the information above into an overall geomorphic assessment of CCW and determine whether CCW has reached a state of equilibrium considering the changes to the system within the period of record.

Figure 1. Project study reach vicinity map

1.3 Historical Overview

The history of CCW within the period of record is discussed throughout this report and in detail in Section 2.8, however to help the reader in understanding the overall context, a brief history of major changes to CCW is summarized below in order of oldest to most recent:

- Temescal Canyon Road and Glen Ivy Road pre-date the earliest collected photographic record (1948),
- Agricultural development along much of the CCW floodplain downstream of Temescal Canyon Road prior to the 1940s.
- The I-15 corridor is cleared and graded in the mid-1960s.
- The Rinker concrete pipe plant (Rinker plant) is constructed in the early 1970s. CCW is diverted and channelized to the west of the Rinker plant. The old channel is cutoff by a constructed levee.
- The I-15 bridges are constructed between 1978-1979 including channelization of CCW and grouted rip-rap bank protection along both banks.
- Aggregate mining begins on the alluvial fan in the early 1980s and progresses westward.
- Clearing, grading and early construction for Tom's Farm begins in the early 1980s.
- Tom's Farms excess right-of-way purchase and maintenance agreement with Caltrans in June 2000.
- Aggregate mining encompasses the entire alluvial fan surface by the mid-1990s. CCW is channelized around the aggregate pits from the Glen Ivy Hot Springs Resort to the Glen Ivy Road crossing.
- CCW was diverted and channelized immediately downstream of the Dawson Creek Road crossing. The new channel alignment parallels Dawson Creek Road and extended to the confluence of Temescal Wash.
- Concurrent with the aggregate pit channelization effort, several in-line infiltration basins were constructed with concrete check dams. Many of the dams were later breached (likely intentionally).
- Construction of the Trilogy at Glen Ivy master planned community between 2002 and 2008.
- Construction of the Glen Ivy Golf Course outlet channel in 2002.
- Construction of Tom's Farms train bridge across the wash in 2002.
- Squaw Mountain Road bridge is constructed between 2001 and 2002
- A box culvert was constructed at the Dawson Creek Road crossing in 2002.
- Culverts were installed at the Glen Ivy Road crossing in 2002.
- A grouted rip-rap grade control structure was installed downstream of I-15 in 2003.
- Structures placed and constructed within the wash between Tom's Farms train bridge and Caltrans I-15 bridge from 2000-2010.
- Significant amount of materials removed from CCW bottom and placed adjacent to CCW in 2014 between train bridge and Trilogy outlet structure

1.4 Reach Descriptions

1.4.1 CCW Reach Designations

- The CCW study was divided into eight descriptive reaches which were incorporated into this analysis and represent the broadest level of spatial relationship. The CCW reach names are used in multiple sections of this report and are listed below for reference and illustrated in Figure 2.
- Reach 1. Temescal Wash confluence to the Dawson Canyon Road culvert.
- Reach 2. Dawson Canyon Road culvert to Rinker Plant.
- Reach 3. Rinker Plant to I-15.
- Reach 4. I-15 to Squaw Mountain Road.
- Reach 5. Squaw Mountain Road to Temescal Canyon Road.
- Reach 6. Temescal Canyon Road to Glen Ivy Road.
- Reach 7. Glen Ivy Road to Glen Ivy Hot Springs Resort parking lot.
- Reach 8. Glen Ivy Hot Springs Resort parking lot to the upstream limit of Glen Ivy Hot Springs Resort.

The division of the eight reaches is based on their unique geomorphic characteristics which are defined and described throughout this report.

1.4.2 Geomorphic Assessment Stationing

A river station alignment was established for this study to give a consistent baseline for more detailed descriptions of CCW. The alignment was divided into 1,000-foot increments beginning at the downstream limit of the study reach. Since CCW has substantially changed laterally over time (due to channelization), the alignment was delineated so as to be applicable to all historical channel locations (thus does not follow the present channel alignment precisely). Figure 3 shows the station alignment and numerical stationing. The stationing is primarily referenced in Section 2.8.

Figure 2. CCW reach designations

Figure 3. River station alignment

Table 2. Flood complaint records

#	Complaint #	Date	Address	Explanation	Findings
1	4439	12/23/08	24327 Swift Deer Tr	We heard through the media of a retaining wall failing in unincorporated area of Corona. Dusty had mentioned the issue to Dale Anderson as well, so we investigated through PE.com an article revolving around a neighbor who had talked to the newspaper--Kat and Steve Sanders. These residents never called the District, however, Edwin and I (Everett Duckworth) went out to the site to investigate whether the nearby Coldwater Canyon Wash contributed to the wall failure.	The westerly boundary of the tract is supported by fill and mechanically stabilized retaining walls that sit on the existing slope that meets the canyon. We found no stream scour of the existing toe of slope from recent rain storms (December 15, 16, 17) that may have weakened the foundation of the wall. However, we found some ponding behind the retaining wall within the back yards of the affected lots. (16-20) APN 290-611-004 thru 006 Coldwater Canyon has a low that meanders toward Squaw Mountain Road but does not flow against the toe of the slope that the wall was built on. We found no evidence that the existing slope experienced runoff, as the bushes and grass were intact. We found no distress of the existing slope. We did see two small erosion streams near lots 18 and 20 that maybe have been there for awhile as grass was growing in the crevice. We could not find a source of runoff of these crevices but did note that it was the only place that bushes were growing and had been growing for some time. One 4" PVC pipe was found in this location but did not have any erosion associated with the pipe. The pipe is thought to be a part of the walls perforated pipe system. There is a finger of the stream that flows from Glen Ivy Road directly to the slope and appears to erode the slope as it is currently a vertical face near lot 25. This slope does not look stable with a retaining wall on top of it. The other portions of the slope appear to be stable at 2:1 with good vegetated cover. The wall appeared to have rotated as the side yard fence had been pulled away from its post. The wall also looked vertical, not with a 10:1 batter as specified on the plans. The wall looked like it had subsided in the area where the face panels were crushed or bent.
2	4440	12/23/08	24279 Swift Deer Tr	See complaint number 4439	See complaint number 4439
3	4441	12/23/08	24295 Swift Deer Tr	See complaint number 4439	See complaint number 4439
4	4442	12/23/08	24311 Swift Deer Tr	See complaint number 4439	See complaint number 4439
5	3570	01/10/05	23890 Trilogy PKY,Glen Ivy HS	Asphalt Road (Glen Ivy Road) is washed out and Caller is worried someone will get into the ravine. Wash out is next to the intersection with Temescal Canyon Road.	Road is apparently owned by Glen Ivy RV Park – Owner's Association.

Table 2 cont..

6	**1815**	03/01/91	23705 Lawson Rd.	Mrs. Schoderer's neighbor channeled water onto her property.	N/A
7	**2062**	05/13/92	9199 Hunt Rd.	Blockage of mapped flooed way (Tract 7240)	N/A
8	**3303**	03/01/91 03/19/02 10/25/04	9145 Hunt Rd.	Water is undermining the road. Mr. Steve Payne said he already left message for Transportation Department. He emailed me some photographs so that I can forward to someone at Transportation. His main concern was the road caving in (See attached photos).	N/A
9	**4615**	12/28/10	23200 Temescal Canyon Rd	The access road near Dawson Canyon Rd has been washed away, need somebody to come and repair it.	Not a County of Transportation maintained road. Every road along Dawson Canyon Road is a privately maintained road.
10	**2297**	03/09/93	10290 Wrangler Way	Caller said there is a lot of water on Temescal Road which was not there on the previous day. She thinks somebody may be releasing water. This will undermine their only access road.	N/A

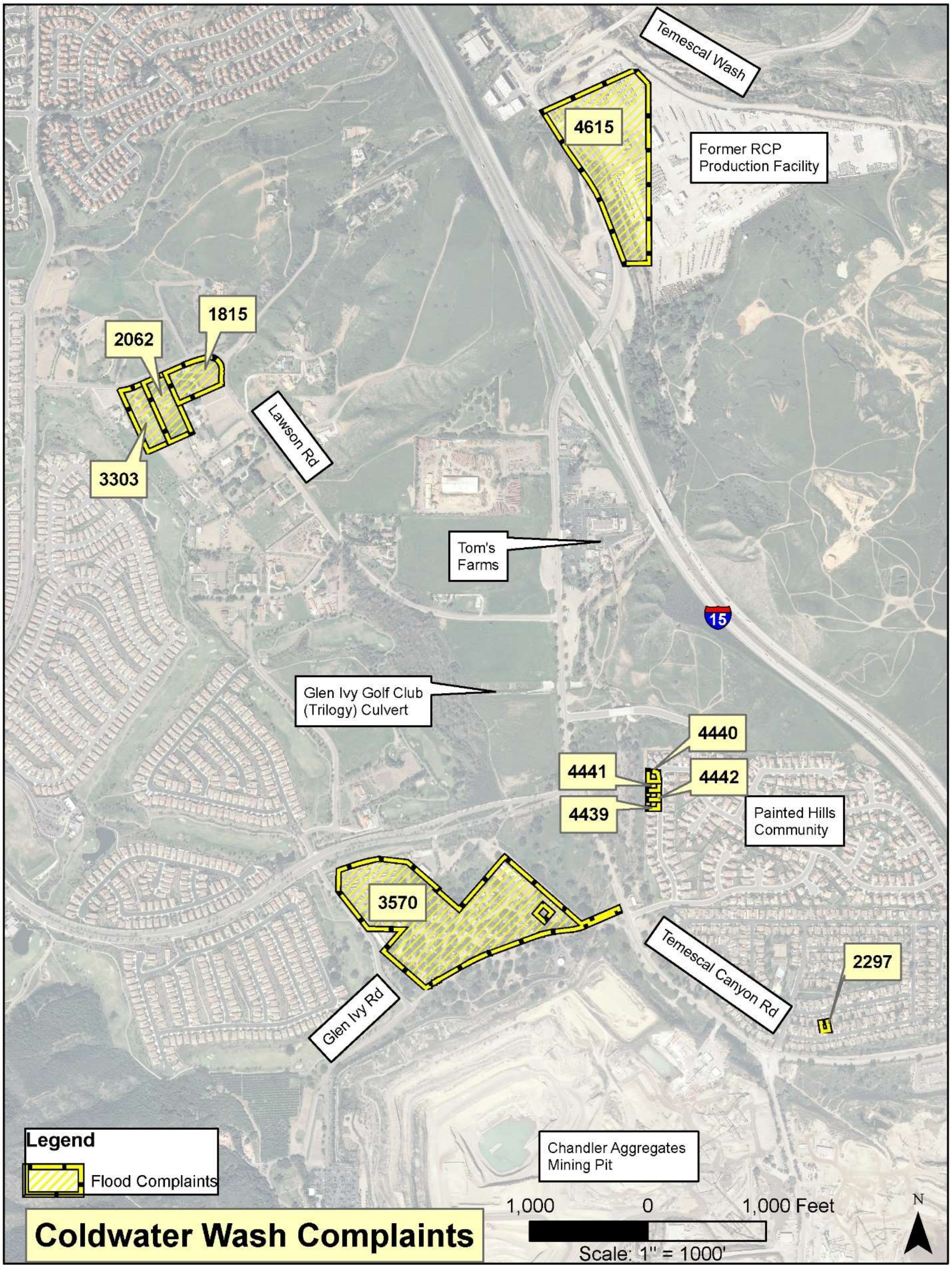

Figure 5. Flood complaint location map

2.8 Temporal Chronology

Coldwater Canyon Wash has experienced substantial changes to its natural form and function. Those changes have occurred at various points in time (temporal) and at different locations (spatial). Watersheds often experience anthropogenic changes that occur linearly either in the downstream direction (development beginning higher in the watershed and progressing downstream over time) or in the upstream direction (beginning in the lower watershed and progressing upstream over time). Determining the causational factors of changes to a watercourse in these situations is often straight forward because changes can be linked to specific development activities. By contrast, the development history of the CCW watershed is non-linear; development in the watershed has occurred as spatially and temporally distinct elements over the period of record. This makes attempting to correlate watercourse changes to development changes more difficult. One way to attempt to get a “big picture” understanding of changes in this situation is to develop a chronology that summarizes changes both temporally and spatially. A chronology was developed for CCW and is shown as Table 6. The chronology is intended to be the “clearing house” of information collected for the history of CCW within the period of record. Figure 13 (following the chronology table) contains field photographs from the September and October 2016 reconnaissance visits and are referenced in Table 6. The following are the elements comprising the chronology:

- **Reach** – The CCW Reach designations
- **Years** – The timeline was set on a decadal scale beginning in the 1940s (earliest collected aerial photography) and extending to the present.
- **River Station** – The stationing established for this study, shown previously as Figure 3.
- **Anthropogenic Change** – A description of development interpreted from collected data and information.
- **Channel Pattern** – Channel pattern interpreted from the collected aerial photography.
- **Floods** – Dates of flood events derived from the local gage record and interpretations from the aerial photography.
- **Channel Sediment and Field Interpretation** – Channel bed sediment characteristics and overall descriptions and interpretations of channel change as observed during the October 2016 field investigation.
- **Field Photos** – Reference to field photos shown in Figure 13.
- **Start Year/End Year** – Specific dates of development activity derived from various data collected for the study.

The temporal chronology contains the overall history of CCW that was interpreted from the historical record collected for this study and contains both facts and interpretations.

Reach	Years	River Station	Anthropogenic Change	Channel Pattern	Floods[1]	Channel Sediment and Field Interpretation (September and October 2016 Field Visit)	Field Photos (see Figure 13)	Start Year	End Year
REACH 3	1940s	4000	Agricultural development and encroachment along the left overbank.	Transition from single, meandering channel to distributary.	-	-	-	-	-
REACH 2		3000	Temescal Canyon Road parallels the flow direction and cut off some of the distributary channel network.	Distributary.	-	-	-	-	-
		2000	Temescal Canyon Road parallels the flow direction and cut off some of the distributary channel network.	Distributary.	-	-	-	-	-
REACH 1		1000	Temescal Canyon Road parallels the flow direction and cut off some of the distributary channel network.	Distributary to Temescal Wash confluence.	-	-	-	-	-
REACH 3	1950s	4000	*No aerial photo coverage available.*	*No aerial photo coverage available.*	-	-	-	-	-
REACH 2		3000	*No aerial photo coverage available.*	*No aerial photo coverage available.*	-	-	-	-	-
		2000	No change.	Distributary.	-	-	-	-	-
REACH 1		1000	No change.	Distributary to Temescal Wash confluence.	-	-	-	-	-
REACH 3	1960s	4000	I-15 corridor clearing and grading for north bridge approach and traffic interchange cutting off some of the distributary channel network.Temescal Canyon Road was realigned to the east cutting off some of the distributary channel network.	Single, meandering.	Flood evidence in 1966 aerial photos	-	-	-	-
REACH 2		3000	Temescal Canyon Road was realigned to the east cutting off some of the distributary channel network.	Transition from single, meandering channel to distributary.		-	-	-	-
		2000	Temescal Canyon Road was realigned to the east cutting off some of the distributary channel network.	Distributary.		-	-	-	-
REACH 1		1000	No change.	Distributary to Temescal Wash confluence.		-	-	-	-

Reach	Years	River Station	Anthropogenic Change	Channel Pattern	Floods[1]	Channel Sediment and Field Interpretation (September and October 2016 Field Visit)	Field Photos (see Figure 13)	Start Year	End Year
REACH 3	1970s	4000	Active construction of the I-15 corridor. The active channel is cutoff via a levee and diverted.	Single, meandering.	-	-	-	-	-
REACH 2		3000	A straight channel is constructed in conjunction with construction of the Rinker plant. The CCW channel is flanked by Temescal Canyon Road to the west and the Rinker plant to the east.	Single, straight (channelized).	-	-	-	-	-
		2000	A straight channel is constructed in conjunction with construction of the Rinker plant. The CCW channel is flanked by Temescal Canyon Road to the west and the Rinker plant to the east.	Single, straight (channelized).	-	-	-	-	-
REACH 1		1000	A straight channel is constructed in conjunction with construction of the Rinker plant. The CCW channel is flanked by Temescal Canyon Road to the west and the Rinker plant to the east. A culvert is constructed for the entrance road to the Rinker plant. The channelization ends at the intersection of Temescal Canyon Road and Dawson Canyon Road.	Single, straight (channelized) upstream of Dawson Canyon Road. Single, meandering downstream of Dawson Canyon Road to Temescal Wash confluence.	-	-	-	-	-
REACH 3	1980s	4000	I-15 corridor construction is complete (bridges and approaches) and encroaches on the left overbank.	Single, meandering.	-	-	-	-	-
REACH 2		3000	Temescal Canyon Road is re-aligned as part of the I-15 traffic interchange.	Single, straight (channelized).	-	-	-	-	-
		2000	No change.	Single, straight (channelized).	-	-	-	-	-

Reach	Years	River Station	Anthropogenic Change	Channel Pattern	Floods[1]	Channel Sediment and Field Interpretation (September and October 2016 Field Visit)	Field Photos (see Figure 13)	Start Year	End Year
REACH 1		1000	No change.	Single, straight (channelized) upstream of Dawson Canyon Road. Single, meandering downstream of Dawson Canyon Road to Temescal Wash confluence.	-	-	-	-	-
REACH 3	1990s	4000	No change.	Single, meandering.	February 1991 January 1993	-	-	-	-
REACH 2		3000	No change.	Single, meandering.		-	-	-	-
		2000	No change.	Single, meandering.		-	-	-	-
REACH 1		1000	Realignment of Dawson Canyon Road and construction of a culvert. Construction of a straight channel parallel to Dawson Canyon Road to the Temescal Wash confluence.	Single, straight (channelized).		-	-	-	-
REACH 3	2000s	4000	No change.	Single, meandering.	February 2003 October 2004 January 2005	-	-	-	-
REACH 2		3000	No change.	Single, meandering.		-	-	-	-
		2000	No change.	Single, meandering.		-	-	-	-
REACH 1		1000	Reconstruction of the Dawson Canyon Road culvert.	Single, meandering.		-	-	2002	2002
REACH 3	2010s	4000	No change.	Single, meandering.	January 2010 December 2010 February 2014	**Channel Bed Sediment:** Thick organic litter through much of the reach. The areas with exposed bed sediments were cobble dominated and armored. **Field Interpretation:** This reach contains the densest vegetation downstream of Reach 8. Multiple locations of vertical cutbanks and exposed tree roots indicating lateral migration. Like previous reaches, multiple perched floodplain terraces were observed with vegetation indicating periods of vertical stability then incision. The highest terrace is 8 feet above the present channel. A secondary terrace at 4 feet above the channel was also observed. Although the reach is heavily vegetated which can serve as a mechanism to slow velocities and reduce erosion, many signs of channel instability were observed (cutbanks, terraces, etc.). Evidence of incipient armoring of the low-flow channel was observed in multiple locations within the reach.	Photos: 25, 26, 27, 28	-	-

Reach	Years	River Station	Anthropogenic Change	Channel Pattern	Floods[1]	Channel Sediment and Field Interpretation (September and October 2016 Field Visit)	Field Photos (see Figure 13)	Start Year	End Year
REACH 2		3000	No change.	Single, meandering.		**Channel Bed Sediment:** Significantly more sand and fewer cobbles than upstream reaches; likely as a result of the constructed channel with fewer cobbles available in the banks. **Field Interpretation:** The beginning of the channelized reach along the west side of the former RC plant. The natural flow path was cut off by a levee and the channel was diverted in the early 1970s. The reach has experienced incision as evidenced by vertical cutbanks along both banks throughout the reach.The bed is less armored in this reach likely due to the lack of available larger material in the banks (artificial channel).	Photos 29, 30	-	-
		2000	No change.	Single, meandering.		**Channel Bed Sediment:** Significantly more sand and fewer cobbles than upstream reaches; likely as a result of the constructed channel with fewer cobbles available in the banks. **Field Interpretation:** Continuation of the channelized reach. Same characteristics at the reach above.	-	-	-
REACH 1		1000	No change.	Single, meandering.		**Channel Bed Sediment:** Significantly more sand and fewer cobbles than upstream reaches; likely as a result of the constructed channel with fewer cobbles available in the banks. **Field Interpretation:** A box culvert beneath Dawson Canyon Road was constructed around 2002. The channel was diverted to the northeast to parallel Dawson Canyon Road. Prior to the diversion, the channel crossed Dawson Canyon Road and continued north to Temescal Wash. The culvers now serve as grade control for the upstream reach. Approximately 2 feet of scour was observed at the culvert outlet. The channel banks near the confluence with Temescal Wash are lined with grouted rip-rap. The rip-rap is actively being undermined and failing in large blocks due to channel incision. The CCW is perched a few feet above Temescal Wash suggesting that additional incision of CCW should be expected during flood events.	Photos 31, 32, 33, 34	-	-

1. Flood data derived from precipitation records from the following RCFCWCD gages: (035 Chase & Taylor)); (321 El Sobrante)
2. *http://www.cal-ipc.org/ip/management/ipcw/pages/detailreport.cfm@usernumber=48&surveynumber=182.php*
3. Personal communication with Robert Lizano, General Manager-Tom's Farms (10/27/2016)

Photo 31. Box culvert inlet at Dawson Canyon Road. Reach 2. 10/4/16.

Photo 32. Box culvert downstream apron. Note the scour on the downstream face. Reach 1. 10/4/16.

Photo 33. View upstream of the right bank near Temescal Wash confluence. Note the failure of the grouted rip-rap. Reach 1. 10/4/16.

Photo 34. The left bank near the Temescal Wash confluence. Note the vertical exposed bank and concrete blocks on the slope. Reach 1. 10/4/16.

Figure 13. Field Photographs from September and October 2016

2.9 Spatial Summary

Spatial summaries were constructed to illustrate the changes in channel thalweg and channel bank positions within the collected historical record. The spatial summaries provide additional context to the evolution of CCW when compared directly with the temporal chronology. Figure 16 shows the channel thalweg spatial summary and indicates the following:

- The most significant changes in channel position are a result of anthropogenic alterations to the system including channelization upstream of Glen Ivy Road and downstream of I-15.
- The reach between Temescal Canyon Road and I-15 has experienced lateral change in excess of 250 feet. Immediately downstream of Temescal Canyon Road the thalweg migrated eastward between 1951 and the present. Since 2001 the thalweg has been located along the eastern side of the floodplain (away from the high bluff).

Figure 17 shows the channel bank spatial summary and indicates the following:

- The active channel corridor upstream of Glen Ivy Road was reduced from a width of nearly 1,500 feet to less than 50 feet with the development of the aggregate mine. CCW was changed from an active alluvial fan distributary system to a single channel system over the course of approximately 15 years.

- The active channel corridor width between Glen Ivy Road and Temescal Canyon Road has been consistent within the period of record.
- Between Temescal Canyon Road and the channelization downstream of I-15 the channel has experienced a consistent pattern of narrowing and incision. Much of this reach is experiencing some level of incipient armoring of the channel bed. Armoring will continue to develop which could result in a reduction in the rate of incision. The channel will likely widen as the incision rate decreases. The left bank sediments in this reach are very different from the right bank. The left bank is comprised of fine sands and silts with sparse gravel lenses indicative of fill material (Figure 14). Most of the sediment eroded from the left bank during subsequent floods will be transported downstream primarily as suspended load. The right bank is comprised of gravels and cobbles within a coarse sand matrix (typical CCW bedload material) (Figure 15). Sediment eroded from the right bank during subsequent floods will supply the reach with additional larger material (cobbles and boulders) required for armoring.
- The channel has been substantially modified beginning just upstream of the Rinker plant. The width became fixed in the channelization reach beginning in the 1970s.

