APPENDIX A

Air Quality and Greenhouse Gas Modeling Results

Deane Tank Project - Los Angeles-South Coast County, Summer

Deane Tank Project

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	7.85	1000sqft	6.70	7,854.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site is 6.7 acres.

Construction Phase - Estimated schedule.

Off-road Equipment -

Off-road Equipment - A crane would be used for tank erection. Like

Off-road Equipment - Grading Equipment to include Dozer, Scraper and Dump Truck. Likely presence of hard bedrock which may require the use of jackhammering equipment to remove the bedrock.

Off-road Equipment -

Trips and VMT - Up to 15 vehicle trips per day during construction.

Grading - Estimated approximatley 30,000 cubic yards of earthwork to be generated for the construction of the road. Option of exporting 9,000 cubic yards of cut soil.

Vehicle Trips - The Proposed Project is not anticipated to generate daily vehicle trips. Infrequent trips would be made due to maintenance as needed. Conservatively, default assumptions remain.

Energy Use - No natural gas or energy use expected for the storage tank. Conservatively, default assumptions are used.

Water And Wastewater - Construction of a new Steel water storage tank with approximately 1.7 MG of storage capacity. Conservatively, default assumption is used. No outdoor water use would be generated.

Solid Waste - No solid waste generation during operation.

Construction Off-road Equipment Mitigation - As recommended by SCAQMD, alternative applicable strategies include construction equipment with Tier 3 emissions standards.

Off-road Equipment -

Area Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	11.00
tblConstructionPhase	NumDays	230.00	174.00
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	NumDays	20.00	22.00
tblGrading	MaterialExported	0.00	39,000.00
tblLandUse	LandUseSquareFeet	7,850.00	7,854.00
tblLandUse	LotAcreage	0.18	6.70
tblOffRoadEquipment	OffRoadEquipmentType		Crushing/Proc. Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Dumpers/Tenders
tblSolidWaste	LandfillCaptureGasFlare	94.00	0.00
tblSolidWaste	LandfillNoGasCapture	6.00	0.00
tblSolidWaste	SolidWasteGenerationRate	9.73	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	8.3317	39.8591	21.1515	0.0895	8.5528	1.2440	9.5704	3.8186	1.1565	4.7725	0.0000	9,310.8837	9,310.8837	1.2138	0.0000	9,341.2280
Maximum	**8.3317**	**39.8591**	**21.1515**	**0.0895**	**8.5528**	**1.2440**	**9.5704**	**3.8186**	**1.1565**	**4.7725**	**0.0000**	**9,310.8837**	**9,310.8837**	**1.2138**	**0.0000**	**9,341.2280**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	7.4424	32.8872	25.2313	0.0895	4.1916	0.8640	4.8966	1.7233	0.8639	2.4259	0.0000	9,310.8837	9,310.8837	1.2138	0.0000	9,341.2280
Maximum	**7.4424**	**32.8872**	**25.2313**	**0.0895**	**4.1916**	**0.8640**	**4.8966**	**1.7233**	**0.8639**	**2.4259**	**0.0000**	**9,310.8837**	**9,310.8837**	**1.2138**	**0.0000**	**9,341.2280**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**10.67**	**17.49**	**-19.29**	**0.00**	**50.99**	**30.54**	**48.84**	**54.87**	**25.30**	**49.17**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Energy	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Mobile	0.1023	0.4332	1.5652	6.0500e-003	0.5152	4.3800e-003	0.5196	0.1379	4.0700e-003	0.1420		616.0076	616.0076	0.0288		616.7269
Total	**0.2820**	**0.4714**	**1.5980**	**6.2800e-003**	**0.5152**	**7.2800e-003**	**0.5225**	**0.1379**	**6.9700e-003**	**0.1449**		**661.8296**	**661.8296**	**0.0297**	**8.4000e-004**	**662.8213**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Energy	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Mobile	0.1023	0.4332	1.5652	6.0500e-003	0.5152	4.3800e-003	0.5196	0.1379	4.0700e-003	0.1420		616.0076	616.0076	0.0288		616.7269
Total	**0.2820**	**0.4714**	**1.5980**	**6.2800e-003**	**0.5152**	**7.2800e-003**	**0.5225**	**0.1379**	**6.9700e-003**	**0.1449**		**661.8296**	**661.8296**	**0.0297**	**8.4000e-004**	**662.8213**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2022	1/28/2022	5	20	
2	Grading	Grading	1/29/2022	5/2/2022	5	66	
3	Building Construction	Building Construction	5/3/2022	12/30/2022	5	174	
4	Paving	Paving	12/1/2022	12/30/2022	5	22	
5	Architectural Coating	Architectural Coating	12/16/2022	12/30/2022	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 66

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 11,781; Non-Residential Outdoor: 3,927; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Crushing/Proc. Equipment	1	8.00	85	0.78
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Grading	Dumpers/Tenders	1	8.00	16	0.38
Building Construction	Cranes	1	7.00	231	0.29
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	4,875.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	1	3.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553		3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**		**1.2427**	**1.2427**		**1.1553**	**1.1553**		**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9246	18.3130	24.6739	0.0388		0.8627	0.8627		0.8627	0.8627	0.0000	3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**0.9246**	**18.3130**	**24.6739**	**0.0388**		**0.8627**	**0.8627**		**0.8627**	**0.8627**	**0.0000**	**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1494	0.0000	7.1494	3.4349	0.0000	3.4349			0.0000			0.0000

Off-Road	2.2092	21.4267	14.5398	0.0315		0.9639	0.9639		0.9026	0.9026		3,022.7997	3,022.7997	0.7928		3,042.6199
Total	**2.2092**	**21.4267**	**14.5398**	**0.0315**	**7.1494**	**0.9639**	**8.1134**	**3.4349**	**0.9026**	**4.3375**		**3,022.7997**	**3,022.7997**	**0.7928**		**3,042.6199**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5861	18.4058	4.5985	0.0569	1.2916	0.0528	1.3444	0.3541	0.0506	0.4046		6,178.2128	6,178.2128	0.4179		6,188.6611
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0402	0.0266	0.3716	1.1000e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		109.8712	109.8712	3.0300e-003		109.9470
Total	**0.6262**	**18.4324**	**4.9701**	**0.0580**	**1.4034**	**0.0537**	**1.4571**	**0.3837**	**0.0514**	**0.4351**		**6,288.0840**	**6,288.0840**	**0.4210**		**6,298.6081**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7883	0.0000	2.7883	1.3396	0.0000	1.3396			0.0000			0.0000
Off-Road	0.7223	14.4547	16.9351	0.0315		0.6513	0.6513		0.6513	0.6513	0.0000	3,022.7997	3,022.7997	0.7928		3,042.6199
Total	**0.7223**	**14.4547**	**16.9351**	**0.0315**	**2.7883**	**0.6513**	**3.4395**	**1.3396**	**0.6513**	**1.9909**	**0.0000**	**3,022.7997**	**3,022.7997**	**0.7928**		**3,042.6199**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5861	18.4058	4.5985	0.0569	1.2916	0.0528	1.3444	0.3541	0.0506	0.4046		6,178.2128	6,178.2128	0.4179		6,188.6611
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0402	0.0266	0.3716	1.1000e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		109.8712	109.8712	3.0300e-003		109.9470
Total	**0.6262**	**18.4324**	**4.9701**	**0.0580**	**1.4034**	**0.0537**	**1.4571**	**0.3837**	**0.0514**	**0.4351**		**6,288.0840**	**6,288.0840**	**0.4210**		**6,298.6081**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3264	3.6612	1.6558	5.0500e-003		0.1520	0.1520		0.1399	0.1399		488.9766	488.9766	0.1581		492.9302
Total	**0.3264**	**3.6612**	**1.6558**	**5.0500e-003**		**0.1520**	**0.1520**		**0.1399**	**0.1399**		**488.9766**	**488.9766**	**0.1581**		**492.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.8500e-003	0.0923	0.0240	2.5000e-004	6.4000e-003	1.7000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		27.2486	27.2486	1.5600e-003		27.2877
Worker	0.0121	7.9800e-003	0.1115	3.3000e-004	0.0335	2.6000e-004	0.0338	8.8900e-003	2.4000e-004	9.1300e-003		32.9614	32.9614	9.1000e-004		32.9841
Total	**0.0149**	**0.1003**	**0.1355**	**5.8000e-004**	**0.0399**	**4.3000e-004**	**0.0404**	**0.0107**	**4.1000e-004**	**0.0111**		**60.2100**	**60.2100**	**2.4700e-003**		**60.2718**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1241	2.3985	2.6879	5.0500e-003		0.0910	0.0910		0.0910	0.0910	0.0000	488.9766	488.9766	0.1581		492.9302
Total	**0.1241**	**2.3985**	**2.6879**	**5.0500e-003**		**0.0910**	**0.0910**		**0.0910**	**0.0910**	**0.0000**	**488.9766**	**488.9766**	**0.1581**		**492.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.8500e-003	0.0923	0.0240	2.5000e-004	6.4000e-003	1.7000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		27.2486	27.2486	1.5600e-003		27.2877

Worker	0.0121	7.9800e-003	0.1115	3.3000e-004	0.0335	2.6000e-004	0.0338	8.8900e-003	2.4000e-004	9.1300e-003		32.9614	32.9614	9.1000e-004		32.9841
Total	**0.0149**	**0.1003**	**0.1355**	**5.8000e-004**	**0.0399**	**4.3000e-004**	**0.0404**	**0.0107**	**4.1000e-004**	**0.0111**		**60.2100**	**60.2100**	**2.4700e-003**		**60.2718**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5609**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0602	0.0399	0.5574	1.6500e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		164.8069	164.8069	4.5500e-003		164.9206
Total	**0.0602**	**0.0399**	**0.5574**	**1.6500e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**164.8069**	**164.8069**	**4.5500e-003**		**164.9206**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Archit. Coating	6.6188					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**6.8233**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0200e-003	2.6600e-003	0.0372	1.1000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	8.0000e-005	3.0400e-003		10.9871	10.9871	3.0000e-004		10.9947
Total	**4.0200e-003**	**2.6600e-003**	**0.0372**	**1.1000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**8.0000e-005**	**3.0400e-003**		**10.9871**	**10.9871**	**3.0000e-004**		**10.9947**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6188					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0183		281.9062

Total	**6.6782**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0200e-003	2.6600e-003	0.0372	1.1000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	8.0000e-005	3.0400e-003		10.9871	10.9871	3.0000e-004		10.9947
Total	**4.0200e-003**	**2.6600e-003**	**0.0372**	**1.1000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**8.0000e-005**	**3.0400e-003**		**10.9871**	**10.9871**	**3.0000e-004**		**10.9947**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1023	0.4332	1.5652	6.0500e-003	0.5152	4.3800e-003	0.5196	0.1379	4.0700e-003	0.1420		616.0076	616.0076	0.0288		616.7269
Unmitigated	0.1023	0.4332	1.5652	6.0500e-003	0.5152	4.3800e-003	0.5196	0.1379	4.0700e-003	0.1420		616.0076	616.0076	0.0288		616.7269

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	54.71	10.36	5.34	182,997	182,997
Total	54.71	10.36	5.34	182,997	182,997

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.545842	0.044768	0.205288	0.119317	0.015350	0.006227	0.020460	0.031333	0.002546	0.002133	0.005184	0.000692	0.000862

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
NaturalGas Unmitigated	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	389.472	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Total		**4.2000e-003**	**0.0382**	**0.0321**	**2.3000e-004**		**2.9000e-003**	**2.9000e-003**		**2.9000e-003**	**2.9000e-003**		**45.8203**	**45.8203**	**8.8000e-004**	**8.4000e-004**	**46.0926**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0.389472	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Total		**4.2000e-003**	**0.0382**	**0.0321**	**2.3000e-004**		**2.9000e-003**	**2.9000e-003**		**2.9000e-003**	**2.9000e-003**		**45.8203**	**45.8203**	**8.8000e-004**	**8.4000e-004**	**46.0926**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Unmitigated	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Total	**0.1755**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7200e-003**	**1.7200e-003**	**0.0000**		**1.8300e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Total	**0.1755**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7200e-003**	**1.7200e-003**	**0.0000**		**1.8300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Deane Tank Project - Los Angeles-South Coast County, Winter

Deane Tank Project

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	7.85	1000sqft	6.70	7,854.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site is 6.7 acres.

Construction Phase - Estimated schedule.

Off-road Equipment -

Off-road Equipment - A crane would be used for tank erection. Like

Off-road Equipment - Grading Equipment to include Dozer, Scraper and Dump Truck. Likely presence of hard bedrock which may require the use of jackhammering equipment to remove the bedrock.

Off-road Equipment -

Trips and VMT - Up to 15 vehicle trips per day during construction.

Grading - Estimated approximatley 30,000 cubic yards of earthwork to be generated for the construction of the road. Option of exporting 9,000 cubic yards of cut soil.

Vehicle Trips - The Proposed Project is not anticipated to generate daily vehicle trips. Infrequent trips would be made due to maintenance as needed. Conservatively, default assumptions remain.

Energy Use - No natural gas or energy use expected for the storage tank. Conservatively, default assumptions are used.

Water And Wastewater - Construction of a new Steel water storage tank with approximately 1.7 MG of storage capacity. Conservatively, default assumption is used. No outdoor water use would be generated.

Solid Waste - No solid waste generation during operation.

Construction Off-road Equipment Mitigation - As recommended by SCAQMD, alternative applicable strategies include construction equipment with Tier 3 emissions standards.

Off-road Equipment -

Area Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	11.00
tblConstructionPhase	NumDays	230.00	174.00
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	NumDays	20.00	22.00
tblGrading	MaterialExported	0.00	39,000.00
tblLandUse	LandUseSquareFeet	7,850.00	7,854.00
tblLandUse	LotAcreage	0.18	6.70
tblOffRoadEquipment	OffRoadEquipmentType		Crushing/Proc. Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Dumpers/Tenders
tblSolidWaste	LandfillCaptureGasFlare	94.00	0.00
tblSolidWaste	LandfillNoGasCapture	6.00	0.00
tblSolidWaste	SolidWasteGenerationRate	9.73	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	8.3406	40.0722	21.1028	0.0884	8.5528	1.2440	9.5713	3.8186	1.1565	4.7733	0.0000	9,196.4939	9,196.4939	1.2279	0.0000	9,227.1900
Maximum	**8.3406**	**40.0722**	**21.1028**	**0.0884**	**8.5528**	**1.2440**	**9.5713**	**3.8186**	**1.1565**	**4.7733**	**0.0000**	**9,196.4939**	**9,196.4939**	**1.2279**	**0.0000**	**9,227.1900**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	7.4513	33.1002	25.1826	0.0884	4.1916	0.8640	4.8974	1.7233	0.8639	2.4267	0.0000	9,196.4939	9,196.4939	1.2279	0.0000	9,227.1900
Maximum	**7.4513**	**33.1002**	**25.1826**	**0.0884**	**4.1916**	**0.8640**	**4.8974**	**1.7233**	**0.8639**	**2.4267**	**0.0000**	**9,196.4939**	**9,196.4939**	**1.2279**	**0.0000**	**9,227.1900**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**10.66**	**17.40**	**-19.33**	**0.00**	**50.99**	**30.54**	**48.83**	**54.87**	**25.30**	**49.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Energy	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Mobile	0.0991	0.4466	1.4672	5.7600e-003	0.5152	4.3900e-003	0.5196	0.1379	4.0900e-003	0.1420		586.8934	586.8934	0.0285		587.6064
Total	**0.2789**	**0.4848**	**1.5001**	**5.9900e-003**	**0.5152**	**7.2900e-003**	**0.5225**	**0.1379**	**6.9900e-003**	**0.1449**		**632.7154**	**632.7154**	**0.0294**	**8.4000e-004**	**633.7007**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Energy	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Mobile	0.0991	0.4466	1.4672	5.7600e-003	0.5152	4.3900e-003	0.5196	0.1379	4.0900e-003	0.1420		586.8934	586.8934	0.0285		587.6064
Total	**0.2789**	**0.4848**	**1.5001**	**5.9900e-003**	**0.5152**	**7.2900e-003**	**0.5225**	**0.1379**	**6.9900e-003**	**0.1449**		**632.7154**	**632.7154**	**0.0294**	**8.4000e-004**	**633.7007**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2022	1/28/2022	5	20	
2	Grading	Grading	1/29/2022	5/2/2022	5	66	
3	Building Construction	Building Construction	5/3/2022	12/30/2022	5	174	
4	Paving	Paving	12/1/2022	12/30/2022	5	22	
5	Architectural Coating	Architectural Coating	12/16/2022	12/30/2022	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 66

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 11,781; Non-Residential Outdoor: 3,927; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Crushing/Proc. Equipment	1	8.00	85	0.78
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Grading	Dumpers/Tenders	1	8.00	16	0.38
Building Construction	Cranes	1	7.00	231	0.29
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	4,875.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	1	3.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553		3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**		**1.2427**	**1.2427**		**1.1553**	**1.1553**		**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0672	0.0442	0.5088	1.5600e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		155.1854	155.1854	4.2700e-003		155.2922
Total	**0.0672**	**0.0442**	**0.5088**	**1.5600e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**155.1854**	**155.1854**	**4.2700e-003**		**155.2922**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9246	18.3130	24.6739	0.0388		0.8627	0.8627		0.8627	0.8627	0.0000	3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**0.9246**	**18.3130**	**24.6739**	**0.0388**		**0.8627**	**0.8627**		**0.8627**	**0.8627**	**0.0000**	**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0672	0.0442	0.5088	1.5600e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		155.1854	155.1854	4.2700e-003		155.2922
Total	**0.0672**	**0.0442**	**0.5088**	**1.5600e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**155.1854**	**155.1854**	**4.2700e-003**		**155.2922**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1494	0.0000	7.1494	3.4349	0.0000	3.4349			0.0000			0.0000

Off-Road	2.2092	21.4267	14.5398	0.0315		0.9639	0.9639		0.9026	0.9026		3,022.7997	3,022.7997	0.7928		3,042.6199
Total	**2.2092**	**21.4267**	**14.5398**	**0.0315**	**7.1494**	**0.9639**	**8.1134**	**3.4349**	**0.9026**	**4.3375**		**3,022.7997**	**3,022.7997**	**0.7928**		**3,042.6199**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6002	18.6160	4.8660	0.0559	1.2916	0.0537	1.3453	0.3541	0.0513	0.4054		6,070.2373	6,070.2373	0.4322		6,081.0419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0448	0.0295	0.3392	1.0400e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		103.4570	103.4570	2.8500e-003		103.5282
Total	**0.6450**	**18.6455**	**5.2051**	**0.0569**	**1.4034**	**0.0545**	**1.4579**	**0.3837**	**0.0522**	**0.4358**		**6,173.6942**	**6,173.6942**	**0.4350**		**6,184.5701**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7883	0.0000	2.7883	1.3396	0.0000	1.3396			0.0000			0.0000
Off-Road	0.7223	14.4547	16.9351	0.0315		0.6513	0.6513		0.6513	0.6513	0.0000	3,022.7997	3,022.7997	0.7928		3,042.6199
Total	**0.7223**	**14.4547**	**16.9351**	**0.0315**	**2.7883**	**0.6513**	**3.4395**	**1.3396**	**0.6513**	**1.9909**	**0.0000**	**3,022.7997**	**3,022.7997**	**0.7928**		**3,042.6199**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6002	18.6160	4.8660	0.0559	1.2916	0.0537	1.3453	0.3541	0.0513	0.4054		6,070.2373	6,070.2373	0.4322		6,081.0419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0448	0.0295	0.3392	1.0400e-003	0.1118	8.7000e-004	0.1127	0.0296	8.1000e-004	0.0305		103.4570	103.4570	2.8500e-003		103.5282
Total	**0.6450**	**18.6455**	**5.2051**	**0.0569**	**1.4034**	**0.0545**	**1.4579**	**0.3837**	**0.0522**	**0.4358**		**6,173.6942**	**6,173.6942**	**0.4350**		**6,184.5701**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3264	3.6612	1.6558	5.0500e-003		0.1520	0.1520		0.1399	0.1399		488.9766	488.9766	0.1581		492.9302
Total	**0.3264**	**3.6612**	**1.6558**	**5.0500e-003**		**0.1520**	**0.1520**		**0.1399**	**0.1399**		**488.9766**	**488.9766**	**0.1581**		**492.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.0000e-003	0.0921	0.0266	2.5000e-004	6.4000e-003	1.8000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		26.4970	26.4970	1.6700e-003		26.5387
Worker	0.0134	8.8400e-003	0.1018	3.1000e-004	0.0335	2.6000e-004	0.0338	8.8900e-003	2.4000e-004	9.1300e-003		31.0371	31.0371	8.5000e-004		31.0585
Total	**0.0164**	**0.1009**	**0.1283**	**5.6000e-004**	**0.0399**	**4.4000e-004**	**0.0404**	**0.0107**	**4.1000e-004**	**0.0111**		**57.5341**	**57.5341**	**2.5200e-003**		**57.5971**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1241	2.3985	2.6879	5.0500e-003		0.0910	0.0910		0.0910	0.0910	0.0000	488.9766	488.9766	0.1581		492.9302
Total	**0.1241**	**2.3985**	**2.6879**	**5.0500e-003**		**0.0910**	**0.0910**		**0.0910**	**0.0910**	**0.0000**	**488.9766**	**488.9766**	**0.1581**		**492.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.0000e-003	0.0921	0.0266	2.5000e-004	6.4000e-003	1.8000e-004	6.5800e-003	1.8400e-003	1.7000e-004	2.0100e-003		26.4970	26.4970	1.6700e-003		26.5387

Worker	0.0134	8.8400e-003	0.1018	3.1000e-004	0.0335	2.6000e-004	0.0338	8.8900e-003	2.4000e-004	9.1300e-003		31.0371	31.0371	8.5000e-004		31.0585
Total	**0.0164**	**0.1009**	**0.1283**	**5.6000e-004**	**0.0399**	**4.4000e-004**	**0.0404**	**0.0107**	**4.1000e-004**	**0.0111**		**57.5341**	**57.5341**	**2.5200e-003**		**57.5971**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0672	0.0442	0.5088	1.5600e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		155.1854	155.1854	4.2700e-003		155.2922
Total	**0.0672**	**0.0442**	**0.5088**	**1.5600e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**155.1854**	**155.1854**	**4.2700e-003**		**155.2922**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5609**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0672	0.0442	0.5088	1.5600e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		155.1854	155.1854	4.2700e-003		155.2922
Total	**0.0672**	**0.0442**	**0.5088**	**1.5600e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**155.1854**	**155.1854**	**4.2700e-003**		**155.2922**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Archit. Coating	6.6188					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**6.8233**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.4800e-003	2.9500e-003	0.0339	1.0000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	8.0000e-005	3.0400e-003		10.3457	10.3457	2.8000e-004		10.3528
Total	**4.4800e-003**	**2.9500e-003**	**0.0339**	**1.0000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**8.0000e-005**	**3.0400e-003**		**10.3457**	**10.3457**	**2.8000e-004**		**10.3528**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6188					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0183		281.9062

Total	**6.6782**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.4800e-003	2.9500e-003	0.0339	1.0000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	8.0000e-005	3.0400e-003		10.3457	10.3457	2.8000e-004		10.3528
Total	**4.4800e-003**	**2.9500e-003**	**0.0339**	**1.0000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**8.0000e-005**	**3.0400e-003**		**10.3457**	**10.3457**	**2.8000e-004**		**10.3528**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0991	0.4466	1.4672	5.7600e-003	0.5152	4.3900e-003	0.5196	0.1379	4.0900e-003	0.1420		586.8934	586.8934	0.0285		587.6064
Unmitigated	0.0991	0.4466	1.4672	5.7600e-003	0.5152	4.3900e-003	0.5196	0.1379	4.0900e-003	0.1420		586.8934	586.8934	0.0285		587.6064

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	54.71	10.36	5.34	182,997	182,997
Total	54.71	10.36	5.34	182,997	182,997

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.545842	0.044768	0.205288	0.119317	0.015350	0.006227	0.020460	0.031333	0.002546	0.002133	0.005184	0.000692	0.000862

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
NaturalGas Unmitigated	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	389.472	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Total		**4.2000e-003**	**0.0382**	**0.0321**	**2.3000e-004**		**2.9000e-003**	**2.9000e-003**		**2.9000e-003**	**2.9000e-003**		**45.8203**	**45.8203**	**8.8000e-004**	**8.4000e-004**	**46.0926**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0.389472	4.2000e-003	0.0382	0.0321	2.3000e-004		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003		45.8203	45.8203	8.8000e-004	8.4000e-004	46.0926
Total		**4.2000e-003**	**0.0382**	**0.0321**	**2.3000e-004**		**2.9000e-003**	**2.9000e-003**		**2.9000e-003**	**2.9000e-003**		**45.8203**	**45.8203**	**8.8000e-004**	**8.4000e-004**	**46.0926**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Unmitigated	0.1755	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Total	**0.1755**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7200e-003**	**1.7200e-003**	**0.0000**		**1.8300e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0200					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7200e-003	1.7200e-003	0.0000		1.8300e-003
Total	**0.1755**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7200e-003**	**1.7200e-003**	**0.0000**		**1.8300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Deane Tank Project

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	7.85	1000sqft	6.70	7,854.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site is 6.7 acres.

Construction Phase - Estimated schedule.

Off-road Equipment -

Off-road Equipment - A crane would be used for tank erection. Like

Off-road Equipment - Grading Equipment to include Dozer, Scraper and Dump Truck. Likely presence of hard bedrock which may require the use of jackhammering equipment to remove the bedrock.

Off-road Equipment -

Trips and VMT - Up to 15 vehicle trips per day during construction.

Grading - Estimated approximatley 30,000 cubic yards of earthwork to be generated for the construction of the road. Option of exporting 9,000 cubic yards of cut soil.

Vehicle Trips - The Proposed Project is not anticipated to generate daily vehicle trips. Infrequent trips would be made due to maintenance as needed. Conservatively, default assumptions remain.

Energy Use - No natural gas or energy use expected for the storage tank. Conservatively, default assumptions are used.

Water And Wastewater - Construction of a new Steel water storage tank with approximately 1.7 MG of storage capacity. Conservatively, default assumption is used. No outdoor water use would be generated.

Solid Waste - No solid waste generation during operation.

Construction Off-road Equipment Mitigation - As recommended by SCAQMD, alternative applicable strategies include construction equipment with Tier 3 emissions standards.

Off-road Equipment -

Area Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	11.00
tblConstructionPhase	NumDays	230.00	174.00
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	NumDays	20.00	22.00
tblGrading	MaterialExported	0.00	39,000.00
tblLandUse	LandUseSquareFeet	7,850.00	7,854.00
tblLandUse	LotAcreage	0.18	6.70
tblOffRoadEquipment	OffRoadEquipmentType		Crushing/Proc. Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Dumpers/Tenders
tblSolidWaste	LandfillCaptureGasFlare	94.00	0.00
tblSolidWaste	LandfillNoGasCapture	6.00	0.00
tblSolidWaste	SolidWasteGenerationRate	9.73	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2008	2.0501	1.1897	4.1100e-003	0.2884	0.0660	0.3544	0.1277	0.0615	0.1891	0.0000	380.9341	380.9341	0.0660	0.0000	382.5852
Maximum	**0.2008**	**2.0501**	**1.1897**	**4.1100e-003**	**0.2884**	**0.0660**	**0.3544**	**0.1277**	**0.0615**	**0.1891**	**0.0000**	**380.9341**	**380.9341**	**0.0660**	**0.0000**	**382.5852**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1102	1.6377	1.4293	4.1100e-003	0.1444	0.0471	0.1916	0.0585	0.0470	0.1056	0.0000	380.9339	380.9339	0.0660	0.0000	382.5850
Maximum	**0.1102**	**1.6377**	**1.4293**	**4.1100e-003**	**0.1444**	**0.0471**	**0.1916**	**0.0585**	**0.0470**	**0.1056**	**0.0000**	**380.9339**	**380.9339**	**0.0660**	**0.0000**	**382.5850**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**45.11**	**20.12**	**-20.14**	**0.00**	**49.91**	**28.63**	**45.95**	**54.16**	**23.49**	**44.19**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2022**	**3-31-2022**	1.2352	0.9567
2	**4-1-2022**	**6-30-2022**	0.5744	0.4468
3	**7-1-2022**	**9-30-2022**	0.1348	0.0867
		Highest	1.2352	0.9567

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004

Energy	7.7000e-004	6.9700e-003	5.8500e-003	4.0000e-005		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	35.3633	35.3633	1.2900e-003	3.8000e-004	35.5077
Mobile	0.0134	0.0625	0.2053	8.0000e-004	0.0695	6.0000e-004	0.0701	0.0186	5.6000e-004	0.0192	0.0000	74.1673	74.1673	3.5500e-003	0.0000	74.2561
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.5759	7.5313	8.1072	0.0595	1.4600e-003	10.0292
Total	**0.0462**	**0.0695**	**0.2112**	**8.4000e-004**	**0.0695**	**1.1300e-003**	**0.0706**	**0.0186**	**1.0900e-003**	**0.0197**	**0.5759**	**117.0621**	**117.6380**	**0.0643**	**1.8400e-003**	**119.7932**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Energy	7.7000e-004	6.9700e-003	5.8500e-003	4.0000e-005		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	35.3633	35.3633	1.2900e-003	3.8000e-004	35.5077
Mobile	0.0134	0.0625	0.2053	8.0000e-004	0.0695	6.0000e-004	0.0701	0.0186	5.6000e-004	0.0192	0.0000	74.1673	74.1673	3.5500e-003	0.0000	74.2561
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.4607	6.0251	6.4858	0.0476	1.1700e-003	8.0234
Total	**0.0462**	**0.0695**	**0.2112**	**8.4000e-004**	**0.0695**	**1.1300e-003**	**0.0706**	**0.0186**	**1.0900e-003**	**0.0197**	**0.4607**	**115.5558**	**116.0166**	**0.0524**	**1.5500e-003**	**117.7874**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**	**1.29**	**1.38**	**18.49**	**15.76**	**1.67**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2022	1/28/2022	5	20	
2	Grading	Grading	1/29/2022	5/2/2022	5	66	
3	Building Construction	Building Construction	5/3/2022	12/30/2022	5	174	
4	Paving	Paving	12/1/2022	12/30/2022	5	22	
5	Architectural Coating	Architectural Coating	12/16/2022	12/30/2022	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 66