Figure 14. Typical left bank sediments in the reach between Temescal Canyon Rd and I-15. Note the predominantly finer sediments with sparse gravels and cobbles.

Figure 15. Typical right bank sediments in the reach between Temescal Canyon Rd and I-15. Note the predominantly larger material within a coarse sand matrix.

3 SUMMARY AND CONCLUSIONS

The field reconnaissance and geomorphic assessment is the first of four tasks in the overall Coldwater Canyon Wash Geomorphology Study. The objectives of this task were:

- Perform a detailed field reconnaissance to identify areas of channel stability and instability, document and photograph existing conditions, and identify regional trends.
- Collect and review historical aerial photography and develop and chronology of changes to the watershed.
- Collect and review historical topography to quantify the changes to the CCW channel.
- Review flood accounts to compare with changes observed in the aerial photography.
- Synthesize the information above into an overall geomorphic assessment of CCW and determine whether CCW has reached a state of equilibrium considering the changes to the system within the period of record.

The following preliminary conclusions were reached based on the results of this analysis:

- CCW has been transformed from an alluvial fan landform to primarily a straight, single channel river system.
- Development in the watershed has occurred with high spatial and temporal variability, thus attributing the response of CCW at any one location to any one single factor (e.g. lowering of Temescal Wash, channelization, infiltration basins, structures, etc.) is not possible.
- Precipitation gage records indicate CCW has experienced relatively few floods within the gage record (~25 years). Of those events, the largest occurred in December 2010. Anecdotal, aerial photography, and field information indicate the 2010 flood caused significant incision of CCW, especially between Temescal Canyon Road and Squaw Mountain Road. Future storm events of similar magnitude will likely repeat the process.
- Temescal Wash has experienced incision within recent time. The regional cause of this incision is outside of the scope of this project, however the impacts are directly impacting its tributaries, including CCW. Given the amount of anthropogenic disturbance to CCW, it is difficult to determine whether the direct responses to the disturbances or the lowering of Temescal Wash have been a bigger driver in the impacts to CCW. Field evidence indicates CCW is presently perched above Temescal Wash, thus additional incision is expected at least up to the Dawson Canyon Road culvert.
- Overall, CCW is responding to external factors that have been applied to the system. Those responses include:
    - Incision. The cutoff of sediment by the infiltration basins and, more recently, the golf course development has resulted in sediment “lean” conditions downstream. As a result, flood flows have scoured the bed attempting to dissipate excess energy. Channelization and steepening of channel slopes also results in incision by concentrating flows. These have also contributed to incision within the CCW system.
    - Incipient Armoring. As the main channel continues to degrade, fine sediments are transported downstream, leaving larger sediment clasts which form an armor layer. This was observed through the study reach. Although the degree of development of an armor layer varied, this process is expected to continue with future floods. As the

armor layer develops over time, the rate of incision will likely decrease. Multiple structures are presently serving as grade control which will also limit future incision:
        - Dawson Canyon Road culvert
        - I-15 rip-rap grade control
        - Temescal Canyon Road
        - Glen Ivy Road
    - Lateral Migration/Widening. Lateral migration has occurred in the period of record (Cross-Section plots) and evidence was observed in the field throughout the study area. As future flood events armor the channel bed reducing the volume of sediment available to scour, it is likely that lateral migration and channel widening will increase as the bank sediments are eroded to dissipate excess energy.
    - Slope. The overall channel slope has increased over the period of record. This is the result of shortening the total channel length through channelization. One mechanism of adjustment of an over-steepened channel is to scour the bed in an attempt to reach an equilibrium slope. The remaining Tasks in the overall Coldwater Canyon Wash Geomorphology Study project will tackle this question and estimate how much adjustment can be expected in the future.

  When considering all the information in this study including the field reconnaissance observations and interpretations and all the analyses performed, it is concluded that CCW has not yet reached a state of equilibrium with respect to channel slope and channel form. The remaining Tasks in the overall Coldwater Canyon Wash Geomorphology Study will further address this question with quantitative analyses.

- Tasks 2-4 of the Coldwater Canyon Wash Geomorphology Study will attempt to better quantify the channel responses observed and discussed in this report and recommend a suite of management measures to slow or eliminate future responses.

Coldwater Canyon Wash Geomorphology Study

Task 2/3 – Future Erosion and Equilibrium Assessment

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Flood hazard zones were delineated along the CCW corridor for use as a planning and regulatory tool to communicate flood hazards. Generally, the flood hazard zone indicates area of erosion and inundation hazard excluding areas subject solely to shallow flooding.

Flooding and erosion hazards are acutely present along the CCW corridor. Development within the identified flood hazard zones should include considerations to mitigate flood hazards as even relatively minor flow events can alter the channel location.

Figure 2. Project Control Stationing.

2.2 Task 1 Review

The following preliminary conclusions were reached based on the results of this analysis:

- CCW has been transformed from an alluvial fan landform to primarily a straight, single channel river system.
- Development in the watershed has occurred with high spatial and temporal variability, thus attributing the response of CCW at any one location to any one single factor (e.g. lowering of Temescal Wash, channelization, infiltration basins, structures, etc.) is not possible.
- Precipitation gage records indicate CCW has experienced relatively few floods within the gage record (~25 years). Of those events, the largest occurred in December 2010. Anecdotal, aerial photography, and field information indicate the 2010 flood caused significant incision of CCW, especially between Temescal Canyon Road and Squaw Mountain Road. Future storm events of similar magnitude will likely repeat the process.
- Temescal Wash has experienced incision within recent time. The regional cause of this incision is outside of the scope of this project, however the impacts are directly impacting its tributaries, including CCW. Given the amount of anthropogenic disturbance to CCW, it is difficult to determine whether the direct responses to the disturbances or the lowering of Temescal Wash have been a bigger driver in the impacts to CCW. Field evidence indicates CCW is presently perched above the thalweg of Temescal Wash, thus additional incision is expected at least up to the Dawson Canyon Road culvert.
- Overall, CCW is responding to external factors that have been applied to the system. Those responses include:
    - Incision. The cutoff of sediment by the infiltration basins and, more recently, the golf course development has resulted in sediment "lean" conditions downstream. As a result, flood flows have scoured the bed attempting to dissipate excess energy. Channelization and steepening of channel bank slopes also results in incision by concentrating flows. These have also contributed to incision within the CCW system.
    - Incipient Armoring. As the main channel continues to degrade, fine sediments are transported downstream, leaving larger sediment clasts which form an armor layer. This was observed throughout the study reach. Although the degree of development of an armor layer varied, this process is expected to continue with future floods. As the armor layer develops over time, the rate of incision will likely decrease. Multiple structures are presently serving as grade control which will also limit future incision:
        - Dawson Canyon Road culvert
        - I-15 rip-rap grade control
        - Temescal Canyon Road
        - Glen Ivy Road
    - Lateral Migration/Widening. Lateral migration has occurred in the period of record (Cross-Section plots) and evidence was observed in the field throughout the study area. As future flood events armor the channel bed reducing the volume of sediment available to scour, it is likely that lateral migration and channel widening will increase as the bank sediments are eroded to dissipate excess energy.

5 HYDRAULIC AND SEDIMENT TRANSPORT MODELING

Numerical modeling of Coldwater Canyon Wash was performed to understand and quantify both the hydraulic performance of the wash as well as the geomorphic response of the wash to specific flow events. Hydraulic and sediment transport modeling was conducted using the Hydrologic Engineering Center River Analysis System (HEC-RAS) version 5.0.3 developed by the US Army Corps of Engineers. The results of these models were both directly used to assess CCW as well as aid in other analytical approaches used in this study.

5.1 MODEL DEVELOPMENT

The following sections below outline the development of the hydraulic and sediment transport model.

5.1.1 Hydraulic Model

Specific elements of the hydraulic model development are discussed below. As the hydraulic model was developed concurrently with the sediment transport model, sediment specific elements of the model are discussed in Section 5.1.2.

5.1.1.1 Cross-Section Alignment and Geometry

Alignment of cross-sections in HEC-RAS was based on aerial imagery, field reconnaissance, and elevation data. Care was taken in the alignment configuration to ensure that lower magnitude flows (10-year and less) were captured with the appropriate cross-section geometry; for sediment transport modeling minor changes in velocity and depth for more frequent events can substantially alter results. A total of 333 cross-sections were included in this model, and they were located approximately every 40 feet along the channel thalweg. Cross-section geometry was extracted from the 2015 and 2016 topographic datasets provided by the RCFCWCD. **Figure 15** through **Figure 17** below depict the location and orientation of the cross-sections used in the model.

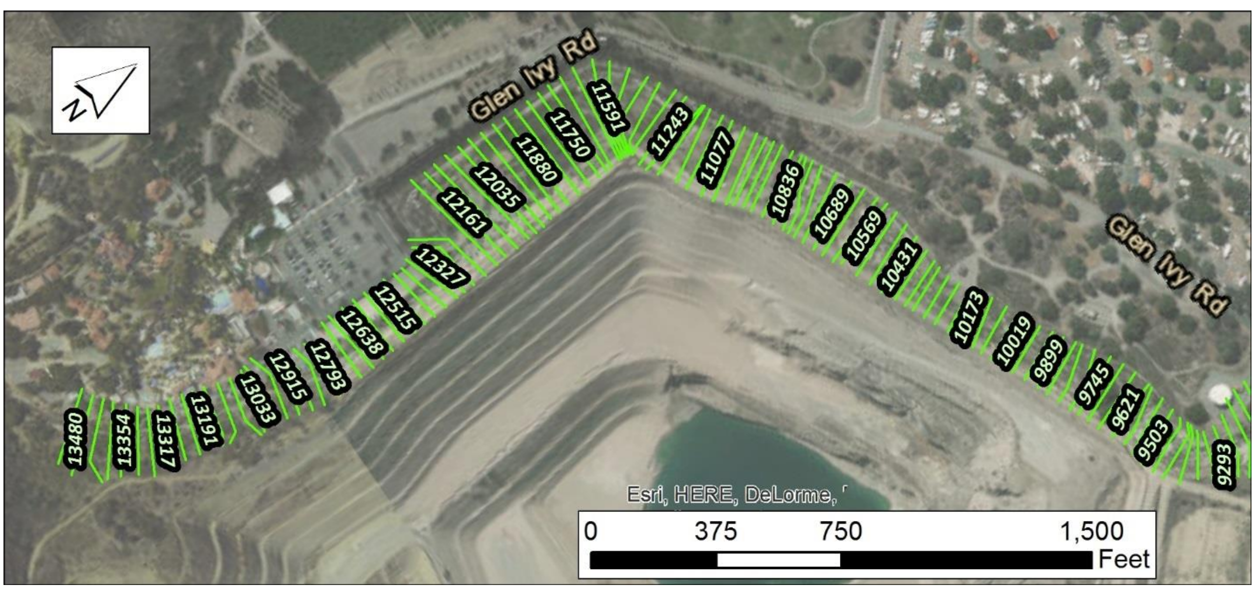

Figure 15. HEC-RAS Cross-Section Locations.

Figure 16. HEC-RAS Cross-Section Locations, cont.

Figure 17. HEC-RAS Cross-Section Locations, cont.

5.1.1.2 Hydraulic Roughness

Manning *n*-values were estimated for the left and right overbanks as well as the channel. **Table 9** below lists the values used on the model based on surface conditions. Land uses in the study reach were delineated manually using 2015 aerial mapping.

The channel bottom was mostly characterized as gravel with low to medium vegetation. The highly-vegetated reach downstream of I-15 was designated with a Dense Vegetation land use. Asphalt and concrete comprised the pavement land use. The fine-gravel land use was mostly found on roadway shoulders and parking lots. The grass/tree land used was primarily used to characterize overbank flow the bridges were replaced with cross-sections. The piers were modeled with station/elevation data, and the roadway was modeled with a lid.

Table 10. Modeled Bridges and Culverts.

Project Control Station	HEC-RAS Station	Description	Feature Type	HEC-RAS Structure Type
608	771	Dawson Canyon Road	Culvert (2 – 7' x 16' RCBC)	Culvert / Roadway
987	1206	Rinker Plant Entrance	Culvert (4 – 60" CMP)	Culvert / Roadway
4290	4784	I-15 Northbound	Bridge / Pier	Lidded Cross-section
4452	4961	I-15 Southbound	Bridge / Pier	Lidded Cross-section
6327	6896	Squaw Mountain Road	Bridge / Pier	Lidded Cross-section
8237	8925	Glen Ivy Road	Culvert (5 – 24" RCP)	Culvert / Roadway

5.1.1.6 Lateral Weirs

Initial iterations of hydraulic modeling suggested there was containment of the 100-year discharge for most of the study reach, and that no significant breakouts exist for the upstream portion of the reach. Downstream of I-15, and adjacent to the Rinker plant, the existing channel becomes narrower and shallower. Moving in the downstream direction, the channel begins to lose containment of the 100-year discharge at RAS Station 2487 along the right bank. **Figure 18** depicts the general flow paths outside of the main channel.

A lateral weir was applied in HEC-RAS to allow for flow to spill into the Rinker plant pad. The topography of the plant was examined to ensure that flow entering would not return to CCW, rather it would pond and eventually flow directly into Temescal Wash. This lateral weir extends approximately 1,900 feet and terminates downstream at Dawson Canyon Road. At that point, containment along the right bank is achieved for the downstream extent of the model. This is in part due to a higher bank elevation relative to the channel, but also because a significant volume of water is diverted into the Rinker plant pad prior to reaching this point.

The discharge in CCW also begins to lose containment on the left side of the wash starting around RAS Station 1359. Flow that crests the bank and roadway (Temescal Canyon Road) is limited, however, to one-dimensional flow as it is constrained further to the left by topographical features. This flow is further constrained by a building which consolidates flow at RAS Station 885. Based on the topography, flow on the roadway as well as all flow to the left at this longitudinal point would continue down the roadway and out of the model. Given the limitations of the one-dimensional model, this flow was not removed and was retained in the channel. A bank station was applied at the point in RS 885 where this break would occur to quantify the overestimated discharge. The 100-year discharge at this point is 3,307 cfs, and the discharge in the left overbank is 520 cfs. While this results in a 19% overestimation of flow downstream of RAS Station 885, the results for the 10-year flow indicate less than 1% of the flow is overestimated. This compromise is valid considering the primary effects of overestimation of flow downstream will be sediment-related, and that sediment modeling is primarily focused on smaller events.

A second lateral weir was applied at RAS Station 600 to model the overflow along the left bank. The topography was examined to ensure that flow entering this overbank does not return to CCW. Flow exiting through this structure is routed toward Temescal Wash through an existing driving range.

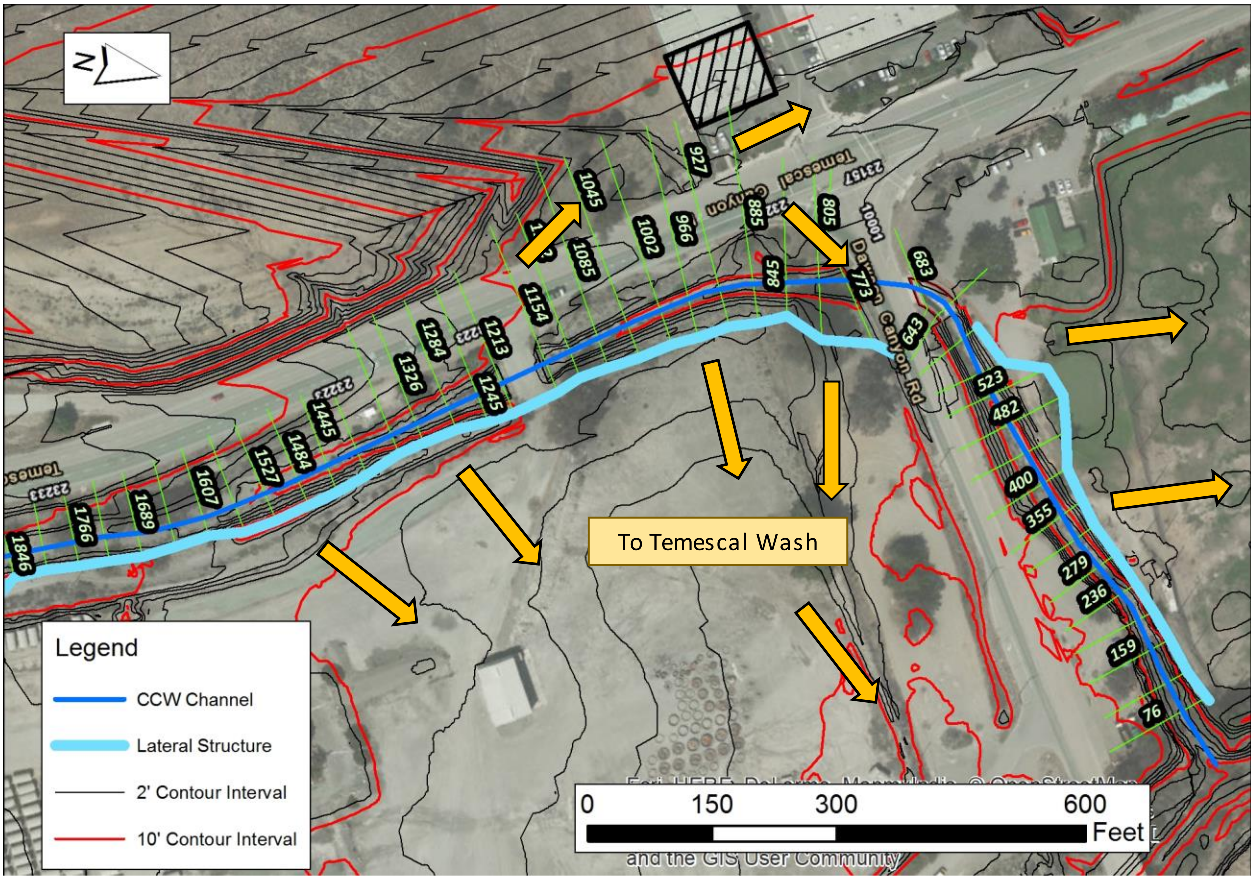

Figure 18. Downstream Lateral Weirs.

5.1.1.7 Levees and Ineffective Flow

The use of levees in this model were primarily limited to model structures that would retain or divert flow (e.g., flood walls). Two such walls (located between RAS Station 13561 and 13275 as well as between Ras Station 12677 and 12327), located near the Glen Ivy Hot Springs were included. For a FEMA floodplain study, additional levee features would need to be identified and modeled per FEMA guidelines.

Ineffective flow areas were applied throughout the model. The crossing of CCW over Glen Ivy Road and Temescal Canyon Road presented several challenges, as the flow pattern is highly two-dimensional both in flow direction as well as water surface elevation. Ineffective flows were assigned liberally in this area in order constrain flow to paths that were tracked longitudinally upstream to downstream, and this exercise was done for all recurrence intervals.

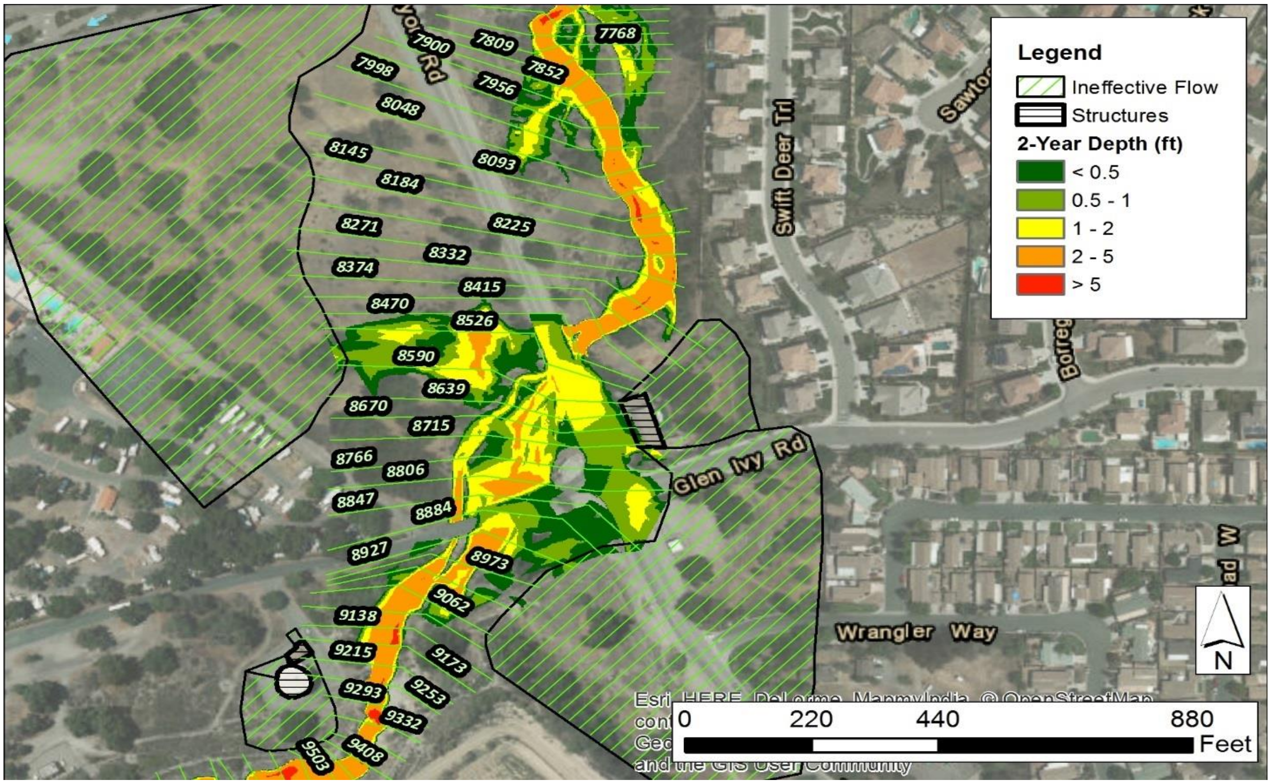

Figure 26. 2-Year Flood Inundation at Glen Ivy Road.

The third area of notable inundation is near the Rinker plant and Dawson Canyon Road. The lateral weir routine in HEC-RAS was used to estimate the amount of flow leaving the model due to lack of channel containment in the area. Two weirs were modeled, one being upstream of Dawson Canyon Road, and the other between the roadway crossing and Temescal Wash, since flow exits to the right upstream of the roadway and to the left downstream of the roadway. **Table 12** below lists the performance of each weir based on recurrence interval. Based on these results, the 2-year discharge has full containment throughout this reach. Approximately 19% (567 cfs) of the inflow to this reach from the 10-year event spills out into the Rinker plant, and an additional 3% (94 cfs) spills into the driving range downstream of Dawson Canyon Road. Nearly half of the entire inflow (2,362 cfs) for the 100-year event is diverted to the Rinker plant. This would likely inundate much of the plant given the relatively flat, graded slope of the plant. Taken together, the results presented in **Table 12** suggest that significant inundation outside of the channel would occur during even relatively minor flow events.

Table 12. Downstream Lateral Weir Performance.

	Upstream of Rinker Plant RS 2606		Dawson Canyon Road RS 773		Temescal Wash RS 76	
Recurrence Interval	Q (cfs)	Remaining	Q (cfs)	Remaining	Q (cfs)	Remaining
2 - Year	1,595	100%	1,595	100%	1,595	100%
5 - Year	2,344	100%	2,145	92%	2,129	91%
10 - Year	2,957	100%	2,390	81%	2,296	78%
25 - Year	3,822	100%	2,649	69%	2,450	64%
50 - Year	4,526	100%	2,790	62%	2,523	56%
100 - Year	5,247	100%	2,885	55%	2,561	49%

Table 18. Channel Geometry Regime Equation Results.

Coldwater Canyon Wash Geomorphology Study																
Observed and Expected Channel Characteristics for Coldwater Canyon Wash																
Equation	Channel Width (ft)				Flow Depth (ft)				Channel Slope (ft/ft)				Channel Velocity (ft/s)			
	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr
REACH G																
Bray - Equation #1	169	156	125	92	3.9	3.7	3.3	2.7	0.0022	0.0024	0.0027	0.0033	4.9	4.8	4.5	4.2
Bray - Equation #2	174	161	129	95	3.9	3.7	3.3	2.7	0.0018	0.0019	0.0022	0.0026	4.7	4.6	4.3	4.0
Hey	74	69	56	42	7.9	7.5	6.4	5.1	0.0031	0.0033	0.0039	0.0049	-	-	-	-
Ackers & Charlton (Channel Width) Lacey (Channel Velocity)	108	101	85	66	-	-	-	-	-	-	-	-	3.1	3.0	2.8	2.5
Parker	163	151	123	91	3.5	3.3	2.8	2.2	0.0019	0.0020	0.0024	0.0031	2.4	2.4	2.3	2.2
Chang	148	137	110	81	2.9	2.8	2.5	2.2	0.0008	0.0009	0.0011	0.0014	-	-	-	-
Kellerhals	103	95	77	58	4.3	4.0	3.4	2.7	0.0043	0.0045	0.0053	0.0067	7.4	7.3	7.0	6.6
AMAFCA	17	17	19	22	-	-	-	-	0.0245	0.0248	0.0260	0.0275	-	-	-	-
BUREC	55	52	45	36	14.7	13.9	11.9	9.6	0.0023	0.0026	0.0035	0.0055	8.3	8.0	7.3	6.4
Average	112	105	85	65	5.9	5.6	4.8	3.9	0.0051	0.0053	0.0059	0.0069	5.1	5.0	4.7	4.3
HEC-RAS Data	106	103	95	86	5.2	4.9	4.1	3.1	0.0276	0.0281	0.0295	0.0312	9.0	8.7	7.8	6.6
Expected Behavior	**Bank Erosion**	**Bank Erosion**	**Deposition**	**Deposition**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**
REACH F																
Bray - Equation #1	153	143	120	92	3.7	3.5	3.2	2.7	0.0024	0.0025	0.0028	0.0033	4.8	4.7	4.5	4.2
Bray - Equation #2	157	147	124	94	3.7	3.5	3.2	2.7	0.0019	0.0020	0.0022	0.0026	4.6	4.5	4.3	4.0
Hey	68	64	54	42	7.4	7.0	6.2	5.1	0.0033	0.0035	0.0040	0.0049	-	-	-	-
Ackers & Charlton (Channel Width) Lacey (Channel Velocity)	99	94	82	66	-	-	-	-	-	-	-	-	3.0	2.9	2.8	2.5
Parker	148	139	118	91	3.2	3.1	2.7	2.2	0.0021	0.0022	0.0025	0.0031	2.4	2.3	2.3	2.2
Chang	132	123	101	75	2.1	2.1	1.9	1.7	0.0009	0.0010	0.0011	0.0014	-	-	-	-
Kellerhals	93	88	74	58	4.0	3.8	3.3	2.7	0.0046	0.0048	0.0055	0.0067	7.2	7.2	6.9	6.6
AMAFCA	11	12	13	15	-	-	-	-	0.0208	0.0207	0.0211	0.0233	-	-	-	-
BUREC	43	41	36	29	11.4	11.0	9.7	7.9	0.0017	0.0018	0.0023	0.0034	8.8	8.5	7.9	7.2
Average	100	95	80	62	5.1	4.9	4.3	3.6	0.0047	0.0048	0.0052	0.0061	5.1	5.0	4.8	4.5
HEC-RAS Data	73	72	70	64	4.1	3.8	3.2	2.4	0.0230	0.0230	0.0237	0.0264	9.6	9.2	8.2	7.2
Expected Behavior	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Deposition**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**
REACH E																
Bray - Equation #1	206	191	153	111	4.5	4.3	3.7	3.0	0.0020	0.0021	0.0024	0.0029	5.2	5.1	4.8	4.4
Bray - Equation #2	212	197	158	114	4.5	4.3	3.7	3.0	0.0016	0.0017	0.0019	0.0023	5.0	4.9	4.6	4.2
Hey	90	83	68	50	9.2	8.7	7.4	5.9	0.0027	0.0028	0.0033	0.0042	-	-	-	-
Ackers & Charlton (Channel Width) Lacey (Channel Velocity)	126	119	99	77	-	-	-	-	-	-	-	-	3.3	3.2	3.0	2.7
Parker	197	183	148	109	4.1	3.8	3.2	2.5	0.0016	0.0017	0.0021	0.0026	2.5	2.5	2.4	2.3
Chang	163	149	116	81	3.1	3.0	2.7	2.3	0.0007	0.0008	0.0009	0.0012	-	-	-	-
Kellerhals	124	116	94	69	5.0	4.7	4.0	3.1	0.0037	0.0039	0.0046	0.0059	7.7	7.6	7.3	6.8
AMAFCA	8	8	9	10	-	-	-	-	0.0140	0.0141	0.0143	0.0149	-	-	-	-
BUREC	60	56	48	38	15.9	15.1	12.8	10.0	0.0015	0.0017	0.0023	0.0036	8.4	8.1	7.4	6.6
Average	132	123	99	73	6.6	6.3	5.4	4.3	0.0035	0.0036	0.0040	0.0047	5.3	5.2	4.9	4.5
HEC-RAS Data	73	72	70	64	4.1	3.8	3.2	2.4	0.0230	0.0230	0.0237	0.0264	9.6	9.2	8.2	7.2
Expected Behavior	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**

Table 18. Channel Geometry Regime Equation Results, cont.

Coldwater Canyon Wash Geomorphology Study																
Observed and Expected Channel Characteristics for Coldwater Canyon Wash																
Equation	Channel Width (ft)				Flow Depth (ft)				Channel Slope (ft/ft)				Channel Velocity (ft/s)			
	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr
REACH D																
Bray - Equation #1	217	201	161	116	4.6	4.4	3.8	3.1	0.0019	0.0020	0.0023	0.0028	5.2	5.1	4.8	4.4
Bray - Equation #2	223	207	165	119	4.6	4.4	3.8	3.1	0.0015	0.0016	0.0018	0.0023	5.0	4.9	4.6	4.3
Hey	94	87	71	52	9.5	9.0	7.7	6.1	0.0025	0.0027	0.0032	0.0041	-	-	-	-
Ackers & Charlton (Channel Width) Lacey (Channel Velocity)	131	124	103	80	-	-	-	-	-	-	-	-	3.3	3.3	3.0	2.7
Parker	207	192	155	114	4.2	4.0	3.3	2.6	0.0016	0.0017	0.0020	0.0025	2.5	2.5	2.4	2.3
Chang	221	202	159	112	2.0	1.9	1.8	1.6	0.0007	0.0007	0.0009	0.0011	-	-	-	-
Kellerhals	130	121	98	72	5.2	4.9	4.1	3.2	0.0035	0.0037	0.0044	0.0056	7.8	7.6	7.3	6.9
AMAFCA	9	10	11	13	-	-	-	-	0.0284	0.0293	0.0319	0.0364	-	-	-	-
BUREC	58	55	46	37	15.5	14.6	12.4	9.8	0.0015	0.0017	0.0023	0.0037	9.5	9.2	8.5	7.5
Average	143	133	108	79	6.5	6.2	5.3	4.2	0.0052	0.0054	0.0061	0.0073	5.6	5.5	5.1	4.7
HEC-RAS Data	73	72	70	64	4.1	3.8	3.2	2.4	0.0230	0.0230	0.0237	0.0264	9.6	9.2	8.2	7.2
Expected Behavior	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**

REACH C																
Bray - Equation #1	217	201	161	116	4.6	4.4	3.8	3.1	0.0019	0.0020	0.0023	0.0028	5.2	5.1	4.8	4.4
Bray - Equation #2	223	207	165	119	4.6	4.4	3.8	3.1	0.0015	0.0016	0.0018	0.0023	5.0	4.9	4.6	4.3
Hey	94	87	71	52	9.5	9.0	7.7	6.1	0.0025	0.0027	0.0032	0.0041	-	-	-	-
Ackers & Charlton (Channel Width) Lacey (Channel Velocity)	131	124	103	80	-	-	-	-	-	-	-	-	3.3	3.3	3.0	2.7
Parker	207	192	155	114	4.2	4.0	3.3	2.6	0.0016	0.0017	0.0020	0.0025	2.5	2.5	2.4	2.3
Chang	196	178	135	92	2.4	2.4	2.2	2.0	0.0007	0.0007	0.0009	0.0011	-	-	-	-
Kellerhals	130	121	98	72	5.2	4.9	4.1	3.2	0.0035	0.0037	0.0044	0.0056	7.8	7.6	7.3	6.9
AMAFCA	11	11	11	12	-	-	-	-	0.0189	0.0190	0.0183	0.0181	-	-	-	-
BUREC	61	58	50	40	16.4	15.6	13.4	10.7	0.0020	0.0022	0.0030	0.0048	8.5	8.2	7.1	6.1
Average	141	131	106	77	6.7	6.4	5.5	4.4	0.0041	0.0042	0.0045	0.0052	5.4	5.3	4.9	4.4
HEC-RAS Data	73	72	70	64	4.1	3.8	3.2	2.4	0.0230	0.0230	0.0237	0.0264	9.6	9.2	8.2	7.2
Expected Behavior	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**

Coldwater Canyon Wash Geomorphology Study

Observed and Expected Channel Characteristics for Coldwater Canyon Wash

Coldwater Canyon Wash Geomorphology Study

Observed and Expected Channel Characteristics for Coldwater Canyon Wash

Equation	Channel Width (ft)				Flow Depth (ft)				Channel Slope (ft/ft)				Channel Velocity (ft/s)			
	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr	100Yr	50Yr	10Yr	2Yr
REACH B																
Bray - Equation #1	217	201	161	116	4.6	4.4	3.8	3.1	0.0019	0.0020	0.0023	0.0028	5.2	5.1	4.8	4.4
Bray - Equation #2	223	207	165	119	4.6	4.4	3.8	3.1	0.0015	0.0016	0.0018	0.0023	5.0	4.9	4.6	4.3
Hey	94	87	71	52	9.5	9.0	7.7	6.1	0.0025	0.0027	0.0032	0.0041	-	-	-	-
Ackers & Charlton (Channel Width) Lacey (Channel Velocity)	131	124	103	80	-	-	-	-	-	-	-	-	3.3	3.3	3.0	2.7
Parker	207	192	155	114	4.2	4.0	3.3	2.6	0.0016	0.0017	0.0020	0.0025	2.5	2.5	2.4	2.3
Chang	194	178	138	97	2.6	2.5	2.3	2.0	0.0007	0.0007	0.0009	0.0011	-	-	-	-
Kellerhals	130	121	98	72	5.2	4.9	4.1	3.2	0.0035	0.0037	0.0044	0.0056	7.8	7.6	7.3	6.9
AMAFCA	10	10	11	12	-	-	-	-	0.0216	0.0220	0.0219	0.0236	-	-	-	-
BUREC	65	62	53	41	17.5	16.5	14.1	11.0	0.0015	0.0017	0.0024	0.0038	7.6	7.3	6.6	5.8
Average	141	131	106	78	6.9	6.5	5.6	4.4	0.0044	0.0045	0.0049	0.0057	5.3	5.1	4.8	4.4
HEC-RAS Data	73	72	70	64	4.1	3.8	3.2	2.4	0.0230	0.0230	0.0237	0.0264	9.6	9.2	8.2	7.2
Expected Behavior	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**
REACH A																
Bray - Equation #1	178	171	149	115	4.1	4.0	3.6	3.1	0.0022	0.0022	0.0024	0.0029	5.0	4.9	4.7	4.4
Bray - Equation #2	210	201	175	135	4.3	4.2	3.8	3.2	0.0006	0.0006	0.0006	0.0007	4.0	3.9	3.8	3.5
Hey	78	75	66	52	11.2	10.9	9.8	8.2	0.0005	0.0005	0.0005	0.0006	-	-	-	-
Ackers & Charlton (Channel Width) Lacey (Channel Velocity)	112	109	97	79	-	-	-	-	-	-	-	-	3.1	3.1	3.0	2.7
Parker	276	266	233	183	3.9	3.8	3.4	2.8	0.0003	0.0003	0.0003	0.0004	3.7	3.6	3.6	3.4
Chang	288	270	225	166	0.0	0.1	0.3	0.4	0.0001	0.0001	0.0001	0.0001	-	-	-	-
Kellerhals	108	104	91	71	5.5	5.4	4.8	4.0	0.0008	0.0008	0.0009	0.0011	6.0	5.9	5.8	5.5
AMAFCA	7	7	7	8	-	-	-	-	0.0128	0.0118	0.0113	0.0115	-	-	-	-
BUREC	53	52	47	39	14.1	13.8	12.6	10.5	0.0003	0.0003	0.0004	0.0006	7.8	7.5	7.0	6.2
Average	146	140	121	94	6.2	6.0	5.5	4.6	0.0022	0.0021	0.0021	0.0022	4.9	4.8	4.6	4.3
HEC-RAS Data	73	72	70	64	4.1	3.8	3.2	2.4	0.0230	0.0230	0.0237	0.0264	9.6	9.2	8.2	7.2
Expected Behavior	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Bank Erosion**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**	**Scour**

6.4 STABLE BANK SLOPE

A stable bank analysis was performed to assess future bank erosion resulting from the geomorphic processes associated with establishing a vertical and lateral equilibrium. This analysis assumes that lateral erosion at the toe of the bank slope would not change moving forward, and that the bank slope extending upward from the toe erodes to form a stable slope. The results of this analysis provided lateral movement at the top of the bank relative to the existing top of bank. Existing bank slopes were determined by delineating the top and toe of both the right and left bank. Thereafter, stable bank slopes were projected from the toe of the banks. Stable bank slopes for coarse, non-cohesive material was bounded between bank slopes of 1.73:1 and 3.08:1 (Wolman and Brush, 1961). This range was based on an experimental study to evaluate channel morphology in coarse sand system, and is the result of many scenarios in which particle size, discharge, and longitudinal slope were varied. It was also stated in this study that particle shape can greatly affect the bank slope, both the upper and lower range stated in this study for average bank slope was used in this study.

The results indicate that the both the left and right banks are over-steepened and are likely to laterally erode with time, relative to the current top of bank. The steeper slope results (SS = 1.7:1) indicate several zones of likely bank retreat. The most prominent location is a 400’ vertical cut-bank that currently extends upstream from the Squaw Mountain Bridge along the left bank. The results from this analysis suggest future surficial lateral erosion distances between 20 and 60 feet as the cut bank erodes to a stable state. Other specific locations of possible bank retreat include just upstream of the Rinker plant, as well as the reach downstream of Dawson Canyon Road to Temescal Canyon Wash. Taking into consideration the results of both upper and lower limits of lateral movement, the most lateral movement is expected to be between just upstream of Squaw Mountain Road to I-15, just upstream of the Rinker plant, and downstream of Dawson Canyon Road. While the results do indicate possible lateral movement in the reach bounded by the proposed City of Corona infiltration basins, it is less certain that these banks will respond naturally, as these basins and banks are anthropogenic in origin.

From an adjacent development perspective, total bank retreat will be the sum of lateral movement at the toe of bank and application of a stable bank slope; the above analysis indicates that without additional movement at the toe of slope, expansion of the top of bank is anticipated.

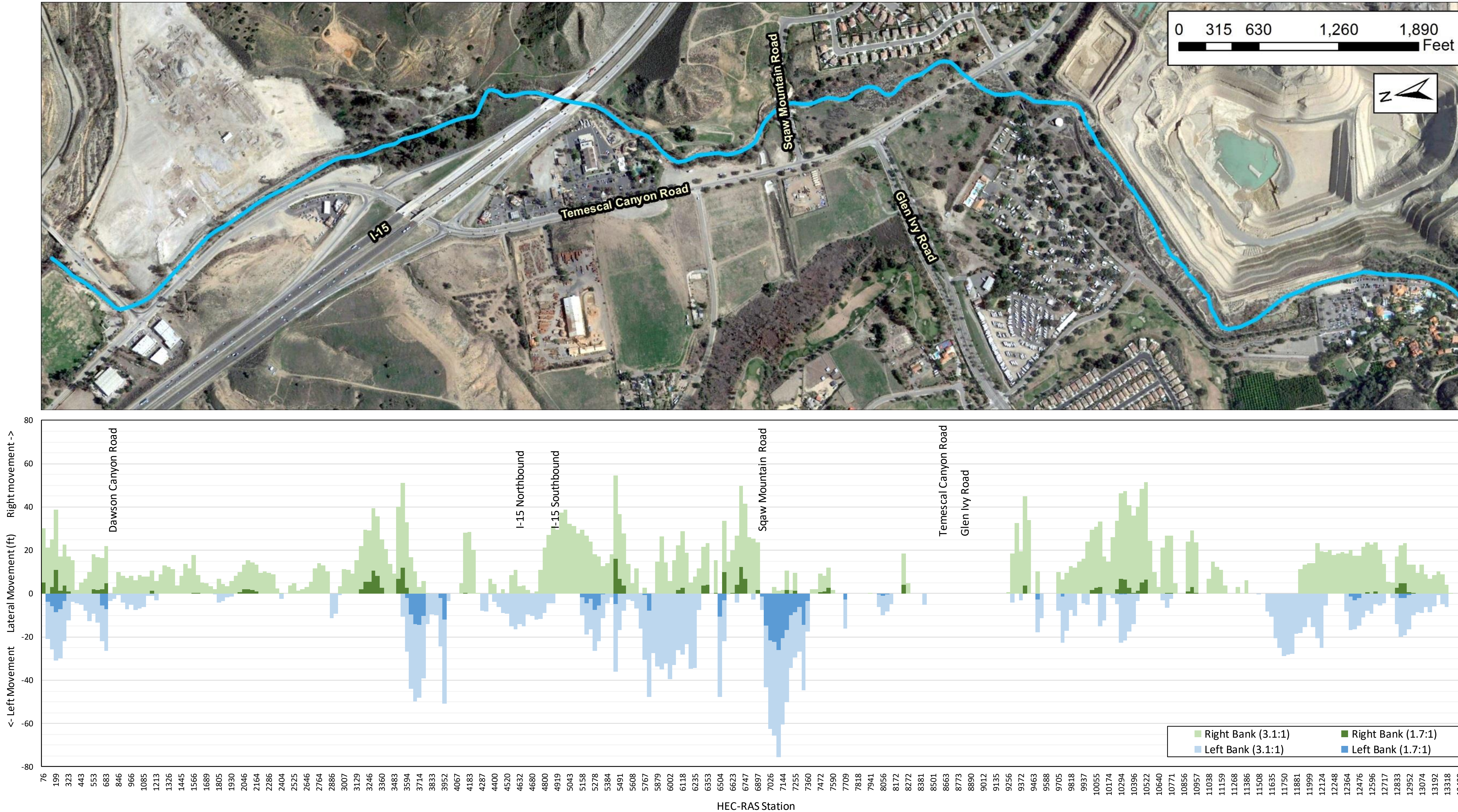

Figure 40. Stable Slope Projection

Figure 44. Bank Erosivity Hazard Index Results.

6.6 Flood Hazard Zones

Based upon the results in Sections 6.1 - 6.5, an estimate of the erosion hazard in the vicinity of CCW was made. Areas of likely erosion hazard are identified as being within an flood hazard zone (FHZ). A figure detailing erosion hazard boundaries may be found in **Appendix B**.

For CCW, FHZ boundaries are developed through a composite of the following analyses:

1. Riverine flooding inundation,
2. Historic channel sinuosity,
3. Stable bank slopes,
4. Bank erodibility, and
5. Geomorphically stable channel width.

While inundation results were used to develop the FHZ limits, the FHZ represents a different type of hazard mapping. Unlike floodplains which are associated with a specific storm event and return interval (e.g. 100-year floodplain), FHZs represent the probable erosion and flood hazard based upon overall geomorphic setting and are not associated with a specific or singular storm event. Additionally, the FHZ is associated with the CCW channel; additional offsite flooding sources may warrant consideration for areas outside of the CCW FHZ.

Flood hazard zones are acceptable as planning level and regulatory tools for erosion hazards and have been utilized by multiple counties in the Southwestern United States. Further assessment of the hazard zone may be considered should there be any significant manmade changes in the future including construction of bank protection or channel realignments.

As discussed in Section 5.2.1.3, adjacent to Glen Ivy Hot Springs, CCW has marginal capacity for the 100-year flow with several breakout points along the perimeter of the Hot Springs identified in the HEC-RAS modeling. Due to the distributed nature of these breakout locations and the potential for breakout flows to travel down Glen Ivy Road and exit the CCW corridor, the DWR flood awareness limits were utilized to capture the flood hazard extents from the upstream limit of study to the downstream limit of the Glen Ivy Hot Springs parking lot.

For this analysis, the Squaw Mountain Road bridge is assumed to be a lateral "hard point" with lasting resistance to lateral migration. Judgement in this regard is based upon the historical lateral stability of the crossing location based upon historical aerial imagery coupled with the current and pending engineered bank protection in the vicinity of the bridge. Vertical degradation of the channel downstream of the bridge poses a potential hazard, however mitigation has been assumed due to proposed improvements associated with potential transfer of the bridge to Riverside County.

Temescal Canyon Road and adjacent property between Squaw Mountain Road bridge and Glen Ivy Road are subject to broadly distributed, shallow flooding. Due to the distributed, shallow nature of this flooding, it has not been included in the FHZ as the hazard is not as acute as that of the riverine hazards associated with the CCW. Development in these areas should still account for the presence of these flow hazards.

At I-15, the Caltrans bridges are subject to a similar assumption of lateral stability, but lateral stability is assumed due to the ongoing maintenance and placement of engineered bank protection rather than a static location in historical aerial imagery. Bank erosion has been observed at the right upstream edge of bank protection at I-15, but this erosion has yet to manifest as a critical threat to the bridge structures.

Immediately adjacent and upstream of the former Rinker plant, the channel has been realigned through development from its historic flow path. Along the left bank, adjacent to Temescal Canyon Road, FHZ limits are based upon potential for geomorphically appropriate widening and bank slope while the right bank is defined by historic channel alignments. This results in a very broad FHZ boundary.

A historical confluence point to the north of the historical Rinker plant extends the FHZ limit near Temescal Wash to the north. The former Rinker plant site is located within the limits of historical confluence points between Temescal Wash and CCW which contributes to the broad FHZ limits in the vicinity.