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 11,781; Non-Residential Outdoor: 3,927; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Crushing/Proc. Equipment	1	8.00	85	0.78
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Grading	Dumpers/Tenders	1	8.00	16	0.38
Building Construction	Cranes	1	7.00	231	0.29
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	4,875.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	1	3.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0264	0.2572	0.2059	3.9000e-004		0.0124	0.0124		0.0116	0.0116	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**0.0264**	**0.2572**	**0.2059**	**3.9000e-004**		**0.0124**	**0.0124**		**0.0116**	**0.0116**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	4.5000e-004	5.2300e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4312	1.4312	4.0000e-005	0.0000	1.4322
Total	**6.1000e-004**	**4.5000e-004**	**5.2300e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.4312**	**1.4312**	**4.0000e-005**	**0.0000**	**1.4322**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.2500e-003	0.1831	0.2467	3.9000e-004		8.6300e-003	8.6300e-003		8.6300e-003	8.6300e-003	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**9.2500e-003**	**0.1831**	**0.2467**	**3.9000e-004**		**8.6300e-003**	**8.6300e-003**		**8.6300e-003**	**8.6300e-003**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	4.5000e-004	5.2300e-003	2.0000e-005	1.6400e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4312	1.4312	4.0000e-005	0.0000	1.4322
Total	**6.1000e-004**	**4.5000e-004**	**5.2300e-003**	**2.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.4312**	**1.4312**	**4.0000e-005**	**0.0000**	**1.4322**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2359	0.0000	0.2359	0.1134	0.0000	0.1134	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0729	0.7071	0.4798	1.0400e-003		0.0318	0.0318		0.0298	0.0298	0.0000	90.4939	90.4939	0.0237	0.0000	91.0872
Total	**0.0729**	**0.7071**	**0.4798**	**1.0400e-003**	**0.2359**	**0.0318**	**0.2677**	**0.1134**	**0.0298**	**0.1431**	**0.0000**	**90.4939**	**90.4939**	**0.0237**	**0.0000**	**91.0872**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0195	0.6263	0.1556	1.8600e-003	0.0419	1.7600e-003	0.0437	0.0115	1.6800e-003	0.0132	0.0000	183.6001	183.6001	0.0127	0.0000	183.9175
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3300e-003	1.0000e-003	0.0115	3.0000e-005	3.6200e-003	3.0000e-005	3.6500e-003	9.6000e-004	3.0000e-005	9.9000e-004	0.0000	3.1487	3.1487	9.0000e-005	0.0000	3.1509
Total	**0.0209**	**0.6273**	**0.1671**	**1.8900e-003**	**0.0455**	**1.7900e-003**	**0.0473**	**0.0125**	**1.7100e-003**	**0.0142**	**0.0000**	**186.7488**	**186.7488**	**0.0128**	**0.0000**	**187.0684**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0920	0.0000	0.0920	0.0442	0.0000	0.0442	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0238	0.4770	0.5589	1.0400e-003		0.0215	0.0215		0.0215	0.0215	0.0000	90.4937	90.4937	0.0237	0.0000	91.0871
Total	**0.0238**	**0.4770**	**0.5589**	**1.0400e-003**	**0.0920**	**0.0215**	**0.1135**	**0.0442**	**0.0215**	**0.0657**	**0.0000**	**90.4937**	**90.4937**	**0.0237**	**0.0000**	**91.0871**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0195	0.6263	0.1556	1.8600e-003	0.0419	1.7600e-003	0.0437	0.0115	1.6800e-003	0.0132	0.0000	183.6001	183.6001	0.0127	0.0000	183.9175
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3300e-003	1.0000e-003	0.0115	3.0000e-005	3.6200e-003	3.0000e-005	3.6500e-003	9.6000e-004	3.0000e-005	9.9000e-004	0.0000	3.1487	3.1487	9.0000e-005	0.0000	3.1509
Total	**0.0209**	**0.6273**	**0.1671**	**1.8900e-003**	**0.0455**	**1.7900e-003**	**0.0473**	**0.0125**	**1.7100e-003**	**0.0142**	**0.0000**	**186.7488**	**186.7488**	**0.0128**	**0.0000**	**187.0684**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0284	0.3185	0.1441	4.4000e-004		0.0132	0.0132		0.0122	0.0122	0.0000	38.5925	38.5925	0.0125	0.0000	38.9046
Total	**0.0284**	**0.3185**	**0.1441**	**4.4000e-004**		**0.0132**	**0.0132**		**0.0122**	**0.0122**	**0.0000**	**38.5925**	**38.5925**	**0.0125**	**0.0000**	**38.9046**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5000e-004	8.1600e-003	2.2000e-003	2.0000e-005	5.5000e-004	2.0000e-005	5.6000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	2.1257	2.1257	1.3000e-004	0.0000	2.1289
Worker	1.0500e-003	7.9000e-004	9.0900e-003	3.0000e-005	2.8600e-003	2.0000e-005	2.8800e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.4903	2.4903	7.0000e-005	0.0000	2.4921
Total	**1.3000e-003**	**8.9500e-003**	**0.0113**	**5.0000e-005**	**3.4100e-003**	**4.0000e-005**	**3.4400e-003**	**9.2000e-004**	**3.0000e-005**	**9.5000e-004**	**0.0000**	**4.6160**	**4.6160**	**2.0000e-004**	**0.0000**	**4.6209**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0108	0.2087	0.2339	4.4000e-004		7.9100e-003	7.9100e-003		7.9100e-003	7.9100e-003	0.0000	38.5925	38.5925	0.0125	0.0000	38.9045

Total	**0.0108**	**0.2087**	**0.2339**	**4.4000e-004**		**7.9100e-003**	**7.9100e-003**		**7.9100e-003**	**7.9100e-003**	**0.0000**	**38.5925**	**38.5925**	**0.0125**	**0.0000**	**38.9045**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5000e-004	8.1600e-003	2.2000e-003	2.0000e-005	5.5000e-004	2.0000e-005	5.6000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	2.1257	2.1257	1.3000e-004	0.0000	2.1289
Worker	1.0500e-003	7.9000e-004	9.0900e-003	3.0000e-005	2.8600e-003	2.0000e-005	2.8800e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.4903	2.4903	7.0000e-005	0.0000	2.4921
Total	**1.3000e-003**	**8.9500e-003**	**0.0113**	**5.0000e-005**	**3.4100e-003**	**4.0000e-005**	**3.4400e-003**	**9.2000e-004**	**3.0000e-005**	**9.5000e-004**	**0.0000**	**4.6160**	**4.6160**	**2.0000e-004**	**0.0000**	**4.6209**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0121	0.1224	0.1604	2.5000e-004		6.2500e-003	6.2500e-003		5.7500e-003	5.7500e-003	0.0000	22.0303	22.0303	7.1300e-003	0.0000	22.2084
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0121**	**0.1224**	**0.1604**	**2.5000e-004**		**6.2500e-003**	**6.2500e-003**		**5.7500e-003**	**5.7500e-003**	**0.0000**	**22.0303**	**22.0303**	**7.1300e-003**	**0.0000**	**22.2084**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	5.0000e-004	5.7500e-003	2.0000e-005	1.8100e-003	1.0000e-005	1.8200e-003	4.8000e-004	1.0000e-005	4.9000e-004	0.0000	1.5744	1.5744	4.0000e-005	0.0000	1.5754
Total	**6.7000e-004**	**5.0000e-004**	**5.7500e-003**	**2.0000e-005**	**1.8100e-003**	**1.0000e-005**	**1.8200e-003**	**4.8000e-004**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**1.5744**	**1.5744**	**4.0000e-005**	**0.0000**	**1.5754**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.1700e-003	0.1243	0.1903	2.5000e-004		6.7000e-003	6.7000e-003		6.7000e-003	6.7000e-003	0.0000	22.0303	22.0303	7.1300e-003	0.0000	22.2084
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.1700e-003**	**0.1243**	**0.1903**	**2.5000e-004**		**6.7000e-003**	**6.7000e-003**		**6.7000e-003**	**6.7000e-003**	**0.0000**	**22.0303**	**22.0303**	**7.1300e-003**	**0.0000**	**22.2084**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	5.0000e-004	5.7500e-003	2.0000e-005	1.8100e-003	1.0000e-005	1.8200e-003	4.8000e-004	1.0000e-005	4.9000e-004	0.0000	1.5744	1.5744	4.0000e-005	0.0000	1.5754
Total	**6.7000e-004**	**5.0000e-004**	**5.7500e-003**	**2.0000e-005**	**1.8100e-003**	**1.0000e-005**	**1.8200e-003**	**4.8000e-004**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**1.5744**	**1.5744**	**4.0000e-005**	**0.0000**	**1.5754**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0364					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1200e-003	7.7500e-003	9.9700e-003	2.0000e-005		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	1.4043	1.4043	9.0000e-005	0.0000	1.4066
Total	**0.0375**	**7.7500e-003**	**9.9700e-003**	**2.0000e-005**		**4.5000e-004**	**4.5000e-004**		**4.5000e-004**	**4.5000e-004**	**0.0000**	**1.4043**	**1.4043**	**9.0000e-005**	**0.0000**	**1.4066**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0525	0.0525	0.0000	0.0000	0.0525
Total	**2.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0525**	**0.0525**	**0.0000**	**0.0000**	**0.0525**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0364					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3000e-004	7.4600e-003	0.0101	2.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	1.4043	1.4043	9.0000e-005	0.0000	1.4066
Total	**0.0367**	**7.4600e-003**	**0.0101**	**2.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**1.4043**	**1.4043**	**9.0000e-005**	**0.0000**	**1.4066**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0525	0.0525	0.0000	0.0000	0.0525
Total	**2.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0525**	**0.0525**	**0.0000**	**0.0000**	**0.0525**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0134	0.0625	0.2053	8.0000e-004	0.0695	6.0000e-004	0.0701	0.0186	5.6000e-004	0.0192	0.0000	74.1673	74.1673	3.5500e-003	0.0000	74.2561
Unmitigated	0.0134	0.0625	0.2053	8.0000e-004	0.0695	6.0000e-004	0.0701	0.0186	5.6000e-004	0.0192	0.0000	74.1673	74.1673	3.5500e-003	0.0000	74.2561

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	54.71	10.36	5.34	182,997	182,997
Total	54.71	10.36	5.34	182,997	182,997

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.545842	0.044768	0.205288	0.119317	0.015350	0.006227	0.020460	0.031333	0.002546	0.002133	0.005184	0.000692	0.000862

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	27.7772	27.7772	1.1500e-003	2.4000e-004	27.8766
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	27.7772	27.7772	1.1500e-003	2.4000e-004	27.8766
NaturalGas Mitigated	7.7000e-004	6.9700e-003	5.8500e-003	4.0000e-005		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	7.5861	7.5861	1.5000e-004	1.4000e-004	7.6311
NaturalGas Unmitigated	7.7000e-004	6.9700e-003	5.8500e-003	4.0000e-005		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	7.5861	7.5861	1.5000e-004	1.4000e-004	7.6311

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	142157	7.7000e-004	6.9700e-003	5.8500e-003	4.0000e-005		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	7.5861	7.5861	1.5000e-004	1.4000e-004	7.6311
Total		**7.7000e-004**	**6.9700e-003**	**5.8500e-003**	**4.0000e-005**		**5.3000e-004**	**5.3000e-004**		**5.3000e-004**	**5.3000e-004**	**0.0000**	**7.5861**	**7.5861**	**1.5000e-004**	**1.4000e-004**	**7.6311**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	142157	7.7000e-004	6.9700e-003	5.8500e-003	4.0000e-005		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	7.5861	7.5861	1.5000e-004	1.4000e-004	7.6311
Total		**7.7000e-004**	**6.9700e-003**	**5.8500e-003**	**4.0000e-005**		**5.3000e-004**	**5.3000e-004**		**5.3000e-004**	**5.3000e-004**	**0.0000**	**7.5861**	**7.5861**	**1.5000e-004**	**1.4000e-004**	**7.6311**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	87179.4	27.7772	1.1500e-003	2.4000e-004	27.8766
Total		**27.7772**	**1.1500e-003**	**2.4000e-004**	**27.8766**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			

General Light Industry	87179.4	27.7772	1.1500e-003	2.4000e-004	27.8766
Total		**27.7772**	**1.1500e-003**	**2.4000e-004**	**27.8766**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Unmitigated	0.0320	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

SubCategory	tons/yr										MT/yr					
Architectural Coating	3.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0284					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0320**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0284					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.9000e-004	1.9000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0320**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	6.4858	0.0476	1.1700e-003	8.0234
Unmitigated	8.1072	0.0595	1.4600e-003	10.0292

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	1.81531 / 0	8.1072	0.0595	1.4600e-003	10.0292
Total		**8.1072**	**0.0595**	**1.4600e-003**	**10.0292**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
General Light Industry	1.45225 / 0	6.4858	0.0476	1.1700e-003	8.0234
Total		**6.4858**	**0.0476**	**1.1700e-003**	**8.0234**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000

Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B

Biological Resource Survey Report

November 9, 2020

MERIDIAN CONSULTANTS
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SUBJECT: **Habitat Assessment for the Santa Clarita Valley Water Agency's Proposed Deane Tank Site Expansion Project Located in the City of Santa Clarita, Los Angeles County, California**

Introduction

This report contains the findings of ELMT Consulting's (ELMT) habitat assessment for Santa Clarita Water Agency's (SCVWA) proposed Deane Tank Site Expansion Project (project or project site) located in the City of Santa Clarita, Los Angeles County, California. The habitat assessment was conducted by biologist Jacob H. Lloyd Davies on September 22, 2020 to document baseline conditions and assess the potential for special-status[1] plant and wildlife species to occur within the project site that could pose a constraint to implementation of the proposed project. Special attention was given to the suitability of the project site to support special-status plant and wildlife species identified by the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB), and other electronic databases as potentially occurring in the general vicinity of the project site.

Project Location

The project site is generally located north of State Route 14, east of Interstate 5, and south of Sierra Highway in the City of Santa Clarita, Los Angeles County, California. The site is depicted on the Mint Canyon quadrangle of the United States Geological Survey's (USGS) 7.5-minute map series within Section 15 of Township 4 North, Range 15 West. Specifically, the site is located on the Deane Zone hilltop site within Accessor Parcel Number (APN) 2839-002-902, which is west of Winterdale Drive and south of Sierra Highway. The rectangular APN parcel is approximately 6.7 acres in size, with access to the existing water tank site provided through a paved roadway located west of Winterdale Drive near the intersection of Nearview Drive. Refer to Exhibits 1-3 in Attachment A.

Project History

The SCVWA's is planning to design and build additional water storage capacity to address an existing deficiency in potable water storage in the Deane Pressure Zone within the SCVWA's Santa Clarita Water Division region (proposed Project). The SCVWA operates two existing one-million-gallon potable water

1 As used in this report, "special-status" refers to plant and wildlife species that are federally and State listed, proposed, or candidates; plant species that have been designated with a California Native Plant Society Rare Plant Rank; wildlife species that are designated by the CDFW as fully protected, species of special concern, or watch list species; and specially protected natural vegetation communities as designated by the CDFW.

tanks on the Deane Zone hilltop site located in the Canyon Country area of the City of Santa Clarita in Los Angeles County. The tanks were constructed around 1984 and provide water storage for wildfire, local operation, residential use, and emergency purposes that serve the areas within the Deane Pressure Zone.

A *Site Planning Summary Report* was prepared for the proposed Project which addresses the existing storage deficiency.[2] According to the *2013 Water Master Plan*, the Deane Pressure Zone has a deficiency in storage of approximately 4.22 million gallons (MG). There are two new large developments within the existing Deane Pressure Zone that require additional storage over and above the existing storage deficiency. The new developments will increase the water storage deficiency to 5.74MG.

Project Description

The purpose of the proposed Project is to build additional water storage capacity for fire protection, emergency and operational needs at the Deane Pressure Zone, which is deficient in storage by 4.22 MG, as of 2013. New developments within the Deane Pressure Zone will increase the existing deficiency to 5.74 MG. New developments within the Deane Pressure Zone include the Skyline Ranch development, which requires an additional 0.87 MG of water demand, and the Sand Canyon Plaza development, which requires 0.65 MG of water demand. The proposed Project includes the construction of a new Steel water storage tank with approximately 1.70 MG of storage capacity to address the recent developments.

The new tank proposed at the Project Site would be approximately 100 feet in diameter, constructed with 29 feet[3] operation water depth, with the capacity to store approximately 1.70 MG of potable water for the Deane Pressure Zone. The water supply for the new tank would be delivered from two existing pump stations located north of the site on Sierra Highway- the Linda Vista Pump Station and Honey House Pump Station and an existing 14' line that is located along the access road. The two pump stations and 14" water line currently supply water to the existing tanks at the Project Site and would be connected to the newly constructed water storage tank at project completion. The proposed tank is located south by southwest of the existing tanks.

As part of the proposed Project, other infrastructure-related components include: the installation of new underground water piping and electrical lines and the relocation of existing utilities; a 20 foot wide asphalt paved access road adjacent to each tank; a new drainage system around the proposed tank and along the access roadway; retaining walls; and an extra fill pad to assist with balancing earthwork on site. An optional access road may be constructed north of the Project Site that would connect the Project Site to the College of Canyons property to the north and downslope of the hilltop.

Existing on-site utilities would remain operational during construction to keep the existing tanks in service. The existing tanks, along with the new tank to be constructed, would be supported by the delivery of water through a 14-inch water pipeline from the pump stations and electrical conduit located below the access driveway. Proposed drainage improvements at the tank site would include the removal of an existing catch basin and drain line. The existing drain line runs from the catch basin down the north-facing slope to a point above an existing terrace drain. The existing drainage patterns of the slope would not be changed by the

2 Santa Clarita Valley Water Agency, *Site Planning Study: New 1.7 MG Reservoir at Existing Deane Tank Site*, September 2020.
3 The actual tank will be 32 feet to match the height of the existing tanks, and depth of water within tank would be 29 feet.

removal of the drain line. The existing supervisory control and data acquisition (SCADA) system would be modified to accept input from the new tank mixer, the seismic isolation valve, and limit switches that provide intrusion alarm notification on the tank hatches.

Upon completion of the construction phase, the existing access road to the tank site will be repaved. New easements may be required for additional access area along the proposed roadway improvements.

The optional access road would be approximately 20-feet wide within the maximum disturbance area. The access road, consisting of asphalt pavement over compacted base, will be constructed along the north facing slope commencing at the existing fire access road within the College of the Canyons campus and connecting to the existing access road, just east of the existing tanks. The north facing slope will be graded to provide a 20' wide pathway at a 20% maximum longitudinal gradient. Cut/fill slopes along with required benches and terrace drains will be constructed as necessary. It is estimated that approximately 30,000 cubic yards of earthwork will be generated for the construction of the road.

Methodology

A literature review and records search were conducted to determine which special-status biological resources have the potential to occur on or within the general vicinity of the project site. In addition to the literature review, a general habitat assessment or field investigation of the project site was conducted to document existing conditions and assess the potential for special-status biological resources to occur within the project site.

Literature Review

Prior to conducting the field investigation, a literature review and records search was conducted for special-status biological resources potentially occurring on or within the vicinity of the project site. Previously recorded occurrences of special-status plant and wildlife species and their proximity to the project site were determined through a query of the CDFW's QuickView Tool in the Biogeographic Information and Observation System (BIOS), CNDDB Rarefind 5, the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California, Calflora Database, compendia of special-status species published by CDFW, and the United States Fish and Wildlife Service (USFWS) species listings.

All available reports, survey results, and literature detailing the biological resources previously observed on or within the vicinity of the project site were reviewed to understand existing site conditions and note the extent of any disturbances that have occurred within the project site that would otherwise limit the distribution of special-status biological resources. Standard field guides and texts were reviewed for specific habitat requirements of special-status and non-special-status biological resources, as well as the following resources:

- Google Earth Pro historic aerial imagery (1994-2018);

- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey[4];
- USFWS Critical Habitat designations for Threatened and Endangered Species; and
- USFWS Endangered Species Profiles.

The literature review provided a baseline from which to inventory the biological resources potentially occurring within the project site. The CNDDB database was used, in conjunction with ArcGIS software, to locate the nearest recorded occurrences of special-status species and determine the distance from the project site.

Habitat Assessment/Field Investigation

Following the literature review, biologist Jacob H. Lloyd Davies inventoried and evaluated the condition of the habitat within a 200-foot buffer around the project site, where applicable, on September 22, 2020. Plant communities and land cover types identified on aerial photographs during the literature review were verified by walking meandering transects throughout the project site. In addition, aerial photography was reviewed prior to the site investigation to locate potential natural corridors and linkages that may support the movement of wildlife through the area. These areas identified on aerial photography were then walked during the field investigation.

Soil Series Assessment

On-site and adjoining soils were researched prior to the field investigation using the USDA NRCS Soil Survey for San Bernardino County, California. In addition, a review of the local geological conditions and historical aerial photographs was conducted to assess the ecological changes that the project site has undergone.

Plant Communities

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities were classified in accordance with Sawyer, Keeler-Wolf and Evens (2009), delineated on an aerial photograph, and then digitized into GIS Arcview. The Arcview application was used to compute the area of each plant community and/or land cover type in acres.

Plants

Common plant species observed during the field investigation were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less-familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

4 A soil series is defined as a group of soils with similar profiles developed from similar parent materials under comparable climatic and vegetation conditions. These profiles include major horizons with similar thickness, arrangement, and other important characteristics, which may promote favorable conditions for certain biological resources.

Wildlife

Wildlife species detected during the field investigation by sight, calls, tracks, scat, or other sign were recorded during surveys in a field notebook. Field guides used to assist with identification of wildlife species during the survey included The Sibley Field Guide to the Birds of Western North America (Sibley 2003), A Field Guide to Western Reptiles and Amphibians (Stebbins 2003), and A Field Guide to Mammals of North America (Reid 2006). Although common names of wildlife species are well standardized, scientific names are provided immediately following common names in this report (first reference only).

Jurisdictional Drainages and Wetlands

Aerial photography was reviewed prior to conducting a field investigation in order to locate and inspect any potential natural drainage features, ponded areas, or water bodies that may fall under the jurisdiction of the Corps, Regional Board, or CDFW. In general, surface drainage features indicated as blue-line streams on USGS maps that are observed or expected to exhibit evidence of flow are considered potential riparian/riverine habitat and are also subject to state and federal regulatory jurisdiction. In addition, ELMT reviewed jurisdictional waters information through examining historical aerial photographs to gain an understanding of the impact of land-use on natural drainage patterns in the area. The USFWS National Wetland Inventory (NWI) and Environmental Protection Agency (EPA) Water Program "My Waters" data layers were also reviewed to determine whether any hydrologic features and wetland areas have been documented on or within the vicinity of the project site.

The biologists carefully assessed the site for depressions, inundation, presence of hydrophytic vegetation, staining, cracked soil, ponding, and indicators of active surface flow and corresponding physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris. Suspected jurisdictional areas were checked for the presence of definable channels, soils, and hydrology.

Existing Site Conditions

The proposed project site is located in an area with a mixture of developed and undeveloped land and sits on top of a graded hill (Deane Zone Hilltop), that is completely surrounded by development. The area immediately surrounding the site supports steep cliff faces that are largely undeveloped. However, at the base of the steep hill, the area is surrounded by residential development to the east, south, and west, and institutional development to the north. The site itself supports both developed and undeveloped land. Developments occurring onsite consist of two existing SCVWA water tanks, access road, and associated structures.

Topography and Soils

Elevation ranges from approximately 1,895 to 1,980 feet above mean sea level. The site occurs at the top of a hill and slopes downward from the center. Based on the NRCS USDA Web Soil Survey, the project site is historically underlain by Ojai loam (30 to 50 percent slopes) and Saugus loam (30 to 50 percent slopes, eroded). Refer to Exhibit 4, *Soils*, in Attachment A. Soils within the existing developed areas are heavily compacted and disturbed, while the soils outside of the existing developed areas are undisturbed.

Vegetation

The site itself supports developed and undeveloped land, the latter of which was recently impacted by a recent fire, as evidenced by remnant burned perennial vegetation and scarring. The periphery of the site primarily supports undeveloped land with the exception of an existing access road. Refer to Attachment B, *Site Photographs*, for representative site photographs. The survey area supports two (2) vegetation communities: coastal sage scrub and non-native grassland. In addition, the site supports two land cover types that would be described as disturbed and developed (refer to Exhibit 5, *Vegetation*, in Attachment A).

Coastal Sage Scrub

The northern boundary of the project site, on the north facing slope supports a coastal sage scrub plant community. This plant community is dominated by California sagebrush (*Artemisia californica*) and supports recovering stands of chamise (*Adenostoma fasciculatum*) and elderberry (*Sambucus nigra*). Other common plant species observed in the coastal sage scrub vegetation community include cryptantha (*Cryptantha* sp.), deerweed (*Acmispon glaber*), rod wirelettuce (*Stephanomeria virgata*), wirelettuce (*Stephanomeria pauciflora*), California buckwheat (*Eriogonum fasciculatum*), chia (*Salvia columbariae*), Tucker oak (*Quercus john-tuckeri*), mulefat (*Baccharis salicifolia*), purple sage (*Salvia leucophylla*), chaparral yucca (*Hesperoyucca whipplei*), common sandaster (*Corethrogyne filaginifolia*), bush groundsel (*Senecio flaccidus* var. *douglasii*), desert wishbone bush (*Mirabilis laevis*), golden currant (*Ribes aureum*), California bush sunflower (*Encelia californica*), flax-leaved horseweed (*Erigeron bonariensis*), tropical horseweed (*Erigeron sumatrensis*), rattlesnake sandmat (*Euphorbia albomarginata*), shismus (*Schismus* sp.), and western ragweed (*Ambrosia psilostachya*).

Non-Native Grassland

The southern and eastern boundaries of the site support a non-native grassland plant community. This plant community is dominated by non-native grasses including wild oat (*Avena fatua*) and red brome (*Bromus madritensis* ssp. *rubens*) and supports mainly weedy/early successional species. Portions of this plant community support groups of fire-damaged native perennial species that would normally denote a coastal sage scrub community; however, native annuals are almost entirely absent from these areas. This indicates that the fire damage triggered a type-conversion fairly recently from coastal sage scrub to non-native grassland in much of the undeveloped areas within these portions of the site. Other common plant species that were observed in the non-native grassland vegetation community include Mediterranean mustard (*Hirschfeldia incana*), tocalote (*Centaurea melitensis*), prickly lettuce (*Lactuca serriola*), telegraph weed (*Heterotheca grandiflora*), tree tobacco (*Nicotiana glauca*), elderberry, chamise, wire lettuce species, cryptantha, schismus, and chaparral yucca.

Disturbed

Disturbed areas onsite include those areas impacted by routine vehicular and foot traffic, and areas that have not recovered from recent fire damage but have also not undergone a type conversion from coastal sage scrub to non-native grassland. Additionally, scattered burn scars are present throughout the disturbed portions of the site, and these scars primarily support recovering perennials and weedy/early successional plant species that are adapted to post-fire conditions. Common plant species observed in the disturbed areas of the site include chaparral yucca, chamise, California bush sunflower, deer weed, Mediterranean mustard, wire lettuce species, horseweed species, brome species, schismus, and cryptantha.

Developed

Developed areas onsite include the existing water storage tanks, associated structures, and the paved access road. These areas are either devoid of vegetation or minimally vegetated with weedy/early successional species adapted to growing in highly disturbed conditions. Plant species observed in the developed portions of the site include deerweed, Mediterranean mustard, and non-native grasses.

Wildlife

Plant communities provide foraging habitat, nesting/denning sites, and shelter from adverse weather or predation. This section provides a discussion of those wildlife species that were observed or are expected to occur within the project site. The discussion is to be used a general reference and is limited by the season, time of day, and weather conditions in which the field investigation was conducted. Wildlife detections were based on calls, songs, scat, tracks, burrows, and direct observation. The project site provides limited habitat for wildlife species except those adapted to a high degree of anthropogenic disturbances and development.

Fish

No fish or hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) that would provide suitable habitat for fish were observed on or within the vicinity of the project site. Therefore, no fish are expected to occur and are presumed absent from the project site.

Amphibians

No amphibians or hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) that would provide suitable habitat for amphibian species were observed on or within the vicinity of the project site. Therefore, no amphibians are expected to occur on the project site and are presumed absent.

Reptiles

The project site provides suitable habitat for a variety of reptile species known to occur within the region. Reptile species observed during the field investigation included coastal whiptail (*Aspidoscelis tigris stejnegeri*), Great Basin fence lizard (*Sceloporus occidentalis longipes*), and western side-blotched lizard (*Uta stansburiana elegans*). Additional common reptile species that could potentially occur on-site include San Diego gopher snake (*Pituophis catenifer annesctens*), and red racer (*Coluber flagellum piceus*).

Birds

The project site provides suitable foraging habitat for a variety of bird species known to occur within the region. Bird species detected during the field investigation include mourning dove (*Zenaida macroura*), California towhee (*Melozone crissalis*), Anna's hummingbird (*Calypte anna*), Bewick's wren (*Thryomanes bewickii*), western bluebird (*Sialia mexicana*), black phoebe (*Sayornis nigricans*), phainopepla (*Phainopepla nitens*), bushtit (*Psaltriparus minimus*), lesser goldfinch (*Spinus psaltria*), turkey vulture (*Cathartes aura*), American crow (*Corvus brachyrhinchos*), red-tailed hawk (*Buteo jamaicensis*), Allen's hummingbird (*Selasphorus sasin*), hooded oriole (*Icterus cucullatus*), blue-gray gnatcatcher (*Polioptila caerulea*), and California quail (*Callipepla californica*).

Mammals

The survey area provides suitable foraging and cover habitat for a variety of mammalian species known to occur within the region. The only mammalian species detected during the field investigation was coyote (*Canis lastrans*). Common mammalian species that could potentially occur on-site include cottontail (*Sylvilagus audubonii*).

Nesting Birds

No active nests or birds displaying nesting behavior were observed during the field survey. The onsite plant communites provide suitable foraging and nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds. If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days prior to ground disturbance to ensure no nesting birds will be impacted from proejct implementaiton.

Migratory Corridors and Linkages

Habitat linkages provide connections between larger habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet still inadequate for others. Wildlife corridors are features that allow for the dispersal, seasonal migration, breeding, and foraging of a variety of wildlife species. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

According to the Los Angeles County Department of Regional Planning, the project site has not been identified as occurring within a wildlife corridor or linkage. However, Santa Clara River, which flows through Soledad Canyon, approximately 0.70 miles south of the site, is recognized wildlife migratory corridor and has been designated by Los Angeles County as a Significant Ecological Area. The project site is separated from Santa Clara River by existing development and roadways and there are no riparian corridors or creeks connecting the project site to this area. Therefore, the project site does not function as a major wildlife movement corridor or linkage. As such, implementation of the proposed project is not expected to have a significant impact to wildlife movement opportunities or prevent local wildlife movement through the area.

Jurisdictional Areas

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates discharge of dredge or fill materials into "waters of the United States" pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the CDFW regulates alterations to streambed and bank under Fish and Wildlife Code Sections 1600 et seq., and the Regional Board regulates discharges into surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act.

The USFWS NWI and the USGS National Hydrography Dataset were reviewed to determine if any blueline streams or riverine resources have been documented within or immediately surrounding the project site. Based on this review, no riverine resources were identified on the project site. Two (2) riverine resources

were identified approximately 0.31 mile northwest and 0.6 mile east of the site, and the Santa Clara River was identified approximately 0.70 miles southeast of the project site. Within the Santa Clara River, the NWI has mapped riverine, freshwater emergent wetlands, and freshwater forested/shrub wetlands.

No discernible drainage courses, inundated areas, or wetland features/obligate plant species that would be considered jurisdictional by the Corps, Regional Board, or CDFW were observed within the proposed project site. It should be noted that the site is bordered to the west and southwest by series of concrete lined v-ditches that were constructed in the uplands to limit erosion and are not considered to be jurisdictional. Further, the proposed project is not expected to impact these areas. Based on the proposed site plan, project activities will not result in impacts to Corps, Regional Board, or CDFW jurisdictional areas and regulatory approvals will not be required.

Special-Status Biological Resources

The CNDDB Rarefind 5 and the CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California were queried for reported locations of special-status plant and wildlife species as well as special-status natural plant communities in the Mint Canyon USGS 7.5-minute quadrangle. The habitat assessment evaluated the conditions of the habitat(s) within the boundaries of the project site to determine if the existing plant communities, at the time of the survey, have the potential to provide suitable habitat(s) for special-status plant and wildlife species.

The literature search identified fifteen (15) special-status plant species, thirty-seven (37) special-status wildlife species, and four (4) special-status plant communities as having potential to occur within the Mint Canyon USGS 7.5-minute quadrangle. Special-status plant and wildlife species were evaluated for their potential to occur within the project site based on habitat requirements, availability and quality of suitable habitat, and known distributions. Species determined to have the potential to occur within the general vicinity of the project site is presented in Attachment D*: Potentially Occurring Special-Status Biological Resources*.

Special-Status Plants

According to the CNDDB and CNPS, thirty-eight (38) special-status plant species have been recorded in the Mint Canyon quadrangles (refer to Attachment D). No special-status plant species were observed on-site during the habitat assessment. The project site has been subject to damage from a recent fire and anthropogenic disturbances from existing on-site and surrounding development. These disturbances have reduced the suitability of the habitat to support special-status plant species known to occur in the general vicinity of the project site. Based on habitat requirements for specific special-status plant species and the availability and quality of habitats needed by each species, it was determined that the project site does not provide suitable habitat for any of the special-status plant species known to occur in the area and all are presumed to be absent from the project site. No focused surveys are recommended.

Special-Status Wildlife

According to the CNDDB, sixty-one (61) special-status wildlife species have been reported in the Mint Canyon quadrangles (refer to Attachment D). One special-status wildlife species was observed during the field investigation: coastal whiptail (*Aspidoscelis tigris stejnegeri*), a California Species of Special Concern. Based on habitat requirements for specific species and the availability and quality of onsite habitats, it was

determined that the proposed project site has a moderate potential to provide suitable habitat for Cooper's hawk (*Accipiter cooperii*) and sharp-shinned hawk (*Accipiter striatus*), and a low potential to provide suitable habitat for California horned lark (*Eremophila alpestris actia*), and coastal California gnatcatcher (*Polioptila californica californica*). Further, it was determined that the project site does not provide suitable habitat for any of the other special-status wildlife species known to occur in the vicinity of the project site.

With the exception of California gnatcatcher, a federally Threatened species, none of the other aforementioned species are federally or state listed as endangered or threatened. In order to ensure impacts to Cooper's hawk, sharp-shinned hawk, California horned lark, and coastal California gnatcatcher do not occur from implementation of the proposed project, a pre-construction nesting bird clearance survey shall be conducted prior to ground disturbance. With implementation of the pre-construction nesting bird clearance survey, impacts to the aforementioned species will be less than significant and no mitigation will be required.

Coastal whiptail is a fairly common species in sage scrub habitats. This species is highly mobile with ample foraging habitat immediately adjacent to the project site in the surrounding undeveloped slopes, as it is expected to move into the adjacent undeveloped habitat. However, to ensure no coastal whiptail will be impacted from project implementation, a pre-construction clearance survey is recommended to be conducted prior to ground disturbing activities to ensure no coastal whiptail will be impacted from project implementation. Since there is ample habitat for this species immediately adjacent to the proposed project footprint, and with implementation of a pre-construction clearance survey, impacts to this species will be less than significant and no mitigation will be required.