Flood hazard zone boundaries have little meaning near the Chandler Aggregates pit due to the ongoing nature and scale of the aggregate extraction there. Historic bank limits and present top-of-pit contours form the primary basis of FHZ delineation in this area.

The results from this analysis also highlighted the natural armoring process that occurs in CCW. **Figure 49** below depicts the D_{50} of the cover layer and the end of the 50 year simulation. Several zones of armoring were noted (circled in red), where the D_{50} approached the measured value in the existing armor layer. This finding substantiates the fact that armoring is an ongoing process in this wash, and it will serve to limit the amount of vertical degradation that can occur.

This result is not meant to be taken as a direct measure of what will happen over the next 50 years, as a series of both assumptions and model limitations are present in this analysis.

It is likely that the berms separating the infiltration basin cells would fail in time, as they appear to not be substantially reinforced, and breaching of these cells has already occurred. The mechanics surrounding the breaching of these berms falls outside the limitations of one dimensional sediment transport modeling, therefore it was assumed that these berms are fixed, and channel changes can only occur in the vertical direction.

Further, as mentioned earlier in this report, the field investigation revealed the presence of armoring, however this armor layer was not laterally consistent, and was focused in areas of noted, recent incision. Therefore, while the channel invert change may be dampened by the specified armor layer additional scouring would occur at more perched areas in the channel where armoring had not already occurred. Lastly, this analysis is highly sensitive to changes in sediment gradation, both in cover layer gradation as well as subsurface gradation. Therefore, conservative approaches should be taken when considering any design criteria.

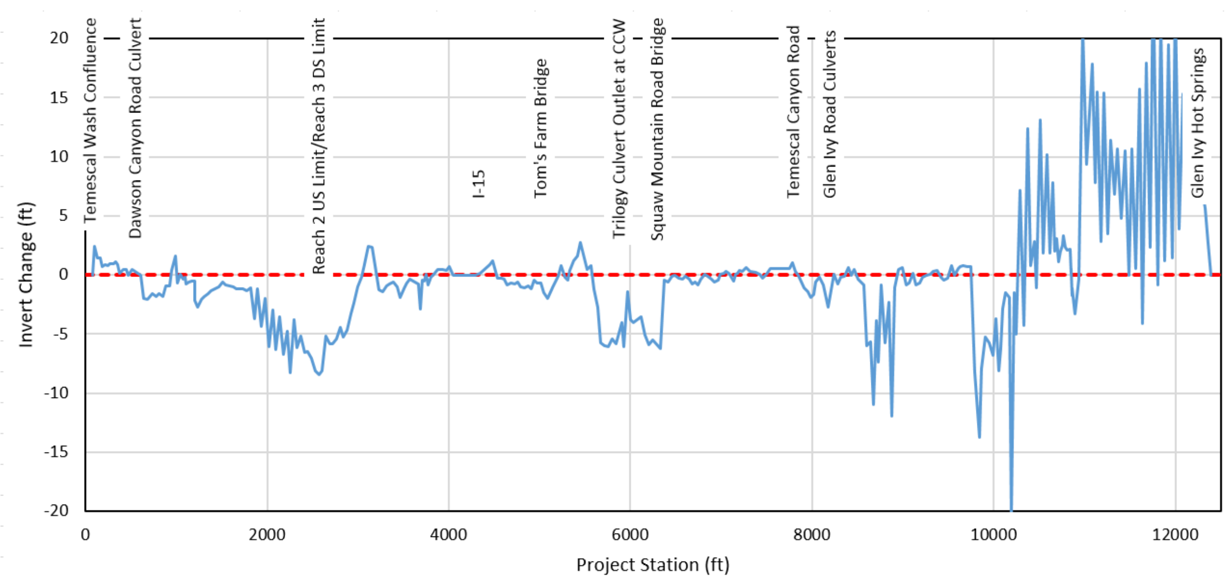

Figure 48. 50 Year Sequence Invert Change.

- u^* is the shear velocity (ft/s)
- V is the average channel velocity (ft/s)
- S is the energy gradient (ft/ft)

Sediment inflow tor this analysis was estimated using the HEC-RAS sediment transport results for the 2-year hydrograph. The sediment concentration in the region just upstream of Temescal Canyon Road was examined, and two bounding concentrations were used to compute equilibrium slope. This provided a low and a high estimate based on uncertainty in the sediment inflow as the equilibrium slope analysis is sensitive to variability in inflow concentration. A high (3,500 mg/l, 2.42 cfs_{sed}) and a low (2,000 mg/l, 1.38 cfs_{sed}) concentration were selected to represent upstream sediment inflow. The sediment inflow into the most upstream point of the equilibrium slope analysis was applied for each subreach, since the assumption is that there would be no net deposition or aggradation between Temescal Canyon Road and Temescal Wash when the wash reaches an equilibrium condition.

The longitudinal slope for each subreach was varied until it yielded a sediment transport capacity equal to the inflow. This slope was projected upstream from the downstream control point to the upstream control point. The difference in elevation between the existing elevation and the projected elevation is the anticipated maximum bed change in the equilibrium state. Note that this bed change does not account for sub-surface features, such as bedrock, which may ultimately limit the vertical extent of bed change; consideration for these elements is beyond the scope of this analysis.

Table 19 lists the equilibrium slope and the long-term bed change by equilibrium subreach. Net scour was predicted for each subreach in this analysis; these results suggest a sediment-lean condition for which the channel will scour in an attempt to lower the energy in the system. The discharge from the Trilogy development is also very sediment-lean, as flow pools upstream into a large retention basin/wetland, and then pours into a channel that leads directly into CCW.

The channel geometry in the less disturbed reaches of CCW have formed based on historical sediment inflows from the contributing watershed. Therefore, it is to be expected that reductions in sediment concentration would result in scouring of the channel banks and bed. For the more disturbed reaches (e.g., adjacent to the Rinker plant, adjacent to Tom's Farms) encroachment and channelization of the wash have furthered the hydraulic efficiency of the wash. This compounds the scour potential, as the system must respond to lower the energy based on an imposed higher-energy cross-sectional shape as well as respond to reductions in sediment delivery.

This procedure applied to CCW provides an upper-bound estimate of the scour potential. It does not, however, account for armoring of the channel bed nor is it a predictive scour analysis. Bed armoring has been observed in the wash and it will continue to serve an important role based on HEC-RAS model results and depth to armor calculations. In addition, this analysis assumes a constant cross-sectional shape over time. The channel response in order to decrease energy can be both vertical and lateral erosion, and lateral erosion is anticipated as a preferential source of sediment as armoring develops. Therefore, the results presented in **Table 19** are to be taken as a theoretical maximum amount of scour, however lateral changes in the wash would be expected as vertical degradation continues. These results indicate that CCW is subject to significant long-term scour.

Table 19. Equilibrium Slope Results.

Equilibrium Slope Subreach	Start Station	End Station	Existing Slope	Equilbrium Slope	Long-Term Bed Change
			[ft/ft]	[ft/ft]	[ft]
1	Temescal Wash	Dawson Canyon Road	0.0135	0.0061	-3.8
2	Dawson Canyon Road	Rinker entrance	0.0213	0.0064	-5.7
3	Rinker entrance	I-15	0.0194	0.0069	-41.1
4	I-15	Trilogy Confluence	0.0183	0.0062	-17.0
5	Trilogy Confluence	Temescal Canyon Road	0.0238	0.0104	-27.0

7.3 Sediment Continuity

HEC-RAS sediment transport modeling was used to assess the equilibrium state of CCW. The 2-year hydrograph was used as inflow to the study reach; however the peak of the hydrograph was extended for an artificially long period of time (400 hours). In doing so, the dominant discharge was imposed on the wash to allow the system to respond and ultimately reach equilibrium. The results of this analysis were compared to the equilibrium slope results, as they are similar analytical techniques. The HEC-RAS model, however, does incorporate the effects of armoring during degradation.

Figure 47 and **Figure 50** show the total sediment throughput relationship through CCW for a variety of hydrologic conditions. Sediment throughput indicates the amount of sediment (in tons) transported through a given cross-section of the HEC-RAS model. Within HEC-RAS sediment throughput accounts for transported material size, bed armoring, and bed elevation change. As shown in these figures, the sediment throughput decreases from the upstream limit to approximately Station 6500. A decreasing trend in sediment throughput suggests a generally depositional trend down to Station 6500. Between Station 6500 and the Temescal Wash confluence, the sediment throughput trend is generally increasing which suggests a generally degradational trend with more sediment transported downstream than is supplied upstream. The general location of the throughput inflection point near Station 6500 likely owes to the distributed flow in the vicinity of Temescal Canyon Road which creates inefficient sediment transport coupled with the presence of armoring in the channel within Reach 5.

Figure 51 displays the results of the HEC-RAS model alongside the channel bottom based on the equilibrium slope. The HEC-RAS results corroborate the finding in the equilibrium slope analysis in that the system is highly degradational. There is close agreement in the model results downstream of project station 2600. The slope predicted by both methods is nearly identical adjacent to the Rinker plant upstream of the entrance. Thereafter, the effects of armoring as well as a coarser sediment gradation yielded less conservative scour results in the HEC-RAS model. Upstream of I-15 toward Squaw Mountain Road, the HEC-RAS results do indicate degradation, however the magnitude is less than the equilibrium slope prediction. Upstream of Squaw Mountain Road toward Temescal Canyon Road the HEC-RAS model predicts very little scour. This is in stark contrast to the 27 feet of scour shown in **Table 19**, however this reach is known to be armored, and the equilibrium slope methodology does not account for this.

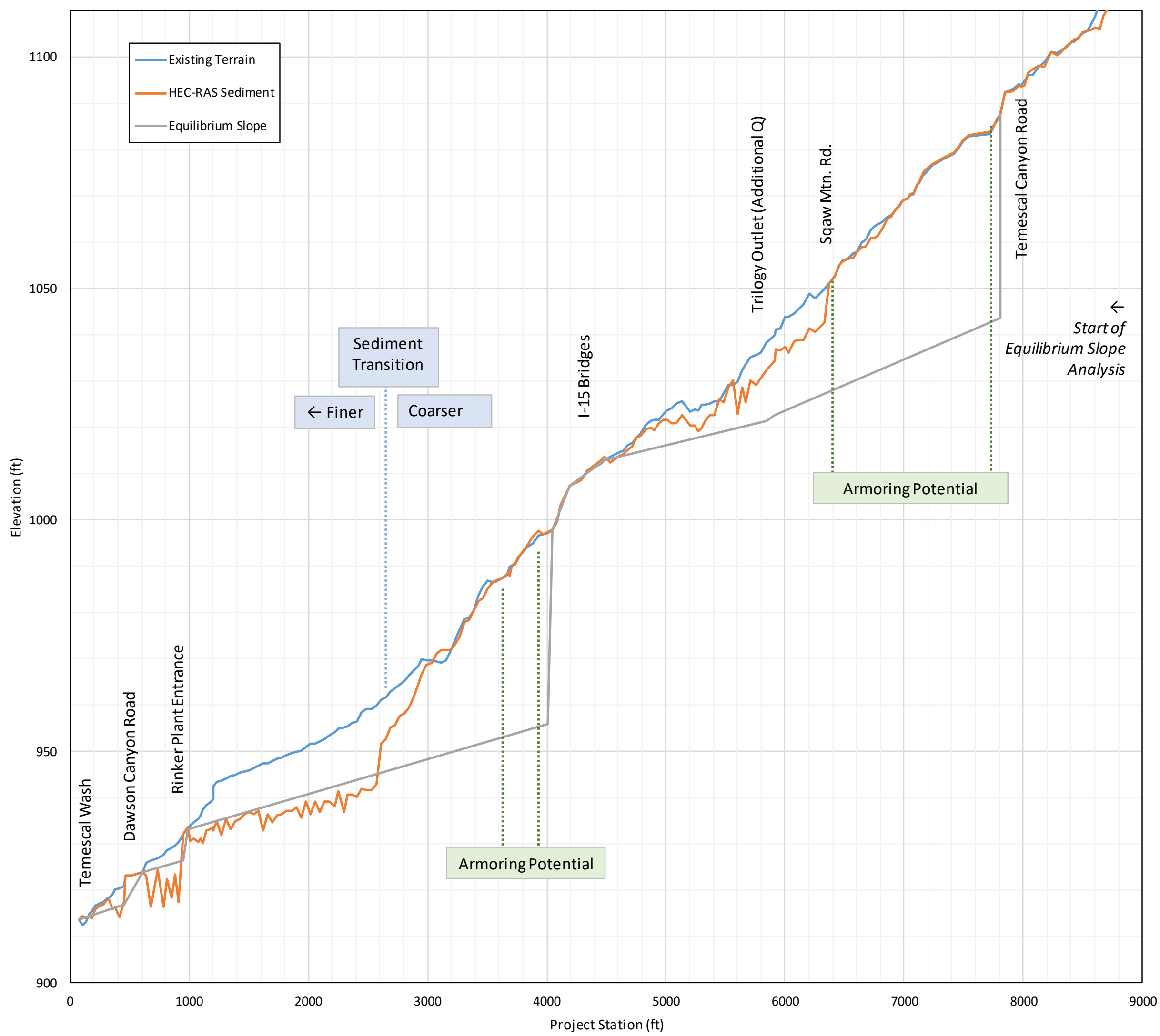

Figure 51. Equilibrium Sediment Transport Results.

7.4 Conclusion

Based upon the analyses described above, CCW is not currently in static or dynamic equilibrium. Vertical equilibrium will likely be achieved as the result of bed armoring prior to achieving a hydraulic equilibrium slope, but this also implies a continuously sediment-lean system that will be prone to scavenging sediment from areas other than the channel bed (i.e. channel banks) once armoring is developed.

8 CONCLUSIONS

Coldwater Canyon Wash is currently in a transitional state. This condition is the result of human intervention in the forms of channelization, encroachment, watershed modification, and removal of sediment in contributing watersheds. While the effects of these changes has largely removed the alluvial fan flooding hazards which previously existed in the project area, the combination of an encroached system without engineered conveyance creates conditions for a variety of flood hazards.

8.1 HYDROLOGY

Prior to this study, composite hydrology was not available for the primary tributaries to CCW. Additionally, by developing composite hydrology based upon existing studies, the significance of recent flow events was put in context of recurrence-interval based design. The December 2010 event, which caused erosion along the upper CCW system and closed Temescal Canyon Road, was approximately ½ of the magnitude of the 2-year storm. A relatively small event in January of 2017 caused approximately 12 feet of lateral movement at Tom’s Farms. Project hydrology and subsequent sediment transport analyses indicate that frequent events, such as these, are significant with respect to channel modification. The potential frequency of these events and proximity of structures and transportation features suggests that inundation and erosion hazards along the CCW system are acute.

8.2 EQUILIBRIUM TRENDS

CCW is an actively degrading system with average bed lowering of 0.22 ft/year over the period of available topographic data, approximately 65 years. The presence of grade control in select areas has locally limited degradation at I-15 and upstream of Temescal Canyon Road, but these features are not adequate to provide broad, system-wide vertical stability. Additionally, the I-15 grade control appears to have been effective thus far at locally stabilizing the system at I-15, but was not intended to mitigate previous channel degradation. Geomorphic analysis indicates that CCW is not in an equilibrium state with respect to its current plan form and is prone to channel modification through natural processes.

Based upon unchecked equilibrium sediment transport conditions, channel degradation will progress to great depths due to a lack of sediment inflow upstream of Temescal Canyon Road. However, channel armoring will likely limit the vertical extent of degradation, particularly for lower-regime flows. Upper-regime flows, based upon depth to armor analysis, will continue to generate vertical degradation in the system once bed armoring is established albeit at a reduced long-term rate due to relative infrequence of high-magnitude flows. In essence, the system contains armoring sediment capable of resisting channel lowering during the frequent, dominant flow events, but not capable of resisting scour during large flow events. Development of this armor layer also creates a condition in which lower-regime flows cannot uptake sediment from the channel bottom and will draw sediment from other available sources, such as the channel banks.

Laterally, CCW is undergoing widening processes. Stable bank slope analysis indicates currently over-steepened banks throughout the system with a sinuous, oscillating trend expressed from the upstream limit of the Rinker Plant to Temescal Canyon Road (see **Figure 40**). Over-steepening of channel banks implies the system is in-process towards a modified planform and supports the geomorphic analysis results which indicate a braided, meandering plan form is the geomorphically appropriate configuration for the channel.

The proximate cause of these imbalances cannot be stated precisely as multiple factors are likely. The long-term presence of Temescal Canyon Road and the relatively undisturbed reach between Temescal Canyon Road and Glen Ivy Road suggest that sediment imbalances downstream of the Temescal Canyon Road are not well associated with the infiltrations basins adjacent to the gravel pit. The unconfined segment of wash downstream of Glen Ivy Road has been persistent and is a naturally inefficient segment for sediment transport. **Figure 50** illustrates long-term sediment transport trends within HEC-RAS and suggests mild deposition should occur within Reaches 4 and 5, particularly for frequent events, such as the 2-year flow.

Additionally, while the design report for the Trilogy development notes increased sediment capture in debris basins and routing through wetlands, these same measures decrease the frequency and volume of outflows and subsequent “sediment transport work” in Coldwater Canyon Wash.

8.3 Future Trends

As an ephemeral, arid watercourse, CCW is prone to spurts of geomorphic activity. The period from December 2010 to December 2016 is an example of rapid changes in channel geometry developing over a single storm followed by a period of little activity. The sporadic nature of flow in the system and speed of change creates a false sense of stability during dry periods and increased alarm during wet periods.

The development of channel bed armoring coupled with bank with little erosion resistance will promote sediment uptake from channel banks during routine flow events as bed armoring matures. Over-steepened bank will continue to erode, particularly at the toe of slope in incised reaches.

The greatest obstacles to CCW establishing equilibrium conditions are based upon human intervention. While trends indicate that CCW will continue downcutting and widening to achieve a geomorphically balanced plan form and sediment balance, such behavior is not palatable for human uses of the surrounding geomorphic floodplain.

8.3.1 Reach-by-Reach Summary

The following summaries use the Reach designations shown in **Figure 1**.

Figure 52. Study Reaches.

8.3.1.1 Reach 1

Reach 1, which runs parallel to Dawson Canyon Road downstream of Temescal Canyon Road, is typified by encroachment on both bank and over-steepened banks. Additionally, vertical degradation is anticipated with future flow events due to a "perched" confluence with Temescal Canyon Wash; **Figure 48** suggests deposition in this reach due to the limit of modeling not extending into Temescal Canyon Wash. Due to a lack of engineered revetment beyond the Dawson Canyon Road culvert, a broad potential for lateral movement exists within Reach 1, although much of this potential is due to the historically erratic confluence location of CCW and Temescal Canyon Wash. Inundation hazards in Reach 1 are currently mitigated by inadequate channel capacity in Reach 2, immediately upstream.

8.3.1.2 Reach 2

Reach 2, which runs parallel to Temescal Canyon Road adjacent to the former Rinker plant, is a largely non-engineered channel segment created through a diversion of CCW around the former Rinker plant. The Dawson Canyon Road culvert functions as a downstream grade control, but **Figure 48** indicates that degradation upstream is anticipated due to a lack of observed armoring potential. Per **Table 11**, the existing culverts in this reach are under-sized for large flood events and contribute to lack of containment. In context, the lack of containment generally contributes to flow over the former Rinker Plant site, but inundation limits extend into Temescal Canyon Road for the 100-year discharge. **Figure 40** suggests that the right bank (Rinker Plant side) is over-steepened, although erosion of both banks is probable due to a lack of erosion resistant material in either bank; these results likely reflect the constructed condition rather than a geomorphically expressed trend.

8.3.1.3 Reach 3

Reach 3, which extends from the former Rinker plant to I-15, is the most downstream reach not to have undergone radical human re-orientation. Reach 3 exhibits degradational trends, although, per **Figure 51**, sediment transport modeling suggests that bed material armoring may limit the vertical extent of the degradation in the upper portion of the reach for frequent, low-magnitude events. Numerous felled trees within the reach indicate an ongoing widening trend due to oversteepened banks and a non-sinuous, non-braided channel. No natural or engineered impediments to widening were observed or identified and widening potential has been assumed to be similar to historical trends with additional top width due to channel incision.

8.3.1.4 Reach 4

Reach 4, which runs through the I-15 bridge and the Tom's Farms property, is unique in the CCW system due to the proximity of active commercial development and structures to the channel. Banks within Reach 4 are generally oversteepened, un-armored, and highly erodible. An overly straight and narrow channel system is subject to a natural trend towards a sinuous, braided plan-form. Vertical channel stabilization achieved through grade control at I-15 and excavation adjacent to Tom's Farms, appears to be accelerating lateral scour as evidenced by bank erosion upstream of the I-15 bank protection and continued undermining of trees near the Tom's Farms auxiliary parking lot.

Vertical excavation of the channel appears to have terminated near the Trilogy development box culvert. On-going sediment transport during future routine flow events will propagate the vertical change upstream to the Squaw Mountain road bridge and upstream properties if left unmitigated.

Coldwater Canyon Wash Geomorphology Study

Task 4 – Recommended Management Measures

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Table of Contents

1 Introduction 4

1.1 Study Limits 4

1.2 Task Objectives 4

1.3 Reach Descriptions 4

1.4 Project Stationing 5

2 Geomorphic Assessment Review 8

2.1 Historical Overview 8

2.2 Task 1 Review 10

2.3 Task 2 Review 11

2.4 Task 3 Review 11

3 Improvement Periods 12

3.1 Near-Term 12

3.2 Pre-Pit Capture 13

3.3 Post-Pit Capture 14

4 CCW Corridor Management Activities 16

4.1 Proposed Public Agency Activities in the CCW Corridor 16

4.1.1 City of Corona Infiltration Basins 16

4.1.2 Riverside County Transportation Culvert at Temescal Canyon Road 16

4.1.3 RCFCWCD Basin 16

4.1.4 Squaw Mountain Road Bridge Scour Retrofit 16

4.1.5 Additional Monitoring and Maintenance 17

4.2 Proposed Private Development Activity 17

4.2.1 Reaches 1, 2, and 3: North of I-15 to Temescal Wash 17

4.2.2 Reaches 4,5 and 6: South of 1-15 to Glen Ivy Road 20

4.2.3 4.2.3 Reach 7: South of Glen Ivy Road to the mouth of CCW 20

5 Management and Regulatory Framework 23

5.1 Protection of Public Infrastructure 23

5.2 Flood Hazard Zone Adoption 23

5.3 Development Standards 23

6 References 25

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List of Figures

Figure 1. Project study reach vicinity map. Photo Date 01/15/2015 6
Figure 2. Project Control Stationing. Photo Date 01/15/2015 7
Figure 3 - Near-Term Flow Rates and Public Infrastructure Improvements 13
Figure 4 - Post-Pit Capture Scenario 15
Figure 5 - CCW at Serrano Commerce Center 18
Figure 6 - CCW at Deleo Commerce Center 19
Figure 7 - Excerpt from Chandler Aggregates Phase III Plans 21
Figure 8 - Excerpt from Corona Coldwater Recharge Master Plan 22
Figure 9 - RCFCWCD Example Cross-Section 24

Appendices

Appendix A – Flood Hazard Zone Exhibit

1 INTRODUCTION

Coldwater Canyon Wash (CCW) originates on the eastern slope of the Santa Ana Mountains at 6,000 feet elevation and flows across the Temescal Valley into Temescal Wash at 900 feet elevation. Historically, CCW was an alluvial fan landform with a topographic apex near the present Glen Ivy Hot Springs Resort. By definition, an alluvial fan is an aggrading landform which receives and deposits sediment over time, resulting in a distributary channel pattern. Anthropogenic changes to CCW downstream of the fan apex beginning in the early 20th century have been altering the geomorphic character of the system. Today, CCW can be characterized as a primarily straight, single channel system. Property owners along CCW are experiencing flood-related problems such as channel scour, bank erosion, sedimentation, and other unpredictable behavior. Riverside County Flood Control and Water Conservation District (RCFCWCD, District) has enlisted JE Fuller/Hydrology & Geomorphology, Inc. (JEF) to conduct a geomorphic study of CCW in an attempt to better understand its present behavior, and to aid in predicting potential future behavior.