Based on regional significance, the potential occurrence of coastal California gnatcatcher within the project site is described in further detail below.

Coastal California Gnatcatcher

California gnatcatcher is a federally threatened species with restricted habitat requirements, being an obligate resident of sage scrub habitats that are dominated by California sagebrush. This species generally occurs below 750 feet elevation in coastal regions and below 1,500 feet inland. According to J. Atwood and J. Bolsinger (1992), 99% of all California gnatcatcher observations are in areas with elevations below 950 feet. There are reported occurrences of California gnatcatcher at 1,600 feet elevation (500 meters) (Davis and McKernan, 1998).

California gnatcatcher ranges from Ventura County south to San Diego County and northern Baja California and is less common in sage scrub with a high percentage of tall shrubs. It prefers habitat with more low-growing vegetation. California gnatcatchers breed between mid-February and the end of August, with peak activity from mid-March to mid-May. Population estimates indicate that there are approximately 1,600 to 2,290 pairs of coastal California gnatcatcher remaining. Declines are attributed to loss of sage scrub habitat due to development, as well as cowbird nest parasitism.

California gnatcatcher are ground and shrub-foraging insectivores. They feed on small insects and other arthropods. A California gnatcatcher's territory is highly variable in size and seems to be correlated with distance from the coast, ranging from less than 1 ha to over 9 ha (Mock, 2004). In a 1998 study, biologist Patrick Mock concluded that California gnatcatcher in the inland region require a larger territory than those

on the coast in order to meet the nutritional requirements needed for survival and breeding.

The Primary Constituent Elements (PCEs)[5] essential to support the biological needs of foraging, reproducing, rearing of young, intra-specific communication, dispersal, genetic exchange, or sheltering for California gnatcatcher that were surveyed for include:

1. Dynamic and Successional sage scrub Habitats and Associated Vegetation (Riversidean Alluvial Fan Sage Scrub, Coastal Sage-Chaparral Scrub, etc.) that provide space for individual and population growth, normal behavior, breeding, reproduction, nesting, dispersal and foraging; and
2. Non-sage scrub habitats such as chaparral, grassland, and riparian areas, in proximity to sage scrub habitats that provide linkages to help with dispersal, foraging and nesting. Non-sage scrub habitats such as chaparral, grassland, and riparian areas, in proximity to sage scrub habitats have the potential to provide linkages to help with dispersal, foraging and nesting.

The coastal sage scrub plant community along the northern boundary of the project site provides marginally suitable foraging habitat for California gnatcatcher. Due to damage from recent wildfires, this area supports mainly weedy/early successional plant species and perennials that are still recovering from being burned. As such, available vegetation is primarily low growing and nesting opportunities for California gnatcatcher are absent from the project site. Additionally, the Coastal Sage scrub plant community is isolated from occupied sage scrub habitats in the region by surrounding development, and the site is above the maximal elevational range for California gnatcatcher, further precluding California gnatcatcher from the project site. As a result, it was determined that California gnatcatcher has a low potential to occur onsite, are presumed absent from the project site. No further actions or focused surveys are recommended.

Special-Status Plant Communities

According to the CNDDB, four (4) special-status plant communities have been reported in the Mint Canyon USGS 7.5-minute quadrangle: Southern Coast Live Oak Riparian Forest, Southern Riparian Scrub, Southern Sycamore Alder Riparian Woodland, and Southern Willow Scrub; none of which were observed onsite. Therefore, no special-status plant communities will be impacted by project implementation.

Critical Habitats

Under the federal Endangered Species Act, "Critical Habitat" is designated at the time of listing of a species or within one year of listing. Critical Habitat refers to specific areas within the geographical range of a species at the time it is listed that include the physical or biological features that are essential to the survival and eventual recovery of that species. Maintenance of these physical and biological features requires special management considerations or protection, regardless of whether individuals or the species are present or not. All federal agencies are required to consult with the USFWS regarding activities they authorize, fund, or permit which may affect a federally listed species or its designated Critical Habitat. The purpose of the consultation is to ensure that projects will not jeopardize the continued existence of the listed species or adversely modify or destroy its designated Critical Habitat. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing is on federal lands, uses federal funds, or

5 Specific elements of physical and biological features that provide for a species' life-history process and are essential to the conservation of the species.

requires federal authorization or permits (e.g., funding from the Federal Highways Administration or a Clean Water Act Permit from the United States Army Corps of Engineers). If a there is a federal nexus, then the federal agency that is responsible for providing the funding or permit would consult with the USFWS.

The project site is not located within federally designated Critical Habitat. Further, the closest Critical Habitat designations are located approximately 1.62 miles northwest for spreading navarretia (*Navarretia fossalis*), 2.1 miles south for coastal California gnatcatcher (*Polioptila californica californica*), 3.34 miles east of the site for arroyo toad (*Anaxyrus californicus* (Exhibit 6, *Critical Habitat*, in Attachment A). Therefore, no impacts to federally designated Critical Habitat will occur from implementation of the proposed project.

Recommendations

Pre-Construction Nesting Bird Clearance Survey (Migratory Bird Treaty Act and Fish and Game Code)

Nesting birds are protected pursuant to the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or eggs). In order to protect migratory bird species, a nesting bird clearance survey should be conducted prior to any ground disturbance or vegetation removal activities that may disrupt the birds during the nesting season.

If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur. If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a no-disturbance buffer. The size of the no-disturbance buffer will be determined by the wildlife biologist and will depend on the level of noise and/or surrounding anthropogenic disturbances, line of sight between the nest and the construction activity, type and duration of construction activity, ambient noise, species habituation, and topographical barriers. These factors will be evaluated on a case-by-case basis when developing buffer distances. Limits of construction to avoid an active nest will be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel will be instructed on the sensitivity of nest areas. A biological monitor should be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.

Pre-Construction Clearance Survey

A pre-construction special-status species survey will be conducted by a qualified biologist prior to initiating ground disturbance activities. The survey will consist of full coverage of the proposed disturbance limits and a 500- foot buffer, and can be performed concurrently with the nesting bird survey. If coastal whiptail or any special-status species are found during pre-construction surveys, a biological monitor may be needed during construction. If determined necessary, biological compliance monitoring will be conducted by a

qualified biologist during construction.

Conclusion

Based on the proposed project footprint and existing site conditions discussed in this report, none of the special-status plant or wildlife species known to occur in the general vicinity of the project site are expected to be directly or indirectly impacted from implementation of the proposed project. With completion of the recommendations provided above, no impacts to year-round, seasonal, or special-status avian residents or special-status species will occur from implementation of the proposed project. Implementation of the project will have "no effect" on federally or State listed species known to occur in the general vicinity of the project site, and will not impact jurisdictional waters. Additionally, the development of the project will not impact designated Critical Habitats or regional wildlife movement corridors/linkages.

Please do not hesitate to contact Tom McGill at (951) 285-6014 or tmcgill@elmtconsulting.com or Travis McGill at (909) 816-1646 or travismcgill@elmtconsulting.com should you have any questions this report.

Sincerely,

Thomas J. McGill, Ph.D.
Managing Director

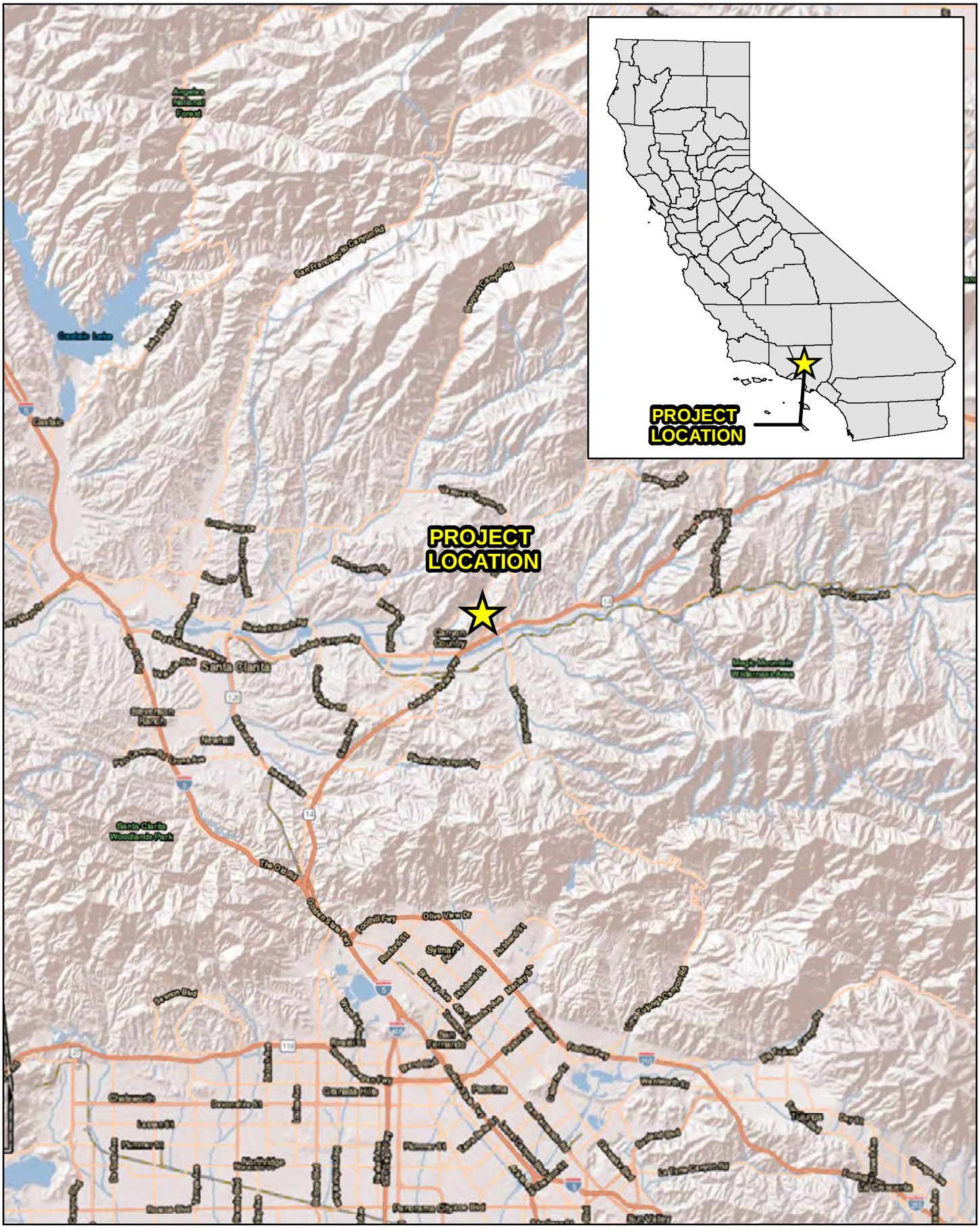
Travis J. McGill
Director

Attachments:

A. *Project Exhibits*
B. *Project Site Plans*
C. *Site Photographs*
D. *Potentially Occurring Special-Status Biological Resources*
E. *Regulations*

Attachment A

Project Exhibits



DEANE TANK SITE EXPANSION PROJECT
HABITAT ASSESSMENT

Regional Vicinity

ELMT CONSULTING

0 1.25 2.5 5 Miles

Source: World Transportation, World Shaded Relief,Los Angeles County

Exhibit 1

DEANE TANK EXPANSION PROJECT
HABITAT ASSESSMENT

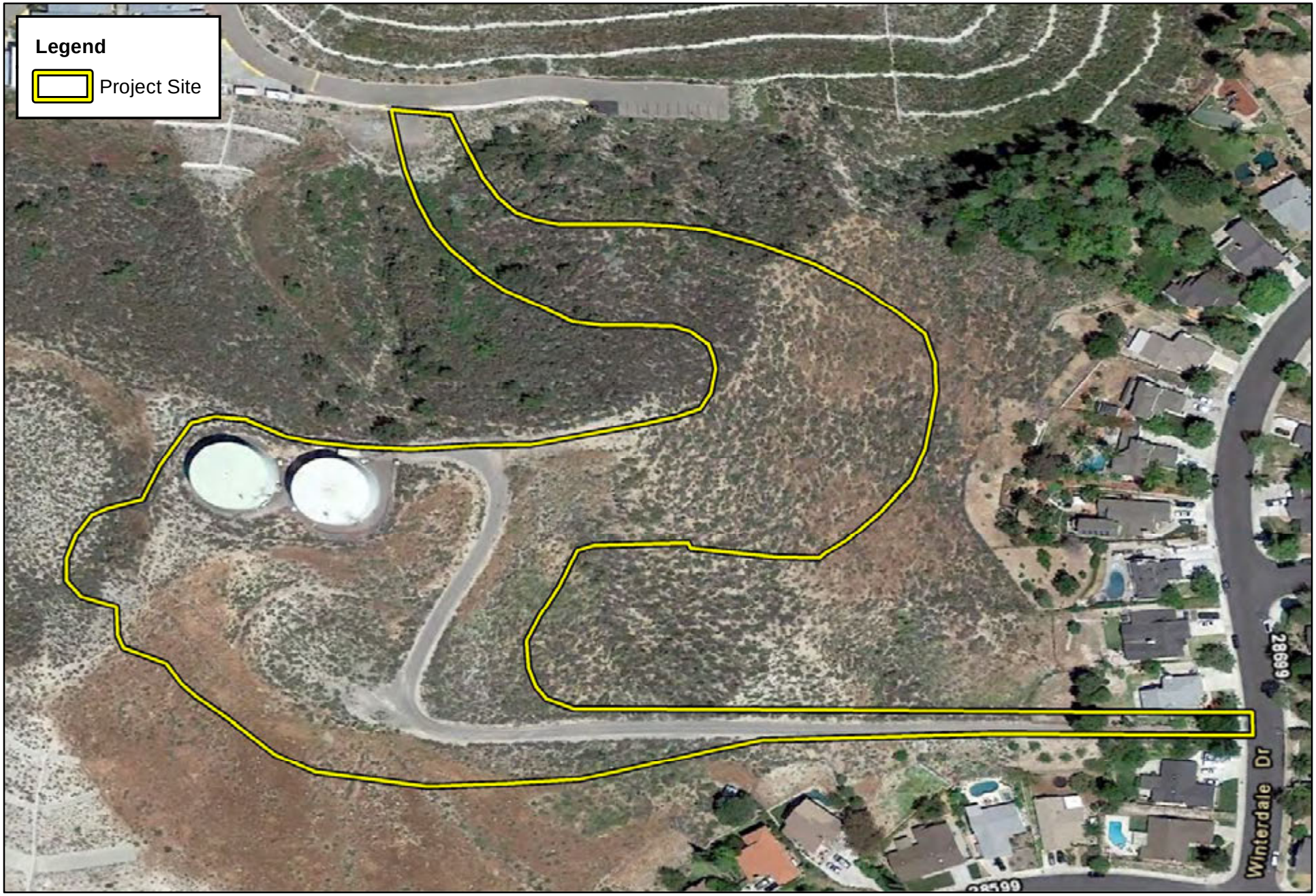
Site Vicinity

ELMT CONSULTING

0 0.25 0.5 1 Miles

Source: USA Topographic Map, Los Angeles County

Exhibit 2



DEANE TANK EXPANSION PROJECT
HABITAT ASSESSMENT

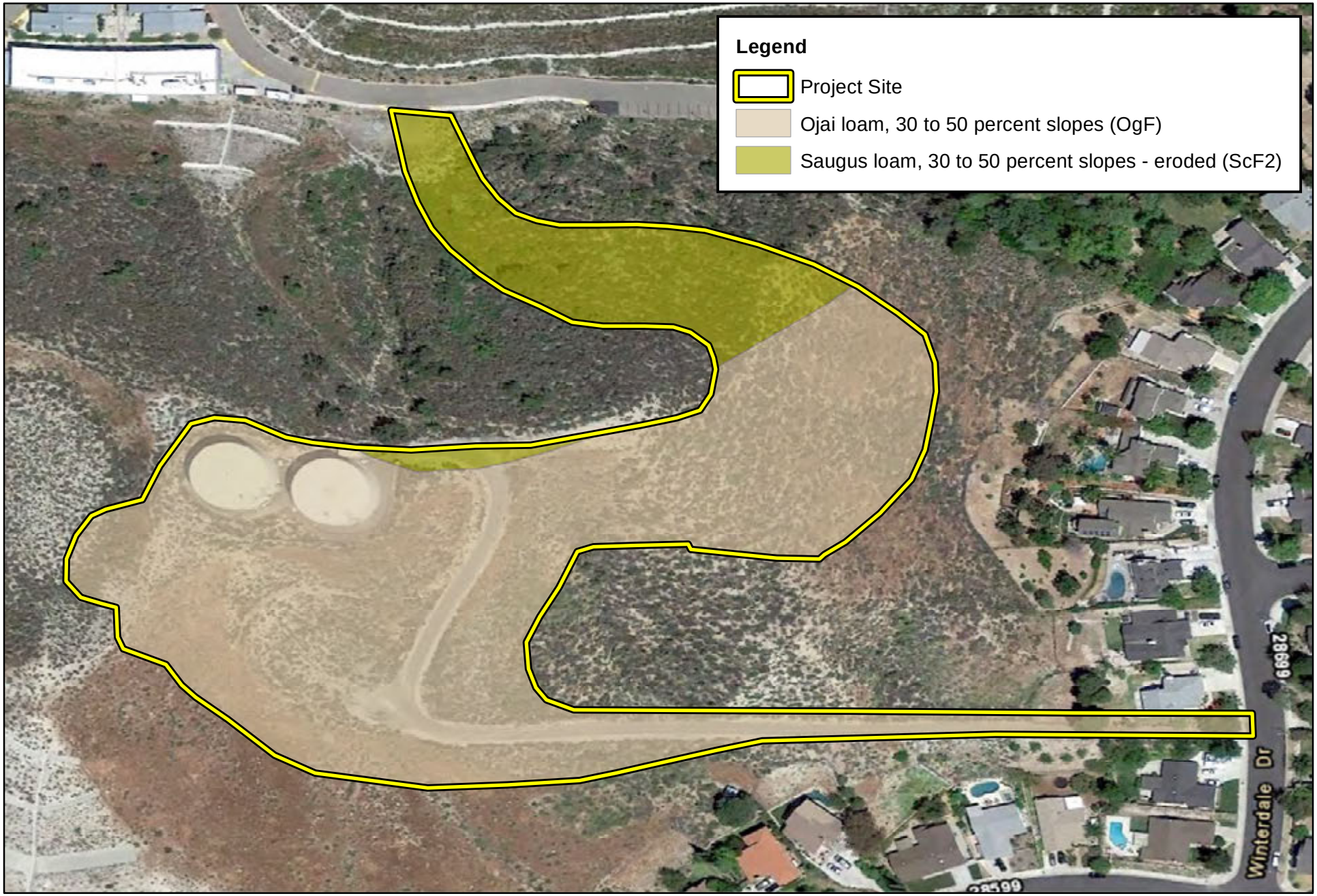
Project Site

ELMT CONSULTING

0 125 250 500 Feet

Source: Google Earth Imagery, Los Angeles County

Exhibit 3



DEANE TANK EXPANSION PROJECT
HABITAT ASSESSMENT

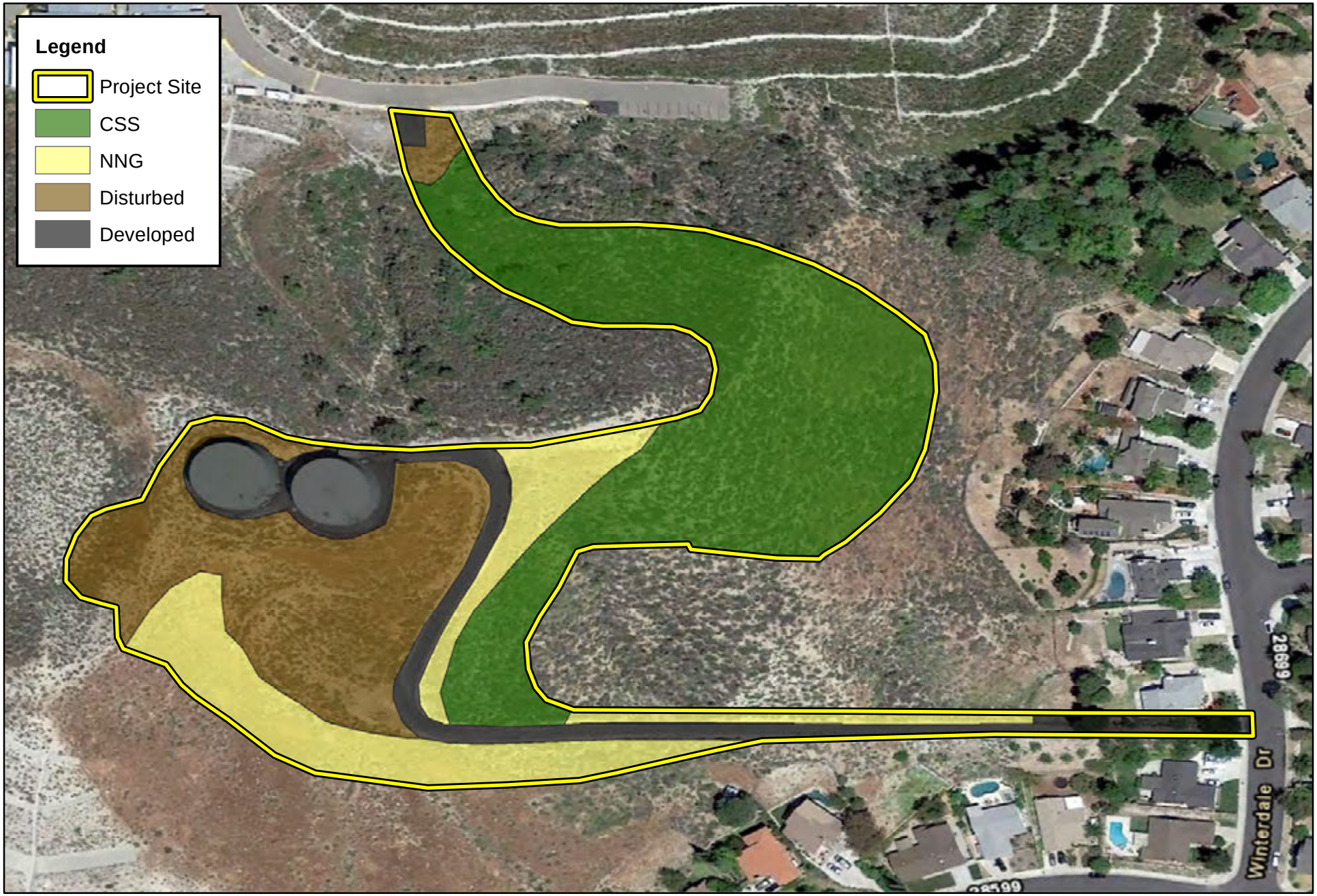
Soils

ELMT CONSULTING

0 125 250 500 Feet

Source: Google Earth Imagery, Soil Survey Geographic Database, Los Angeles County

Exhibit 4



DEANE TANK EXPANSION PROJECT
HABITAT ASSESSMENT

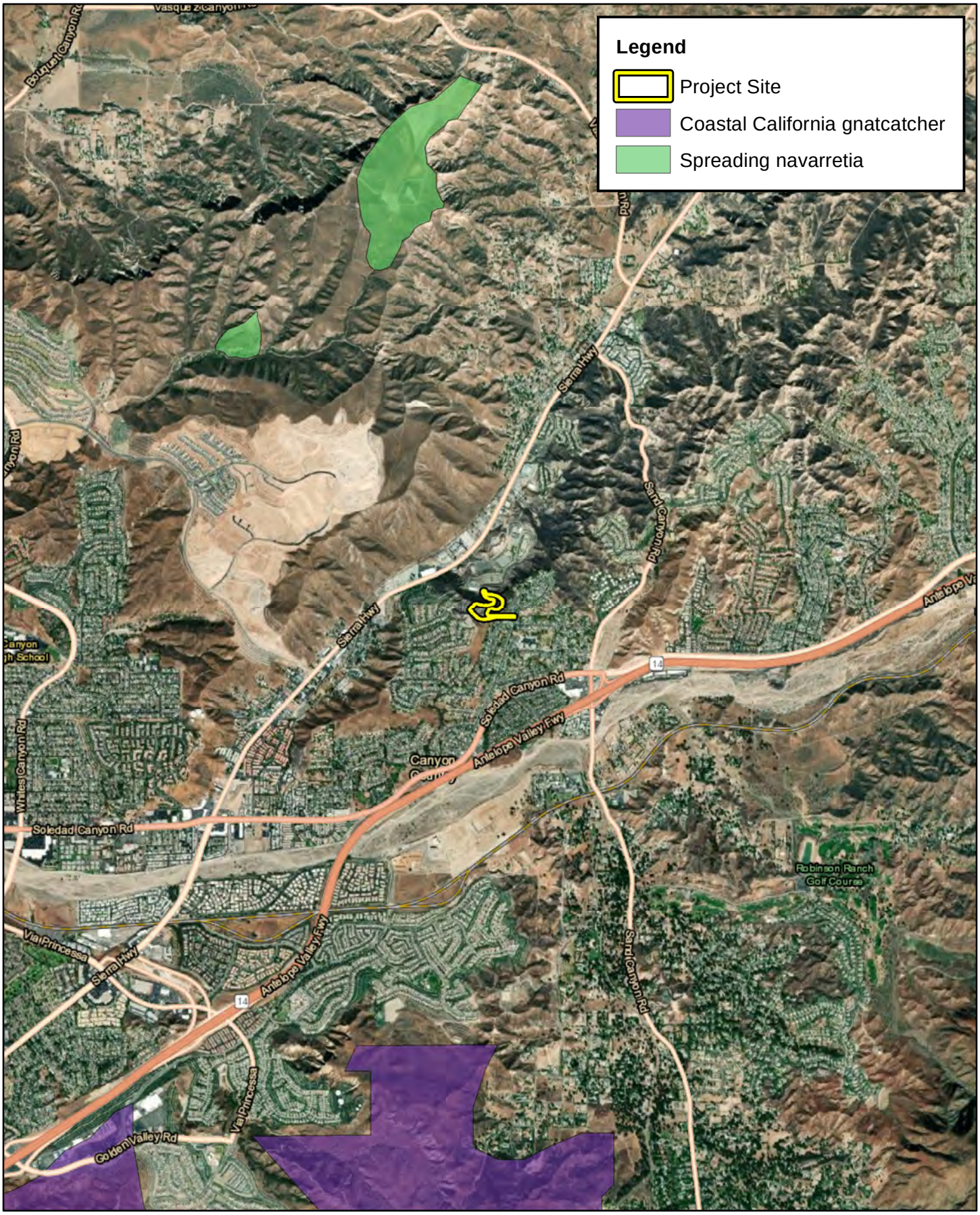
Vegetation

ELMT CONSULTING

0 125 250 500 Feet

Source: Google Earth Imagery, Los Angeles County

Exhibit 5



DEANE TANK EXPANSION PROJECT
HABITAT ASSESSMENT

Critical Habitat

ELMT CONSULTING

0 0.25 0.5 1 Miles

Source: ESRI Aerial Imagery, USFWS Critical Habitat, Los Angeles County

Exhibit 6

Attachment B

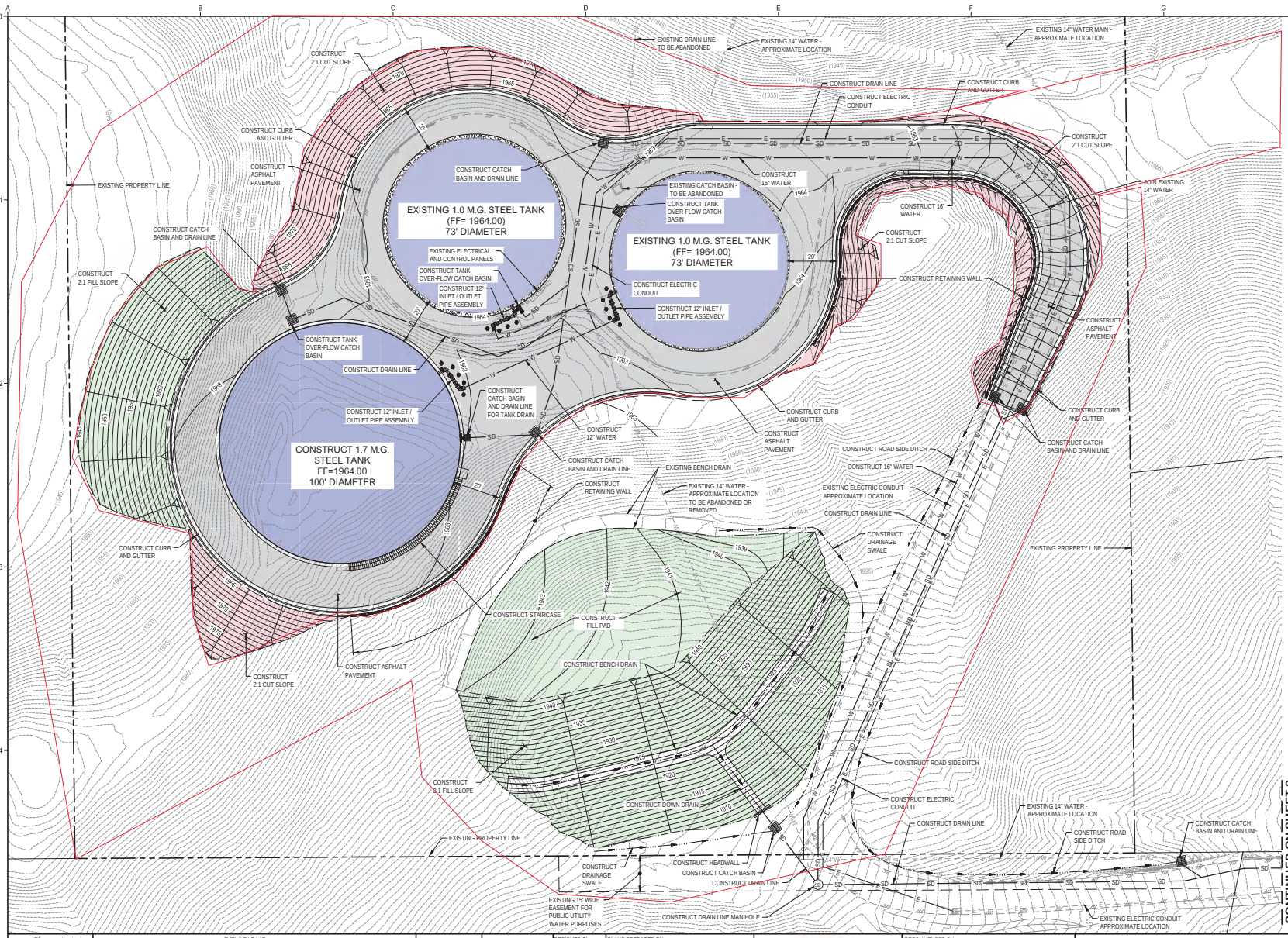
Site Plans

SOURCE: Google Earth - 2020

FIGURE **2-2**

Meridian Consultants

Project Site Plan



DIAL TOLL FREE 811 AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT (USA) OF SOUTHERN CALIFORNIA

REVISIONS			
NO.	DESCRIPTION	DATE	BY

SCALES

IF THIS BAR IS NOT DIMENSIONED AS SHOWN, ADJUST SCALES ACCORDINGLY

DESIGNED BY:	MM
DRAWN BY:	MM
CHECKED BY:	WDB

PLANS PREPARED BY:
CIVILTEC engineering inc.
Civil, Water, Wastewater, Drainage, and Transportation Engineering
Construction Management • Surveying
California • Arizona
118 West Lime Avenue
Monrovia, CA 91016
Phone: 626.357.0588
Fax: 626.303.7957
Web: www.civiltec.com

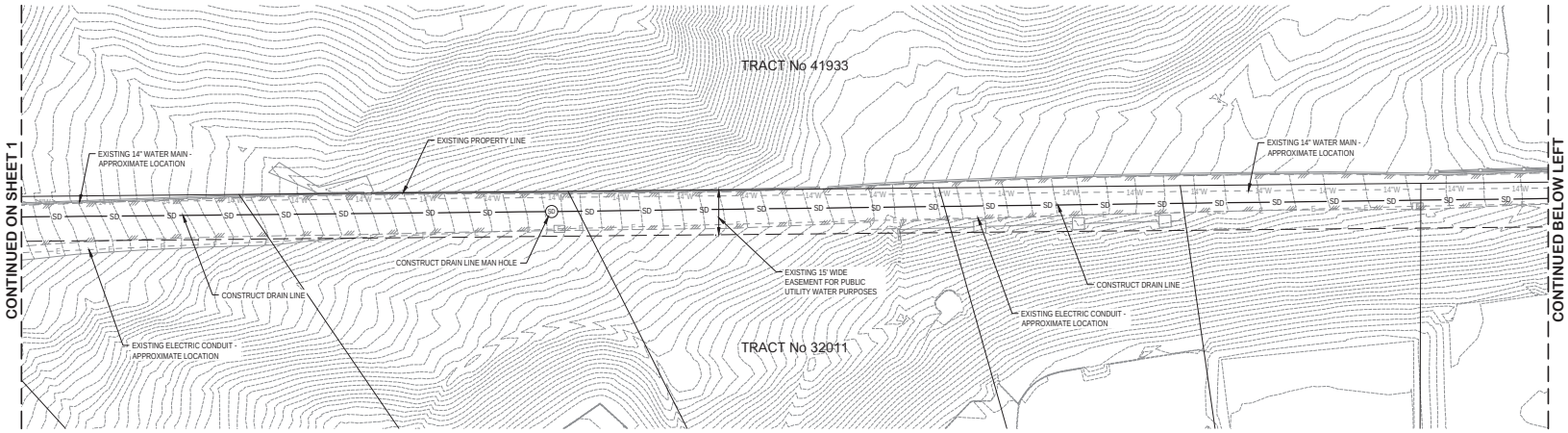
SCV WATER
SANTA CLARITA VALLEY WATER AGENCY
ENGINEERING SERVICES SECTION
26521 SUMMIT CIRCLE
SANTA CLARITA, CA. 91350
(661) 259-2737

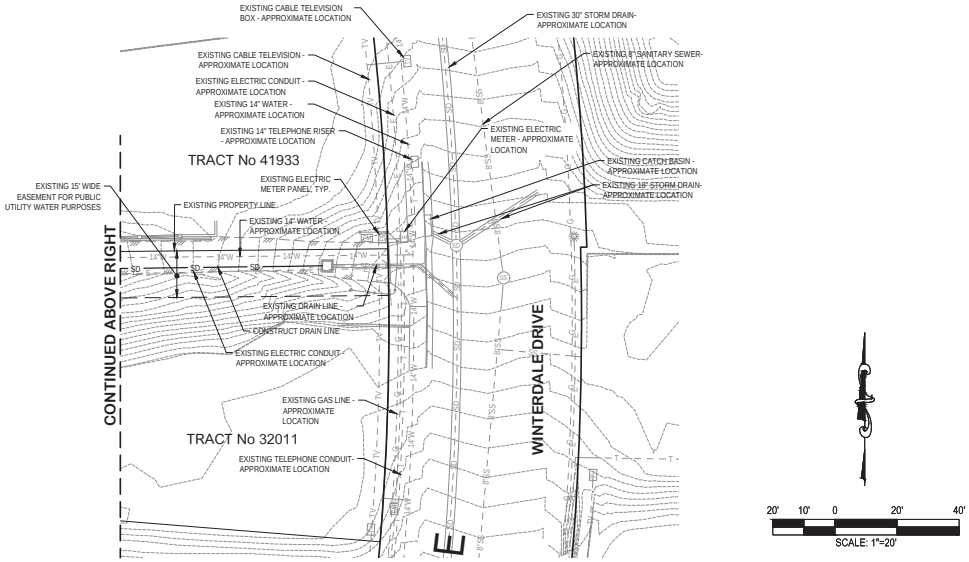
RECOMMENDED BY:	
JASON YIM, PRINCIPAL ENGINEER	DATE
RECOMMENDED BY:	
KEITH ABERCROMBIE, CHIEF OPERATING OFFICER	DATE
APPROVED BY: SANTA CLARITA VALLEY WATER AGENCY	
COURTNEY MAEL, CHIEF ENGINEER	DATE

SANTA CLARITA VALLEY WATER AGENCY
NEW DEANE TANK SITE

PRELIMINARY SITE PLAN

DATE:	JULY 2020
PROJECT NO.	2020123,00
DRAWING NO.:	
SHEET NO.:	1 OF 2





DIGALERT
DIAL TOLL FREE 811 AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT (USA) OF SOUTHERN CALIFORNIA

REVISIONS			
NO.	DESCRIPTION	DATE	BY

SCALES

IF THIS BAR IS NOT DIMENSIONED AS SHOWN, ADJUST SCALES ACCORDINGLY

DESIGNED BY: MM
DRAWN BY: MM
CHECKED BY: WDB

PLANS PREPARED BY:
CIVILTEC engineering inc.
Civil, Water, Wastewater, Drainage, and Transportation Engineering
Construction Management • Surveying
California • Arizona
118 West Lime Avenue
Monrovia, CA 91016
Phone: 626.357.0588
Fax: 626.303.7957
Web: www.civiltec.com

SCV WATER
SANTA CLARITA VALLEY WATER AGENCY
ENGINEERING SERVICES SECTION
26521 SUMMIT CIRCLE
SANTA CLARITA, CA. 91350
(661) 259-2737

RECOMMENDED BY:
JASON YIM, PRINCIPAL ENGINEER DATE
RECOMMENDED BY:
KEITH ABERCROMBIE, CHIEF OPERATING OFFICER DATE
APPROVED BY: SANTA CLARITA VALLEY WATER AGENCY
COURTNEY MAEL, CHIEF ENGINEER DATE

SANTA CLARITA VALLEY WATER AGENCY
NEW DEANE TANK SITE

PRELIMINARY SITE PLAN

DATE: JULY 2020
PROJECT NO. 2020123,00
DRAWING NO.:
SHEET NO.: 2 OF 2

Attachment C

Site Photographs

Photograph 1: From the northwest corner of the project site looking east along the northern boundary.

Photograph 2: From the northwest corner of the project site looking south along the western boundary.

Photograph 3: From the southwest corner of the project site looking north along the western boundary.

Photograph 4: From the southwest corner of the project site looking east along the southern boundary.

Photograph 5: From the southern boundary of the project site looking north.

Photograph 6: From the southeast corner of the project site looking northwest.

Photograph 7: From the eastern boundary of the project site looking west.

Photograph 8: From the northeast corner of the project site looking west along the northern boundary.

Photograph 9: From the middle of the project site looking northeast at the area for the optional access road.

Photograph 10: Looking north at the north facing slope where the optional access road is proposed.

Attachment D

Potentially Occurring Special-Status Plant Species

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
SPECIAL-STATUS WILDLIFE SPECIES				
Accipiter cooperii Cooper's hawk	Fed: None CA: WL	Generally found in forested areas up to 3,000 feet in elevation, especially near edges and rivers. Prefers hardwood stands and mature forests, but can be found in urban and suburban areas where there are tall trees for nesting. Common in open areas during nesting season.	No	**Moderate**. There is low quality foraging habitat on-site. No suitable nesting opportunities occur on-site. Adapted to urban environments and occurs commonly.
Accipiter striatus sharp-shinned hawk	Fed: None CA: WL	Found in pine, fir and aspen forests. They can be found hunting in forest interior and edges from sea level to near alpine areas. Can also be found in rural, suburban and agricultural areas, where they often hunt at bird feeders. Typically found in southern California in the winter months.	No	**Moderate**. There is low quality foraging habitat on-site. No suitable nesting opportunities occur on-site. Adapted to urban environments and occurs commonly.
Aimophila ruficeps canescens southern California rufous-crowned sparrow	Fed: None CA: WL	Typically found between 3,000 and 6,000 feet in elevation. Breed in sparsely vegetated shrublands on hillsides and canyons. Prefers coastal sage scrub dominated by California sagebrush (*Artemisia californica*), but can also be found breeding in coastal bluff scrub, low-growing serpentine chaparral, and along the edges of tall chaparral habitats.	No	**Presumed absent.** No suitable habitat is present on-site.
Anniella pulchra Northern California legless lizard	Fed: None CA: SSC	Occurs primarily in areas with sandy or loose loamy soils under sparse vegetation of beaches, chaparral, or pine-oak woodland; or near sycamores, oaks, or cottonwoods that grow on stream terraces. Often found under or in the close vicinity of logs, rocks, old boards, and the compacted debris of woodrat nests.	No	**Presumed absent.** No suitable habitat is present on-site.
Anniella stebbinsi Southern California legless lizard	Fed: None CA: SSC	Occurs primarily in areas with sandy or loose loamy soils under sparse vegetation of beaches, chaparral, or pine-oak woodland; or near sycamores, oaks, or cottonwoods that grow on stream terraces. Often found under or in the close vicinity of logs, rocks, old boards, and the compacted debris of woodrat nests.	No	**Presumed absent.** No suitable habitat is present on-site.
Arizona elegans occidentalis California glossy snake	Fed: None CA: SSC	Occurs in a wide variety of habitat types including open desert, grasslands, shrublands, chaparral, and woodlands. Prefers areas where the soil is loose and sandy which allows for burrowing.	No	**Presumed absent.** No suitable habitat is present on-site.
Artemisiospiza belli belli Bell's sage sparrow	Fed: None CA: WL	Occurs in chaparral dominated by fairly dense stands of chamise. Also found in coastal sage scrub in south of range.	No	**Presumed absent**. No suitable habitat is present.
Asio flammeus short-eared owl	Fed: None CA: SSC	Suitable habitats include salt- and freshwater marshes, irrigated alfalfa or grain fields, and ungrazed grasslands and old pastures. Tule marsh or tall grasslands with cover 30 to 50 cm in height can support nesting pairs.	No	**Presumed absent**. No suitable habitat is present.
Aspidoscelis tigris stejnegeri coastal whiptail	Fed: None CA: SSC	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage such as chaparral, woodland, and riparian areas.	Yes	**Present.** This species was observed onsite during the field investigation.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Athene cunicularia burrowing owl	Fed: None CA: SSC	Prefers habitat with short, sparse vegetation with few shrubs and well-drained soils in grassland, shrub steppe, and desert habitats. Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the project site.
Baeolophus inornatus oak titmouse	Fed: None CA: None	Lives mostly in warm, open, dry oak or oak-pine woodlands. Restricted to southwest Oregon to northwest Baja California with another population in the Cape District of south Baja California.	No	**Presumed absent.** No suitable habitat is present on-site.
Batrachoseps gabrieli San Gabriel slender salamander	Fed: None CA: None	Known from select localities in the San Gabriel Mountains and the Mt. Baldy area of Los Angeles County and the western end of the San Bernardino Mountains in San Bernardino Co., with an elevation range of 1,200- 5,085 feet. Occurs on talus slopes surrounded by a variety of conifer and montane hardwood species, including bigcone spruce, pine, white fir, incense cedar, canyon live oak, black oak, and California laurel.	No	**Presumed absent.** No suitable habitat is present on-site.
Bombus crotchii Crotch bumble bee	Fed: None CA: CE	Exclusive to coastal California east towards the Sierra-Cascade Crest; less common in western Nevada.	No	**Presumed absent.** No suitable habitat is present on-site.
Branchinecta lynchi vernal pool fairy shrimp	Fed: **THR** CA: None	Associated with vernal pools. Can be found in association with other ephemeral habits including alkali pools, seasonal drainages, stock ponds, vernal swales, and rock outcrops.	No	**Presumed absent.** No suitable habitat is present on-site.
Buteo swainsoni Swainson's hawk	Fed: None CA: **THR**	Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grassland or suitable grain or alfalfa fields or livestock pastures.	No	**Presumed absent.** No suitable habitat is present on-site.
Calypte costae Costa's hummingbird	Fed: None CA: None	Desert and semi-desert, arid brushy foothills and chaparral. A desert hummingbird that breeds in the Sonoran and Mojave Deserts. Departs desert heat moving into chaparral, scrub, and woodland habitats.	No	**Presumed absent.** No suitable habitat is present on-site.
Catostomus santaanae Santa Ana sucker	Fed: **THR** CA: SSC	Occur in the watersheds draining the San Gabriel and San Bernardino Mountains of southern California. Steams that Santa Ana Sucker inhabit are generally perennial streams with water ranging in depth from a few inches to several feet and with currents ranging from slight to swift.	No	**Presumed absent.** No suitable habitat is present on-site.
Chaetura vauxi Vaux's swift	Fed: None CA: SSC	Prefers redwood and Douglas-fir habitats with nest-sites in large hallow trees and snags, especially tall, burned-out snags. Fairly common migrant throughout most of the state in April and May, and August and September.	No	**Presumed absent.** No suitable habitat is present on-site.
Contopus cooperi olive-sided flycatcher	Fed: None CA: SSC	Uncommon to common, summer resident in a wide variety of forest and woodland habitats below 9,000 ft. throughout California exclusive of the deserts, the Central Valley, and other lowland valleys and basins. Preferred nesting habitats include mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine.	No	**Presumed absent.** No suitable habitat is present on-site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Corynorhinus townsendii Townsend's big-eared bat	Fed: None CA: SSC	Now considered uncommon in California. Details of its distribution are not well known. This species is found in all but subalpine and alpine habitats, and may be found at any season throughout its range. Most abundant in mesic habitats.	No	**Presumed absent.** No suitable habitat is present on-site.
Eremophila alpestris actia California horned lark	Fed: None CA: WL	Generally found in shortgrass prairies, grasslands, disturbed fields, or similar habitat types. Flocks in groups.	No	**Low.** There is marginal foraging habitat present on-site. No suitable nesting habitat is present on-site; surrounding habitats provide suitable nesting opportunities.
Euphydryas editha quino quino checkerspot butterfly	Fed: **END** CA: None	Range is now limited to a few populations in Riverside and San Diego counties. Common in meadows and upland sage scrub/chapparal habitat.	No	**Presumed absent.** No suitable habitat is present on-site.
Gasterosteus aculeatus williamsoni unarmored threespine stickleback	Fed: **END** CA: **END**; FP	Occurs in weedy, permanent pools or backwaters and in slow-moving water along the margins of a stream. It primarily occurs in cool and clear water with mud or sand substrates. This species is known to occur only in the upper Santa Clara River system and in San Antonio Creek in northern Santa Barbara County.	No	**Presumed absent.** No suitable habitat is present on-site.
Lanius ludovicianus loggerhead shrike	Fed: None CA: SSC	Often found in broken woodlands, shrublands, and other habitats. Prefers open country with scattered perches for hunting and fairly dense brush for nesting.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the project site.
Lepus californicus bennettii San Diego black-tailed jackrabbit	Fed: None CA: SSC	Occurs in diverse habitats, but primarily is found in arid regions supporting shortgrass habitats. Openness of open scrub habitat is preferred over dense chaparral.	No	**Presumed absent.** No suitable habitat is present on-site.
Oncorhynchus mykiss irideus **pop. 10** steelhead – southern california DPS	Fed: **END** CA: None	Found in permanent coastal streams from San Diego to the Smith River.	No	**Presumed absent.** No suitable habitat is present on-site.
Onychomys torridus ramona southern grasshopper mouse	Fed: None CA: SSC	Inhabits alkali desert scrub and other desert scrub habitats, and to a lesser extent succulent shrubs, desert washes, desert riparian, coastal scrub, mixed chaparral, and sagebrush habitats. Generally rare in valley foothill and montane riparian habitats. Prefers low to moderate shrub cover and requires friable soils.	No	**Presumed absent**. No suitable habitat is present.
Phrynosoma blainvillii coast horned lizard	Fed: None CA: SSC	Found in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. The key elements of such habitats are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Polioptila californica californica coastal California gnatcatcher	Fed: **THR** CA: SSC	Obligate resident of sage scrub habitats that are dominated by California sagebrush (*Artemisia californica*). This species generally occurs below 750 feet elevation in coastal regions and below 1,500 feet inland. Ranges from the Ventura County, south to San Diego County and northern Baja California and it is less common in sage scrub with a high percentage of tall shrubs. Prefers habitat with more low-growing vegetation.	No	**Low.** There is marginal foraging habitat present on-site. No suitable nesting habitat is present on-site; surrounding habitats provide suitable nesting opportunities. The project site occurs above the typical elevation range for this species.
Rana draytonii California red-legged frog	Fed: **THR** CA: SSC	Inhabits quiet pools of streams, marshes, and occasionally ponds. Occurs along the coast ranges from Mendocino County south and in portions of the Sierra Nevada and Cascades ranges.	No	**Presumed absent.** No suitable habitat is present on-site.
Salvadora hexalepis virgultea coast patch-nosed snake	Fed: None CA: SSC	Found in brushy or shrubby vegetation along the coast and requires small mammal burrows for refuge and overwintering.	No	**Presumed absent.** No suitable habitat is present on-site.
Setophaga petechia yellow warbler	Fed: None CA: SSC	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes and the eastern side of the Sierra Nevada. Winters along the Colorado River and in parts of Imperial and Riverside Counties. Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas near stream courses.	No	**Presumed absent.** No suitable habitat is present on-site.
Spea hammondii western spadefoot	Fed: None CA: SSC	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washed, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	No	**Presumed absent.** No suitable habitat is present on-site.
Spinus lawrencei Lawrence's goldfinch	Fed: None CA: None	Open woodlands, chaparral, and weedy fields. Closely associated with oaks. Nests in open oak or other arid woodland and chaparral near water.	No	**Presumed absent.** No suitable habitat is present on-site.
Taxidea taxus American badger	Fed: None CA: SSC	Primarily occupy grasslands, parklands, farms, tallgrass and shortgrass prairies, meadows, shrub-steppe communities and other treeless areas with sandy loam soils where it can dig more easily for its prey. Occasionally found in open chaparral (with less than 50% plant cover) and riparian zones.	No	**Presumed absent.** No suitable habitat is present on-site.
Thamnophis hammondii two-striped garter snake	Fed: None CA: SSC	Occurs in or near permanent fresh water, often along streams with rocky beds and riparian growth up to 7,000 feet in elevation.	No	**Presumed absent.** No suitable habitat is present on-site.
Vireo vicinior gray vireo	Fed: None CA: SSC	A common factor to the habitat type is shrub cover that forms a continuous zone of twig growth from one to five feet above the ground. Shrubbery may either be closed as in chaparral, or partly open, as in the understory of pinyon-juniper woodland.	No	**Presumed absent.** No suitable habitat is present on-site.
SPECIAL-STATUS PLANT SPECIES				
Berberis nevinii Nevin's barberry	Fed: **END** CA: **END** CNPS: 1B.1	Grows in chaparral, cismontane woodland, coastal scrub, and riparian scrub. Usually found on steep, north facing slopes or in low grade sandy washes. Found at elevations ranging from 197 to 3,904 feet. Blooming period ranges from March to June.	No	**Presumed Absent.** There is no suitable habitat within the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Calochortus clavatus* var. *clavatus club-haired mariposa-lily	Fed: None CA: None CNPS: 4.3	Grows in serpentine, clay, and rocky soils in chaparral, cismontane woodland, coastal scrub, and valley and foothill grasslands. Found at elevations ranging from 246 to 4,265 feet. Blooming period can begin as early as March, but is typically from May to June.	No	**Presumed absent.** No suitable habitat is present on-site.
Calochortus clavatus* var. *gracilis slender mariposa-lily	Fed: None CA: None CNPS: 1B.2	Grows in chaparral, coastal scrub, and valley and foothill woodlands. Found at elevations ranging from 1,050 to 3,280 feet. Blooming period is typically from March to June, but can extend through November.	No	**Presumed absent.** No suitable habitat is present on-site.
Calochortus palmeri* var. *palmeri Palmer's mariposa-lily	Fed: None CA: None CNPS: 1B.2	Occurs in meadows and seeps, chaparral, and lower montane coniferous forest in vernally moist places. Found at elevations ranging from 3,281 to 7,841 feet. Blooming period is from April to July.	No	**Presumed Absent.** No suitable habitat is present on-site. The project site is outside of the elevation range for this species.
Calochortus plummerae Plummer's mariposa-lily	Fed: None CA: None CNPS: 4.2	Prefers openings in chaparral, foothill woodland, coastal sage scrub, valley and foothill grasslands, cismontane woodland, lower montane coniferous forest and yellow pine forest. Often found on dry, rocky slopes and soils and brushy areas. Can be very common after a fire. From 328 to 5,577 feet in elevation. Blooming period is from May to July.	No	**Presumed absent.** No suitable habitat is present on-site.
Calystegia peirsonii Peirson's morning-glory	Fed: None CA: None CNPS: 4.2	Grows in chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grasslands. Found at elevations ranging from 98 to 4,921 feet. Blooming period is from April to June.	No	**Presumed absent.** No suitable habitat is present on-site.
Delphinium parryi* ssp. *purpureum Mt. Pinos larkspur	Fed: None CA: None CNPS: 4.3	Grows in chaparral, Mojavean desert scrub, and pinyon and juniper woodlands. Found at elevations ranging from 3,280 to 8,530 feet. Blooming period is from May to June.	No	**Presumed Absent.** No suitable habitat is present on-site. The project site is outside of the elevation range for this species.
Dodecahema leptoceras slender-horned spineflower	Fed: **END** CA: **END** CNPS: 1B.1	Chaparral, coastal scrub (alluvial fan sage scrub). Flood deposited terraces and washes. Found at elevations ranging from 1,181 to 2,690 feet. Blooming period is from April to June.	No	**Presumed absent.** No suitable habitat is present on-site.
Harpagonella palmeri Palmer's grapplinghook	Fed: None CA: None CNPS: 4.2	Occurs on clay soils in chaparral, coastal scrub, and valley and foothill grasslands. Found at elevations ranging from 66 to 3,133 feet. Blooming period is from March to May.	No	**Presumed absent.** No suitable habitat is present on-site.
Hulsea vestita* ssp. *parryi Parry's hulsea	Fed: None CA: None CNPS: 4.3	Occurs in granitic and gravelly soils within alpine boulder and rock field, and subalpine coniferous forest. Found at elevations ranging from 9,301 to 12,795 feet. Blooming period is from June to October.	No	**Presumed Absent.** No suitable habitat is present on-site. The project site is outside of the elevation range for this species.
Juglans californica southern California black walnut	Fed: None CA: None CNPS: 4.2	Found in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats. Found at elevations ranging from 164 to 2,953 feet. Blooming period is from March to August.	No	**Presumed absent.** No suitable habitat is present on-site.
Navarretia fossalis spreading navarretia	Fed: **THR** CA: None CNPS: 1B.1	Grows in chenopod scrub, assorted shallow freshwater marshes and swamps, playas, and vernal pools. Found at elevations ranging from 98 to 2,149 feet. Blooming period is from April to June.	No	**Presumed absent**. No suitable habitat is present.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Navarretia setiloba Piute Mountains navarretia	Fed: None CA: None CNPS: 1B.1	Grows in clay or gravelly loam soils in cismontante woodland, pinyon and juniper woodland, and valley and foothill grassland habitats. Found at elevations ranging from 935 to 6,890 feet. Blooming period is from April to July.	No	**Presumed absent**. No suitable habitat is present.
Opuntia basilaris* var. *brachyclada short-joint beavertail	Fed: None CA: None CNPS: 1B.2	Occurs in chaparral, Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodlands. Found at elevations ranging from 1,394 to 5,905 feet. Blooming period typically ranges from April to June, occasionally extending through August.	No	**Presumed Absent.** There is no suitable habitat within the project site.
Orcuttia californica California Orcutt grass	Fed: **END** CA: **END** CNPS: 1B.1	Primarily restricted to the southern basaltic claypan vernal pools at the Santa Rosa Plateau, and alkali vernal pools at Skunk Hollow, and at Salt Creek. Grows in elevations ranging from 45 to 2,165 feet above msl. Blooming period is from April to August.	No	**Presumed absent**. No suitable habitat is present on-site.
SPECIAL-STATUS PLANT COMMUNITIES				
Southern Coast Live Oak Riparian Forest	CDFW Sensitive Habitat	Open to locally dense evergreen riparian woodlands dominated by *Quercus agrifolia*. This type appears to be richer in herbs and poorer in understory shrubs than other riparian communities. Bottomlands and outer floodplains along larger streams, on fine-grained, rich alluvium. Canyons and valleys of coastal southern California.	No	**Absent**
Southern Riparian Scrub	CDFW Sensitive Habitat	Riparian zones dominated by small trees or shrubs, lacking taller riparian trees.	No	**Absent**
Southern Sycamore Alder Riparian Woodland	CDFW Sensitive Habitat	Below 2,000 meters in elevation, sycamore and alder often occur along seasonally-flooded banks; cottonwoods and willows also are often present. Poison-oak, mugwort, elderberry and wild raspberry may be present in the understory.	No	**Absent**
Southern Willow Scrub	CDFW Sensitive Habitat	Southern willow scrub consists of dense, broadleaved, winter-deciduous stands of trees dominated by shrubby willows in association with mule fat and scattered emergent cottonwood and western sycamores. This vegetation community occurs on loose, sandy or fine, gravelly alluvium deposited near stream channels during flood flows. Frequent flooding maintains this early seral community, preventing succession to a riparian woodland or forest. In the absence of periodic flooding, this early seral type would be succeeded by southern cottonwood or western sycamore riparian forest.	No	**Absent**

U.S. Fish and Wildlife Service (USFWS) - Federal
END - Federally Endangered
THR - Federally Threatened

California Department of Fish and Wildlife (CDFW) - California
END - State Endangered
CEND - State Candidate Endangered
SSC - Species of Special Concern
WL - Watch List

California Native Plant Society (CNPS)
California Rare Plant Rank
1A Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B Plants Rare, Threatened, or Endangered in California and Elsewhere

Threat Ranks
0.1 - Seriously threatened in California
0.2 - Moderately threatened in California
0.3 - Not very threatened in California

FP - Fully Protected

2B Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere

4 Plants of Limited Distribution – A Watch List

Attachment E

Regulations

Special status species are native species that have been afforded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels.

Federal Regulations

Endangered Species Act of 1973

Federally listed threatened and endangered species and their habitats are protected under provisions of the Federal Endangered Species Act (ESA). Section 9 of the ESA prohibits "take" of threatened or endangered species. "Take" under the ESA is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct." The presence of any federally threatened or endangered species that are in a project area generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. Under the regulations of the ESA, the United States Fish and Wildlife Service (USFWS) may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act.

Critical Habitat is designated for the survival and recovery of species listed as threatened or endangered under the ESA. Critical Habitat includes those areas occupied by the species, in which are found physical and biological features that are essential to the conservation of an ESA listed species and which may require special management considerations or protection. Critical Habitat may also include unoccupied habitat if it is determined that the unoccupied habitat is essential for the conservation of the species.

Whenever federal agencies authorize, fund, or carry out actions that may adversely modify or destroy Critical Habitat, they must consult with USFWS under Section 7 of the ESA. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highway Administration or a permit from the U.S. Army Corps of Engineers (Corps)).

If USFWS determines that Critical Habitat will be adversely modified or destroyed from a proposed action, the USFWS will develop reasonable and prudent alternatives in cooperation with the federal institution to ensure the purpose of the proposed action can be achieved without loss of Critical Habitat. If the action is not likely to adversely modify or destroy Critical Habitat, USFWS will include a statement in its biological opinion concerning any incidental take that may be authorized and specify terms and conditions to ensure the agency is in compliance with the opinion.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S. Government Code [USC] 703) makes it unlawful to pursue, capture, kill, possess, or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union, and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 USC 703; 50 CFR 10, 21).

The MBTA covers the taking of any nests or eggs of migratory birds, except as allowed by permit pursuant to 50 CFR, Part 21. Disturbances causing nest abandonment and/or loss of reproductive effort (i.e., killing or abandonment of eggs or young) may also be considered "take." This regulation seeks to protect migratory birds and active nests.

In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). Six families of raptors occurring in North America were included in the amendment: Accipitridae (kites, hawks, and eagles); Cathartidae (New World vultures); Falconidae (falcons and caracaras); Pandionidae (ospreys); Strigidae (typical owls); and Tytonidae (barn owls). The provisions of the 1972 amendment to the MBTA protects all species and subspecies of the families listed above. The MBTA protects over 800 species including geese, ducks, shorebirds, raptors, songbirds and many relatively common species.

State Regulations

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) provides for the protection of the environment within the State of California by establishing State policy to prevent significant, avoidable damage to the environment through the use of alternatives or mitigation measures for projects. It applies to actions directly undertaken, financed, or permitted by State lead agencies. If a project is determined to be subject to CEQA, the lead agency will be required to conduct an Initial Study (IS); if the IS determines that the project may have significant impacts on the environment, the lead agency will subsequently be required to write an Environmental Impact Report (EIR). A finding of non-significant effects will require either a Negative Declaration or a Mitigated Negative Declaration instead of an EIR. Section 15380 of the CEQA Guidelines independently defines "endangered" and "rare" species separately from the definitions of the California Endangered Species Act (CESA). Under CEQA, "endangered" species of plants or animals are defined as those whose survival and reproduction in the wild are in immediate jeopardy, while "rare" species are defined as those who are in such low numbers that they could become endangered if their environment worsens.

California Endangered Species Act (CESA)

In addition to federal laws, the state of California implements the CESA which is enforced by CDFW. The CESA program maintains a separate listing of species beyond the FESA, although the provisions of each act are similar.

State-listed threatened and endangered species are protected under provisions of the CESA. Activities that may result in "take" of individuals (defined in CESA as; "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") are regulated by CDFW. Habitat degradation or modification is not included in the definition of "take" under CESA. Nonetheless, CDFW has interpreted "take" to include the destruction of nesting, denning, or foraging habitat necessary to maintain a viable breeding population of protected species.

The State of California considers an endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is considered as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the

absence of special protection or management. A rare species is one that is considered present in such small numbers throughout its range that it may become endangered if its present environment worsens. State threatened and endangered species are fully protected against take, as defined above.

The CDFW has also produced a species of special concern list to serve as a species watch list. Species on this list are either of limited distribution or their habitats have been reduced substantially, such that a threat to their populations may be imminent. Species of special concern may receive special attention during environmental review, but they do not have formal statutory protection. At the federal level, USFWS also uses the label species of concern, as an informal term that refers to species which might be in need of concentrated conservation actions. As the Species of Concern designated by USFWS do not receive formal legal protection, the use of the term does not necessarily ensure that the species will be proposed for listing as a threatened or endangered species.

Fish and Game Code

Fish and Game Code Sections 3503, 3503.5, 3511, and 3513 are applicable to natural resource management. For example, Section 3503 of the Code makes it unlawful to destroy any birds' nest or any birds' eggs that are protected under the MBTA. Further, any birds in the orders Falconiformes or Strigiformes (Birds of Prey, such as hawks, eagles, and owls) are protected under Section 3503.5 of the Fish and Game Code which makes it unlawful to take, possess, or destroy their nest or eggs. A consultation with CDFW may be required prior to the removal of any bird of prey nest that may occur on a project site. Section 3511 of the Fish and Game Code lists fully protected bird species, where the CDFW is unable to authorize the issuance of permits or licenses to take these species. Pertinent species that are State fully protected by the State include golden eagle (*Aquila chrysaetos*) and white-tailed kite (*Elanus leucurus*). Section 3513 of the Fish and Game Code makes it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Native Plant Protection Act

Sections 1900–1913 of the Fish and Game Code were developed to preserve, protect, and enhance Rare and Endangered plants in the state of California. The act requires all state agencies to use their authority to carry out programs to conserve Endangered and Rare native plants. Provisions of the Native Plant Protection Act prohibit the taking of listed plants from the wild and require notification of the CDFW at least ten days in advance of any change in land use which would adversely impact listed plants. This allows the CDFW to salvage listed plant species that would otherwise be destroyed.

California Native Plant Society Rare and Endangered Plant Species

Vascular plants listed as rare or endangered by the CNPS, but which have no designated status under FESA or CESA are defined as follows:

California Rare Plant Rank

1A- Plants Presumed Extirpated in California and either Rare or Extinct Elsewhere

1B- Plants Rare, Threatened, or Endangered in California and Elsewhere

2A- Plants Presumed Extirpated in California, But More Common Elsewhere

2B- Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

3- Plants about Which More Information is Needed - A Review List

4- Plants of Limited Distribution - A Watch List

Threat Ranks

.1- Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2- Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

.3- Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known).

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates activities pursuant to Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the CDFG regulates activities under the Fish and Game Code Section 1600-1616, and the Regional Board regulates activities pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act.

Federal Regulations

Section 404 of the Clean Water Act

Since 1972, the Corps and EPA have jointly regulated the filling of waters of the United States, including wetlands, pursuant to Section 404 of the CWA. The Corps has regulatory authority over the discharge of dredged or fill material into the waters of the United States under Section 404 of the CWA. The Corps and EPA define "fill material" to include any "material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States." Examples include, but are not limited to, the placement of sand, rock, clay, construction debris, wood chips, and "materials used to create any structure or infrastructure in the waters of the United States."

In April of 2020, the Corps and the EPA provided a new definition for *waters of the United States* [Federal Register, Vol. 85, No. 77 (April 21, 2020)] which encompass:

- The territorial seas and traditional navigable waters;
- Perennial and intermittent tributaries that contribute surface water flow to such waters;
- Certain lakes, ponds, and impoundments of jurisdictional waters; and
- Wetlands adjacent to other jurisdictional waters.