1.1 STUDY LIMITS

The study area extends from immediately upstream of the Glen Ivy Hot Springs Resort to the confluence with Temescal Wash, and is approximately 2.5 river miles in length. Descriptions of CCW throughout this report are generally referenced by major geographic features which are shown in **Figure 1** for reference.

1.2 TASK OBJECTIVES

This report summarizes the management measures planned by RCFCWCD (and others) within the CCW corridor.

1.3 REACH DESCRIPTIONS

The CCW study was divided into eight descriptive reaches which were incorporated into this analysis and represent the broadest level of spatial relationship. The CCW reach names are used in multiple sections of this report and are listed below for reference and illustrated in **Figure 1**. The division of the eight reaches is based on their unique geomorphic characteristics which are defined and described throughout this report.

- Reach 1. Temescal Wash confluence to the Dawson Canyon Road culvert.
- Reach 2. Dawson Canyon Road culvert to Rinker Plant.
- Reach 3. Rinker Plant to I-15.
- Reach 4. I-15 to Squaw Mountain Road.
- Reach 5. Squaw Mountain Road to Temescal Canyon Road.
- Reach 6. Temescal Canyon Road to Glen Ivy Road.
- Reach 7. Glen Ivy Road to Glen Ivy Hot Springs Resort parking lot.
- Reach 8. Glen Ivy Hot Springs Resort parking lot to the upstream limit of Glen Ivy Hot Springs Resort.

1.4 PROJECT STATIONING

A Project Control alignment was established for this study to give a consistent baseline for more detailed descriptions of CCW. Since CCW has substantially changed laterally over time (due to channelization), the alignment was delineated so as to be applicable for all historical channel locations (thus does not follow the present channel alignment precisely). **Figure 2 shows the station alignment and numerical stationing. Because results are projected onto this alignment, it is suitable for result display and comparison**. Scaling distances from **Figure 2** is not recommended due to the projected nature of the data; point of interest locations have been noted on charts, where applicable, to assist in interpreting results.

Figure 1. Project study reach vicinity map. Photo Date 01/15/2015

Figure 2. Project Control Stationing. Photo Date 01/15/2015

2 GEOMORPHIC ASSESSMENT REVIEW

Task 1 of this project identified key contributing factors that have caused or exacerbated lateral and vertical erosion and deposition along CCW. The following sub sections serve to highlight the key findings from this task.

2.1 HISTORICAL OVERVIEW

A brief history of major changes to CCW is summarized below in order of oldest to most recent:

- Temescal Canyon Road and Glen Ivy Road pre-date the earliest collected photographic record (1948),
- Agricultural development along much of the CCW floodplain downstream of Temescal Canyon Road prior to the 1940s.
- The I-15 corridor is cleared and graded in the mid-1960s.
- The Rinker concrete pipe plant (Rinker plant) is constructed in the early 1970s. CCW is diverted and channelized to the west of the Rinker plant. The old channel is cutoff by a constructed levee.
- The I-15 bridges are constructed between 1978-1979 including channelization of CCW and grouted rip-rap bank protection along both banks.
- Aggregate mining begins on the alluvial fan in the early 1980s and progresses westward.
- Clearing, grading and early construction for Tom’s Farm begins in the early 1980s.
- Tom’s Farms excess right-of-way purchase and maintenance agreement with Caltrans in June 2000.
- Aggregate mining encompasses the entire alluvial fan surface by the mid-1990s. CCW is channelized around the aggregate pits from the Glen Ivy Hot Springs Resort to the Glen Ivy Road crossing.
- CCW was diverted and channelized immediately downstream of the Dawson Creek Road crossing. The new channel alignment parallels Dawson Creek Road and extended to the confluence of Temescal Wash.
- Concurrent with the aggregate pit channelization effort, several in-line infiltration basins were constructed with concrete check dams. Many of the dams were later breached (likely intentionally).
- Construction of the Trilogy at Glen Ivy master planned community between 2002 and 2008.
- Construction of the Glen Ivy Golf Course outlet channel in 2002.
- Construction of Tom’s Farms train bridge across the wash in 2002.
- Squaw Mountain Road bridge is constructed between 2001 and 2002
- A box culvert was constructed at the Dawson Creek Road crossing in 2002.
- Culverts were installed at the Glen Ivy Road crossing in 2002.
- A grouted rip-rap grade control structure was installed downstream of I-15 in 2003.
- Structures placed and constructed within the wash between Tom’s Farms train bridge and Caltrans I-15 bridge from 2000-2010.

- Significant amount of materials removed from CCW bottom and placed adjacent to CCW in 2014 between train bridge and Trilogy outlet structure.

2.2 TASK 1 REVIEW

The following preliminary conclusions were reached based on the results of this analysis:

- CCW has been transformed from an alluvial fan landform to primarily a straight, single channel river system.
- Development in the watershed has occurred with high spatial and temporal variability, thus attributing the response of CCW at any one location to any one single factor (e.g. lowering of Temescal Wash, channelization, infiltration basins, structures, etc.) is not possible.
- Precipitation gage records indicate CCW has experienced relatively few floods within the gage record (~25 years). Of those events, the largest occurred in December 2010. Anecdotal, aerial photography, and field information indicate the 2010 flood caused significant incision of CCW, especially between Temescal Canyon Road and Squaw Mountain Road. Future storm events of similar magnitude will likely repeat the process.
- Temescal Wash has experienced incision within recent time. The regional cause of this incision is outside of the scope of this project, however the impacts are directly impacting its tributaries, including CCW. Given the amount of anthropogenic disturbance to CCW, it is difficult to determine whether the direct responses to the disturbances or the lowering of Temescal Wash have been a bigger driver in the impacts to CCW. Field evidence indicates CCW is presently perched above the thalweg of Temescal Wash, thus additional incision is expected at least up to the Dawson Canyon Road culvert.
- Overall, CCW is responding to external factors that have been applied to the system. Those responses include:
    - <u>Incision</u>. The cutoff of sediment by the infiltration basins and, more recently, the golf course development has resulted in sediment "lean" conditions downstream. As a result, flood flows have scoured the bed attempting to dissipate excess energy. Channelization and steepening of channel bank slopes also results in incision by concentrating flows. These have also contributed to incision within the CCW system.
    - <u>Incipient Armoring</u>. As the main channel continues to degrade, fine sediments are transported downstream, leaving larger sediment clasts which form an armor layer. This was observed throughout the study reach. Although the degree of development of an armor layer varied, this process is expected to continue with future floods. As the armor layer develops over time, the rate of incision will likely decrease. Multiple structures are presently serving as grade control which will also limit future incision:
        - Dawson Canyon Road culvert
        - I-15 rip-rap grade control
        - Temescal Canyon Road
        - Glen Ivy Road
    - <u>Lateral Migration/Widening</u>. Lateral migration has occurred in the period of record (Cross-Section plots) and evidence was observed in the field throughout the study area. As future flood events armor the channel bed reducing the volume of sediment available to scour, it is likely that lateral migration and channel widening will increase as the bank sediments are eroded to dissipate excess energy. The degree to which this will occur is likely to vary based upon the present planform and channel width.

- Slope. The overall channel slope has increased over the period of record. This is the result of shortening the total channel length through channelization. One mechanism of adjustment of an over-steepened channel is to scour the bed in an attempt to reach an equilibrium slope.

When considering all the information in this study including the field reconnaissance observations and interpretations and all the analyses performed, it is concluded that CCW Reaches 1-5 and 7 have not yet reached a state of equilibrium with respect to channel slope and channel form.

2.3 Task 2 Review

The following conclusions were developed based upon the Task 2 Analysis:

- Geomorphic trends within CCW largely indicate a state of geomorphic dis-equilibrium.
- In its current state, the CCW channel is generally overly straight and is transitioning to a meandering plan-form through erosive processes.
- Reach 5 is the most geomorphically appropriate reach in the system based upon current channel width and the magnitude of recent flows.
- Reach 6 is the least geomorphically disturbed reach in the system and has been subject to broad, shallow flooding throughout the period of data available for this study
- Banks along CCW, particularly in Reaches 1-5, are over-steepened.
- Little natural resistance to bank erosion is present; bank materials are readily transportable. Reach 8 exhibits the least erodible bank sediments in the system.
- Pronounced lateral channel movement is anticipated in Reaches 1-5. In Reach 5, the channel is subject to some lateral movement, but has evidenced greater long-term lateral stability and a lesser degree of encroachment and incision.

2.4 Task 3 Review

The following conclusions were developed based upon the Task 3 Analysis:

- The 2010 flow event was not a major flow event with respect to peak discharge magnitude. The peak discharge was 477 cfs which is less than CCW’s 2-year peak discharge.
- Hydrologic modeling indicates the Trilogy culvert should have conveyed a large flow during the 2010 flow event, but no evidence of flow of this magnitude was observed in the field or in aerial imagery taken following the event.
- Downstream of Temescal Canyon Road and upstream of the former Rinker Plant, the CCW channel system generally has sufficient capacity to convey the 100-year discharge.
- The dominant discharge/channel forming event for CCW is on the order of the 2-year event.
- The CCW system shows armoring potential as a limiting factor for vertical degradation for the 2-year event.

3 IMPROVEMENT PERIODS

Proposed activities and improvements within the CCW corridor have been organized into three categories based upon their likely time horizon and potentially, a triggering event (e.g. the closure of the Chandler Aggregates pits). The categories, Near-Term, Pre-Pit Capture, and Post-Pit Capture, are discussed individually below and presented in likely chronological order.

3.1 NEAR-TERM

Near-term activities are defined as those improvements which are currently planned for implementation, but may not have a definitive date for completion. Near-term activities include the following:

1. Construction of the Riverside County Transportation culverts at Temescal Canyon Road near Glen Ivy Road;
2. RCFCWCD Basin upstream of Temescal Canyon Road culverts;
3. Squaw Mountain Road bridge scour retrofit.
4. City of Corona Infiltration Basins
5. Monitoring of Painted Hills community slopes
6. Monitoring of Trilogy outfall

The locations of near-term public infrastructure activities are shown in **Figure 3**. These activities area detailed in Section 4.1 of the report.

Pending modification of Ordinance 458, development within the Department of Water Resources flood awareness areas will be regulated based upon documentation of flood hazard mitigation; see **Section 5.2** for additional details regarding ordinance modification. Prior to modification of Ordinance 458, flood hazard zones (FHZ) as defined in this project, will be used to inform property owners of current flood hazards related to Coldwater Canyon Wash. **Figure 3** depicts the currently effective flood awareness zone (blue polygon) and the proposed flood hazard zone (red line).

Figure 3 - Near-Term Flow Rates and Public Infrastructure Improvements

3.2 Pre-Pit Capture

The Pre-Pit Capture period is defined as the period prior to closure of the Chandler Aggregates pit. The current permit for the Chandler Aggregates operation expires in approximately 20 years and the duration of this period is assumed to be approximately that length. During the Pre-Pit Capture period, 100-year flows originating in Coldwater Canyon will be un-mitigated and the reaches of CCW upstream of the Trilogy Outfall culvert will be subject to the 100-year peak discharge of 3,455 cfs. Downstream of the Trilogy Outfall culvert, the 100-year peak discharge of 5,247 cfs is applicable during this period.

During this period, development within the flood hazard zone (see **Figure 3**) will be regulated by RCFCWCD.

3.3 POST-PIT CAPTURE

Following the cessation of mining activity in the Chandler Aggregates Pit, the mine's closure plan outlines construction of a diversion structure to divert flows originating from Coldwater Canyon directly into the mining pit. With the exception of local drainage flows, under this scenario and assuming associated improvements in CCW approaching the diversion structure, 100-year flows from the mouth of Coldwater Canyon will be reduced to zero. Downstream of the Trilogy Outfall culvert, 100-year flow of 2,190 cfs from the Trilogy Outfall will be the regulatory discharge. Due to the reduced discharge upstream of the Trilogy outfall, the flood hazard zone will be truncated upstream of the Trilogy outfall and downstream of the proposed pit diversion structure as shown in **Figure 4**.

Figure 4 - Post-Pit Capture Scenario

4 CCW CORRIDOR MANAGEMENT ACTIVITIES

4.1 PROPOSED PUBLIC AGENCY ACTIVITIES IN THE CCW CORRIDOR

Several relevant activities are proposed within the CCW channel corridor and are listed below. Private development is discussed separately in **Section 4.2.**

4.1.1 City of Corona Infiltration Basins

The City of Corona has prepared preliminary plans for improvements to the existing breached basins within CCW Reach 7. The proposed system consists of a series of inline basins formed from cross-channel obstructions with low-flow bypass pipes and concrete armor-flex protection for overtopping flows. The proposed improvements outlet via a diked basin with an outlet at the location of the existing Glen Ivy Road culverts and provide incidental flood protection due to detention and infiltration of minor events.

4.1.2 Riverside County Transportation Culvert at Temescal Canyon Road

Riverside County Transportation is constructing a 2-barrel 6'x2' reinforced concrete box culvert (RCBC) at Temescal Canyon Road at the existing CCW thalweg/overflow location. The culvert has a capacity of approximately 200 cfs and construction is anticipated to be complete in 2019.

Based upon the capacity of the RCBC, this culvert is not intended to convey the 100-year or even the 2-year discharge. Transportation's design does not include an approach channel which may limit the water conveyed within the culvert during events. During events which exceed the capacity of the culvert, overtopping of Temescal Canyon Road will occur as no other conveyance mechanism is available.

4.1.3 RCFCWCD Basin

RCFCWCD has previously acquired parcels adjacent to the proposed location of the Temescal Canyon Road culvert and has developed conceptual plans for construction of an interception and retention basin to direct flows to the County Transportation culvert inlet. The basin also functions incidentally as a retention basin with some groundwater recharge capacity. RCFCWCD will proceed with the construction of this basin after RCBC has been placed by Riverside County Transportation.

4.1.4 Squaw Mountain Road Bridge Scour Retrofit

In 2012, JLC Engineering completed a floodplain and scour analysis of Squaw Mountain Road bridge for Riverside County. Squaw Mountain Road bridge was built by private developers (KB Home) and is not currently within public right-of-way and has not been accepted by the County for maintenance. The stated purpose of the study was to "provide a recommendation to protect the existing bridge from potential scour". Notably, the analyses utilized highly bulked flows (bulking factors of 75%) in modeling.

The JLC report indicates that vertical degradation and bulked flows have created a condition in which the Squaw Mountain Road bridge is subject to 100-yr scour which exceeds the values calculated in the original design. Due to this and the potential for long term degradation, the grade control structure proposed in the 2012 report may not be adequate for future long-term scour and additional review of this element of the design is recommended.

The current owner of the Squaw Mountain Road bridge may have an interest in transferring ownership of the bridge and dedicated right-of-way to Riverside County. Prior to taking ownership of the bridge, -

Riverside County will require scour retrofit measures to be constructed. The scour retrofit plans have been drafted and are currently under County Transportation's review.

4.1.5 Additional Monitoring and Maintenance

While not presently at risk, several areas in public right-of-way are subject to possible future erosion hazards. Specifically, the slope adjacent to the Painted Hills community and the Trilogy Outfall will be subject to on-going monitoring and maintenance by the County.

While the slope at the Painted Hills community lacks engineered bank protection, a review of historical bank alignments (see previous reports for this study) indicates the right-bank position has not changed significantly during the period of review of this study. Should that condition change and active bank erosion is observed, RCFCWCD has acquired sufficient right-of-way to access the upstream section of slope and will place riprap to protect the slope if necessary.

The Trilogy Outfall, while showing no evidence of flows of significant magnitude, is subject to vertical degradation within CCW which may cause riprap at the outfall terminus to launch into CCW. Riverside County will monitor this condition and may apply additional rock as needed to stabilize the stone chute.

4.2 Proposed Private Development Activity

4.2.1 Reaches 1, 2, and 3: North of I-15 to Temescal Wash

The reaches downstream of I-15 are subject to private commercial development which, through the development process, will mitigate the flood hazards present in the reaches.

Specifically, the Serrano Commerce Center planning documents depict collecting CCW immediately downstream of I-15 along the wash's historic flow path through Reach 3 (Proactive Engineering Consultants, 2006). Near the downstream terminus of the development, a re-alignment of Temescal Canyon Road is proposed which would cross CCW. As stated in the planning documents, the channel is intended to be an earthen bottomed, steep-sided channel with bank protection, grade control structures, and maintenance access points. The stated intent is for the developer to transfer ownership and maintenance of the channel to RCFCWCD. Figure 5 shows the extent and location of proposed improvements.

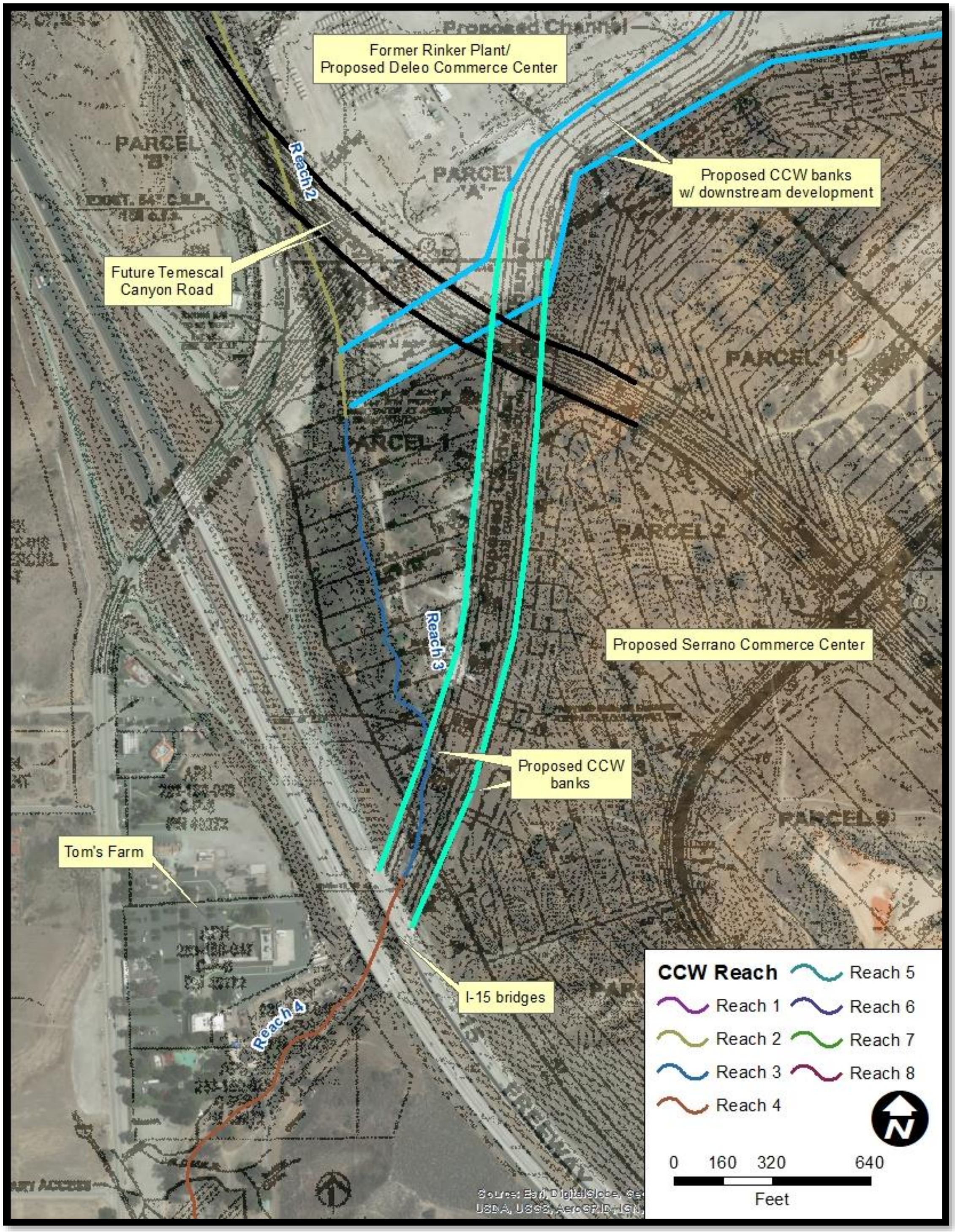

Figure 5 - CCW at Serrano Commerce Center

Immediately downstream of the Serrano Commerce Center, the Deleo Commerce Center has submitted a pre-application review (PAR) to RCFCWCD (Proactive Engineering Consultants West, Inc., 2017). The Deleo PAR documentation indicates an understanding of the possible upstream development and shows an interim routing of CCW with future re-alignment at the upstream end of the project “by others”. The

Deleo PAR explicitly indicates grade control structures and bank slopes, but bank protection methods are not detailed. **Figure 6** shows the extent and location of the proposed improvements.