Additionally, the new definition identifies 12 categories of those waters and features that are excluded from the definition of ''waters of the United State, such as features that only contain water in direct response to rainfall (e.g., ephemeral features), groundwater, many ditches, prior converted cropland, and waste treatment systems. The final rule excludes from the definition of ''waters of the United States'' all waters or features not mentioned above. In addition to this general exclusion, the final rule specifically clarifies that waters of the United States do not include the following:

- Groundwater, including groundwater drained through subsurface drainage systems;
- Ephemeral features that flow only indirect response to precipitation, including ephemeral streams, swales, gullies, rills, and pools;
- Diffuse stormwater runoff and directional sheet flow over upland;
- Ditches that are not traditional navigable waters, tributaries, or that are not constructed in adjacent wetlands, subject to certain limitations;
- Prior converted cropland;
- Artificially irrigated areas that would revert to upland if artificial irrigation ceases;
- Artificial lakes and ponds that are not jurisdictional impoundments and that are constructed or excavated in upland or non-jurisdictional waters;

- Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non jurisdictional waters for the purpose of obtaining fill, sand, or gravel;
- Stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater runoff;
- Groundwater recharge, water reuse, and wastewater recycling structures constructed or excavated in upland or in non-jurisdictional waters; and
- Waste treatment systems.

Section 401 of the Clean Water Act

Pursuant to Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity which may result in any discharge to waters of the United States must provide certification from the State or Indian tribe in which the discharge originates. This certification provides for the protection of the physical, chemical, and biological integrity of waters, addresses impacts to water quality that may result from issuance of federal permits, and helps insure that federal actions will not violate water quality standards of the State or Indian tribe. In California, there are nine Regional Water Quality Control Boards (Regional Board) that issue or deny certification for discharges to waters of the United States and waters of the State, including wetlands, within their geographical jurisdiction. The State Water Resources Control Board assumed this responsibility when a project has the potential to result in the discharge to waters within multiple Regional Boards.

State Regulations

Fish and Game Code

Fish and Game Code Sections 1600 et. seq. establishes a fee-based process to ensure that projects conducted in and around lakes, rivers, or streams do not adversely impact fish and wildlife resources, or, when adverse impacts cannot be avoided, ensures that adequate mitigation and/or compensation is provided.

Fish and Game Code Section 1602 requires any person, state, or local governmental agency or public utility to notify the CDFW before beginning any activity that will do one or more of the following:

(1) substantially obstruct or divert the natural flow of a river, stream, or lake;
(2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or
(3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake.

Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State. CDFW's regulatory authority extends to include riparian habitat (including wetlands) supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. Generally, the CDFW takes jurisdiction to the top of bank of the stream or to the outer limit of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks

that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. A Section 1602 Streambed Alteration Agreement would be required if impacts to identified CDFW jurisdictional areas occur.

Porter Cologne Act

The California *Porter-Cologne Water Quality Control Act* gives the State very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Porter-Cologne Act has become an important tool in the post SWANCC and Rapanos regulatory environment, with respect to the state's authority over isolated and insignificant waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file a Report of Waste Discharge in the event that there is no Section 404/401 nexus. Although "waste" is partially defined as any waste substance associated with human habitation, the Regional Board also interprets this to include fill discharged into water bodies.

APPENDIX C

Cultural Resource Report

CULTURAL RESOURCES ASSESSMENT

Deane Tank Site Expansion Project

Santa Clarita, Los Angeles County, California

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Project No. MER2002

National Archaeological Data Base Information:
Type of Study: Reconnaissance Cultural Resources Assessment
Resources Recorded: None
Keywords: Santa Clarita
USGS Quadrangle: 7.5-minute *Mint Canyon, California* (1995)

BCRCONSULTING LLC

October 30, 2020

MANAGEMENT SUMMARY

BCR Consulting LLC (BCR Consulting) is under contract to Meridian Consultants to conduct a Cultural Resources Assessment of the Deane Tank Site Expansion Project (the project) located in The City of Santa Clarita (City), Los Angeles County, California. Tasks completed for the scope of work include a cultural resources records search, pedestrian cultural resources survey, Sacred Lands File search with the Native American Heritage Commission, and paleontological overview. These tasks were performed in partial fulfillment of California Environmental Quality Act (CEQA) requirements. The South Central Coastal Information Center (SCCIC) at California State University, Fullerton completed the archaeological records search. This research has revealed that five cultural resource studies have taken place resulting in the recording of two cultural resources (both isolated prehistoric artifacts) within one-half mile of the project site. One of the previous studies assessed a portion of the project site for cultural resources but did not identify any cultural resources within the project boundaries. The project site contains two water reservoir tanks and has been subjected to building construction and road grading related to the tanks.

During the field survey, BCR Consulting archaeologists did not identify any cultural resources within the project boundaries. Due to a lack of cultural resources located within the project site, BCR Consulting recommends that no additional cultural resources work or monitoring is necessary for any proposed project activities. However, if previously undocumented cultural resources are identified during earthmoving activities, a qualified archaeologist should be contacted to assess the nature and significance of the find, diverting construction excavation if necessary.

Findings were negative during the Sacred Lands File search with the NAHC. The Santa Clarita Valley Water Agency (SCVWA) initiated Assembly Bill (AB) 52 Native American Consultation for the project, although BCR Consulting mailed notifications to tribes on behalf of SCVWA. Since SCVWA will carry out the required Native American Consultation, the results of the consultation are not provided in this document. However, this report may be used during the consultation process, and BCR Consulting staff is available to answer questions and address concerns as necessary.

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would “directly or indirectly destroy a unique paleontological resource”. The appended Paleontological Overview provided in Appendix B has recommended that:

> The geologic unit underlying the project area is mapped entirely as valley deposits associated with the Mint Canyon Formation dating to the Miocene epoch (Dibblee, 1996). The Western Science Center does not have localities within the project area or within a one mile radius, but the Mint Canyon Formation is considered to be of high paleontological sensitivity and is known to preserve vertebrate fossil material.
>
> Any fossils recovered from the Deane Tank Site Expansion Project area would be scientifically significant. Excavation activity associated with development of the area has the potential to impact the paleontologically sensitive Miocene sedimentary units and it is the recommendation of the Western Science Center that

a paleontological resource mitigation plan be put in place to monitor, salvage, and curate any recovered fossils associated with the current study area.

If human remains are encountered during the undertaking, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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INTRODUCTION

BCR Consulting LLC (BCR Consulting) is under contract to Meridian Consults to conduct a Cultural Resources Assessment of the Deane Tank Project (the project) located in the City of Santa Clarita (City), Los Angeles County, California. A reconnaissance-level pedestrian cultural resources survey of the project site was completed in partial fulfillment of California Environmental Quality Act (CEQA) requirements. The Santa Clarita Valley Water Agency (SCVWA) is lead agency for the project. The project site is located in sections 14 and 15 of Township 4 North, Range 15 West, San Bernardino Baseline and Meridian, as depicted on the United States Geological Survey (USGS) *Mint Canyon, California* (1995) 7.5-minute topographic quadrangle (Figure 1).

Project Description

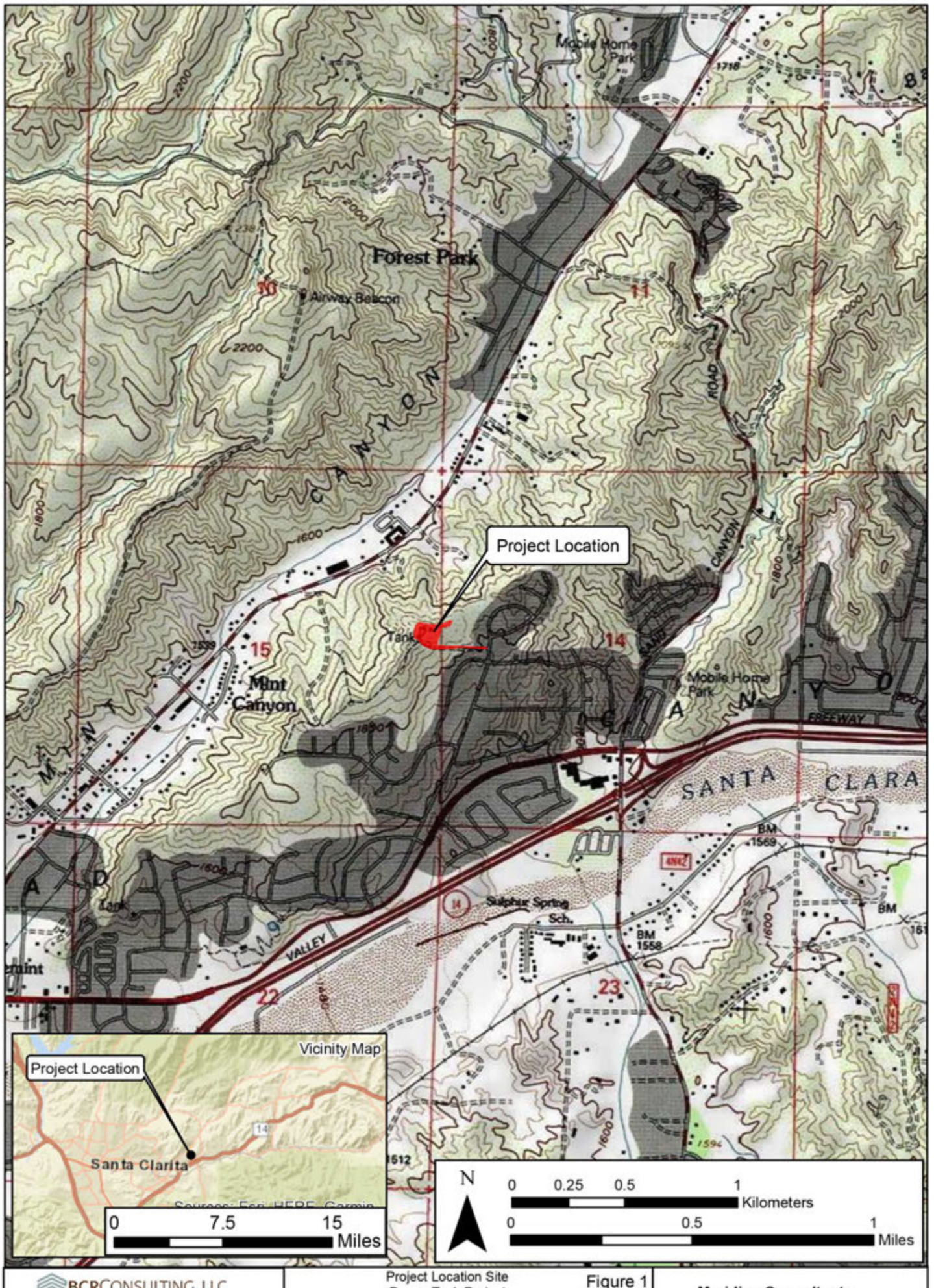
SCVWA is planning to design and build additional storage capacity in the Deane Pressure Zone, located on parcel APN 2839-002-902 westerly of Winterdale Drive and Southernly of Sierra Highway in the City of Santa Clarita, California. The rectangular project parcel is approximately 6.7 acres in size on top of a hill with access to the site provided through a paved roadway located within an easement off Winterdale Drive near the intersection of Nearview Drive. The purpose of the proposed Project is to supplement existing water service at the Deane Pressure Zone which is deficient in storage by 4.22 million-gallon (MG) per the 2013 Water Master Plan and new development within the Deane Pressure Zone has increased the deficiency. For reference, the portion of the Skyline Ranch development within the Deane Pressure Zone equates to an additional 0.87 MG of storage needed, while the Sand Canyon Plaza development adds another 0.65 MG of storage needed. Together, the total additional storage volume required is 5.66MG.

SCVWA has proposed an additional tank for the Deane Tank site to supplement the storage shortage at the Deane Pressure Zone. A single 100-foot diameter reservoir will be constructed with 29 feet operation water depth, providing an additional 1.70 MG capacity. The water supply for the new tank will be delivered from the existing two pump stations located north of the site on Sierra Highway- the Linda Vista Pump Station and Honey House Pump Station. These two pump stations currently supply water to the existing tanks at the project parcel and pipes from these stations will eventually be tied to the new piping on the site. The discharge pipeline from these pump stations is aligned along the north facing slope at the site.

To stay consistent with the existing floor elevation onsite, the ground elevation for the new tank will be cut and graded to match the elevation of the existing tanks. Existing utilities onsite will remain operational during the construction of the new tank. Related project components include utilities, a 20 feet wide asphalt paved access roadway around all tanks, drainage system around the tank site and the access roadway, potential retaining walls, and an extra fill pad to assist with balancing earthwork.

Regulatory Setting

The California Environmental Quality Act. CEQA applies to all discretionary projects undertaken or subject to approval by the state's public agencies (California Code of Regulations 14(3), § 15002(i)). Under CEQA, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may



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Project Location Site
Deane Tank Project

Figure 1

Reference: ESRI; USGS Quad: Mint Canyont (1995), California

Meridian Consultants

have a significant effect on the environment" (Cal. Code Regs. tit. 14(3), § 15064.5(b)). State CEQA Guidelines section 15064.5(a) defines a "historical resource" as a resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in, the California Register of Historical Resources (California Register)
- Listed in a local register of historical resources (as defined at Cal. Public Res. Code § 5020.1(k))
- Identified as significant in a historical resource survey meeting the requirements of § 5024.1(g) of the Cal. Public Res. Code
- Determined to be a historical resource by a project's lead agency (Cal. Code Regs. tit. 14(3), § 15064.5(a))

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California…Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources" (Cal. Code Regs. tit. 14(3), § 15064.5(a)(3)).

The significance of a historical resource is impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for the California Register. If an impact on a historical or archaeological resource is significant, CEQA requires feasible measures to minimize the impact (State CEQA Guidelines § 15126.4 (a)(1)). Mitigation of significant impacts must lessen or eliminate the physical impact that the project will have on the resource.

Section 5024.1 of the Cal. Public Res. Code established the California Register. Generally, a resource is considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register (Cal. Code Regs. tit. 14(3), § 15064.5(a)(3)). The eligibility criteria for the California Register are similar to those of the National Register of Historic Places (National Register), and a resource that meets one of more of the eligibility criteria of the National Register will be eligible for the California Register.

The California Register program encourages public recognition and protection of resources of architectural, historical, archaeological, and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding and affords certain protections under CEQA. Criteria for Designation:

1. 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. Associated with the lives of persons important to local, California or national history.

3. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values.
4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time has passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resources." (CCR 4852 [d][2]). Fifty years is normally considered sufficient time for a potential historical resource, and in order that the evaluation remain valid for a minimum of five years after the date of this report, all resources older than 45 years (i.e. resources from the "historic-period") will be evaluated for California Register listing eligibility, or CEQA significance. The California Register also requires that a resource possess integrity. This is defined as the ability for the resource to convey its significance through seven aspects: location, setting, design, materials, workmanship, feeling, and association.

Assembly Bill 52. California Assembly Bill 52 was approved on September 25, 2014. As stated in Section 11 of AB 52, the act applies only to projects that have a notice of preparation or a notice of negative declaration or mitigated negative declaration filed on or after July 1, 2015. AB 52 establishes "tribal cultural resources" (TCRs) as a new category of resources under CEQA. As defined under Public Resources Code Section 21074, TCRs are "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe" that are either: (1) included or determined to be eligible for inclusion in the CRHR; included in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or (2) determined by the lead agency to be significant pursuant to the criteria for inclusion in the CRHR set forth in Public Resources Code Section 5024.1(c), if supported by substantial evidence and taking into account the significance of the resource to a California Native American tribe. A "historical resource" as defined in Public Resources Code Section 21084.1, a "unique archaeological resource" as defined in Public Resources Code Section 21083.2(g), or a "nonunique archaeological resource" as defined in Public Resources Code Section 21083.2(h) may also be TCRs. AB 52 further establishes a new consultation process with California Native American tribes for proposed projects in geographic areas that are traditionally and culturally affiliated with that tribe. Per Public Resources Code Section 21073, "California Native American tribe" includes federally and non-federally recognized tribes on the NAHC contact list. Subject to certain prerequisites, AB 52 requires, among other things, that a lead agency consult with the geographically affiliated tribe before the release of an environmental review document for a proposed project regarding project alternatives, recommended mitigation measures, or potential significant effects, if the tribe so requests in writing. If the tribe and the lead agency agree upon mitigation measures during their consultation, these mitigation measures must be recommended for inclusion in the environmental document (Public Resources Code Sections 21080.3.1, 21080.3.2, 21082.3, 21084.2, and 21084.3). Since the SCVWA will initiate and carry out the required AB52 Native American Consultation, the results of the consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff are available to answer questions and address comments as necessary.

Paleontological Resources. CEQA provides guidance relative to significant impacts on paleontological resources, indicating that a project would have a significant impact on paleontological resources if it disturbs or destroys a unique paleontological resource or site or unique geologic feature. Section 5097.5 of the California Public Resources Code specifies that any unauthorized removal of paleontological remains is a misdemeanor. Further, California Penal Code Section 622.5 sets the penalties for damage or removal of paleontological resources. CEQA documentation prepared for projects would be required to analyze paleontological resources as a condition of the CEQA process to disclose potential impacts. Please note that as of January 2018 paleontological resources are considered in the geological rather than cultural category. Therefore, paleontological resources are not summarized in the body of this report. A paleontological overview completed by professional paleontologists from the Western Science Center is provided as Appendix B.

NATURAL SETTING

The elevation of the project site is approximately 1995 feet above mean sea level (AMSL). A series of east-west (transverse) oriented mountain ranges characterize the region, and local topography consists of steep hillsides with incised canyons formed by drainages. Formations include stream channel alluvium and marine shales, mudstones, siltstones, and fine sandstones of the upper Miocene Castaic Formation, which have been deposited by sediments derived from the Soledad Basin -an eastern extension of the Ventura Basin (Stanton 1960). The deposits observed during the field survey have been consistent with the described sediments, and have not exhibited material utilized for the production of prehistoric stone tools. Plant communities present included mixed chaparral and coastal sage scrub communities (see Williams et al. 2008). Species observed include buckbrush (Ceanothus cuneatus), black sage (Salvia mellifera), chamise (Adenostoma fasculatum), and various non-native grasses. Elements of southern oak woodland plant community have been observed in the vicinity, but not within the APE. Plants within the noted communities have been commonly exploited during prehistory by local natives (see Lightfoot and Parrish 2009:259, 266, 350, 352).

CULTURAL SETTING

Prehistoric Context

The project is encompassed by traditional Tataviam territory. The Tataviam were probably Takic speakers, although by the historic era their language had diverged considerably from their Takic speaking Gabrielino and Kitanemuk neighbors (King and Blackburn 1978). Like other Native American groups in southern California, the Tataviam were semi-nomadic hunter-gatherers who subsisted by exploitation of seasonably available plant and animal resources. The Tataviam probably first encountered Europeans when Spanish explorers reached California's interior during the 16th century (King and Blackburn 1978). Little is known ethnographically regarding this group, although archaeological data has indicated that their material cultural and spatial organization of cemeteries and villages resembled that of their neighbors, such as the Kitanemuk, Serrano, Chumash and Gabrielino (ibid.).

History

Historic-era California is generally divided into three periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

Spanish Period. The first European to pass through the area is thought to be a Spaniard called Father Francisco Garces. Having become familiar with the area, Garces acted as a guide to Juan Bautista de Anza, who had been commissioned to lead a group across the desert from a Spanish outpost in Arizona to set up quarters at the Mission San Gabriel in 1771 near what today is Pasadena (Beck and Haase 1974). Garces was followed by Alta California Governor Pedro Fages, who briefly explored the region in 1772. Searching for San Diego Presidio deserters, Fages had traveled through Riverside to San Bernardino, crossed over the mountains into the Mojave Desert, and then journeyed westward to the San Joaquin Valley (Beck and Haase 1974).

Mexican Period. In 1821, Mexico overthrew Spanish rule and the missions began to decline. By 1833, the Mexican government passed the Secularization Act, and the missions, reorganized as parish churches, lost their vast land holdings, and released their neophytes (Beattie and Beattie 1974).

American Period. The American Period, 1848–Present, began with the Treaty of Guadalupe Hidalgo. In 1850, California was accepted into the Union of the United States primarily due to the population increase created by the Gold Rush of 1849. The cattle industry reached its greatest prosperity during the first years of the American Period. Mexican Period land grants had created large pastoral estates in California, and demand for beef during the Gold Rush led to a cattle boom that lasted from 1849–1855. However, beginning about 1855, the demand for beef began to decline due to imports of sheep from New Mexico and cattle from the Mississippi and Missouri Valleys. When the beef market collapsed, many California ranchers lost their ranches through foreclosure. A series of disastrous floods in 1861–1862, followed by a significant drought further diminished the economic impact of local ranching. This decline combined with agricultural and real estate developments of the late 19th century, set the stage for diversified economic pursuits that have continued to proliferate to this day (Beattie and Beattie 1974; Cleland 1941).

PERSONNEL

David Brunzell, M.A., RPA acted as the Project Manager and Principal Investigator for the current study and compiled the technical report with contributions from BCR Consulting Archaeological Crew Chief, Joseph Orozco, M.A., RPA. The South Central Coastal Information Center (SCCIC) at California State University, Fullerton completed the archaeological records search. Staff Archaeologist Nick Shepetuk, B.A. completed the pedestrian field survey.

METHODS

Records Search

Prior to fieldwork, BCR Consulting requested an archaeological records search from the SCCIC. The records search completed a review of all recorded historic and prehistoric cultural resources, as well as a review of known cultural resources, and survey and excavation reports generated from projects completed within one mile of the project site. In addition, a review was conducted of the National Register of Historic Places (National

Register), the California Register of Historical Resources (California Register), and documents and inventories from the California Office of Historic Preservation including the lists of California Historical Landmarks, California Points of Historical Interest, Listing of National Register Properties, and the Built Environment Resource Directory (BERD).

Field Survey

An archaeological pedestrian field survey of the project site was conducted on September 22 and October 22, 2020. The survey was conducted by walking parallel transects approximately 15 meters apart across 100 percent of the project site. Soil exposures, including natural and artificial clearings, were carefully inspected for evidence of cultural resources.

RESULTS

Records Search

The SCCIC at California State University, Fullerton completed the archaeological records search. This research has revealed that five cultural resource studies have taken place resulting in the recording of two cultural resources (both isolated prehistoric artifacts) within one-half mile of the project site. One of the previous studies assessed a portion of the project site for cultural resources but did not identify any cultural resources within the project boundaries. Results are summarized in Table A and a complete records search bibliography is provided in Appendix D.

Table A. Cultural Resources and Reports Within 1/2 Mile of the Project Site

USGS 7.5 Min. Quad.	Cultural Resources Within 1/2 Mile of Project Site	Cultural Resource Studies Within 1/2 Mile of Project Site
Mint Canyon, California (1995)	P-19-100335: Prehistoric Isolate (1/4 Mile SW) P-19-100336: Prehistoric Isolate (1/4 Mile S)	LA-00500, 00502, 01084*, 04008, 13158

*Assessed a portion of the project area

Field Survey

During the field survey, BCR Consulting staff carefully inspected the project site, and identified no cultural resources within the proposed impact areas. Surface visibility was approximately 80 percent within the project site. Sediments consisted of sandy silt with poorly sorted gravels. The property has been subject to severe disturbances related to existing water tank construction and grading for access to the tanks.

RECOMMENDATIONS

BCR Consulting conducted a Cultural Resources Assessment of the Deane Tank Site Expansion Project located in the City of Santa Clarita, Los Angeles County, California. The records search data combined with the field survey results have indicated that there are no cultural resources (including prehistoric or historic-period archaeological sites or historic buildings) within or adjacent to the project site, and conditions have failed to indicate sensitivity for buried cultural resources. Therefore BCR Consulting recommends that no additional cultural resource work or monitoring is necessary for any earthmoving proposed within the project site. However, if previously undocumented cultural resources are identified during earthmoving activities, a qualified archaeologist should be contacted to assess the nature and significance of the find, diverting construction excavation if necessary.

Findings were negative during the Sacred Lands File search with the NAHC. The SCVWA initiated Assembly Bill (AB) 52 Native American Consultation for the project, although BCR Consulting mailed notifications to tribes on behalf of SCVWA. Since SCVWA will carry out the required Native American Consultation, the results of the consultation are not provided in this document. However, this report may be used during the consultation process, and BCR Consulting staff is available to answer questions and address concerns as necessary.

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would "directly or indirectly destroy a unique paleontological resource". The appended Paleontological Overview provided in Appendix B has recommended that:

> The geologic unit underlying the project area is mapped entirely as valley deposits associated with the Mint Canyon Formation dating to the Miocene epoch (Dibblee, 1996). The Western Science Center does not have localities within the project area or within a one mile radius, but the Mint Canyon Formation is considered to be of high paleontological sensitivity and is known to preserve vertebrate fossil material.
>
> Any fossils recovered from the Deane Tank Site Expansion Project area would be scientifically significant. Excavation activity associated with development of the area has the potential to impact the paleontologically sensitive Miocene sedimentary units and it is the recommendation of the Western Science Center that a paleontological resource mitigation plan be put in place to monitor, salvage, and curate any recovered fossils associated with the current study area.

If human remains are encountered during the undertaking, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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APPENDIX A

NAHC SACRED LANDS FILE SEARCH

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

September 17, 2020

Nicholas Shepetuk
BCR Consulting

Via Email to: nickshepetuk@gmail.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, Deane Tank Site Expansion Project, Los Angeles County

Dear Mr. Shepetuk:

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 negative.

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: steven.quinn@nahc.ca.gov.

Sincerely,

Steven Quinn
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Los Angeles County
9/17/2020

Barbareno/Ventureno Band of Mission Indians
Julie Tumamait-Stenslie, Chairperson
365 North Poli Ave
Ojai, CA, 93023
Phone: (805) 646 - 6214
jtumamait@hotmail.com
Chumash

Chumash Council of Bakersfield
Julio Quair, Chairperson
729 Texas Street
Bakersfield, CA, 93307
Phone: (661) 322 - 0121
chumashtribe@sbcglobal.net
Chumash

Coastal Band of the Chumash Nation
Mariza Sullivan, Chairperson
P. O. Box 4464
Santa Barbara, CA, 93140
Phone: (805) 665 - 0486
cbcntribalchair@gmail.com
Chumash

Fernandeno Tataviam Band of Mission Indians
Jairo Avila, Tribal Historic and Cultural Preservation Officer
1019 Second Street, Suite 1
San Fernando, CA, 91340
Phone: (818) 837 - 0794
Fax: (818) 837-0796
jairo.avila@tataviam-nsn.us
Tataviam

Fernandeno Tataviam Band of Mission Indians
Rudy Ortega, Tribal President
1019 Second Street, Suite 1
San Fernando, CA, 91340
Phone: (818) 837 - 0794
Fax: (818) 837-0796
rortega@tataviam-nsn.us
Tataviam

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org
Gabrieleno

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com
Gabrieleno

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com
Gabrielino

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com
Gabrielino

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com
Gabrielino

Northern Chumash Tribal Council
Fred Collins, Spokesperson
P.O. Box 6533
Los Osos, CA, 93412
Phone: (805) 801 - 0347
fcollins@northernchumash.org
Chumash

San Fernando Band of Mission Indians
Donna Yocum, Chairperson
P.O. Box 221838
Newhall, CA, 91322
Phone: (503) 539 - 0933
Fax: (503) 574-3308
ddyocum@comcast.net
Kitanemuk
Vanyume
Tataviam

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 Deane Tank Site Expansion Project, Los Angeles County.

San Luis Obispo County Chumash Council
Mark Vigil, Chief
1030 Ritchie Road
Grover Beach, CA, 93433
Phone: (805) 481 - 2461
Fax: (805) 474-4729

Chumash

Santa Ynez Band of Chumash Indians
Kenneth Kahn, Chairperson
P.O. Box 517
Santa Ynez, CA, 93460
Phone: (805) 688 - 7997
Fax: (805) 686-9578
kkahn@santaynezchumash.org

Chumash

APPENDIX B

PALEONTOLOGICAL RESOURCES OVERVIEW

WESTERN SCIENCE CENTER

BCR Consulting LLC
Nicholas Shepetuk
505 West 8th Street
Claremont, CA 91711

September 24, 2020

Dear Mr. Shepetuk,

This letter presents the results of a record search conducted for the Deane Tank Site Expansion Project in the city of Santa Clarita, Los Angeles County, California. The project site is located west of Winterdale Drive, east of Summit Hills Drive, and south of Sierra Highway in Section 15 of Township 4 North and Range 15 West on the Mint Canyon CA USGS 7.5 minute topographic quadrangle.

The geologic unit underlying the project area is mapped entirely as valley deposits associated with the Mint Canyon Formation dating to the Miocene epoch (Dibblee, 1996). The Western Science Center does not have localities within the project area or within a one mile radius, but the Mint Canyon Formation is considered to be of high paleontological sensitivity and is known to preserve vertebrate fossil material.

Any fossils recovered from the Deane Tank Site Expansion Project area would be scientifically significant. Excavation activity associated with development of the area has the potential to impact the paleontologically sensitive Miocene sedimentary units and it is the recommendation of the Western Science Center that a paleontological resource mitigation plan be put in place to monitor, salvage, and curate any recovered fossils associated with the current study area.

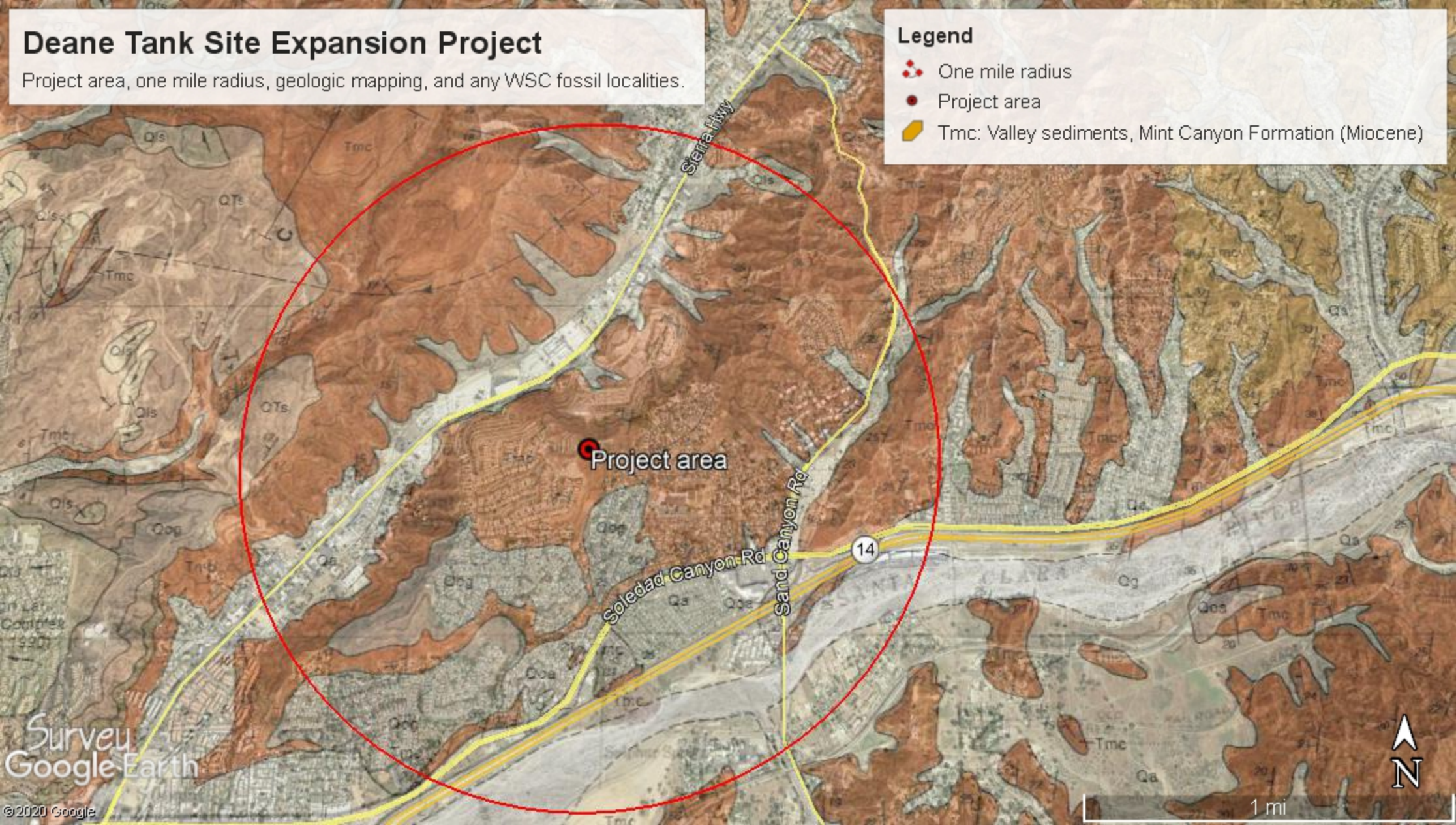
If you have any questions, or would like further information, please feel free to contact me at dradford@westerncentermuseum.org

Sincerely,

Darla Radford
Collections Manager

Deane Tank Site Expansion Project

Project area, one mile radius, geologic mapping, and any WSC fossil localities.



APPENDIX C

PROJECT PHOTOGRAPHS

Photo 1: Existing Tanks to Remain (View SE)

Photo 2: Project Area Overview (View W)

Photo 3: Project Site Overview (View NE)

Photo 4: Project Site Overview (View NE)

APPENDIX D

CONFIDENTIAL RECORDS SEARCH BIBLIOGRAPHY

Confidential Records Redacted per federal and State regulations

APPENDIX D

Energy Calculations

Table 1. Summary of Energy Use During Construction

Fuel Type	Quantity
Diesel	
On-Site Construction Equipment	19,200 Gallons
Off-Site Motor Vehicles	15,629 Gallons
Total	34,829 Gallons
Gasoline	
On-Site Construction Equipment	0 Gallons
Off-Site Motor Vehicles	966 Gallons
Total	966 Gallons
Electricity	1,939 kWh

Table 2. Summary of Annual Energy Use During Operation

Source	Units	Buildout	Existing
Electricity	kWh/yr		
Water Conveyence	kWh/yr	22,136	
Total Electricty	kWh/yr	22,136	
Transportation/On-Site Sources			
Diesel	gallons	1,126	
Gasoline	gallons	6,579	
Total	gallons	7,705	

Table 3. Water by Land Use "Regulatory Compliance"

		Project		
Land Use	**Units**	**Indoor/Outdoor Us**	**Indoor Use**	**Outdoor Use**
Buildout	Mgal	1.7/0	1.7	0

Water and Wastewater Electricity Intensity (kWh/gallon)

Supply Water	0.009727
Treat Water	0.000111
Distribute Water	0.001272
Wastewater Treatment	0.001911

Source: CalEEMod User's Guide, Appendix D, Table 9.2 Los Angeles County - Los Angeles-South Coast

Indoor Water Factor	0.013021	kWh/gallon (supply, treat, distribute, wastewater treatment)
Outdoor Water Factor	0.01111	kWh/gallon (supply, treat, and distribute)

Table 4. Off-Road Equipment Fuel Usage During Construction

Phase Name	Off-road Equipment Type	Amount	Hours per Day	Horsepower	Load Factor	Number of Days	Diesel Fuel Usage (Gallons per Project)
Project Site							
Demolition	Concrete/Industrial Saws	1	8	81	0.73	20	473
Demolition	Excavators	3	8	158	0.38	20	1,441
Demolition	Rubber Tired Dozers	2	8	247	0.4	20	1,581
Grading	Crushing/Proc. Equipment	1	8	85	0.78	66	1,750
Grading	Dumpers/Tenders	1	8	16	0.38	66	161
Grading	Rubber Tired Dozers	1	8	247	0.4	66	2,608
Grading	Scrapers	1	8	367	0.48	66	4,651
Building Construction	Cranes	1	7	231	0.29	174	4,080
Paving	Pavers	2	8	130	0.42	22	961
Paving	Paving Equipment	2	8	132	0.36	22	836
Paving	Rollers	2	8	80	0.38	22	535
Architectural Coating	Air Compressors	1	6	78	0.48	11	124
Sub-Total							*19,200*

Notes:

Equipment assumptions from CalEEMod.

Fuel usage estimate of 0.05 gallons per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3 E.

Table 5. On-Road Vehicle Fuel Usage During Construction

		Daily Trips		Total			Trip Length (Miles)			Total Length (Miles)			Fuel Consumption (Gallons)	
Long Beach River Park	**Days**	**Worker**	**Vendor**	**Worker Trips**	**Vendor Trips**	**Haul Trips**	**Worker**	**Vendor**	**Hauling**	**Worker**	**Vendor**	**Hauling**	**Gasoline**	**Diesel**
Demolition	20	15	0	300	0	0	14.7	6.9	20	4,410	0	0	159	117
Grading	66	10	0	660	0	4,875	14.7	6.9	20	9,702	0	97,500	350	14,995
Building Construction	174	3	1	522	174	0	14.7	6.9	20	7,673	1,201	0	277	384
Paving	22	15	0	330	0	0	14.7	6.9	20	4,851	0	0	175	128
Architectural Coating	11	1	0	11	0	0	14.7	6.9	20	162	0	0	6	4
Total	**293**	**44**	**1**	**1,823**	**174**	**4,875**	**n/a**	**n/a**	**n/a**	**26,798**	**1,201**	**97,500**	**966**	**15,629**

Fuel Efficiency	Gas	DSL
Workers	27.75	37.81
Vendor/Haul Trucks	0	6.62

Total	966	15,629

Notes:

Fuel efficiency calculated in ***Table 7: EMFAC2017 Results - Construction.***

Table 6. Water Usage for Control of Fugitive Dust During Construction

Phase Name	Total Acres Graded	Gallons for Project	Electricity (kWh)
Project	66	**199,320**	**1,938.8**

Notes:

Total disturbed acreage for demolition Project Site area. Total disturbed acreage for site preparation through architectural coating per CalEEMod for proposed Project.

Water Usage

3,020 gallons per acre

Source: Air & Waste Management Association, Air Pollution Engineering Manual, 1992 Edition

Supply Water Electricity Intensity

0.009727 kWh/gallons (CalEEMod default for South Coast Air Basin)

Table 7. EMFAC2017 Results - Construction

Vehicle Class	Fuel	VMT (miles per day)	Fuel (1,000 gal per day)	Fuel Efficiency (miles per gallon)	Fuel	VMT (miles per day)	Fuel (1,000 gal per day)	Fuel Efficiency (miles per gallon)
LDA	GAS	154,312,636	5,096.55	30.28	DSL	1,405,949	29.72	47.31
LDT1	GAS	17,402,686	666.55	26.11	DSL	6,756	0.31	21.82
LDT2	GAS	52,851,239	2,173.39	24.32	DSL	384,253	11.04	34.80
			Average (LDA, LDT1, LDT2)	**27.75**				**37.81**
T7 Tractor Construction	DSL	250,084	37.80	6.62				

Construction Worker Fleet Mix

LDA	50%
LDT1	25%
LDT2	25%

Vendor and Delivery/Haul Truck Fleet Mix

HHDT	100%

EMFAC2017 (v1.0.2) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	Fuel_Consumption
LOS ANGELES	2022	LDA	Aggregated	Aggregated	GAS	4040504.833	154312636.5	19063483.35	5096.55014
LOS ANGELES	2022	LDA	Aggregated	Aggregated	DSL	35580.70761	1405948.594	168445.7609	29.71915281
LOS ANGELES	2022	LDA	Aggregated	Aggregated	ELEC	79346.01523	3237232.352	396260.3789	0
LOS ANGELES	2022	LDT1	Aggregated	Aggregated	GAS	466456.294	17402686.02	2155709.822	666.5509097
LOS ANGELES	2022	LDT1	Aggregated	Aggregated	DSL	276.3592923	6755.981354	979.1709586	0.309652997
LOS ANGELES	2022	LDT1	Aggregated	Aggregated	ELEC	3550.873409	146697.1661	17760.7296	0
LOS ANGELES	2022	LDT2	Aggregated	Aggregated	GAS	1395327.914	52851239.49	6550846.129	2173.392058
LOS ANGELES	2022	LDT2	Aggregated	Aggregated	DSL	9029.025545	384253.17	44544.01587	11.04279173
LOS ANGELES	2022	LDT2	Aggregated	Aggregated	ELEC	14572.87567	476540.0157	73737.31066	0
LOS ANGELES	2022	T7 tractor constr	Aggregated	Aggregated	DSL	3625.325785	250084.1249	16389.95692	37.80397958
									8015.368685
									8015368.685

Gas	7936.493108	7936493.108	2896819984	2,925,609,569.94
Diesel	78.87557712	78875.57712	28789585.65	
Electricity	0	0	0	

Table 8. On road Vehicles - Operational

Scenario	Annual VMT	Fuel Consumption (gal)		
		Gasoline	Diesel	Total
Operation	182,997	6,579	1,126	7,705

Table 9. Fuel Consumption Summary

Fuel	Fuel Efficiency (MPG)	%Fleet	%Existing
Gasoline	26.0	93.5%	0.0%
Diesel	10.2	6.3%	0.0%
Natural Gas	3.4	0.2%	0.0%

Notes:

Percent fleet based on VMT from EMFAC2017 as shown in ***Table 10: EMFAC2017 Emissions Inventory-Operations***

Based on CalEEMod output sheets.

Fuel efficiency based on calculations in ***Table 10: EMFAC2017 Emissions Inventory-Operations,*** *from EMFAC2017.*

Table 10. EMFAC2017 Emissions Inventory - Operations

Fuel	VMT (miles/day)	Fuel Consumption (1,000 gal/day)	Fuel Efficiency (miles per gallon)	Fuel Percentage
GAS	268,859,805	10,338	26.0	93.5
DSL	18,239,802	1,782	10.2	6.3
Natural Gas	549,623	160	3.4	0.2

Note: Fuel percentage based on VMT.
Fuel efficiency calculated using fuel consumption and VMT from EMFAC2017.

Buildout

EMFAC2017 (v1.0.2) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	Fuel_Consumption
LOS ANGELES	2022	All Other Buses	Aggregated	Aggregated	DSL	2426.598446	146501.7328	20383.427	14.3421019
LOS ANGELES	2022	LDA	Aggregated	Aggregated	DSL	35580.70761	1405948.594	168445.76	29.7191528
LOS ANGELES	2022	LDT1	Aggregated	Aggregated	DSL	276.3592923	6755.981354	979.17096	0.309653
LOS ANGELES	2022	LDT2	Aggregated	Aggregated	DSL	9029.025545	384253.17	44544.016	11.0427917
LOS ANGELES	2022	LHD1	Aggregated	Aggregated	DSL	66438.77298	2829556.448	835716.18	130.175266
LOS ANGELES	2022	LHD2	Aggregated	Aggregated	DSL	26821.57306	1100164.26	337381.65	56.1858244
LOS ANGELES	2022	MDV	Aggregated	Aggregated	DSL	19913.35499	791156.8054	97958.745	29.4302125
LOS ANGELES	2022	MH	Aggregated	Aggregated	DSL	6142.766028	64185.85871	614.2766	6.09420068
LOS ANGELES	2022	Motor Coach	Aggregated	Aggregated	DSL	690.4147844	93044.15999	10080.056	14.2840955
LOS ANGELES	2022	PTO	Aggregated	Aggregated	DSL	0	79209.0386	0	16.0541121
LOS ANGELES	2022	SBUS	Aggregated	Aggregated	DSL	3866.897734	122197.4183	44623.464	16.0638421
LOS ANGELES	2022	T6 Ag	Aggregated	Aggregated	DSL	12.10479957	101.9666453	53.261118	0.01218157
LOS ANGELES	2022	T6 CAIRP heavy	Aggregated	Aggregated	DSL	339.4332582	67083.52265	4955.7256	5.8078138
LOS ANGELES	2022	T6 CAIRP small	Aggregated	Aggregated	DSL	181.7202948	9464.327402	2653.1163	0.87587781
LOS ANGELES	2022	T6 instate construct	Aggregated	Aggregated	DSL	2542.224734	170126.8415	11493.299	16.7121855
LOS ANGELES	2022	T6 instate construct	Aggregated	Aggregated	DSL	8462.077315	450145.7555	38256.723	43.9584365
LOS ANGELES	2022	T6 instate heavy	Aggregated	Aggregated	DSL	10547.07409	1455514.974	121711.77	131.868535
LOS ANGELES	2022	T6 instate small	Aggregated	Aggregated	DSL	38737.1496	1972425.144	447021.34	190.794054
LOS ANGELES	2022	T6 OOS heavy	Aggregated	Aggregated	DSL	195.638099	38838.81209	2856.3162	3.3588366

LOS ANGELES	2022	T6 OOS small	Aggregated	Aggregated	DSL	104.3823473	5388.107709	1523.9823	0.49952956
LOS ANGELES	2022	T6 Public	Aggregated	Aggregated	DSL	4527.375726	70713.41714	13733.04	8.66083027
LOS ANGELES	2022	T6 utility	Aggregated	Aggregated	DSL	1014.343198	17105.5263	11664.947	1.76607585
LOS ANGELES	2022	T7 Ag	Aggregated	Aggregated	DSL	5.193051548	102.8930892	22.849427	0.01852168
LOS ANGELES	2022	T7 CAIRP	Aggregated	Aggregated	DSL	6382.019495	1134600.882	93177.485	164.652398
LOS ANGELES	2022	T7 CAIRP constructi	Aggregated	Aggregated	DSL	677.6914819	122203.5881	3063.8168	16.7040882
LOS ANGELES	2022	T7 NNOOS	Aggregated	Aggregated	DSL	6908.616933	1383134.925	100865.81	190.163757
LOS ANGELES	2022	T7 NOOS	Aggregated	Aggregated	DSL	2520.514105	445789.868	36799.506	66.3383045
LOS ANGELES	2022	T7 POLA	Aggregated	Aggregated	DSL	8290.297935	1076131.599	63006.264	189.442814
LOS ANGELES	2022	T7 Public	Aggregated	Aggregated	DSL	5501.543454	111458.0695	16688.015	19.1802686
LOS ANGELES	2022	T7 Single	Aggregated	Aggregated	DSL	6004.21985	398912.551	69287.865	60.9272672
LOS ANGELES	2022	T7 single constructi	Aggregated	Aggregated	DSL	4339.818685	303164.6252	19620.152	44.8680139
LOS ANGELES	2022	T7 SWCV	Aggregated	Aggregated	DSL	1392.501649	56894.30171	5430.7564	28.0461909
LOS ANGELES	2022	T7 tractor	Aggregated	Aggregated	DSL	12303.60189	1664070.759	156255.74	233.28579
LOS ANGELES	2022	T7 tractor construct	Aggregated	Aggregated	DSL	3625.325785	250084.1249	16389.957	37.8039796
LOS ANGELES	2022	T7 utility	Aggregated	Aggregated	DSL	407.1754051	8267.098357	4682.5172	1.3123269
LOS ANGELES	2022	UBUS	Aggregated	Aggregated	DSL	37.1389	5105.145298	148.5556	0.80713293
LOS ANGELES	2022	LDA	Aggregated	Aggregated	GAS	4040504.833	154312636.5	19063483	5096.55014
LOS ANGELES	2022	LDT1	Aggregated	Aggregated	GAS	466456.294	17402686.02	2155709.8	666.55091
LOS ANGELES	2022	LDT2	Aggregated	Aggregated	GAS	1395327.914	52851239.49	6550846.1	2173.39206
LOS ANGELES	2022	LHD1	Aggregated	Aggregated	GAS	107665.0189	3912114.95	1604048.4	374.458459
LOS ANGELES	2022	LHD2	Aggregated	Aggregated	GAS	18107.10123	636816.2065	269768.83	69.9544021
LOS ANGELES	2022	MCY	Aggregated	Aggregated	GAS	181916.5067	1290803.93	363833.01	36.0849732
LOS ANGELES	2022	MDV	Aggregated	Aggregated	GAS	941584.3061	33063464.21	4363838.4	1672.52569
LOS ANGELES	2022	MH	Aggregated	Aggregated	GAS	19672.43712	198291.6854	1968.0306	38.6350509
LOS ANGELES	2022	OBUS	Aggregated	Aggregated	GAS	4028.136326	167752.5949	80594.952	33.5574804
LOS ANGELES	2022	SBUS	Aggregated	Aggregated	GAS	1393.897962	56948.09952	5575.5918	6.1896841
LOS ANGELES	2022	T6TS	Aggregated	Aggregated	GAS	14669.99802	811414.7327	293517.32	160.705439
LOS ANGELES	2022	T7IS	Aggregated	Aggregated	GAS	55.46637507	5860.691124	1109.7712	1.42694799
LOS ANGELES	2022	UBUS	Aggregated	Aggregated	GAS	463.7251984	33581.36145	1854.9008	7.9442888
LOS ANGELES	2022	LDA	Aggregated	Aggregated	ELEC	79346.01523	3237232.352	396260.38	0
LOS ANGELES	2022	LDT1	Aggregated	Aggregated	ELEC	3550.873409	146697.1661	17760.73	0
LOS ANGELES	2022	LDT2	Aggregated	Aggregated	ELEC	14572.87567	476540.0157	73737.311	0
LOS ANGELES	2022	MDV	Aggregated	Aggregated	ELEC	7529.633431	254507.8273	38504.203	0
LOS ANGELES	2022	UBUS	Aggregated	Aggregated	ELEC	14	1217.553685	56	0
LOS ANGELES	2022	T7 SWCV	Aggregated	Aggregated	NG	2627.443069	106986.7103	10247.028	47.8510215
LOS ANGELES	2022	UBUS	Aggregated	Aggregated	NG	4177.418205	442636.1645	16709.673	112.547171

	VMT Sum	Fuel Sum	Fuel Sum/Year
Diesel	18239802.29	1781.566463	**650,271,759**
Gas	268859805.4	10337.97552	**3,773,361,064**
Natural Gas	549622.8748	160.3981923	**58,545,340**
			4,482,178,164

APPENDIX E

Geologic and Soils Report

BYER GEOTECHNICAL, INC.

August 25, 2020
BG 23237

Civiltec Engineering, Inc.
118 West Lime Avenue
Monrovia, California 91016

Attention: W. David Byrum

Subject

Transmittal of Geologic and Soils Engineering Exploration
Proposed Santa Clarita Valley Water Agency Deane Tank,
Retaining Walls, and Grading
Assessor's ID No. 2839-002-902
Between 28613 and 28625 Winterdale Drive
Santa Clarita, California

Dear Mr Byrum:

Byer Geotechnical has completed our report dated August 25, 2020, which describes the geologic and soils engineering conditions with respect to construction of the proposed project. Four copies of the report and the CD are enclosed.

It is our understanding that your office will file the report and CD with the reviewing governmental agency's. Please review the report carefully prior to submittal to the governmental agency. Questions concerning the report should be directed to the undersigned. Byer Geotechnical appreciates the opportunity to offer our consultation and advice on this project.

Very truly yours,
BYER GEOTECHNICAL, INC.

James E. Tucker
Project Geologist

BYER GEOTECHNICAL, INC.

GEOLOGIC AND SOILS ENGINEERING EXPLORATION
PROPOSED SANTA CLARITA VALLEY WATER AGENCY DEANE TANK, RETAINING WALLS, AND GRADING
ASSESSOR'S ID NO. 2839-002-902
BETWEEN 28613 AND 28625 WINTERDALE DRIVE
SANTA CLARITA, CALIFORNIA
FOR CIVILTEC ENGINEERING, INC.
BYER GEOTECHNICAL, INC., PROJECT NUMBER BG 23237
AUGUST 25, 2020

1461 East Chevy Chase Drive, Suite 200 • Glendale, California 91206 • tel 818.549.9959 • fax 818.543.3747 • www.byergeo.com

GEOLOGIC AND SOILS ENGINEERING EXPLORATION
PROPOSED SANTA CLARITA VALLEY WATER AGENCY DEANE TANK, RETAINING WALLS, AND GRADING
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BYER GEOTECHNICAL, INC., PROJECT NUMBER BG 23237
AUGUST 25, 2020

INTRODUCTION

This report has been prepared per our signed Agreement and summarizes findings of Byer Geotechnical, Inc., geologic and soils engineering exploration performed on a portion of the site. The purpose of this study is to evaluate the nature, distribution, engineering properties, relative stability, and geologic structure of the earth materials underlying the site with respect to construction of the proposed water tank. This report is intended to assist in the design and completion of the proposed project and to reduce geotechnical risks that may affect the project. The professional opinions and advice presented in this report are based upon commonly accepted exploration standards and are subject to the AGREEMENT with TERMS AND CONDITIONS, and the GENERAL CONDITIONS AND NOTICE section of this report. No warranty is expressed or implied by the issuing of this report.

PROPOSED PROJECT

The scope of the proposed project was determined from the preliminary plans prepared by Civiltec Engineering, Inc. The project consists of grading a level pad to accommodate the proposed 1.7 million gallon, 100 foot diameter water tank. Grading will consist of cut and fill operations to create the level pad. Access will be provided by connecting to an existing paved road which ascends from Winterdale Drive to the existing two water tanks. The pad is to be enlarged to create access around the tank by placing retaining walls up to 11 feet high over the descending slope to support the backfill to the southeast and placing a fill slope to the west.

EXPLORATION

The scope of the field exploration was determined from our initial site visit and consultation with W. David Byrum of Civiltect Engineering, Inc. The preliminary plans prepared by Civiltec Engineering Inc., dated July 2020, were a guide to our work on this project. Exploration was conducted using techniques normally applied to this type of project in this setting. This report is limited to the area of the exploration and the proposed project as shown on the Geologic Map and cross sections. The scope of this exploration did not include an assessment of general site environmental conditions for the presence of contaminants in the earth materials and groundwater. Conditions affecting portions of the property outside the area explored are beyond the scope of this report.

Exploration was conducted on June 30, 2020 with the aid of a track-mounted backhoe. It included excavating six test pits to depths of 4 to 8½ feet. Samples of the earth materials were obtained and delivered to our soils engineering laboratory for testing and analysis. The test pits were visually logged by the project consultant. The test pits were backfilled and tamped, but should not be considered compacted.

Office tasks included laboratory testing of selected soil samples, review of published maps and photos for the area, review of our files, review of agency files, preparation of cross sections, preparation of the Geologic Map, slope stability calculations, engineering analysis, and preparation of this report. Earth materials exposed in the test pits are described on the enclosed Log of Test Pits. Appendix I contains a discussion of the laboratory testing procedures and results.

The proposed project, surface geologic conditions, and the locations of the test pits, are shown on the Geologic Map. Subsurface distribution of the earth materials, projected geologic structure, and the proposed project are shown on Sections A, B, and C. Sections A and B forms the basis for the slope stability calculations.

PRIOR WORK

Several reports for the Tract 45416, located to the west of the subject property, were prepared in the 1990's and early 2000's. GeoConcepts prepared the report *Limited Geologic and Soils Engineering Investigation, Grading Plan Review, Tract 45416* dated February 2, 1998. This report contains laboratory test results performed on samples obtained during exploration for the bedrock (conglomerate of the Mint Canyon Formation) which is also present on the subject property. The J. Byer Group prepared the report *Geologic and Soils Engineering Update, Grading Plan for Tract 45416, Sierra Highway, Santa Clarita, California* dated March 9, 2001, assuming geotechnical responsibility for the project. The J. Byer Group performed observations and testing of the compaction of fill during grading of the Tract 45416. The compacted fill was certified by The J. Byer Group in their report *Final Compaction Report, Proposed Residential Lots, Lots 35-66, 85-87, and 105-113, Tract 45416, Linda Vista Street and Sierra Highway, Santa Clarita, California* dated August 13, 2003. A portion of the compacted fill extends onto the westernmost portion of the subject property as shown on the enclosed Geologic Map.

SITE DESCRIPTION

The subject property consists of a partially-graded hillside parcel in the hills to the north of Soledad Canyon, in the city of Santa Clarita, of the County of Los Angeles, California (34.4316° N Latitude, 118.4338° W Longitude). It is located approximately ½ mile north of the Antelope Valley (14) Freeway and ½ mile west of Sand Canyon Road. The site is developed with two water tanks on a level pad surrounded by asphalt. The pad is accessed via a 1,120 foot long, paved road from Winterdale Drive. The pad is at an elevation approximately 190 feet higher than the point where the access road intersects Winterdale Drive. The paved access road runs west from Winterdale Drive approximately 800 feet then turns north for an additional 320 feet to the pad. The pad is located on the top of a southwest trending ridge. A secondary ridge trends to the northwest, west and south of the main ridge. The slope to the north of the pad descends approximately 200 feet at approximately a 1½:1 gradient to a level pad occupied by buildings, roads, and parking areas for the College of the Canyons School. A narrow (less than 8 feet wide) unpaved access road descends from the level pad along the slope face to lower College of the Canyons pad. A deeply incised (approximately 12 feet deep) erosion gully descends from the upper portion of the unpaved access road perpendicular to the contours of the slope contours to the College of the Canyons pad. The cut slope to the west of the level tank pad and ridge top descends approximately 20 feet at gradients ranging from 1½:1 to 1:1 to a level pad area. This pad area was created during grading for Tract 45416. This level pad area is approximately 120 feet wide with a descending compacted fill slope farther to the west. This compacted fill slope descends approximately 150 feet at a 2:1 gradient. There are several 8 to 10 foot wide and one 25 foot wide concrete terrace drains on the slope which collect slope drainage and direct it to a descending concrete drainage swale in the middle of the slope. The drainage swale empties into a debris basin at the base of the slope. A 45 foot high 1.2:1 cut slope descends to the southeast of the pad to a gently sloping pad area west of the paved access road. Slopes to the south and east of the access road descend approximately 100 at approximately a 2:1 gradient to building pads. These building pads are developed with single family residences.

Vegetation on the site consists of a moderately thick assemblage of native chaparral on the slopes. Surface drainage for the slopes is by sheetflow runoff down the contours of the land to the north, west, and southeast. Pad drainage runs down the paved access road to an inlet structure south of the road.

GROUNDWATER

Groundwater was not encountered in the test pits to a maximum depth of 8½ feet. Previous exploration (by others) performed as part of development of Tract 45416 in the area of the proposed property did not encounter groundwater. Seasonal fluctuations in groundwater levels occur due to variations in climate, irrigation, development, and other factors not evident at the time of the exploration. Groundwater levels may also differ across the site. Groundwater can saturate earth materials causing subsidence or instability of slopes.

EARTH MATERIALS

Fill

Minor fill, associated with previous site grading, underlies the pad area of the site to a maximum observed depth of one foot in Test Pit 2. Greater depths of fill may occur. The fill consists of gravelly sand which is light gray brown, dry, medium dense to dense with rock fragments up to six inches.

Compacted Fill

Compacted fill associated with the grading and development of Tract 45416 underlies the west portion of the site. The compacted fill consists of sandy gravel and gravelly sand which is light gray, light gray brown, gray brown dry to moist, dense to very dense with rock fragments up to 18 inches.

Bedrock

Bedrock underlying the site and encountered in the test pits consists of conglomerate mapped as part of the Mint Canyon Formation (Dibblee, Jr., 1996). The bedrock is brown, light brown, light gray to gray, hard to very hard, subrounded to subangular clasts up to 12 inches in a fine to coarse grained matrix.

GEOLOGIC STRUCTURE

The bedrock described above is common to this area of Santa Clarita and the geologic structure is consistent with regional trends. The bedrock observed in the test pits is generally massive and lacks significant structural planes. The regional structure as shown on the enclosed Regional Geologic Map consists of bedding which strikes approximately north south and dips between 21 and 25 degrees to the west.

The massive nature of the bedrock is favorable for the gross stability of the site and proposed project.

GENERAL SEISMIC CONSIDERATIONS

The subject property is located in an active seismic region. Moderate to strong earthquakes can occur on numerous local faults. The United States Geological Survey, California Geological Survey (CGS), private consultants, and universities have been studying earthquakes in southern California for several decades. Early studies were directed toward earthquake prediction and estimation of the effects of strong ground shaking. Studies indicate that earthquake prediction is not practical and not sufficiently accurate to benefit the general public. Governmental agencies now require earthquake-resistant structures. The purpose of the code seismic-design parameters is to prevent collapse during strong ground shaking. Cosmetic damage should be expected.

Southern California faults are classified as "active" or "potentially active." Faults from past geologic periods of mountain building that do not display evidence of recent offset are considered "potentially active." Faults that have historically produced earthquakes or show evidence of movement within the past 11,000 years are known as "active faults." No known active faults cross the subject property, and the property is not located within a currently-designated Alquist-Priolo Earthquake Fault Zone (CGS, 2000).

The following table lists the applicable seismic coefficients for the project based on the California Building Code:

SEISMIC COEFFICIENTS (2019 California Building Code - Based on ASCE Standard 7-16)		
Latitude = 34.4316° N Longitude = 118.4338° W	Short Period (0.2s)	One-Second Period
Earth Materials and Site Class from Table 20.3-1, ASCE Standard 7-10	Bedrock - C	
Mapped Spectral Accelerations from Figures 1613.3.1 (1) and 1613.3.1 (2) and USGS	S_s = 2.074 (g)	S_1 = 0.762 (g)
Site Coefficients from Tables 1613.3.3 (1) and 1613.3.3 (2) and USGS	F_A = 1.2	F_V = 1.4
Maximum Considered Spectral Response Accelerations from Equations 16-37 and 16-38, 2013 CBC	S_{MS} = 2.489 (g)	S_{M1} = 1.067 (g)
Design Spectral Response Accelerations from Equations 16-39 and 16-40, 2013 CBC	S_{DS} = 1.659 (g)	S_{D1} = 0.711 (g)
Maximum Considered Earthquake Geometric Mean (MCE_G) Peak Ground Acceleration, adjusted for Site Class effects	PGA_M = 1.051 (g)	

Reference: U.S. Geological Survey, **Geologic Hazards Science Center, U. S. Seismic Design Maps,** http://earthquake.usgs.gov/designmaps/us/application.php

The principal seismic hazard to the proposed project is strong ground shaking from earthquakes produced by local faults. It is likely that the subject property will be shaken by future earthquakes produced in southern California.

Ground Motion

To determine the ground motion for the project site, a probabilistic seismic deaggregation analysis was performed, using the USGS 2008 Interactive Deaggregation application available online (http://earthquake.usgs.gov/hazards/interactive/) for a 10-percent probability of exceedance in 50 years (475-year return period) and using a shear-wave velocity estimate of 537 meters-per-second. The results are shown on the enclosed Seismic Hazard Deaggregation Chart The analysis indicates a peak ground acceleration (PGA) of 0.54g, a modal earthquake magnitude (M_w) of 7.9, and a modal fault distance of 10.7 kilometers.

Liquefaction

The CGS has not mapped the site within an area where historic occurrence of liquefaction or geological, geotechnical, and groundwater conditions indicate a potential for permanent ground displacement such that mitigation as defined in Public Resources Code Section 2693 (c) would be required. The subject property is underlain by bedrock, which is not subject to liquefaction.

SLOPE STABILITY

Gross Stability

The CGS has designated the property within a state zone requiring seismic landslide investigation per Public Resources Code, Section 2693 (c).

Slopes analyzed for stability are based on the enclosed Sections A and B. The gross stability of the slopes was analyzed using a computerized version of Simplified Bishop's Method *(Slide 7.0*, Rocscience, Inc., 2016).

The analysis shows that the existing and proposed slopes are grossly stable with a factor of safety in excess of 1.5 under static conditions and 1.1 under pseudo-static (seismic) conditions. The calculations use the shear tests of samples believed to be representative of the strength of the earth materials underlying the site. The cross sections and geologic structure used are the most critical for the slopes analyzed.

CONCLUSIONS AND RECOMMENDATIONS

General Findings

The conclusions and recommendations of this exploration are based upon review of the preliminary plans, review of published maps, six test pits, field geologic mapping, research of available records, laboratory testing, engineering analysis, and years of experience performing similar studies on similar sites. It is the finding of Byer Geotechnical, Inc., that development of the proposed project is feasible from a geologic and soils engineering standpoint, provided the advice and recommendations contained in this report are included in the plans and are implemented during construction.

The recommended bearing material is the bedrock. Conventional spread footings may be utilized for the tank and retaining wall east of the existing water tank. A deepened foundation system consisting of friction piles and grade beams may be utilized to support the proposed retaining wall southeast of the proposed water tank. Soils to be exposed at finished grade will be in the non-expansive range.

Code Sections 111

Relative to the County of Los Angeles Code Section 111, it is the finding of Byer Geotechnical that following the implementation of the recommendations contained in this report, the completed grading will be free of potential geologic hazards such as future landsliding, slippage, and fault

rupture, and that potential geologic hazards such as seismic-induced settlement are adequately mitigated. The completed grading will not adversely affect the site or adjoining properties.

SITE PREPARATION

The following general grading specifications may be used in preparation of the grading plan and job specifications. It should be noted that excavation of the onsite material will generate a large proportion of material greater than six inches in size, which should not be placed in the compacted fill. Byer Geotechnical would appreciate the opportunity of reviewing the plans to ensure that these recommendations are included. The grading contractor should be provided with a copy of this report.

A. The area to receive compacted fill should be prepared by removing all vegetation, debris, and existing uncertified fill. The exposed excavated area should be observed by the geologist prior to placing compacted fill. The exposed grade should be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted to 90 percent of the maximum dry density.

B. Fill, consisting of soil approved by the soils engineer, shall be placed in horizontal lifts, moistened as required, benched into bedrock, and compacted in six-inch layers with suitable compaction equipment. The excavated onsite materials are considered satisfactory for reuse in the controlled fills, however excavation of the onsite material will generate a large proportion of material greater than 6 inches in size. Any imported fill shall be observed by the soils engineer prior to use in fill areas. Rocks larger than six inches in diameter shall not be used in the fill.