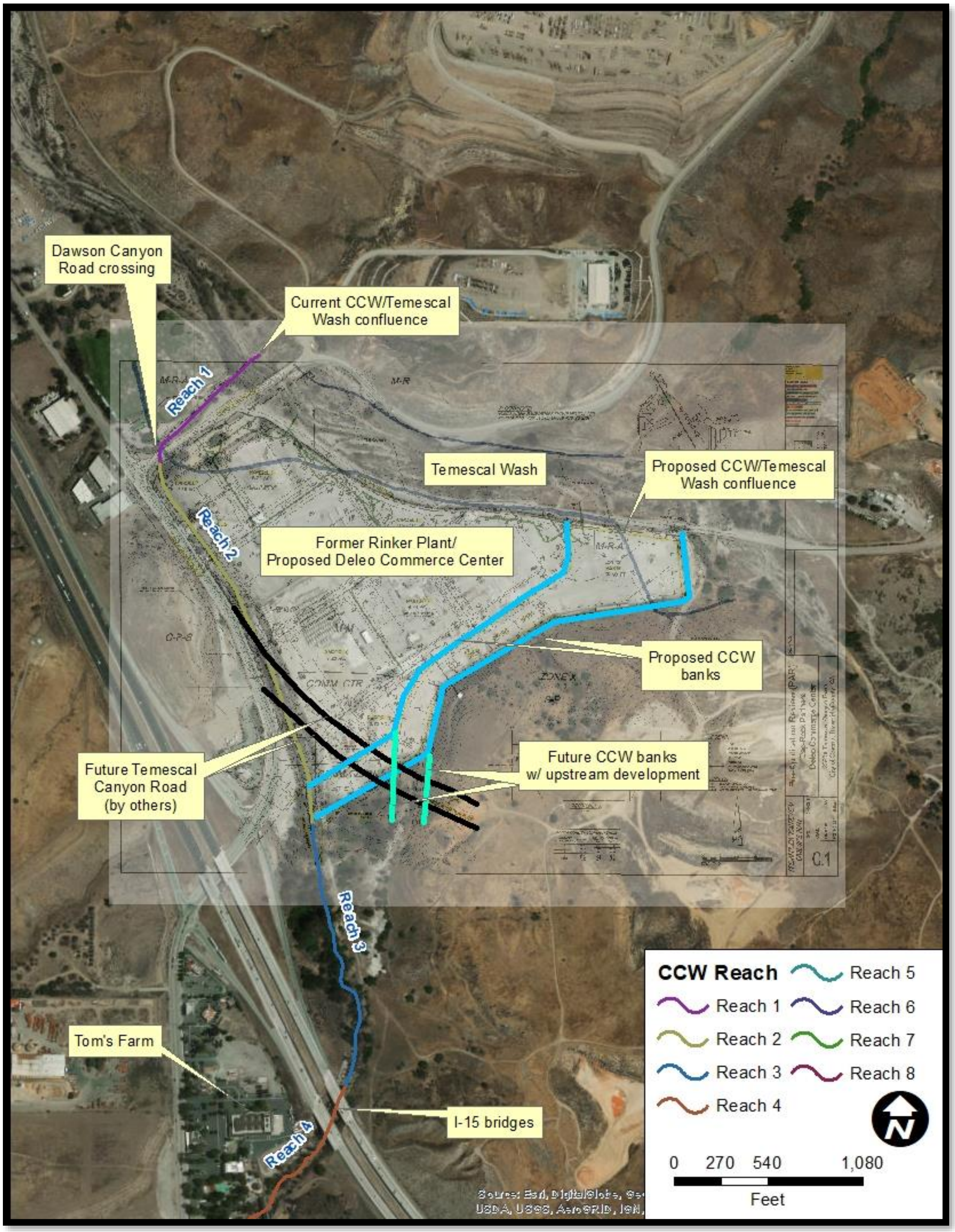

Figure 6 - CCW at Deleo Commerce Center

In aggregate, these developments along CCW can mitigate the localized flood hazards in Reaches 1, 2, and 3 of CCW through appropriate engineering design and re-orientation of the wash away from Temescal Canyon Road (Reach 2 currently runs adjacent to Temescal Canyon Road) and Dawson Canyon Road (Reach 1 currently runs adjacent to Dawson Canyon Road). The use of grade controls structures can limit future vertical degradation and bank protection will limit lateral movement of the wash.

Due to the uncertain nature of private development, the time-frame for construction of these improvements is unknown. RCFCWCD is aware of the existing flood hazards in Reaches 1, 2, and 3 and considers these private development proposals adequate for the purpose of stabilizing the lower reaches of CCW at a planning level.

4.2.2 Reaches 4, 5 and 6: South of 1-15 to Glen Ivy Road

Upstream of I-15, private developments along CCW are either pre-existing or not currently proposed. A broad series of flood hazards including inundation near the intersection of Temescal Canyon and Glen Ivy Roads as well as lateral and vertical erosion hazards between I-15 and Temescal Canyon Road exist. Development within the flood hazard zone (FHZ) will be regulated by RCFCWCD as discussed in **Section 5.2** and **Section 5.3**.

4.2.3 Reach 7: South of Glen Ivy Road to the mouth of CCW

The existing Chandler Aggregates pit is approximately 400 feet deep with a flood storage volume of approximately 40,000 ac-ft. As part of the previously approved mine closure plan for the Chandler Aggregates pit, a diversion structure will be constructed to divert the 100-year discharge into the Chandler Aggregates pit. The concept was originally proposed as part of the phasing and closure plan for the Chandler Aggregates pit (KCT Consultants, Inc, 2000); see **Figure 7**. The concept was continued in the strategic planning by the City of Corona for recharge facilities in the Coldwater groundwater subbasin (KWC Engineers, 2016); see **Figure 8**. The current mining permit for the Chandler Aggregates pit is due to expire in 2038. The closure of the mining operation and construction of diversion works represents a major change in the hydrologic regime of the CCW system and a change in regulatory discharges and flood hazard zone limits for portions of the CCW system.

4.2.4 Reach 8: Upstream limit of Study to Glen Ivy Road

While additional private development activity is currently planned at Glen Ivy Hot Springs, the details of the activity have not been submitted to RCFCWCD to-date.

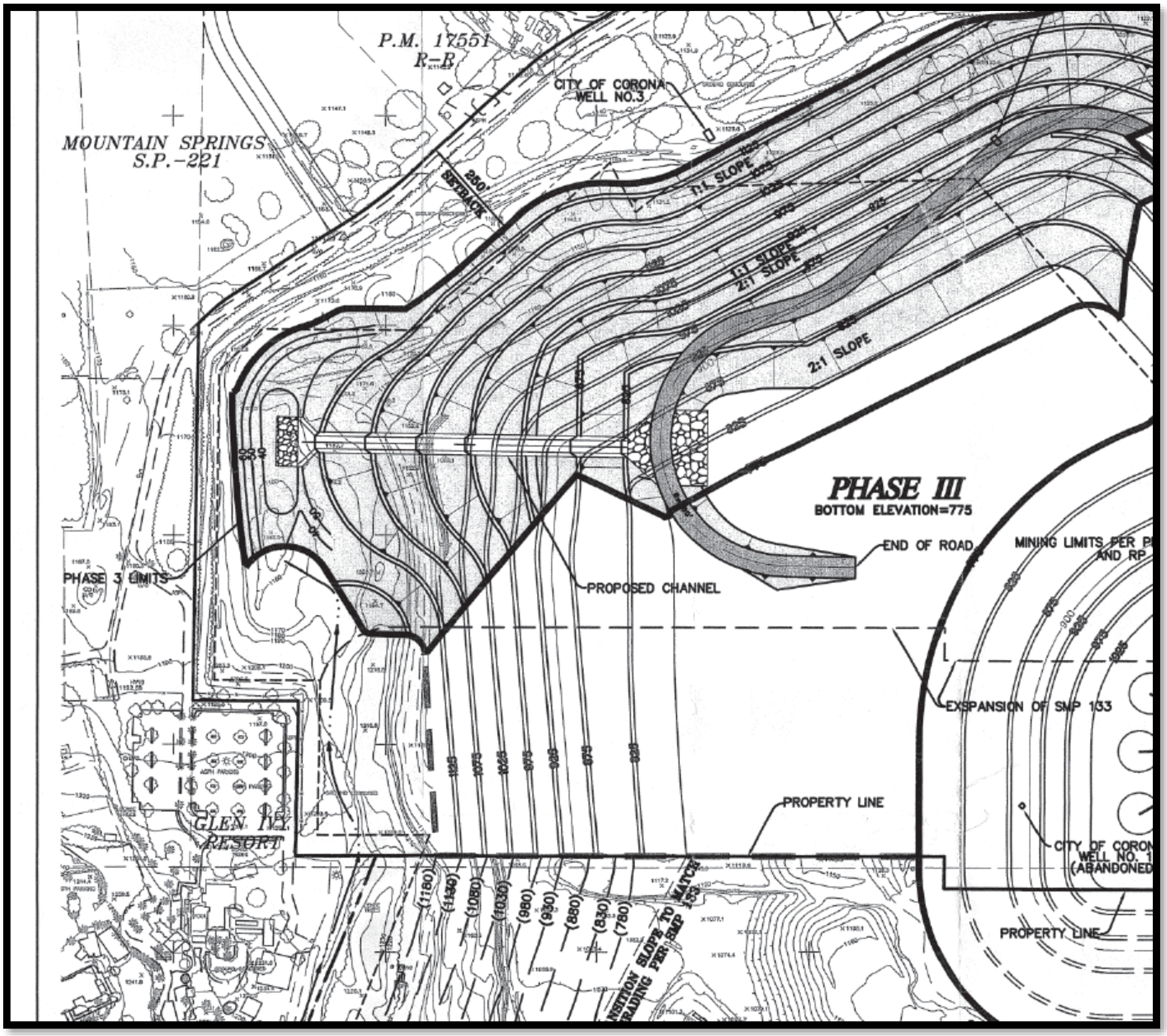

Figure 7 - Excerpt from Chandler Aggregates Phase III Plans

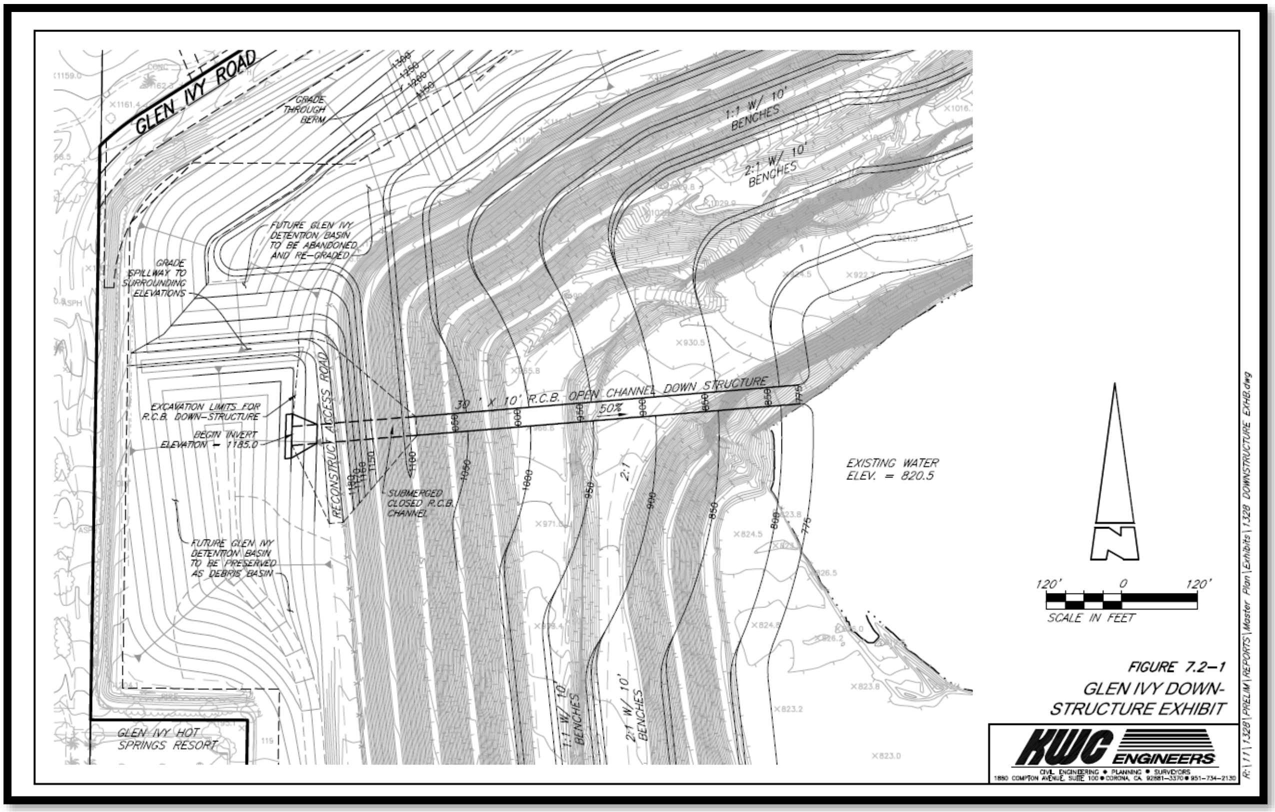

Figure 8 - Excerpt from Corona Coldwater Recharge Master Plan

5 Management and Regulatory Framework

Management measures and regulatory actions within the CCW corridor are intended to facilitate responsible development along the CCW corridor and within areas of identified flood hazard.

Management and regulatory measures for each period described in **Section 3** are described below.

5.1 Protection of Public Infrastructure

Near-term improvements to public infrastructure elements have been described previously in Section 4.1, these measures meet RCFCWCD's goal to protect public infrastructure in the near-term period. Additional corridor-wide measures are described below.

5.2 Flood Hazard Zone Adoption

Currently, RCFCWCD has adopted the California Department of Water Resources (DWR) flood awareness zones for regulation of flood hazards. Within the CCW corridor, the DWR flood awareness delineation does not uniformly align with flood hazards as identified in this study. To better address current flood hazards, RCFCWCD will adopt the flood hazard zone (FHZ), as delineated by this study, in lieu of the DWR flood awareness zone. Use of the FHZ will require a revision to Ordinance 458 and a revision of the regulatory boundaries to supplant the CCW DWR zone with the FHZ while merging the FHZ with the DWR flood awareness zones associated with other watercourses, notably near Mayhew Canyon.

5.3 Development Standards

Generally, channel improvements on private property within CCW which are designed and constructed to RCFCWCD standards may be transferred to RCFCWCD for on-going maintenance activities. Due to RCFCWCD's future liability for maintenance and operation of these improvements, adherence to RCFCWCD's drainage standards is a vital element of any proposed channel improvements. Proposed improvements within the FHZ which do not adequately document mitigation of flood-related hazards will not be approved for construction. Ownership of improvements which are appropriate designed and built to mitigate the FHZ per RCFCWCD engineering standards may be transferred to RCFCWCD to operate and maintain the facilities.

Figure 9 depicts a typical section with specific elements required for acceptance by RCFCWCD. These specific elements are listed below. Generally, the values shown in **Figure 9** are not prescriptive, but are included to illustrate the type of detail expected for improvement plans.

1. Engineered bank revetment: While rock riprap is depicted in **Figure 9**, other forms of engineered bank protection maybe acceptable to RCFCWCD, RCFCWCD will not accept bank protection if continual ongoing maintenance is required, such as revetments which require irrigation. Vertically, bank revetment must extend above the 100-year water surface elevation and below the 100-year scour depth. Scour calculations should include long-term scour estimates based upon observed trends or engineering analysis.
2. Access roads and ramps: RCFCWCD requires access roads and ramps to allow for maintenance activities within the channel. RCFCWCD requires a minimum of 15' wide access roads on both sides of the channel.

3. Access control: Depicted as chain link fence in **Figure 9**, access control is required to limit unauthorized access or use of the channel facilities. Gates at connections to roadways may also be required.
4. Slope treatment: Depicted as a 1.5:1 cut slope and a 2:1 fill slope in **Figure 9**, portions of the CCW corridor have existing tall, over-steepened banks. Slopes may require slope stability analysis and appropriate engineered stabilization.

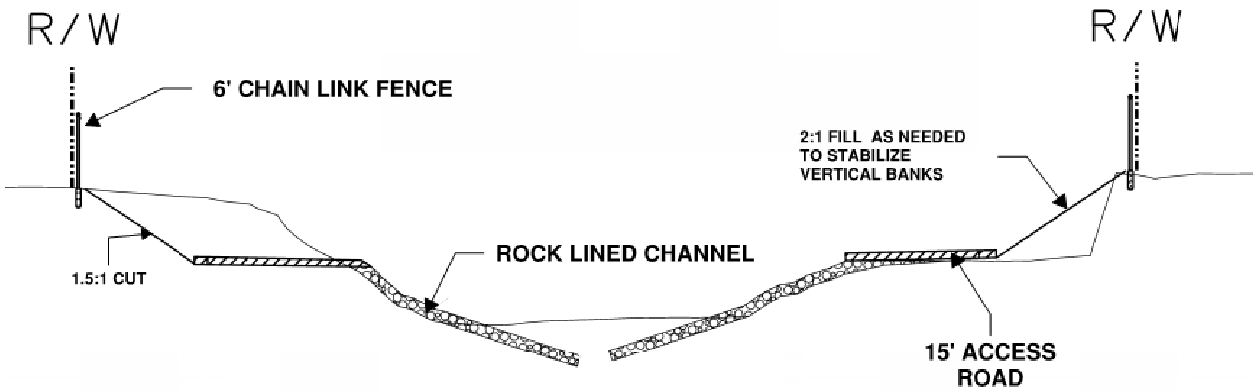

Figure 9 - RCFCWCD Example Cross-Section

Following are the additional parameters that shall also be considered:

- End-treatment at the upstream and downstream limits of proposed revetment where existing bank protection is not available for continuity of protection;
- Planimetric “flared” protection may be necessary to mitigate potential upstream channel migration.
- Transverse grade control structures may also be required to stabilize the channel invert.
- Considerations for lateral inflow locations should also be included.

6 REFERENCES

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Appendix I
Noise and Vibration Study

taha environmental planners

Technical Memorandum

TO: Jane Chang
AECOM

FROM: Terry A. Hayes Associates Inc.

DATE: July 15, 2024

RE: El Sobrante Landfill Renewable Natural Gas Facility Project Noise and Vibration Study

Introduction

Terry A. Hayes Associates Inc. (TAHA) has completed a Noise and Vibration Study for the El Sobrante Landfill Renewable Natural Gas (RNG) Facility Project (Project) in accordance with the provisions of the California Environmental Quality Act (CEQA) Statutes and Guidelines. This memorandum discussed the methodology and results of the noise and vibration analyses and the potential environmental impacts associated with construction and future operation of the Project. This Study is organized as follows:

- Introduction
- Executive Summary
- Project Description
- Noise and Vibration Topical Information
- Existing Setting
- Regulatory Framework
- Significance Thresholds
- Methodology
- Impact Assessment
- References

Executive Summary

Noise and vibration impacts associated with the El Sobrante Landfill were analyzed as part of the 1998 Environmental Impact Report (EIR) for the El Sobrante Landfill Expansion, the 2009 Supplemental EIR (SEIR) for the El Sobrante Landfill Solid Waste Facility Permit Revision, and the 2018 Addendum to the EIR and SEIR. In 2018, the CEQA Guidelines were updated and included changes to the Noise checklist questions. Question a, Question c, and Question d were consolidated into Question a, and Question e and Question f were consolidated into Question c. **Table 1** shows a summary of project changes to the previous environmental document conclusions. The construction and operation of the Project would not result in any new significant impacts and the conclusions of the previous environmental documents would not be altered.

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TABLE 1: SUMMARY OF PREVIOUS ENVIRONMENTAL DOCUMENT CONCLUSIONS AND PROJECT CHANGES TO CONCLUSIONS

Environmental Factor	Where Impact Was Analyzed in Prior Environmental Documents.	Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?	1998 EIR § 4.7; 2009 SEIR, § 4.3; 2018 Addendum § 3.2	No	No	No	No
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	1998 EIR § 4.7; 2009 SEIR, § 4.3; 2018 Addendum § 3.2	No	No	No	No
c. A substantial increase in ambient noise levels in the project vicinity above levels existing without the project?	1998 EIR § 4.7; 2009 SEIR, § 4.3; 2018 Addendum § 3.2	No	No	No	No
d. A substantial temporary or periodic increase in ambient noise level in the project vicinity above levels existing without the project?	1998 EIR § 4.7; 2009 SEIR, § 4.3; 2018 Addendum § 3.2	No	No	No	No
e. For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	1998 EIR. Appendix A, § 31; 2018 Addendum § 3.2	No	No	No	No
f. For a project within the vicinity of a private airship, would the project expose people residing or working in the project area to excessive noise levels?	1998 EIR. Appendix A, § 31; 2018 Addendum § 3.2	No	No	No	No

SOURCE: Riverside County Waste Management Department, *El Sobrante Landfill Expansion Draft Environmental Impact Report*, April 1994.; Riverside County Waste Management Department, *El Sobrante Landfill Solid Waste Facility Permit Revision Final Supplemental Environmental Impact Report*, March 31, 2009.; Riverside County Department of Waste Resources, *Addendum to the Environmental Impact Report for the El Sobrante Landfill Expansion & the El Sobrante Landfill Solid Waste Facility Permit Revision Supplemental Environmental Impact Report*, January 2018.

Project Description

The Project proposes the installation of an RNG Facility at the Waste Management (WM)'s El Sobrante Landfill to utilize existing landfill gas (LFG) that would be diverted from existing landfill flares and processed to meet Southern California Gas Company (SoCal Gas) specifications for local distribution via an existing SoCal Gas pipeline. Specifically, the Project would include the following elements:

South RNG Site

The South RNG Site would be an approximately 0.3-acre area located adjacent to El Sobrante Landfill's two existing LFG flares (flare station). The 0.3-acre area currently contains three concrete pads that were previously used for co-gen power generation; these existing concrete pads would be removed and replaced with concrete specifically designed for the equipment to be utilized at the site. The South RNG Site location is part of a larger graded area associated with the existing landfill entry and scales.

The RNG process would begin at the South RNG Site through the interception of LFG by tapping into the discharge manifold header piping prior to the gas being burned at the existing flare station. The diverted, raw LFG would be conveyed to the North RNG Site utilizing a 30-inch diameter pipe to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road. The North RNG Site would treat LFG that meets minimum specifications for processing; LFG that does not meet minimum specifications would be returned within a separate pipe (LFG reject line) in the same pipe trench back to the South RNG Site.

After the initial treatment process at the North RNG Site, the partially treated gas would be sent via another pipe in the pipe trench to be refined at the South RNG Site (i.e., final nitrogen removal) sufficient to meet SoCal Gas specifications. It would then be diverted via a sales gas compressor to a dedicated underground sales gas main to be placed within an underground pipe trench within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road and sent southward to the Gas POR Site. Waste gas from the refining process would be sent (via separate pipe in the pipe trench) to the recuperative oxidizer at the North RNG site for further treatment and release. Ancillary equipment to be located at the South RNG Site would include sales gas compressors, nitrogen rejection units, condensate treatment equipment, gas coolers, various tanks, transformers/switch gear, and a utilities building. The South RNG Site would also include an approximately 3,200-square foot maintenance and office building, which would be used as an equipment control center as well as for routine equipment maintenance required for the RNG Facility (e.g., instrument repair/swap out, inspections, oil and filter parts for compressor changes, etc.). For vehicle access to, and parking at, the South RNG Site a 25-foot-wide access easement would be dedicated between the proposed equipment and structures at the South RNG Site and the existing flare station. Building and equipment heights at the South RNG Site would typically range between 5 and 12 feet above ground surface, but with the housing for the nitrogen rejection units being 80 feet above ground surface.

North RNG Site

The North RNG Site would be an approximately 1.2-acre area on an existing graded landfill pad, approximately 0.5-mile north of the South RNG Site. This pad currently contains the landfill's former maintenance shop, a trailer, a concrete pad, a 40,000-gallon reclaimed water storage tank, and potable water booster tanks. The North RNG Site is where initial treatment/refining of the LFG would occur and is referred herein as the 'RNG Facility'. The RNG Facility would utilize the existing concrete pads when and where available but would require removal of the existing canopy structure of the former maintenance facility and the existing trailer. The existing water storage tank and potable water booster tanks would be protected in place (i.e., these tanks would not be part of the 1.2-acre RNG Facility). The RNG Facility would consist of various equipment, which would be located on separate concrete pads with above and below ground pipe connections. Equipment would include scrubbers, blowers, coolers, LFG compressors, absorbers, strippers, oxidizers, exchangers, filters, tanks, amine treatment, utilities building, motor control center building, etc., with heights ranging from 5 to 80 feet above ground surface. The

RNG Facility would be bordered by 12-foot-high fencing with colored slats (to match the adjacent natural terrain) with sound-attenuating drapes on the inside of the fence.