C. The moisture content of the fill should be near the optimum moisture content. When the moisture content of the fill is too wet or dry, the fill shall be moisture conditioned and mixed until the proper moisture is attained.

D. The fill shall be compacted to at least 90 percent of the maximum laboratory dry density for the material used. The maximum dry density shall be determined by ASTM D 1557-12 or equivalent.

E. Field observation and testing shall be performed by the soils engineer during grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compactive effort shall be made with adjustment of the moisture content, as necessary, until 90 percent relative compaction is obtained. A minimum of one compaction test is required for each 500 cubic yards or two vertical feet of fill placed.

Fill Slopes

Fill slopes may be constructed at a 2:1 gradient. Compacted fill should be keyed and benched into either the existing compacted fill or bedrock. Keyways should be a minimum of 15 feet wide and three feet into bedrock of compacted fill as measured on the downhill side. The base of all fills require subdrains. Fill slopes shall be overbuilt about two feet and trimmed to expose the compacted inner core. Trackwalking of slopes is not acceptable to Byer Geotechnical. Spoils from drain excavations should be removed from the site and not cast over the finished slope.

Cut Slopes

The proposed cut slopes up to 16 feet high in the bedrock may be excavated at a 2:1 gradient.

Excavation Characteristics

The bedrock was penetrated by the test pits to 8½ feet. Hard bedrock was found in Test Pit 2. Excavation difficulty is a function of the degree of weathering and amount of fracturing within the bedrock. The bedrock generally becomes harder and more difficult to excavate with increasing depth. Hard, cemented layers are also known to occur at random locations and depths and may be encountered during foundation excavation. Should a hard, cemented layer be encountered, coring or the use of jackhammers may be necessary. In addition, excavations will generate large amounts of oversized material. Clasts observed during exploration within the conglomerate were in excess of 12 inches in diameter.

FOUNDATION DESIGN

Spread Footings

Continuous footings may be used to support the proposed tank and retaining wall east of the existing tanks provided they are founded in bedrock. Continuous footings should be a minimum of 12 inches in width. Pad footings should be a minimum of 24-inches square. The following chart contains the recommended design parameters.

Bearing Material	Minimum Embedment Depth of Footing (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Bedrock	12	4,000	0.5	400	8,000

Increases in the bearing value are allowable at a rate of 800 pounds-per-square-foot for each additional foot of footing width or depth to a maximum of 8,000 pounds-per-square-foot. For bearing calculations, the weight of the concrete in the footing may be neglected.

The bearing value shown above is for the total of dead and frequently applied live loads and may be increased by one-third for short duration loading, which includes the effects of wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third.

Footings adjacent to retaining walls should be deepened below a 1:1 plane from the bottom of the lower retaining wall.

All continuous footings should be reinforced with a minimum of four #4 steel bars: two placed near the top and two near the bottom of the footings. Footings should be cleaned of all loose soil, moistened, free of shrinkage cracks, and approved by the geologist prior to placing forms, steel, or concrete.

Modulus of Subgrade Reaction

The allowable modulus of subgrade reaction, k_1, is 250 kips-per-cubic-foot for a 12-inch by 12-inch footing. The modulus should be reduced for larger footings. For rectangular footings of dimensions B x L, the following formula may be used (Bowles, 1996):

$$k_s = k_1 * (m + 0.5) / (1.5 * m)$$

where k_s = Modulus of subgrade reaction for a full-size mat foundation,

$$m = L / B.$$

Deepened Foundations - Friction Piles

Cast-in-place, concrete friction piles are recommended to support the proposed retaining wall to be constructed over the descending slope to the southeast of the proposed water tank. Piles should be a minimum of 24 inches in diameter and a minimum of eight feet into bedrock. The structural engineer may design piles that are deeper or larger in diameter depending on final loads. Piles may be assumed fixed at three feet into bedrock. The piles may be designed for a skin friction of 500 pounds-per-square-foot for that portion of pile in contact with the bedrock. Piles for retaining walls need only be tied in one horizontal direction with grade beams. The bottom of the grade beam should be a minimum of five horizontal feet to the descending slope face.

Lateral Design

The friction value is for the total of dead and frequently applied live loads and may be increased by one-third for short duration loading, which includes the effects of wind or seismic forces. Resistance to lateral loading may be provided by passive earth pressure within the bedrock.

Passive earth pressure may be computed as an equivalent fluid having a density of 400 pounds-per-cubic-foot. The maximum allowable earth pressure is 8,000 pounds-per-square-foot. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Piles spaced more than 3-pile diameters on center may be considered isolated.

Foundation Settlement

Settlement of the foundation systems is expected to occur on initial application of loading. A total settlement of one-fourth to one-half of an inch may be anticipated. Differential settlement should not exceed one-fourth of an inch.

Foundation Setback

The California Building Code requires that foundations be a sufficient depth to provide a horizontal setback from a descending slope steeper than 3:1. The required setback is one-third the height of the slope, with a maximum of 40 feet, measured horizontally, from the base of the foundation to the slope face. On the subject property, the slope descends below the building area up to 180 feet. The code-required clearance is 40 feet.

Geologic conditions on the site are favorable for stability. It is the opinion of Byer Geotechnical that the required setback can be reduced to 20 feet from the slope face. The recommended setback is an "alternate setback" per the 2016 California Building Code, Section 1808.7.5, based upon this site-specific geologic and geotechnical study.

RETAINING WALLS

General Design

Retaining walls up to 11 feet high with a level backslope and up to eight feet high with a 2:1 backslope may be designed for an equivalent fluid pressure of 43 pounds-per-cubic-foot per the enclosed calculations. Retaining walls should be provided with a subdrain or weepholes covered with a minimum of 12 inches of ¾-inch crushed gravel.

For design of walls in hillside areas, the temporary backcut should be considered in the wall height. Backfilling a 1:1 temporary cut at 2:1, when the original slope is steeper than 2:1, results in a higher wall. The topographic survey data should be checked to avoid the need for a costly redesign during construction.

Seismic Loading

It is unclear what guidelines should be utilized for seismic loading on the proposed retaining walls. The seismic loading on the proposed retaining walls was calculated using a horizontal pseudo-static seismic coefficient (k_h) equal to ⅓ $PGA_M = 0.35g$ based on the enclosed he calculations (Calculation Sheet #2). It is the opinion of Byer Geotechnical, Inc., that the static design pressures are sufficient to support seismic loading.

Should the County of Los Angeles guidelines be utilized the seismic loading should be based on Section S004.0 of the Administrative Manual, which was recently updated on January 6, 2020. The following equations (based on Section S004.0) were used to determine the seismic loading (ΔP_{ae}) on cantilevered retaining walls over six feet high, with a level backfill and a sloping backfill (2:1):

level backfill $\Delta P_{ae} - \frac{1}{2} \gamma H^2 (0.42\ PGA / g)$

sloping backfill $\Delta P_{ae} = \frac{1}{2} \gamma H^2 (0.70\ PGA / g)$

Where: γ = Unit Weight of Soil = 135 pcf

H = Retained Height = 11 feet level, 8 feet sloping

$PGA = S_{DS} / 2.5 = 1.659 / 2.5 = 0.66g$

The results indicate that the seismic load for a retained height up to 11 feet with a level backfill is 2,276 pounds, which is to be added to the active pressure. The seismic load for a retained height up to 8 feet with a sloping backfill (2:1) is 2,007 pounds, which is to be added to the active pressure The seismic load should be applied at 0.4H measured from the bottom of the wall.

Backfill

Retaining wall backfill should be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557-12, or equivalent. Where access between the retaining wall and the temporary excavation prevents the use of compaction equipment, retaining walls should be backfilled with ¾-inch crushed gravel to within two feet of the ground surface. Where the area between the wall and the excavation exceeds 18 inches, the gravel must be vibrated or wheel-rolled, and tested for compaction. The upper two feet of backfill above the gravel should consist of a compacted-fill blanket to the surface.

Foundation Design

Retaining wall footings may be sized per the "Deepened Foundations" and "Spread Footings" sections of this report.

Freeboard

Retaining walls surcharged by a sloping condition should be provided with a minimum of 12 inches of freeboard for slough protection. An open "V" drain should be placed behind the wall so that all upslope flows are directed to an approved location.

Temporary Excavations

Temporary excavations will be required during grading to construct the proposed retaining walls. The excavations will be up to eight feet in height and will expose soil over bedrock. The bedrock is capable of maintaining vertical excavations up to eight feet per the enclosed calculations. Where vertical excavations in the bedrock exceed eight feet in height, the upper portion should be trimmed to 1:1 (45 degrees).

The geologist should be present during grading to see temporary slopes. All excavations should be stabilized within 30 days of initial excavation. Water should not be allowed to pond on top of the excavations nor to flow toward them. No vehicular surcharge should be allowed within three feet of the top of the cut.

DRAINAGE

Control of site drainage is important for the performance of the proposed project. Pad drainage should be collected and transferred to an approved location in non-erosive drainage devices. Drainage should not be allowed to pond on the pad or against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters located within retaining wall backfill should be sealed to prevent moisture intrusion into the backfill. Drainage control devices require periodic cleaning, testing, and maintenance to remain effective.

WATERPROOFING

Retaining walls are subject to moisture intrusion, seepage, and leakage, and should be waterproofed. Waterproofing paints, compounds, or sheeting can be effective if properly installed. Equally important is the use of a subdrain that daylights to the atmosphere. The subdrain should be covered with ¾-inch crushed gravel to help the collection of water. Landscape areas above the wall should be sealed or properly drained to prevent moisture contact with the wall or saturation of wall backfill.

PLAN REVIEW

Formal plans ready for submittal to the building department should be reviewed by Byer Geotechnical. Any change in scope of the project may require additional work.

SITE OBSERVATIONS DURING CONSTRUCTION

The building department requires that the geotechnical engineer provide site observations during grading and construction. Foundation excavations should be observed and approved by the geotechnical engineer or geologist prior to placing steel, forms, or concrete. The geologist should observe bottoms for fill, compaction of fill, pool excavations, temporary slopes, permanent cut slopes, and subdrains. All fill that is placed should be approved by the geotechnical engineer and the building department prior to use for support of structural footings and floor slabs.

Please advise Byer Geotechnical, Inc., at least 24 hours prior to any required site visit. The building department stamped plans, the permits, and the geotechnical reports should be at the job site and available to our representative. The project consultant will perform the observation and post a notice at the job site with the findings. This notice should be given to the agency inspector.

FINAL REPORTS

The geotechnical engineer will prepare interim and final compaction reports upon request. The geologist will prepare reports summarizing pile excavations.

CONSTRUCTION SITE MAINTENANCE

It is the responsibility of the contractor to maintain a safe construction site. The area should be fenced and warning signs posted. All excavations must be covered and secured. Soil generated by foundation excavations should be either removed from the site or placed as compacted fill. Soil should not be spilled over any descending slope. Workers should not be allowed to enter any unshored trench excavations over five feet deep. Water shall not be allowed to saturate open footing trenches.

GENERAL CONDITIONS AND NOTICE

This report and the exploration are subject to the following conditions. Please read this section carefully; it limits our liability.

In the event of any changes in the design or location of any structure, as outlined in this report, the conclusions and recommendations contained herein may not be considered valid unless the changes are reviewed by Byer Geotechnical, Inc., and the conclusions and recommendations are modified or reaffirmed after such review.

The subsurface conditions, excavation characteristics, and geologic structure described herein have been projected from test excavations on the site and may not reflect any variations that occur between these test excavations or that may result from changes in subsurface conditions.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, irrigation, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site. High groundwater levels can be extremely hazardous. Saturation of earth materials can cause subsidence or slippage of the site.

If conditions encountered during construction appear to differ from those disclosed herein, notify us immediately so we may consider the need for modifications. Compliance with the design concepts, specifications, and recommendations requires the review of the engineering geologist and geotechnical engineer during the course of construction.

THE EXPLORATION WAS PERFORMED ONLY ON A PORTION OF THE SITE, AND CANNOT BE CONSIDERED AS INDICATIVE OF THE PORTIONS OF THE SITE NOT EXPLORED.

This report, issued and made for the sole use and benefit of the client, is not transferable. Any liability in connection herewith shall not exceed the Phase I fee for the exploration and report or a negotiated fee per the Agreement. No warranty is expressed, implied, or intended in connection with the exploration performed or by the furnishing of this report.

THIS REPORT WAS PREPARED ON THE BASIS OF THE PRELIMINARY DEVELOPMENT PLAN FURNISHED. FINAL PLANS SHOULD BE REVIEWED BY THIS OFFICE AS ADDITIONAL GEOTECHNICAL WORK MAY BE REQUIRED.

Byer Geotechnical appreciates the opportunity to provide our service on this project. Any questions concerning the data or interpretation of this report should be directed to the undersigned.

Respectfully submitted,
BYER GEOTECHNICAL, INC.

James E. Tucker
Project Geologist

ENGINEERING GEOLOGIST
ROBERT I. ZWEIGLER
E. G. 1210
Exp. 11/30/22
STATE OF CALIFORNIA

Robert I. Zweigler
E. G. 1210/G. E. 2120

REGISTERED PROFESSIONAL ENGINEER
ROBERT I. ZWEIGLER
No. 2120
Exp. 06-30-22
GEOTECHNICAL
STATE OF CALIFORNIA

JET:RIZ:cj
S:\FINAL\BG\23237_Civiltec_Engineering\23237_Civiltec_SCVWA_Geologic and Soils Engineering Exploratin_8.24.20.wpd

Enc: List of References
Appendix I - Shear Test Diagrams by GeoConcepts , Inc., and The J. Byer Group, Inc. (JB 18474) (2 Pages)
Appendix II - Laboratory Testing
Summary of Corrosion Test Results
Log of Test Pits 1 - 6 (2 Pages)
Appendix III - Calculations and Figures
Calculation Sheets (30 Pages)
Seismic Hazard Deaggregation Chart
Aerial Vicinity Map
Regional Geologic Map
Regional Topographic Map
Regional Fault Map
Seismic Hazard Zones Map

In Pocket: Geologic Map
Sections A, B, and C (1 Sheet)

xc: (4) Addressee (E-mail and Mail)

REFERENCES

California Building Standards Commission (2019), **2019 California Building Code,** Based on the 2018 International Building Code (IBC), Title 24, Part 2, Vol. 1 and 2.

California Department of Conservation (1999), **State of California, Seismic Hazard Zones, Mint Canyon Quadrangle**, Official Map, Division of Mines and Geology.

California Department of Conservation (2008), **Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California.**

California Geological Survey (Formerly California Division of Mines and Geology), 2000, **Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones, Southern Region,** DMG CD 2000-003.

Dibblee, T. W. (1996), **Geologic Map of the Mint Canyon Quadrangle, Los Angeles County, California**, 1:24,000 scale, Dibblee Foundation, Santa Barbara, California, Map DF-57.

Jennings, C. W., and Bryant, W. A. (2010), **Fault Activity Map of California**, California Geological Survey, 150th Anniversary, Map No. 6.

U.S. Geological Survey, **Geologic Hazards Science Center, U. S. Seismic Design Maps,** http://earthquake.usgs.gov/designmaps/us/application.php.

Software

Slide 7.0, Rocscience, Inc., 2016.

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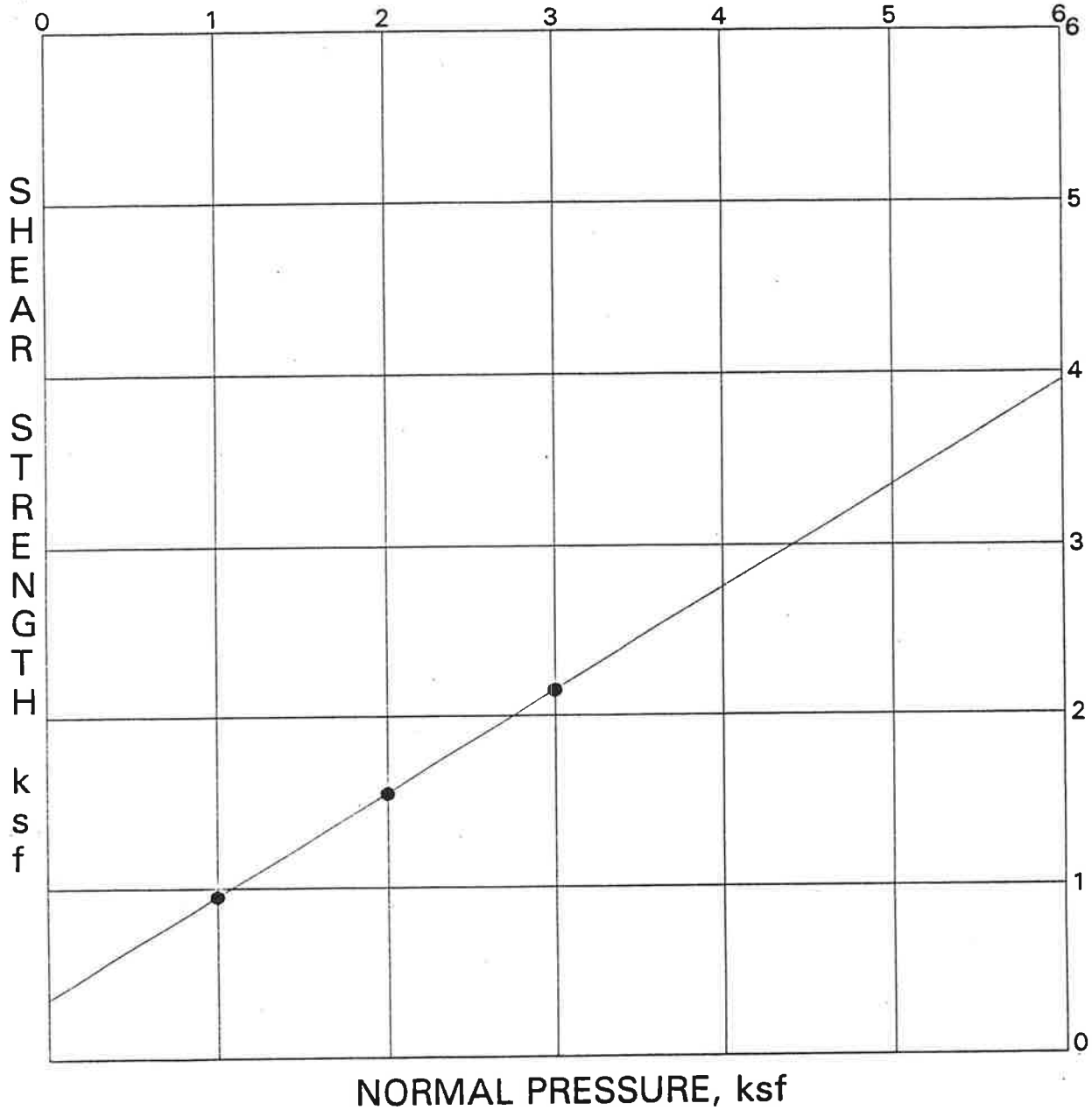
APPENDIX I

Shear Test Diagrams by GenConcepts Inc., and The J. Byer Group, Inc.

PROJECT: 1169
PROJECT LOCATION: Tract 45416, Santa Clarita

SAMPLE LOCATION: BULK @ 0.00
DESCRIPTION: Remolded to 90%



Test Results

Moisture Content (%)	Density (pcf)	Ultimate Strength
Insitu: 12.0 Saturated: 28.0	Dry Density: 124.6	Phi (deg): 30.0 Cohesion (psf): 0.350

SHEAR TEST DIAGRAM

GeoConcepts, Inc.

14424 Friar Street, Van Nuys

Figure S.11

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
1461 E. CHEVY CHASE DRIVE, GLENDALE, CA 91206
(818) 549-9959 FAX: (818) 543-3747

SHEAR DIAGRAM

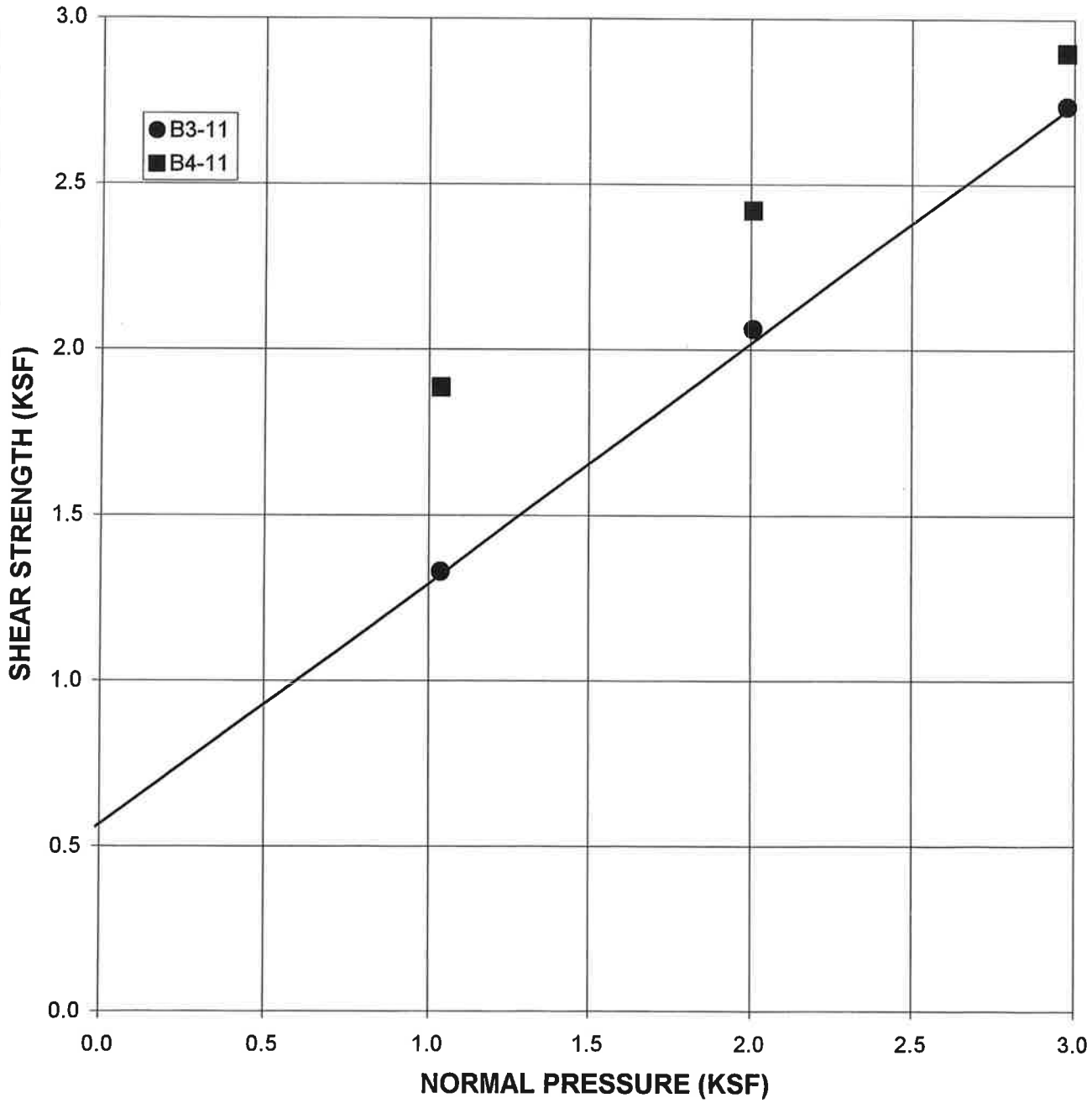
JB: 18474-B CONSULTANT JAI
CLIENT: PARDEE CONSTRUCTION

EARTH MATERIAL: BEDROCK

NOTE: 2½ INCH RING SAMPLES

Phi Angle =	**36 degrees**	**Average Moisture Content**	**14.1%**
Cohesion =	**575 psf**	**Average Dry Density (pcf)**	**119.5**
		Percent Saturation	**97.4%**

DIRECT SHEAR TEST - ASTM D-3080 (ULTIMATE VALUES)



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APPENDIX II

Laboratory Testing and Test Pits

August 25, 2020
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APPENDIX II

LABORATORY TESTING

A bulk samples of the bedrock was obtained from Test Pit 2 and transported to an outside laboratory for testing and analysis.

Maximum Density

The maximum dry density and optimum moisture content of the future compacted fill were determined using the procedures outlined in ASTM D 1557-12, a five-layer standard.

Test Pit	Depth (Feet)	USCS + Color Soil Type	Maximum Density (pcf)	Optimum Moisture %	Expansion Index
2	2	light gray brown Gravelly Sand	130.0	10.0	Nil

Corrosion

A sample of the fill was transported to Environmental Geotechnology Laboratory for chemical testing. The testing was performed in accordance with Caltrans Standards 643 (pH), 422 (Chloride Content), 417 (Sulfate Content), and 532 (Resistivity). The results of the testing are reported in the following table:

CHEMICAL TEST RESULTS TABLE

Sample	pH	Chloride (PPM)	Sulfate (%)	Resistivity (Ohm-cm)
TP 2 - 2'	7.52	145	0.007	2,500

The chloride and sulfate contents of the soil are negligible and not a factor in corrosion. The pH is near neutral and not a factor. The resistivity indicates that the soil is in the moderately corrosive range to ferrous metals.

SUMMARY OF CORROSION TEST RESULTS

PROJECT NAME: Civil Tec Water Tank

EGLAB JOB NO.: 20-249-031

PROJECT NO.: BG #23237

CLIENT: Byer Geotechnical, Inc.

DATE: 8/18/2020

Summarized By: JT

BORING NO.	SAMPLE NO.	DEPTH (ft)	pH CalTrans 643	Chloride Content CalTrans 422 (ppm)	Sulfate Content CalTrans 417 (% by weight)	Minimum Resistivity CalTrans 643 (ohm-cm)
N/A	A	N/A	7.52	145	0.007	2,500

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DRIVE, SUITE 200, GLENDALE, CA 91206
tel 818.549.9959 fax 818.543.3747

LOG OF TEST PITS

CLIENT: CIVILTEC ENGINEERING, INC.

GEOLOGIST: JET BG: 23237

REPORT DATE: 8/25/20 DATE LOGGED: 6/30/20

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
TEST PIT #1			Surface Conditions: Top of Ridge		
			0 - 4	**BEDROCK:**	Mint Canyon Formation: Conglomerate, brown to light brown, gray, hard rounded clasts up to 12 inches in a medium to coarse grained matrix
			4 - 8½		Mint Canyon Formation: Sandstone and Conglomerate, light gray, subrounded to subangular clasts up to 6 inches in a fine to coarse grained matrix, hard
			End at 8½ Feet; No Water; No Caving; No Fill.		
TEST PIT #2			Surface Conditions: Angle Point of West Fence; Elevation 1971		
			0 - 1	**FILL:**	Gravelly Sand, light gray, brown, dry, medium dense to dense
			1 - 2	**BEDROCK:**	Conglomerate, gray, brown, light gray, subrounded clasts up to 6 inches in a fine to coarse grained matrix
			2 - 3½		Sandstone, light gray, medium to coarse grained, moderately hard, friable
			3½ - 5		Conglomerate, light gray, gray, dark to light gray, moderately hard, subangular clasts up to 12 inches in a coarse grained matrix
			5 - 6½		Sandstone, greenish-gray to grayish-brown, very hard, fine grained
			End at 6½ Feet; No Water; No Caving; Fill to 1 Foot.		
TEST PIT #3			Surface Conditions: Level Area Southwest of Existing Tank		
			0 - 1	**FILL:**	Sandy Gravel, gray, brown, dry, medium dense, rock to six inches
			1 - 2	**BEDROCK:**	Mint Canyon Formation: Conglomerate, light gray, gray, subrounded clasts up to 14 inches in a coarse matrix, friable, moderately hard
			2 - 4		less friable, hard to very hard, clasts up to 24 inches
			End at 4 Feet; No Water; No Caving; Fill to 1 Foot. Unable to Continue Due to Hard Rock and Clasts		

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DRIVE, SUITE 200, GLENDALE, CA 91206
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LOG OF TEST PITS

CLIENT: CIVILTEC ENGINEERING, INC.

GEOLOGIST: JET BG: 23237

REPORT DATE: 8/25/20 DATE LOGGED: 6/30/20

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
TEST PIT #4			Surface Conditions: Fill Pad North Side; Elevation: 1946		
			0 - 1½	**COMPACTED FILL:**	Gravelly Sand/Sandy Gravel, light gray to grayish-brown, dry to slightly moist, medium dense to dense, roots up to eight inches, rock fragments up to eight inches
			1½ - 7½		gray brown, moist, dense to very dense, rock fragments up to eight inches
			End at 7½ Feet; No Water; No Caving; Compacted Fill to Total Depth.		
TEST PIT #5			Surface Conditions: Toe of Cut South of Fill Pad		
			0 - ½	**FILL:**	Gravelly Sand, gray brown, dry, slightly loose to slightly dense, roots up to ¼ inch
			½ - 5	**BEDROCK:**	Mint Canyon Formation: Conglomerate, light gray, gray brown, moderately hard, subrounded to subangular, clasts up to 18 inches in a medium to coarse grained matrix
			5 - 6		Pebbly Sandstone, light gray, moderately hard to hard, coarse grained
			6 - 8		Conglomerate, light gray, brown, hard, subrounded clasts up to 12 inches in a medium to coarse grained matrix
			End at 8 Feet; No Water; No Caving; Fill to ½ Foot.		
TEST PIT #6			Surface Conditions: Fill Pad South Side; Elevation 1946		
			0 - 1½	**COMPACTED FILL:**	Sandy Gravel, light grayish-brown, dry, medium dense, to dense, roots to ¼ inch, rock fragments to eight inches
			1½ - 3		gray brown, moist, dense, rock fragments to 12 inches
			3 - 7½		rock fragments up to 18 inches, dense to very dense
			End at 7½ Feet; No Water; No Caving; Compacted Fill to Total Depth.		

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

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APPENDIX III

Calculation and Figures

BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

RETAINING WALL

BG: **23237** ENGINEER: **JET**
CLIENT: **CIVILTEC SCVWA TANK**
CALCULATION SHEET # **1**

CALCULATE THE DESIGN ACTIVE EQUIVALENT FLUID PRESSURE (EFP) FOR THE PROPOSED RETAINING WALL. ASSUME BACKFILL IS SATURATED AND THERE IS NO HYDROSTATIC PRESSURE THE RETAINED HEIGHT AND BACKSLOPE AND SURCHARGE CONDITIONS ARE LISTED BELOW. USE THE MONONOBE-OKABE METHOD FOR SEISMIC FORCES.

CALCULATION PARAMETERS

EARTH MATERIAL:	COMPACTED FILL	WALL HEIGHT	11 feet
SHEAR DIAGRAM:	GEOCONCEPTS	BACKSLOPE ANGLE:	0 degrees
COHESION:	350 psf	SURCHARGE:	300 pounds
PHI ANGLE:	30 degrees	SURCHARGE TYPE:	U Uniform
DENSITY	135 pcf	INITIAL FAILURE ANGLE:	20 degrees
SAFETY FACTOR:	1.5	FINAL FAILURE ANGLE:	70 degrees
WALL FRICTION	0 degrees	INITIAL TENSION CRACK:	1 feet
CD (C/FS):	233.3 psf	FINAL TENSION CRACK:	20 feet
PHID = ATAN(TAN(PHI)/FS) =	21.1 degrees		
HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h)	0 g		
VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v)	0 g		

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	54 degrees
AREA OF TRIAL FAILURE WEDGE	41.2 square feet
TOTAL EXTERNAL SURCHARGE	1500.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	7065.4 pounds
NUMBER OF TRIAL WEDGES ANALYZED	1020 trials
LENGTH OF FAILURE PLANE	10.2 feet
DEPTH OF TENSION CRACK	2.7 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	6.0 feet
CALCULATED HORIZONTAL THRUST ON WALL	**1930.4 pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**31.9 pcf**
DESIGN EQUIVALENT FLUID PRESSURE	**43.0 pcf**

CONCLUSION:

THE CALCULATION INDICATES THAT CANTILEVER RETAINING WALLS UP TO 11 FEET HIGH, WITH LEVEL BACKSLOPE, MAY BE DESIGNED FOR AN ACTIVE EQUIVALENT FLUID PRESSURE OF 43 POUNDS-PER-CUBIC-FOOT.

BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL.
818.543.3747 FAX

RETAINING WALL

BG: **23237** ENGINEER: **JET**
CLIENT: **CIVILTEC SCVWA TANK**

CALCULATION SHEET # **2**

CALCULATE THE DESIGN SEISMIC FORCE FOR THE PROPOSED RETAINING WALL. ASSUME BACKFILL IS SATURATED AND THERE IS NO HYDROSTATIC PRESSURE THE RETAINED HEIGHT AND BACKSLOPE AND SURCHARGE CONDITIONS ARE LISTED BELOW. USE THE MONONOBE-OKABE METHOD FOR SEISMIC FORCES.