Once the gas has met certain carbon dioxide (CO_2), hydrogen sulfide (H_2S), volatile organic compounds (VOCs), and moisture concentrations it would be diverted via the amine treatment and hydration unit back to the South RNG Site for final nitrogen removal and compression into a 6-inch sales gas main to be placed in an underground pipe trench within the existing pavement or shoulder of the landfill access road between the South RNG and Gas POR Sites.

Gas Point of Receipt (POR) Site

The RNG process concludes at the 0.2-acre SoCal Gas POR Site that will be located at the southwest portion of the El Sobrante Landfill within the existing shoulder turnout approximately 600 feet northeast of the Temescal Canyon Road and Dawson Canyon Road intersection. A temporarily closed Temescal Driving Range is located to the north, and a potential future Temescal Valley Commercial Center (TVCC) development area is located to the south (across Dawson Canyon Road) of the Gas POR Site. The 6-inch sales gas RNG main will be brought to the POR underground via HDD drilling beneath Temescal Canyon Wash and brought to grade/connected within the fence-enclosed POR. SoCalGas will have various pieces of equipment to receive the RNG, including gas analyzer, gas odorant equipment, electrical equipment, etc., that would be housed within shelters or canopies. Equipment at the POR would be supported on concrete slabs to be placed above 3- to 5-feet of over excavation of the existing onsite soils. The overall POR facility would be on a raised fill pad so that it is one foot above the base flood elevation. An approximately 3-foot-high masonry retaining wall would support the fill on its southern side between Dawson Canyon Road and an internal POR access road/driveway. The entire POR facility would be surrounded by 6-foot-high decorative fencing. It will be installed, owned, and maintained by SoCal Gas.

Underground piping

Between the South RNG Site and North RNG Site an approximate 5-foot-8-inch wide by 8.5-foot-deep pipe trench, approximately 3,700 linear feet in length, would be installed via open cut trenching within the existing pavement or shoulder of the landfill access road. This pipe trench would house six separate lines: a 30-inch, high-density polyethylene (HDPE) LFG supply line to send raw LFG to the RNG plant; a 6-inch FlexSteel line to send partially treated gas from North RNG Site to the exchanger at the South RNG Site for semi-treatment; a 12-inch HDPE line to send partially treated waste gas from the South RNG Site to the recuperative oxidizer at the North Site for further treatment and release; a 4-inch HDPE fuel gas line to service the recuperative oxidizer and amine heater at the North RNG Site; a 20-inch HDPE LFG reject line from the North to South site to the existing flare station; and a 2-inch HDPE condensate line.

Between the South RNG Site and the north side of Temescal Canyon Wash (opposite the Gas POR Site) an approximate 4-foot-wide by 5-foot-deep pipe trench, approximately 6,700 linear feet in length, would be installed via open cut trenching (within the existing pavement or shoulder of the landfill access road/Dawson Canyon Road). This pipe trench would house four separate lines: a 6-inch FlexSteel sales gas main delivering RNG to the POR; a 4-inch HDPE reject gas line for rejected gas from the POR back to South RNG Site; a 4-inch HDPE fuel gas line (from a service meter tap near the POR) to the North RNG Site; and a 2-inch treated condensate line from the South RNG Site to a manhole at the Dawson Canyon Road Bridge.

Underground piping would then be accomplished via HDD boring to cross beneath, and avoid disturbance of, Temescal Canyon Wash. Two bores of approximately 500 linear feet, one for the 6-inch sales gas main and one for the two 4-inch lines (fuel gas and rejected gas lines), would be drilled beneath the wash with minimum depths of 20-foot below the surface at the center of the wash.

SoCal Gas Pipeline Interconnection

The RNG will ultimately be delivered to SoCal Gas' main pipeline located underground in the public right-of-way within Temescal Canyon Road, approximately 600 linear feet southwest from the POR. This would require approximately 600 feet of trenching performed by SoCal Gas within Dawson Canyon Road (between the Gas POR Site and existing SoCal Gas main pipeline) to install an underground pipeline interconnection between the POR and existing main pipeline.

Figure 1 shows the regional vicinity of the proposed project. **Figure 2** project site. **Figure 3** to **Figure 5** displays the proposed site plan.

CONSTRUCTION ACTIVITIES

Construction of the Project is anticipated to begin in October 2024 and take approximately 18 months to complete (with completion anticipated in February 2026). A crew of approximately 6 to 12 construction workers (daily) would be in the Project area during construction. Temporary construction staging areas adjacent to Dawson Canyon Road (approximately 0.6 acre) about 500 feet northeast of the Dawson Canyon Road Bridge over Temescal Canyon Wash, at the South RNG Site (approximately 0.08 acre), and at the North RNG Site (approximately 0.07 acre) would be used for equipment staging and laydown; all three sites would have materials (e.g., demolition and soil) stockpiled on short-term bases. Any excess material requiring disposal would utilize El Sobrante Landfill. Temporary lane closures along the landfill access road/Dawson Canyon Road would occur; however, access to El Sobrante Landfill for normal landfill operations would be maintained throughout the construction period with the use of construction flaggers (e.g., during trenching within roadways, etc.).

Construction activities will include grading, trenching, directional drilling, import of construction materials (asphalt concrete, aggregate base, decomposed granite, and fill material), soil compaction, equipment installations, building construction, etc.).

Major equipment to be used during construction includes, but is not limited to: backhoe, boom truck, concrete pump rig, crane, dozer, excavator, skid loader, vibratory compacter/roller, generator, loader, motor grader, paving machine, roller, sheeps foot, dump truck, flatbed truck, oil/lube truck, pickup truck, water truck, 18-wheel low boy, fuel truck, horizontal directional drill, Redi-Mix truck, etc.

The total construction-related disturbance footprint for the Project, both permanent and temporary, would be approximately 5.5 acres.

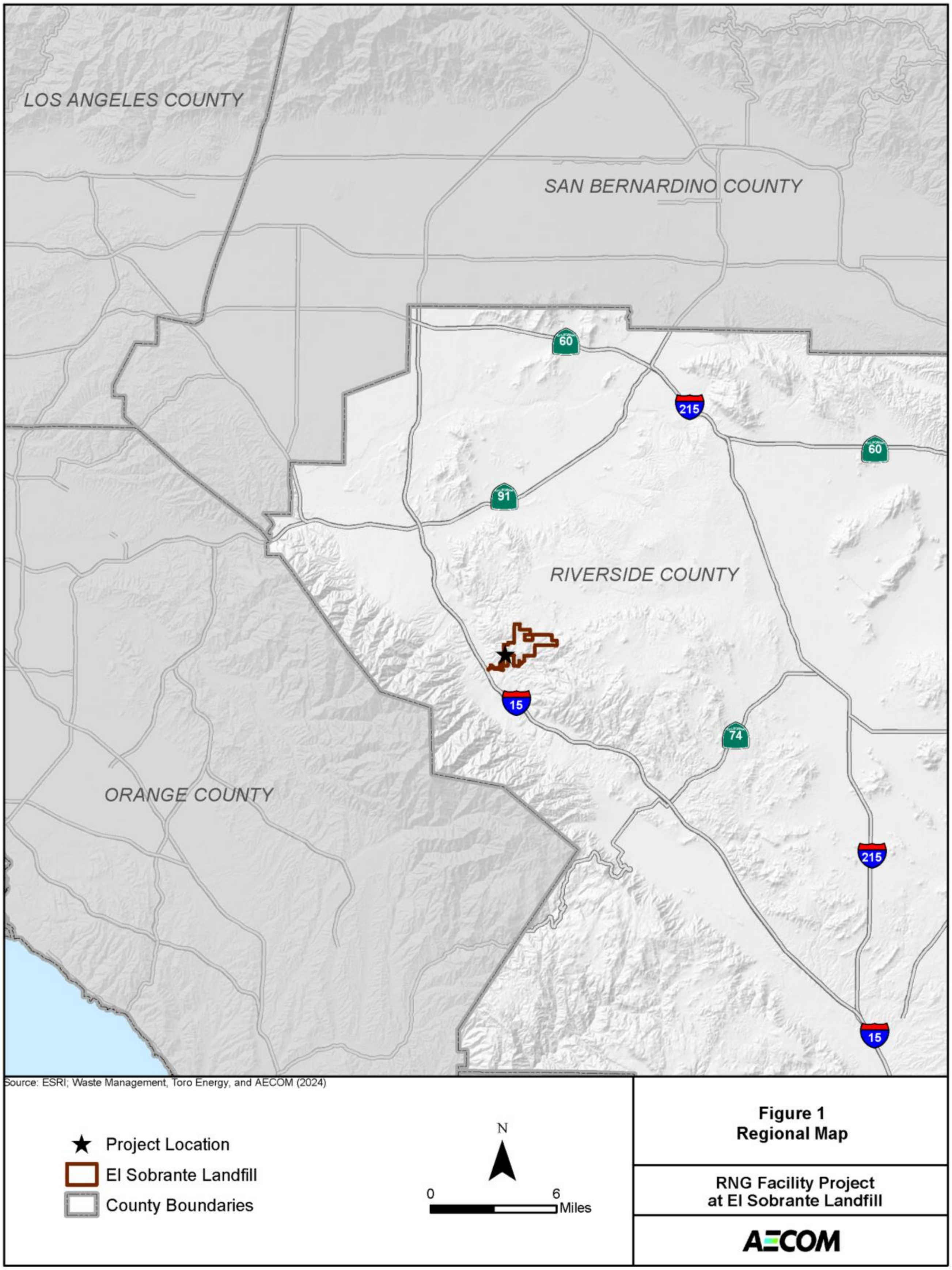

Figure 1
Regional Map

RNG Facility Project at El Sobrante Landfill

AECOM

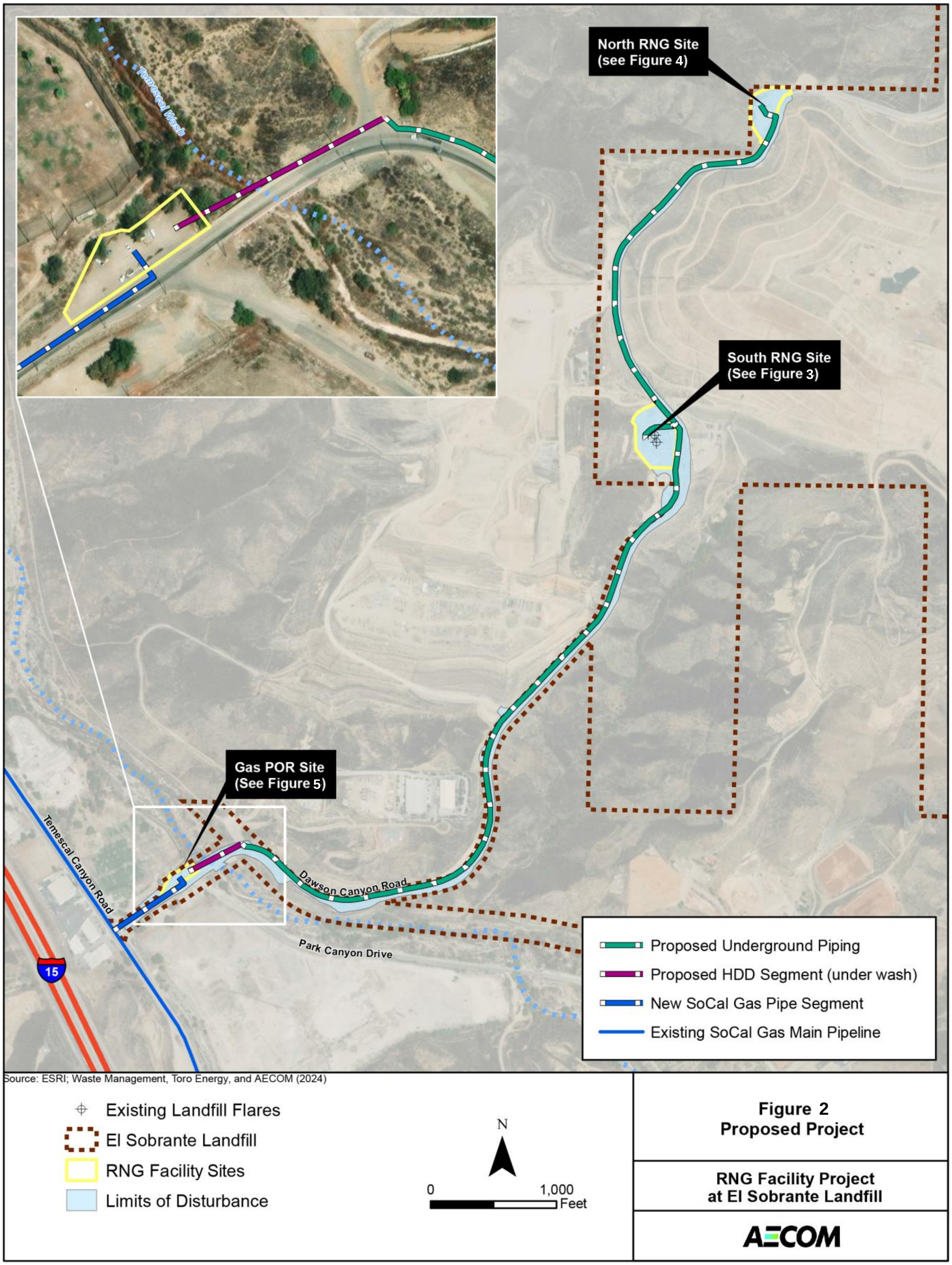

Figure 2
Proposed Project

RNG Facility Project at El Sobrante Landfill

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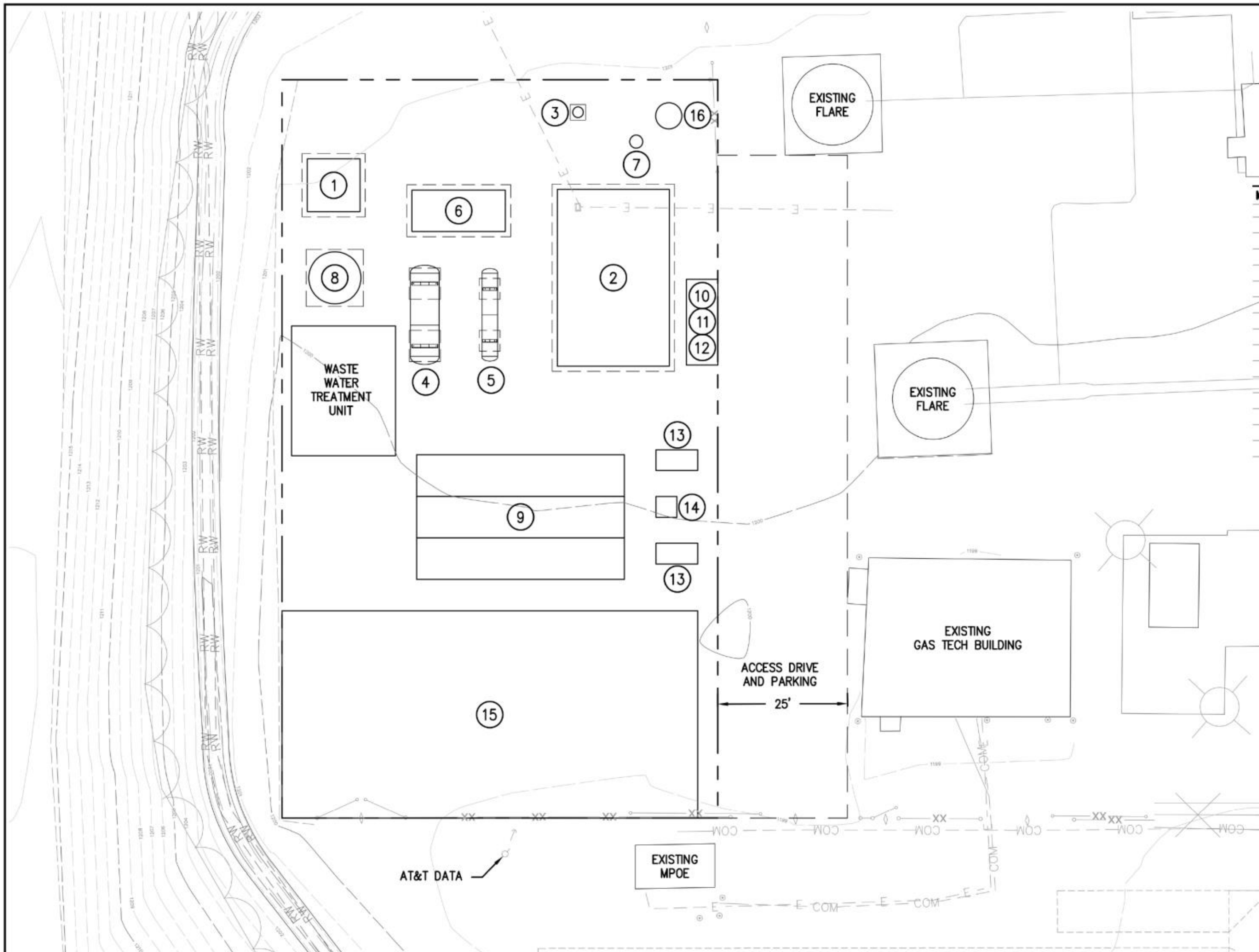


EQUIPMENT LEGEND

MARK	DESCRIPTION	HEIGHT
1	NRU COLD BOX	80'
2	RESIDUE COMPRESSOR	10'
3	SALES COALESCING FILTER	6'
4	NITROGEN RECEIVER	6.5'
5	COLD VENT DRUM	5'
6	NRU VALVING SKID	3'
7	SOUTH FLARE SUMP	–15'
8	SOUTH SLOP TANK	12'
9	UTILITIES BUILDING	9.5'
10	RESIDUE WASTE OIL TANK	10'
11	RESIDUE WASTE OIL JATCO PUMP UNIT	5'
12	RESIDUE LUBE OIL TANK	10'
13	TRANSFORMER	6'
14	SWITCH GEAR	6'
15	MAINTENANCE BUILDING	6'
16	LFG INLET SCRUBBER	–19'

Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

Figure 3
South RNG Site

RNG Facility Project
at El Sobrante Landfill

AECOM

EQUIPMENT LEGEND

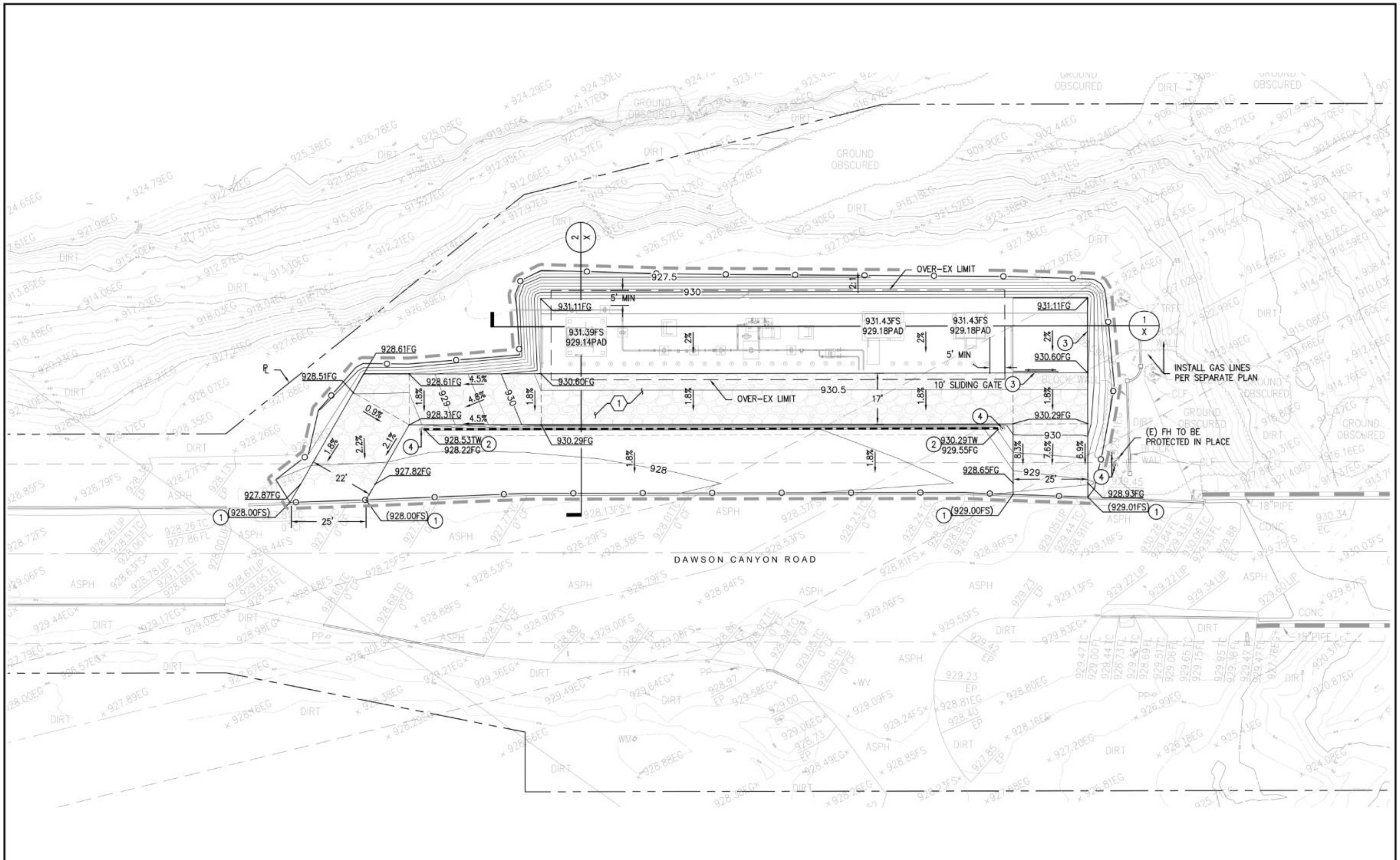
MARK	DESCRIPTION	HEIGHT
1	INLET BLOWER SUCTION SCRUBBER	15'
2	INLET BLOWERS	6'
3	INLET BLOWER GAS COOLER	12'
4	INLET BLOWER DISCHARGE SCRUBBER	15'
5	LFG COMPRESSOR A	25'
6	LFG COMPRESSOR B	25'
7	LFG COMPRESSOR COOLER A	12'
8	LFG COMPRESSOR COOLER B	12'
9	INLET FILTER COALESCER	20'
10	PRE TREAT ABSORBER	45'
11	GAS/GAS EXCHANGER	40'
12	MAIN INLET ABSORBER/INLET ABSORBER	80'
13	HP FLASH TANK	25'
14	ATMOSPHERIC FLASH/AIR STRIPPER	75'
15	PRETREAT STRIPPER/INCINERATOR	45'
16A	TOX RECOOP OXIDIZER	15'
16B	TOX BLOWER	45'
17	PLANT TOX SCRUBBER	15'
18	PRETREAT EXCHANGER	20'
19	CHILLED WATER SKID	17'
20	PRE TREAT COOLER	17'
21	SELEXOL SKID	17'
22	AMINE SKID	17'
23	AMINE HEATER	17'
24	O2 REMOVAL SKID	17'
25	O2 GAS COOLER	12'
26	AMINE COOLER	12'
27	DEHY SKID	17'
28	FLARE SUMP	-15'
29	UTILITIES BUILDING	9.5'
30	SLOP TANK (x2)	15'
31	480 VOLT MCC	9.5'
32	4160 MCC BUILDING	9.5'
33	PIPE RACK	20'
34	CHILLED WATER UNIT	17'
35	5TH STAGE COALESCING FILTER	15'
36	LFG LUBE OIL TANK	10'
37	LFG WASTE OIL JATCO PUMP UNIT	5'
38	LFG WASTE OIL TANK	10'

Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

Figure 4
North RNG Site

RNG Facility Project at El Sobrante Landfill

AECOM



Source: Origins Engineering Co., Waste Management, Toro Energy, and AECOM (2024)

LEGEND

- RIDGE LINE / GRADE BREAK
- OVER-EX LIMIT
- GRADING DAYLIGHT LIMIT
- LIMIT OF WORK

CONSTRUCTION NOTES

1. JOIN EXISTING CURB AND MATCH GRADE.
2. CONSTRUCT MASONRY RETAINING WALL PER SPPWC STANDARD PLAN 618-3 TYPE A.
3. CONSTRUCT 6' CHAIN LINK FENCE AND GATES PER SPPWC STANDARD PLAN 600-4. DRIVE GATE OPENING WIDTHS PER PLAN. (POR CHAIN LINK PER SEPARATE SGC PLANS)
4. INSTALL CONCRETE BOLLARD PER SEPARATE STRUCTURAL PLANS

PAVING LEGEND

UNPAVED ROAD
PLACE 18" MINIMUM ¾ INCH MINUS, CLASS 2 AGGREGATE BASE PER CALTRANS STANDARD SPECIFICATIONS, COMPACTED TO AT LEAST 95% RELATIVE COMPACTION UNDERLAIN BY A GEOTEXTILE LAYER AS DESCRIBED IN THE GEOTECHNICAL REPORT.

N

Not to Scale

Figure 5
Gas POR Site

RNG Facility Project at El Sobrante Landfill

AECOM

PROJECT OPERATIONS

The Project has been sized to process up to 15,000 standard cubic feet per minute (SCFM) of LFG, which would translate to a maximum RNG output of 8,600 million British thermal units (MMBTU) per day. Operation of the RNG Facility would require the use of fuel gas for heating certain refining/treatment equipment at the North RNG Site. Waste gas from the treatment/refining process would be directed to the recuperative oxidizer for further treatment and release (with less overall methane [emissions] in it than flared LFG). The Project does not increase the production of LFG at El Sobrante Landfill, but would reduce the overall amount of LFG that is flared.

Toro expects to hire seven full-time employees and up to three part-time employees for operation of the RNG Facility. Regular deliveries of materials (oil, chemicals, spare parts [e.g., filters]) are expected to require one truck trip per week. Infrequent maintenance truck trips (limited to emergency instrument repairs/swap outs, inspections, and other maintenance needs [e.g., oil changes]) would require up to seven vehicle trips spanning up to 10 calendar days out of a year.

Toro and WM are separate corporate entities; therefore, the RNG Facility and ESL are owned and operated independently. Each source will maintain separate permits and reporting.

Noise and Vibration Topical Information

The standard unit of measurement for noise is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The A-weighted scale, abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. The noise analysis discusses sound levels in terms of Equivalent Noise Level (L_{eq}). L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single-event duration, single-event occurrence, frequency and time of day. Due to the lower background noise level, human reaction to sound between 7:00 p.m. and 10:00 p.m. is as if the sound were actually 5 dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 dBA to sound levels in the night from 10:00 p.m. to 7:00 a.m. Because CNEL accounts for human sensitivity to sound, CNEL is always a higher number than the actual 24-hour average sound level.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or “point source,” decreases by approximately 6 dBA over hard surfaces (e.g., reflective surfaces such as parking lots or smooth bodies of water) and 7.5 dBA over soft surfaces (e.g., absorptive surfaces such as soft dirt, grass, or scattered bushes and trees) for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level is 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet over a hard surface.

Noise generated by a mobile source decreases by approximately 3 dBA over hard surfaces and 4.8 dBA over soft surfaces for each doubling of the distance. Generally, noise is most audible when the source is in a direct line-of-sight of the receiver. Solid barriers, such as walls, berms, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source since sound can only reach the receiver by bending over the top of the barrier. However, if a barrier is not sufficiently high or long to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as rock blasting, pile driving, and heavy earth-moving equipment. High levels of vibration may cause physical personal injury or damage to buildings. However, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of vibration may damage fragile buildings or interfere with equipment that is highly sensitive to vibration (e.g., electron microscopes).

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The VdB acts to compress the range of numbers required to describe vibration.[1]

Existing Setting

The Project site is located in the Temescal Canyon area of unincorporated western Riverside County, California and is located east of the Interstate (I)-15 and Temescal Canyon Road, approximately two miles southeast of the City of Corona. The Project site is surrounded by vacant land and the typography varies from gently to steeply sloping hills to ridges to flat mesas. Several industrial and commercial uses are located west of the site along the I-15. The nearest noise sensitive uses near the Project site are single-family homes located approximately 1,500 feet to the northwest of the proposed Gas POR Site and a Riverside County Habitat Conservation Area located to the west of the North RNG Site.

Noise measurements were taken as part of the 2009 SEIR. Six short-term measurements were taken for a 10-minute period and three long-term measurements were taken for a 24-hour period. **Table 2** shows the measured short-term noise levels and **Table 3** shows the measured long-term noise levels.

TABLE 2: SHORT-TERM NOISE LEVEL MEASUREMENTS

Location Description	Noise Level (dBA, L_{eq})
Located near a gas station 100 feet from the centerline of Temescal Canyon Rd., east of the I-15 Freeway	65.2
Located at the noise sensitive residences at the terminus of Dawson Canyon Rd. east of the El Sobrante Landfill	38.1
Located at the nearest noise sensitive residences to the south of the El Sobrante Landfill	45.0
Located near the motorcross track at the intersection of Dawson Canyon Rd. and Clay Canyon Dr.	69.0
Located 100 feet west of the El Sobrante Access centerline south of the landfill facility	60.4
Located 100 feet south of the El Sobrante Access road near the landfill entrance gates	64.9
SOURCE: Urban Crossroads, *El Sobrante Landfill Noise Analysis*, April 16, 2008.	

[1]FTA, *Transit Noise and Vibration Impact Assessment*, September 2018.

TABLE 3: LONG-TERM NOISE LEVEL MEASUREMENTS		
Location Description	**Daytime Noise Level (dBA, L_{eq}) 7 a.m. to 7 p.m.**	**Nighttime Noise Level (dBA, L_{eq}) 7 p.m. to 7 a.m.**
Located at the nearest noise sensitive residences to the south of the El Sobrante Landfill	52.3 to 56.1	50.0 to 58.1
Located 100 feet north of the Clay Canyon Dr. centerline near the existing cement piping factory	47.1 to 51.1	47.9 to 50.5
Located 100 feet west of the El Sobrante Access centerline south of the landfill facility	53.7 to 61.5	50.4 to 60.3
SOURCE: Urban Crossroads, *El Sobrante Landfill Noise Analysis*, April 16, 2008.		

Regulatory Framework

NOISE

Federal. The Noise Control Act of 1972 established programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, the United States Environmental Protection Agency (USEPA) determined that subjective issues such as noise would be better addressed at local levels of government, thereby allowing more individualized control for specific issues by designated federal, state, and local government agencies. Consequently, in 1982, responsibilities for regulating noise control policies were transferred to specific federal agencies, and state and local governments. However, noise control guidelines and regulations contained in the USEPA rulings in prior years remain in place.

State. The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation. State regulations governing noise levels generated by individual motor vehicles and occupational noise control are not applicable to planning efforts, nor are these areas typically subject to CEQA analysis.

Local. The County of Riverside has identified two separate types of noise sources: (1) stationary and (2) mobile. For the purposes of this Study, the noise impacts associated with the construction and operation of the Project are governed by the County of Riverside noise ordinance standards for stationary noise sources. The off-site truck traffic noise impacts are governed by the County of Riverside noise standards for mobile noise.

The Noise Element contains several policies that are applicable to the construction and operation of the Project, which includes:

N 4.1 Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels:

a. 45 dBA-10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.

b. 65 dBA-10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

N 4.1 Develop measures to control non-transportation noise impacts.

N 4.3 Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented.

N 4.5 Encourage major stationary noise-generating sources throughout the County of Riverside to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of conditional use permits or business licenses or prior to the approval and/or issuance of new conditional use permits for said facilities.

The Noise Element contains several policies that are applicated to project-related truck traffic noise impacts to the study area, which includes:

N 9.3 Require development that generations increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses to provide for appropriate mitigation measures.

VIBRATION

Federal. The County has not established thresholds related to vibration. In the absence of County thresholds, Federal Transit Administration (FTA) guidance may be used to assess the potential for vibration-related damage and annoyance.[2] For damage, the impact criteria are established based on the structural foundation of the potentially impacted building. Historic uses are held to a vibration damage threshold of 0.12 inches per second, as they are more sensitive to vibration damage than newer structures. The most stringent annoyance criteria related to annoyance is 65 VdB for buildings subject to frequent vibration events (e.g., multiple equipment passbys). The frequent event annoyance criteria for residences and institutional land uses with primarily daytime use are 72 and 75 VdB, respectively.

Local. The County of Riverside acknowledges that a community annoyance related to noise is vibration. The Noise Element contains one policy related to vibration that is applicable to the construction and operation of the Project:

N 16.2 Consider the following land uses sensitive to vibration: Hospitals, residential areas, libraries, concert halls, sensitive research operations, schools, and offices.

Significance Thresholds

NOISE

This study was undertaken to determine whether construction or operation of the Project would have the potential to result in significant environmental impacts related to noise or vibration in the context of the Appendix G Environmental Checklist criteria of the CEQA Guidelines. Implementation of the Project may result in a significant environmental impact related to noise and vibration if the Project would result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
b) Generation of excessive ground-borne vibration or ground-borne noise levels; and/or
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

[2] FTA, *Transit Noise and Vibration Impact Assessment*, September 2018.

The Project would exceed the local standards and substantially increase temporary construction noise levels if construction and operation activities would exceed the County of Riverside noise standards set forth in the County of Riverside General Plan Noise Element.

VIBRATION

Because the Project operations would not create perceptible vibration and vibration-generating maintenance and repair activities comparable to existing conditions, this study only considers construction vibration. The construction-related vibration analysis considers the potential for building damage and annoyance. Maximum vibration levels were assessed based on frequent vibration events happening more than 70 times in one day, which would be consistent with the movement of construction equipment. The Project would result in a significant construction vibration impact if:

- Vibration levels would exceed 0.12 inches per second at historic structures.
- Vibration levels would exceed 0.2 inches per second at non-historic structures constructed of non-engineered timber and masonry.
- Vibration levels would exceed 65 VdB at sensitive buildings, such as recording studios and medical facilities.

Methodology

NOISE

The noise and vibration analyses consider construction sources. Noise levels associated with typical construction equipment were obtained from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM).[3] This model predicts noise from construction based on a compilation of empirical data and the application of acoustical propagation formulas. Maximum equipment noise levels were adjusted based on anticipated percent of use. Combined construction activity noise levels were estimated by combining anticipated equipment for each activity using RCNM. The projected noise level during the construction period at receptors was calculated by (1) making a distance adjustment to the construction source sound level and (2) logarithmically adding the adjusted construction noise source level to the ambient noise level.

According to California Department of Transportation (Caltrans) guidance, air temperature and humidity affect molecular absorption differently depending on the frequency spectrum and can vary significantly over long distances in a complex manner. Molecular absorption in air also reduces noise levels with distance. However, according to Caltrans, this phenomenon only accounts for about 1 dBA per 1,000 feet, which is an inaudible and negligible difference in noise levels. Noise levels for this analysis have been estimated using a decrease of 6 dBA over hard surfaces for each doubling of the distance. The methodology and formulas obtained from the Caltrans Technical Noise Supplement can be viewed below.

[3] FHWA, *Roadway Construction Noise Model*, Version 1.1, August 2008.

(1) Noise Distance Attenuation Formula: $dBA_2 = dBA_1 + C \times LOG_{10} (D_1/D_2)$

Where:

dBA_1 = *Noise level at the reference distance of 50 feet*

dBA_2 = *Noise level at the receptor*

C = Coefficient for hard ground or soft ground

Hard ground C = 20
Soft ground C = 25

D_1 = *Reference distance (50 feet)*

D_2 = *Distance from source to receptor (measured distance)*

(2) Logarithmic Noise Level Addition Formula: $Ns = 10*LOG_{10}((10^{(N1/10)})+(10^{(N2/10)}))$

Where:

Ns = Noise level Sum

N1 = Noise level one

N2 = Noise level two

VIBRATION

Vibration levels were estimated using example vibration levels and propagation formulas provided by FTA.[4] The methodology and formulas obtained from the FTA Transit Noise and Vibration Assessment guidance can be viewed below. Vibration damage is assessed using formula (3) and vibration annoyance is assessed using formula (4).

(3) *Vibration Damage Attenuation Formula:* $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

Where:

PPV_{equip} = *Peak particles velocity in inches per second of the equipment adjusted for distance*

PPV_{ref} = *Reference vibration level in inches per second at 25 feet*

D = Distance from the equipment to the receptor in feet

(4) *Vibration Annoyance Attenuation Formula:* $Lv_{equip} = Lv_{ref} - 30 \times LOG (D/25)$

Where:

Lv_{equip} = *Vibration level in vibration decibels of equipment adjusted for distance*

Lv_{ref} = *Reference vibration level in vibration decibels at 25 feet*

D = Distance from the equipment to the receptor in feet

[4] FTA, *Transit Noise and Vibration Impact Assessment*, September 2018.

Impact Assessment

a) Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (Less-Than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Noise impacts associated with the El Sobrante Landfill were analyzed as part of the 1998 EIR, the 2009 SEIR, and the 2018 Addendum. As discussed in the 2009 SEIR and 2018 Addendum, the Project site emits noise levels of approximately 40.0 dBA, L_{eq} at the nearest sensitive receptors, which when combined with existing ambient noise levels of 47.9 dBA, L_{eq} would result in exterior noise levels of approximately 48.6 dBA, L_{eq}. The landfill's contribution of 0.7 dBA is considered less than "barely perceptible" and the overall noise levels are well below the County of Riverside's 65 dBA, L_{eq} exterior standard. This analysis considers the potential for new construction and operational activities to result in increased noise levels relative to what was disclosed in the 1998 EIR, the 2009 SEIR, and the 2018 Addendum.

CONSTRUCTION

The temporary construction activities associated with the Project would be conducted within the existing landfill and is located over 1,500 feet from the nearest sensitive receptors. Construction activities will include grading, trenching, directional drilling, import of construction materials, soil compaction, equipment installations, and building construction. Typical noise levels from major construction equipment that would be used during construction are listed in **Table 4**. The loudest piece of equipment would be a paving machine, which has a noise level of 82.5 dBA, L_{eq} at 50 feet. At 1,500 feet, the noise level would be approximately 53.0 dBA, L_{eq}. As the 24-hour CNEL noise level is calculated by averaging the 24 individual hourly noise levels (with sensitivity weighting applied for evening and nighttime hours) there is no potential for this non-continuous 53.0 dBA, L_{eq} noise level to increase the existing 24-hour noise level. Construction staging and stockpile areas would remain within the Project site or would be disposed of at the El Sobrante Landfill. Construction activities would still maintain 1,500 feet or more of separation from the nearest sensitive receptors and would not result in an increase of existing ambient noise levels. Therefore, construction of the Project would not include activities that would expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.

TABLE 4: CONSTRUCTION EQUIPMENT NOISE LEVELS	
Construction Equipment	**Noise Level at 50 feet (dBA, L_{eq})**
18-wheel Low Boy	70.3
Backhoe	73.6
Boom Truck	70.3
Concrete Pump Rig	74.4
Crane	72.6
Dozer	77.7
Dump Truck	72.5
Excavator	76.7
Flatbed Truck	70.3
Fuel Truck	72.5
Generator	77.6
Haul Truck	72.5
Horizontal Directional Drill	72.2
Loader	80.0
Motor Grader	81.0
Oil/lube Truck	71.0
Paving Machine	82.5
Pickup Truck	71.0
Red-Mix Truck	74.8
Roller	73.0
Sheeps Foot	73.0
Skid Loader	80.0
Vibratory Compactor/Roller	73.0
Water Truck	71.0
SOURCE: Federal Highway Administration, *Roadway Construction Noise Model*, Version 1.1, 2008.	

OPERATIONS

Implementation of the Project would require up to seven additional full-time employees, up to three additional part-time employees, and one truck trip per week for regular deliveries of materials. Additionally, vehicle trips would be required for maintenance, but would be infrequent (seven vehicle trips spanning up to 10 calendar days out of a year). Caltrans has stated that a doubling of traffic volumes on a roadway segment is typically needed to audibly increase traffic noise.[5] The new vehicle trips would have no potential to double existing traffic volumes. Thus, the Project would not substantially increase vehicle trips and roadway noise would remain similar to existing conditions.

Operations of the RNG Facility would include the processing of up to 15,000 SCFM of LFG and include possible noise generating equipment such as gas compressors, condensers, and blowers. WM has conducted noise studies for an 8,000-SCFM facility that would be approximately the size of each RNG site. Thus, the approximate noise level used for this analysis is 89.0 dBA at 50 feet at each RNG site. The nearest sensitive receptor located to the southeast would be approximately 3,600 feet from the South RNG facility and 5,300 feet from the North RNG facility. The noise level at the nearest sensitive receptor noise generated by the combination of the two RNG facilities would be approximately 53.5 dBA, L_{eq} which when combined with the ambient noise level is 55.9 dBA, L_{eq}. Conservatively, this does not account for attenuation provided by topography and intervening structures,

[5] Caltrans, *Technical Noise Supplement, page 6-5*, September 2013.

which would further reduce noise levels. Without accounting for topography, the overall noise level would remain below the County of Riverside exterior noise standard of 65 dBA, L_{eq}. The sensitive receptors have their line of sight to the RNG facility obstructed by rolling hills that reach up to 500 feet higher from the canyon floor. Due to topography, operational noise levels are reduced by topography acting as a natural noise barrier. Additionally, the North RNG Site would be bordered by 12-foot-high fencing with sound-attenuating drapes on the inside of the fence that would further reduce noise levels.

Operation of the Gas POR Site would include minimal equipment such as a gas analyzer, gas odorant equipment, and electrical equipment that would generate minimal noise. Additionally, the nearest sensitive receptor to the Gas POR Site is located over 1,500 feet to the west and any noise from equipment would not have the potential to increase noise levels to above the County of Riverside exterior noise standard. Thus, operational noise would not result in a significant increase in noise at sensitive receptors. The North RNG Site is located at the boundary of the landfill where undeveloped land to the west and north is associated with the Riverside County Habitat Conservation Area. While noise from operation of the North RNG Site would likely be perceptible to wildlife that are in close proximity to this location, existing landfill-related operations presently include vehicular traffic (haul trucks) and associated human presence. Wildlife in close proximity would thus likely be accustomed to existing landfill-related noise and activity (or avoid the zones near the perimeter of the landfill due to the existing noise generated by the landfill. Therefore, implementation of the Project would not include activities that would expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.

b) Would the Project result in generation of excessive ground-borne vibration or ground-borne noise levels? (Less-Than-Significant Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

Ground-borne vibration and ground-borne noise impacts associated with the El Sobrante Landfill were analyzed as part of the 1998 EIR, the 2009 SEIR, and the 2018 Addendum. This analysis considers the potential for new construction and operational activities to result in increased in ground-borne vibration or ground-borne noise levels relative to what was disclosed in the 1998 EIR, the 2009 SEIR, and the 2018 Addendum.

CONSTRUCTION VIBRATION

Operation of heavy equipment can generate varying degrees of vibration, depending on the procedure and equipment. Typical vibration levels associated with construction equipment are provided in **Table 5**. Heavy equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of a construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, and to slight damage at the highest levels. In most cases, the primary concern regarding construction vibration relates to damage.

TABLE 5: VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT		
Equipment	**PPV at 25 Feet (Inches/Second)**	**PPV at 50 Feet (Inches/Second)**
Large Bulldozer	0.089	0.031
Excavator	0.040	0.014
Small Bulldozer	0.003	0.001
SOURCE: FTA, *Transit Noise and Vibration Impact Assessment, September 2018; New Hampshire Department of Transportation, Ground Vibrations Emanating from Construction Equipment*, September 8, 2012.		

Construction of the Project would require trenching to install underground piping. Trenching activity would be most typically represented by excavators. Excavators generate a vibration level of approximately 0.040 inches per second at 25 feet. Structures associated with sensitive receptors nearest to the trenching zones would be at least 1,500 feet away, and no sensitive buildings, such as recording studios and medical facilities, were identified in the area. At a distance of 1,500 feet, vibration generating equipment would generate vibration levels below the vibration damage threshold of 0.2 inches per second for non-engineered timber and masonry buildings. Therefore, the Project would result in a less-than-significant impact related to structure damage from construction vibration.

OPERATIONAL VIBRATION

Roadway vibration from rubber-tired vehicles would not be perceptible outside of the roadway right-of-way. Roadway vibration would not result in an increase in vibration at sensitive receptors**.** The RNG facilities would not include significant vibration-generating equipment that would result in exposure of sensitive receptors to increased vibration. Additionally, the nearest sensitive receptors are located more than 3,000 feet to the southeast of the South RNG Site and more than 1,500 feet to the west of the Gas POR Site. Any vibration generating equipment would generate vibration levels below the vibration damage threshold of 0.2 inches per second for non-engineered timber and masonry buildings. Therefore, the Project would result in a less-than-significant impact related to off-site roadway vibration.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels? (No Impact)

Do the Proposed Changes Involve New Significant Impacts or Substantially More Severe Impacts?	Any New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Any New Information Requiring New Analysis or Verification?	Any Previously Infeasible or New Mitigation Measures to Address Impacts, but Would not be Implemented?
No	No	No	No

The Project would be located within the same landfill footprint as described in the 1998 EIR, 2009 SEIR, and 2018 Addendum. There are no existing or planned private airstrips or airports within the vicinity of the Project site. The nearest airport to the Project site is the Corona Municipal Airport, which is located approximately 10 miles to the northwest. Thus, the Project would not be affected by airport noise and no impact related to airport or airstrip noise would occur.

References

California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

County of Riverside, *County of Riverside General Plan Noise Element*, December 8, 2015.

Federal Highway Administration, *Traffic Noise Model Version 3.1*, 2021.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.

New Hampshire Department of Transportation, *Ground Vibrations Emanating from Construction Equipment*, September 8, 2012.

Riverside County Department of Waste Resources, *Addendum to the Environmental Impact Report for the El Sobrante Landfill Expansion & the El Sobrante Landfill Solid Waste Facility Permit Revision Supplemental Environmental Impact Report*, January 2018.

Riverside County Waste Management Department, *El Sobrante Landfill Expansion Draft Environmental Impact Report*, April 1994.

Riverside County Waste Management Department, *El Sobrante Landfill Solid Waste Facility Permit Revision Final Supplemental Environmental Impact Report*, March 31, 2009.