CALCULATION PARAMETERS

EARTH MATERIAL:	COMPACTED FILL	WALL HEIGHT	11 feet
SHEAR DIAGRAM:	GEOCONCEPTS	BACKSLOPE ANGLE:	0 degrees
COHESION:	350 psf	SURCHARGE:	300 pounds
PHI ANGLE:	30 degrees	SURCHARGE TYPE:	U Uniform
DENSITY	135 pcf	INITIAL FAILURE ANGLE:	20 degrees
SAFETY FACTOR:	1	FINAL FAILURE ANGLE:	70 degrees
WALL FRICTION	0 degrees	INITIAL TENSION CRACK:	6.8 feet
CD (C/FS):	350.0 psf	FINAL TENSION CRACK:	20 feet

PHID = ATAN(TAN(PHI)/FS) = 30.0 degrees

HORIZONTAL PSEUDO STATIC SEISMIC COEFFICIENT (k_h) 0.35 g

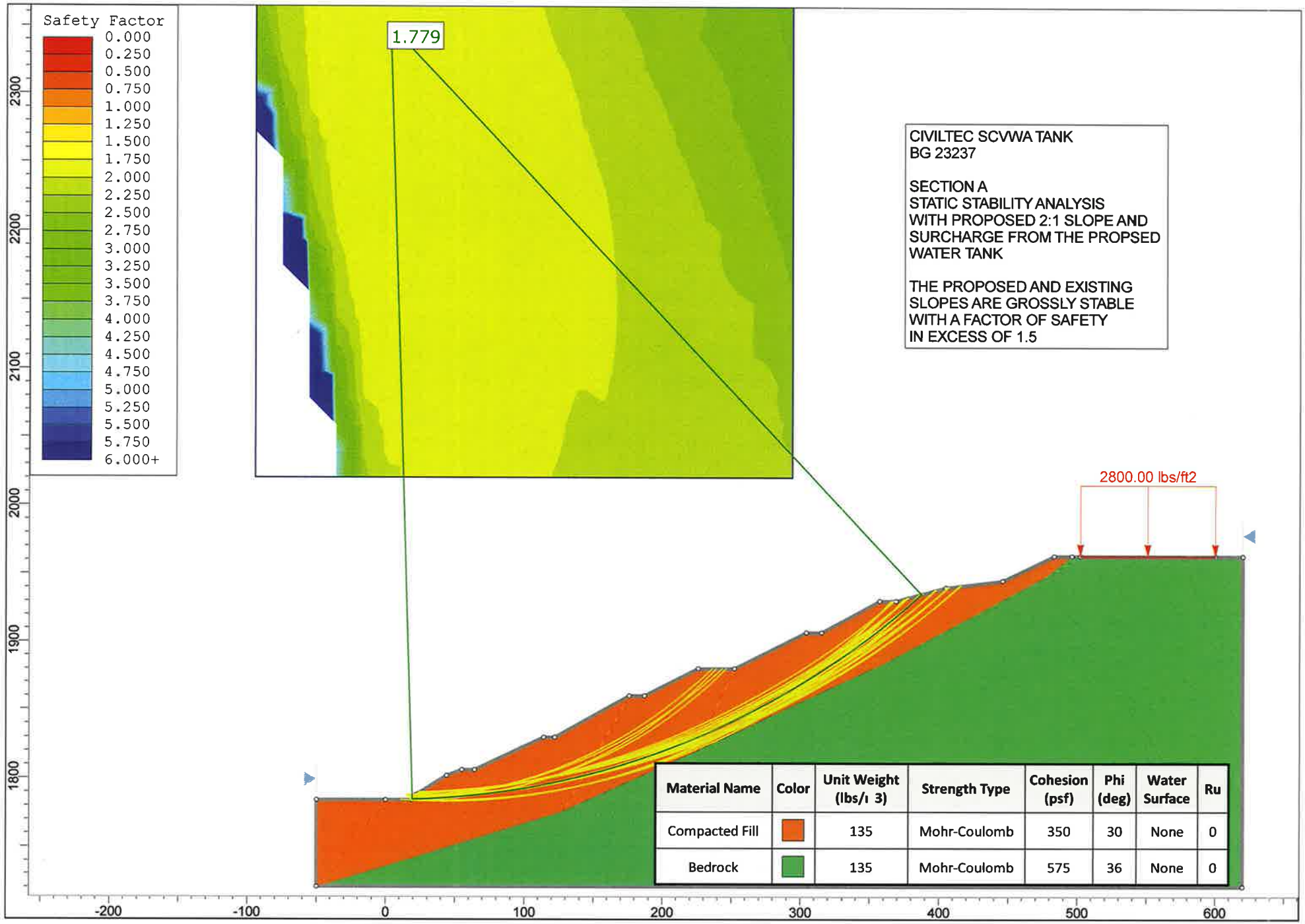
VERTICAL PSEUDO STATIC SEISMIC COEFFICIENT (k_v) 0 g

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	42 degrees
AREA OF TRIAL FAILURE WEDGE	61.9 square feet
TOTAL EXTERNAL SURCHARGE	600.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	8961.4 pounds
NUMBER OF TRIAL WEDGES ANALYZED	714 trials
LENGTH OF FAILURE PLANE	11.8 feet
DEPTH OF TENSION CRACK	3.1 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	8.8 feet
CALCULATED HORIZONTAL THRUST ON WALL	**1371.8 pounds**

CONCLUSIONS:

THE CALCULATION INDICATES THAT NO ADDITIONAL SEISMIC LOADING IS REQUIRED FOR CANTILEVER RETAINING WALLS UP TO 11 FEET HIGH (CALCULATED SEISMIC THRUST IS LESS THAN THE DESIGN ACTIVE THRUST OF 2601.5 POUNDS).



CIVILTEC SCVWA TANK
BG 23237

SECTION A
STATIC STABILITY ANALYSIS
WITH PROPOSED 2:1 SLOPE AND
SURCHARGE FROM THE PROPSED
WATER TANK

THE PROPOSED AND EXISTING
SLOPES ARE GROSSLY STABLE
WITH A FACTOR OF SAFETY
IN EXCESS OF 1.5

Material Name	Color	Unit Weight (lbs/ı 3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Compacted Fill		135	Mohr-Coulomb	350	30	None	0
Bedrock		135	Mohr-Coulomb	575	36	None	0

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name:	23237 Section A Static
Slide Modeler Version:	7.038
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	8/19/2020, 7:24:56 AM

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Failure Direction:	Right to Left
Data Output:	Standard
Maximum Material Properties:	20
Maximum Support Properties:	20

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Grid Search
Radius Increment:	10
Composite Surfaces:	Disabled
Reverse Curvature:	Invalid Surfaces
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	2800
Orientation:	Normal to boundary

Material Properties

Property	Compacted Fill	Bedrock
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	135	135
Cohesion [psf]	350	575
Friction Angle [deg]	30	36
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	1.778580
Center:	2.478, 2349.866
Radius:	565.864
Left Slip Surface Endpoint:	19.187, 1784.249
Right Slip Surface Endpoint:	387.429, 1935.119
Resisting Moment:	5.68449e+008 lb-ft
Driving Moment:	3.19608e+008 lb-ft
Total Slice Area:	11675.8 ft2
Surface Horizontal Width:	368.243 ft
Surface Average Height:	31.7067 ft

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 4515
Number of Invalid Surfaces: 336

Error Codes:

Error Code -103 reported for 68 surfaces
Error Code -106 reported for 4 surfaces
Error Code -1000 reported for 264 surfaces

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.
-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.77858

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	7.36486	3775.14	2.06511	Compacted Fill	350	30	358.98	638.475	499.654	0	499.654	512.598	512.598
2	7.36486	8495.52	2.81152	Compacted Fill	350	30	562.277	1000.05	1125.93	0	1125.93	1153.54	1153.54
3	7.36486	12747.8	3.55842	Compacted Fill	350	30	743.658	1322.66	1684.69	0	1684.69	1730.94	1730.94
4	7.36486	16506.9	4.30592	Compacted Fill	350	30	902.31	1604.83	2173.43	0	2173.43	2241.37	2241.37
5	7.36486	18681.2	5.05415	Compacted Fill	350	30	991.729	1763.87	2448.89	0	2448.89	2536.6	2536.6
6	7.36486	18976.3	5.80325	Compacted Fill	350	30	1000.21	1778.95	2475.02	0	2475.02	2576.68	2576.68
7	7.36486	19655.7	6.55335	Compacted Fill	350	30	1024.94	1822.93	2551.19	0	2551.19	2668.93	2668.93
8	7.36486	22267.9	7.30457	Compacted Fill	350	30	1131.23	2011.98	2878.65	0	2878.65	3023.65	3023.65
9	7.36486	24795.2	8.05707	Compacted Fill	350	30	1233.04	2193.06	3192.27	0	3192.27	3366.81	3366.81
10	7.36486	27224.2	8.81096	Compacted Fill	350	30	1329.85	2365.25	3490.52	0	3490.52	3696.66	3696.66
11	7.36486	29554.5	9.56639	Compacted Fill	350	30	1421.71	2528.62	3773.47	0	3773.47	4013.08	4013.08
12	7.36486	31785.3	10.3235	Compacted Fill	350	30	1508.61	2683.19	4041.21	0	4041.21	4316.01	4316.01
13	7.36486	33888.1	11.0825	Compacted Fill	350	30	1589.45	2826.96	4290.22	0	4290.22	4601.55	4601.55
14	7.36486	33748.1	11.8434	Compacted Fill	350	30	1577	2804.82	4251.87	0	4251.87	4582.56	4582.56
15	7.36486	34355	12.6064	Compacted Fill	350	30	1595.29	2837.35	4308.21	0	4308.21	4664.99	4664.99
16	7.36486	36734	13.3717	Compacted Fill	350	30	1685.88	2998.47	4587.28	0	4587.28	4988.04	4988.04
17	7.36486	39009.4	14.1395	Compacted Fill	350	30	1771.41	3150.6	4850.77	0	4850.77	5297.02	5297.02
18	7.36486	41180.3	14.9099	Compacted Fill	350	30	1851.9	3293.75	5098.72	0	5098.72	5591.81	5591.81
19	7.36486	43245.5	15.683	Compacted Fill	350	30	1927.34	3427.93	5331.14	0	5331.14	5872.27	5872.27
20	7.36486	45204	16.4591	Compacted	350	30	1997.75	3553.15	5548.02	0	5548.02	6138.23	6138.23

				Fill									
21	7.36486	47054.3	17.2383	Compacted Fill	350	30	2063.11	3669.4	5749.36	0	5749.36	6389.51	6389.51
22	7.36486	47776.1	18.0208	Compacted Fill	350	30	2082.77	3704.38	5809.96	0	5809.96	6487.53	6487.53
23	7.36486	45597.9	18.8068	Compacted Fill	350	30	1987.05	3534.13	5515.08	0	5515.08	6191.79	6191.79
24	7.36486	45643.6	19.5964	Compacted Fill	350	30	1979.93	3521.46	5493.13	0	5493.13	6198.01	6198.01
25	7.36486	46734.4	20.39	Compacted Fill	350	30	2013.84	3581.78	5597.61	0	5597.61	6346.16	6346.16
26	7.36486	47709.5	21.1877	Compacted Fill	350	30	2042.78	3633.24	5686.74	0	5686.74	6478.58	6478.58
27	7.36486	48566.9	21.9897	Compacted Fill	350	30	2066.7	3675.8	5760.46	0	5760.46	6595.03	6595.03
28	7.36486	49304.8	22.7963	Compacted Fill	350	30	2085.61	3709.43	5818.71	0	5818.71	6695.26	6695.26
29	7.36486	48335.7	23.6076	Compacted Fill	350	30	2038.27	3625.23	5672.85	0	5672.85	6563.68	6563.68
30	7.36486	45085.3	24.4241	Compacted Fill	350	30	1903.55	3385.62	5257.85	0	5257.85	6122.31	6122.31
31	7.36486	41696.1	25.2458	Compacted Fill	350	30	1764.67	3138.6	4830	0	4830	5662.11	5662.11
32	7.36486	38465.3	26.0732	Compacted Fill	350	30	1632.99	2904.4	4424.36	0	4424.36	5223.4	5223.4
33	7.36486	37907.2	26.9064	Compacted Fill	350	30	1603.61	2852.15	4333.85	0	4333.85	5147.64	5147.64
34	7.36486	37925.4	27.7458	Compacted Fill	350	30	1596.05	2838.7	4310.55	0	4310.55	5150.13	5150.13
35	7.36486	37806	28.5918	Compacted Fill	350	30	1583.22	2815.88	4271.04	0	4271.04	5133.94	5133.94
36	7.36486	37545.8	29.4446	Compacted Fill	350	30	1565.07	2783.61	4215.14	0	4215.14	5098.62	5098.62
37	7.36486	37141.3	30.3046	Compacted Fill	350	30	1541.57	2741.8	4142.72	0	4142.72	5043.7	5043.7
38	7.36486	36588.6	31.1723	Compacted Fill	350	30	1512.63	2690.34	4053.59	0	4053.59	4968.67	4968.67
39	7.36486	35679.1	32.048	Compacted Fill	350	30	1470.72	2615.79	3924.46	0	3924.46	4845.18	4845.18
40	7.36486	31873.8	32.9321	Compacted Fill	350	30	1323.57	2354.07	3471.15	0	3471.15	4328.46	4328.46
41	7.36486	28445.1	33.8252	Compacted Fill	350	30	1191.55	2119.26	3064.44	0	3064.44	3862.87	3862.87
42	7.36486	27409	34.7277	Compacted Fill	350	30	1146.98	2039.99	2927.16	0	2927.16	3722.18	3722.18
43	7.36486	26256.1	35.6402	Compacted Fill	350	30	1098.56	1953.87	2777.98	0	2777.98	3565.64	3565.64
44	7.36486	24925.5	36.5632	Compacted Fill	350	30	1044.19	1857.18	2610.51	0	2610.51	3384.96	3384.96
45	7.36486	23410.9	37.4974	Compacted Fill	350	30	983.796	1749.76	2424.46	0	2424.46	3179.29	3179.29
46	7.36486	21670.5	38.4434	Compacted Fill	350	30	916.057	1629.28	2215.77	0	2215.77	2942.96	2942.96
47	7.36486	17268.1	39.402	Compacted Fill	350	30	756.353	1345.23	1723.79	0	1723.79	2345.11	2345.11
48	7.36486	11404	40.374	Compacted Fill	350	30	548.222	975.057	1082.63	0	1082.63	1548.77	1548.77
49	7.36486	6849.69	41.3602	Compacted Fill	350	30	387.915	689.937	588.788	0	588.788	930.303	930.303
50	7.36486	2321.69	42.3616	Compacted Fill	350	30	230.837	410.561	104.895	0	104.895	315.394	315.394

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.77858

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	19.1865	1784.25	0	0	0
2	26.5514	1784.51	2509.19	0	0
3	33.9162	1784.88	6239.99	0	0
4	41.2811	1785.33	10941.3	0	0
5	48.646	1785.89	16376.5	0	0
6	56.0108	1786.54	22080	0	0
7	63.3757	1787.29	27588.3	0	0
8	70.7405	1788.13	32972.8	0	0
9	78.1054	1789.08	38580.4	0	0
10	85.4703	1790.12	44326.7	0	0
11	92.8351	1791.26	50128.9	0	0
12	100.2	1792.5	55908.1	0	0
13	107.565	1793.85	61589.2	0	0
14	114.93	1795.29	67097.6	0	0
15	122.295	1796.83	72136.7	0	0
16	129.659	1798.48	76781	0	0
17	137.024	1800.23	81157	0	0
18	144.389	1802.09	85193.8	0	0
19	151.754	1804.05	88824.1	0	0
20	159.119	1806.11	91984.4	0	0
21	166.484	1808.29	94615	0	0
22	173.849	1810.58	96659.8	0	0
23	181.213	1812.97	98067.5	0	0
24	188.578	1815.48	98858.2	0	0
25	195.943	1818.1	99026.4	0	0
26	203.308	1820.84	98523.6	0	0
27	210.673	1823.69	97322.6	0	0
28	218.038	1826.67	95400.5	0	0
29	225.403	1829.76	92738.5	0	0
30	232.767	1832.98	89479.2	0	0
31	240.132	1836.33	85902.9	0	0
32	247.497	1839.8	82116	0	0
33	254.862	1843.4	78189.7	0	0
34	262.227	1847.14	73793.8	0	0
35	269.592	1851.01	68840.1	0	0
36	276.957	1855.03	63347.4	0	0
37	284.321	1859.19	57341.2	0	0
38	291.686	1863.49	50854	0	0
39	299.051	1867.95	43925.5	0	0
40	306.416	1872.56	36654.8	0	0
41	313.781	1877.33	29836.7	0	0
42	321.146	1882.26	23482.6	0	0
43	328.511	1887.37	16980.8	0	0
44	335.875	1892.65	10396.3	0	0
45	343.24	1898.11	3821.54	0	0
46	350.605	1903.76	-2638.25	0	0
47	357.97	1909.61	-8850.93	0	0
48	365.335	1915.66	-13713.6	0	0
49	372.7	1921.92	-16458.7	0	0
50	380.065	1928.4	-17421.5	0	0
51	387.429	1935.12	0	0	0

List Of Coordinates

Distributed Load

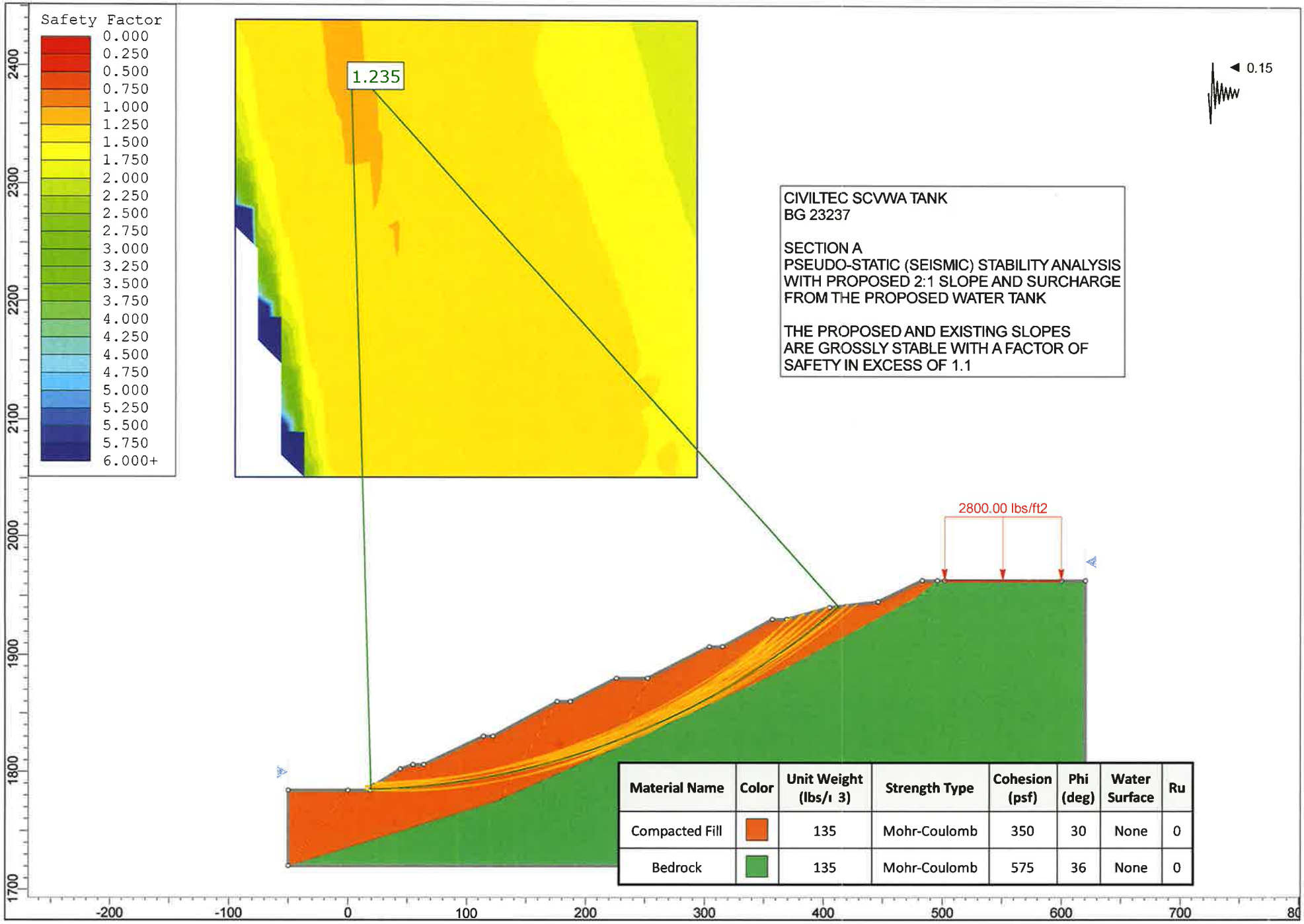
X	Y
600	1963
502	1963

External Boundary

X	Y
-50	1720
620	1720
620	1963
600	1963
502	1963
496	1963
483	1963
446	1945
405	1940
369	1930
357	1930
315	1907
304	1907
252	1880
226	1880
187	1860
176	1860
122	1830
114	1830
64	1806
55	1806
44	1802
22	1788
19	1784
0	1784
-50	1784

Material Boundary

X	Y
-50	1720
128	1776
225	1820
360	1884
479	1949
496	1963



Material Name	Color	Unit Weight (lbs/ı 3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Compacted Fill		135	Mohr-Coulomb	350	30	None	0
Bedrock		135	Mohr-Coulomb	575	36	None	0

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name:	23237 Section A Seismic
Slide Modeler Version:	7.038
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	8/19/2020, 7:24:56 AM

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Failure Direction:	Right to Left
Data Output:	Standard
Maximum Material Properties:	20
Maximum Support Properties:	20

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Grid Search
Radius Increment:	10
Composite Surfaces:	Disabled
Reverse Curvature:	Invalid Surfaces
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

Seismic Load Coefficient (Horizontal): 0.15

1 Distributed Load present

Distributed Load 1

Distribution:	Constant
Magnitude [psf]:	2800
Orientation:	Normal to boundary

Material Properties

Property	Compacted Fill	Bedrock
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	135	135
Cohesion [psf]	350	575
Friction Angle [deg]	30	36
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	**1.235280**
Center:	2.478, 2399.927
Radius:	615.548
Left Slip Surface Endpoint:	19.460, 1784.614
Right Slip Surface Endpoint:	412.625, 1940.930
Resisting Moment:	6.72861e+008 lb-ft
Driving Moment:	5.44701e+008 lb-ft
Total Slice Area:	13458.2 ft2
Surface Horizontal Width:	393.165 ft
Surface Average Height:	34.2305 ft

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 4604
Number of Invalid Surfaces: 247

Error Codes:

Error Code -103 reported for 37 surfaces
Error Code -106 reported for 12 surfaces
Error Code -1000 reported for 198 surfaces

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.
-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.23528

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	7.8633	4089.65	1.94707	Compacted Fill	350	30	518.195	640.116	502.495	0	502.495	520.111	520.111
2	7.8633	9367.77	2.67961	Compacted Fill	350	30	822.178	1015.62	1152.89	0	1152.89	1191.37	1191.37
3	7.8633	14235.4	3.41259	Compacted Fill	350	30	1098.88	1357.42	1744.91	0	1744.91	1810.43	1810.43
4	7.8633	18116	4.14613	Compacted Fill	350	30	1315.6	1625.13	2208.59	0	2208.59	2303.96	2303.96
5	7.8633	20159	4.88035	Compacted Fill	350	30	1424.75	1759.97	2442.14	0	2442.14	2563.8	2563.8
6	7.8633	20028	5.61537	Compacted Fill	350	30	1409.08	1740.61	2408.62	0	2408.62	2547.16	2547.16
7	7.8633	22275.8	6.35133	Compacted Fill	350	30	1527.97	1887.47	2662.98	0	2662.98	2833.05	2833.05
8	7.8633	25298.9	7.08833	Compacted Fill	350	30	1689.01	2086.4	3007.52	0	3007.52	3217.55	3217.55
9	7.8633	28212.9	7.82652	Compacted Fill	350	30	1842.05	2275.45	3334.99	0	3334.99	3588.19	3588.19
10	7.8633	31017.3	8.56602	Compacted Fill	350	30	1987.2	2454.75	3645.53	0	3645.53	3944.86	3944.86
11	7.8633	33711.3	9.30696	Compacted Fill	350	30	2124.53	2624.39	3939.35	0	3939.35	4287.52	4287.52
12	7.8633	36294.4	10.0495	Compacted Fill	350	30	2254.11	2784.46	4216.61	0	4216.61	4616.08	4616.08
13	7.8633	36853.1	10.7937	Compacted Fill	350	30	2271.63	2806.1	4254.08	0	4254.08	4687.16	4687.16
14	7.8633	37341.9	11.5398	Compacted Fill	350	30	2285.05	2822.68	4282.81	0	4282.81	4749.36	4749.36
15	7.8633	40214.3	12.2878	Compacted Fill	350	30	2426.82	2997.8	4586.12	0	4586.12	5114.72	5114.72
16	7.8633	42976.1	13.038	Compacted Fill	350	30	2560.89	3163.42	4872.98	0	4872.98	5466	5466
17	7.8633	45622.6	13.7905	Compacted Fill	350	30	2687.13	3319.36	5143.08	0	5143.08	5802.63	5802.63
18	7.8633	48152.7	14.5454	Compacted Fill	350	30	2805.58	3465.68	5396.51	0	5396.51	6124.46	6124.46

19	7.8633	50565.1	15.3029	Compacted Fill	350	30	2916.29	3602.43	5633.37	0	5633.37	6431.33	6431.33
20	7.8633	52839	16.0632	Compacted Fill	350	30	3018.24	3728.37	5851.51	0	5851.51	6720.57	6720.57
21	7.8633	52285.1	16.8263	Compacted Fill	350	30	2971.51	3670.65	5751.53	0	5751.53	6650.17	6650.17
22	7.8633	50728.9	17.5926	Compacted Fill	350	30	2873.23	3549.24	5541.24	0	5541.24	6452.27	6452.27
23	7.8633	52099.7	18.3621	Compacted Fill	350	30	2926.53	3615.08	5655.29	0	5655.29	6626.67	6626.67
24	7.8633	53547	19.1351	Compacted Fill	350	30	2982.86	3684.67	5775.83	0	5775.83	6810.78	6810.78
25	7.8633	54867.7	19.9117	Compacted Fill	350	30	3031.84	3745.17	5880.6	0	5880.6	6978.8	6978.8
26	7.8633	56060.1	20.6921	Compacted Fill	350	30	3073.45	3796.57	5969.64	0	5969.64	7130.51	7130.51
27	7.8633	55970.1	21.4766	Compacted Fill	350	30	3049.86	3767.43	5919.17	0	5919.17	7119.1	7119.1
28	7.8633	52771	22.2653	Compacted Fill	350	30	2871.12	3546.64	5536.73	0	5536.73	6712.24	6712.24
29	7.8633	49285.6	23.0585	Compacted Fill	350	30	2680.12	3310.7	5128.08	0	5128.08	6268.95	6268.95
30	7.8633	46058.8	23.8564	Compacted Fill	350	30	2503.98	3093.12	4751.23	0	4751.23	5858.56	5858.56
31	7.8633	45920.2	24.6592	Compacted Fill	350	30	2480.97	3064.69	4701.99	0	4701.99	5840.97	5840.97
32	7.8633	46350.5	25.4672	Compacted Fill	350	30	2485.61	3070.42	4711.9	0	4711.9	5895.73	5895.73
33	7.8633	46635.9	26.2808	Compacted Fill	350	30	2482.85	3067.02	4706.01	0	4706.01	5932.07	5932.07
34	7.8633	46773.3	27.1	Compacted Fill	350	30	2472.68	3054.45	4684.25	0	4684.25	5949.59	5949.59
35	7.8633	46759.5	27.9253	Compacted Fill	350	30	2455.08	3032.71	4646.59	0	4646.59	5947.88	5947.88
36	7.8633	46591.1	28.7569	Compacted Fill	350	30	2430.01	3001.74	4592.95	0	4592.95	5926.48	5926.48
37	7.8633	44827.7	29.5953	Compacted Fill	350	30	2329.95	2878.14	4378.87	0	4378.87	5702.21	5702.21
38	7.8633	40473.6	30.4406	Compacted Fill	350	30	2110.07	2606.53	3908.43	0	3908.43	5148.41	5148.41
39	7.8633	39273.8	31.2934	Compacted Fill	350	30	2039.02	2518.76	3756.4	0	3756.4	4995.82	4995.82
40	7.8633	38684.4	32.1539	Compacted Fill	350	30	1996.66	2466.43	3665.76	0	3665.76	4920.88	4920.88
41	7.8633	37919.2	33.0226	Compacted Fill	350	30	1946.49	2404.46	3558.42	0	3558.42	4823.58	4823.58
42	7.8633	36973	33.9	Compacted Fill	350	30	1888.45	2332.77	3434.27	0	3434.27	4703.26	4703.26
43	7.8633	35827.7	34.7866	Compacted Fill	350	30	1821.94	2250.61	3291.95	0	3291.95	4557.6	4557.6
44	7.8633	31890.9	35.6827	Compacted Fill	350	30	1631.77	2015.69	2885.05	0	2885.05	4056.85	4056.85
45	7.8633	26143.5	36.589	Compacted Fill	350	30	1364.35	1685.36	2312.92	0	2312.92	3325.78	3325.78
46	7.8633	21923.6	37.5062	Compacted Fill	350	30	1167.92	1442.71	1892.63	0	1892.63	2789.01	2789.01
47	7.8633	17727	38.4347	Compacted Fill	350	30	975.54	1205.07	1481.01	0	1481.01	2255.18	2255.18
48	7.8633	13308.3	39.3753	Compacted Fill	350	30	776.732	959.482	1055.65	0	1055.65	1693.11	1693.11
49	7.8633	8658.66	40.3288	Compacted Fill	350	30	571.478	705.935	616.498	0	616.498	1101.64	1101.64
50	7.8633	3156.53	41.296	Compacted Fill	350	30	333.98	412.559	108.355	0	108.355	401.723	401.723

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.23528

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	19.4603	1784.61	0	0	0
2	27.3236	1784.88	3322.81	0	0
3	35.1869	1785.25	7951.83	0	0
4	43.0502	1785.72	13630.3	0	0
5	50.9135	1786.29	19988.5	0	0
6	58.7768	1786.96	26516.9	0	0
7	66.6401	1787.73	32719.3	0	0
8	74.5034	1788.61	39049.9	0	0
9	82.3667	1789.59	45582	0	0
10	90.23	1790.67	52215.3	0	0
11	98.0933	1791.85	58854.9	0	0
12	105.957	1793.14	65410.6	0	0
13	113.82	1794.53	71797.3	0	0
14	121.683	1796.03	77736.4	0	0
15	129.547	1797.64	83208.9	0	0
16	137.41	1799.35	88385.4	0	0
17	145.273	1801.17	93182.5	0	0
18	153.136	1803.1	97521.1	0	0
19	161	1805.14	101327	0	0
20	168.863	1807.29	104530	0	0
21	176.726	1809.56	107064	0	0
22	184.59	1811.94	108886	0	0
23	192.453	1814.43	110031	0	0
24	200.316	1817.04	110445	0	0
25	208.18	1819.77	110086	0	0
26	216.043	1822.62	108922	0	0
27	223.906	1825.59	106926	0	0
28	231.769	1828.68	104176	0	0
29	239.633	1831.9	100989	0	0
30	247.496	1835.25	97484.3	0	0
31	255.359	1838.72	93723.3	0	0
32	263.223	1842.33	89350.2	0	0
33	271.086	1846.08	84276.4	0	0
34	278.949	1849.96	78511.1	0	0
35	286.813	1853.98	72070.1	0	0
36	294.676	1858.15	64975.3	0	0
37	302.539	1862.47	57255.6	0	0
38	310.402	1866.93	49277.4	0	0
39	318.266	1871.55	41721.4	0	0
40	326.129	1876.33	33892.9	0	0
41	333.992	1881.28	25654.9	0	0
42	341.856	1886.39	17070.5	0	0
43	349.719	1891.67	8212.6	0	0
44	357.582	1897.13	-831.593	0	0
45	365.446	1902.78	-9088.39	0	0
46	373.309	1908.62	-15794	0	0
47	381.172	1914.65	-21330.3	0	0
48	389.036	1920.89	-25567.9	0	0
49	396.899	1927.35	-28275.2	0	0
50	404.762	1934.02	-29200.2	0	0
51	412.625	1940.93	0	0	0

List Of Coordinates

Distributed Load

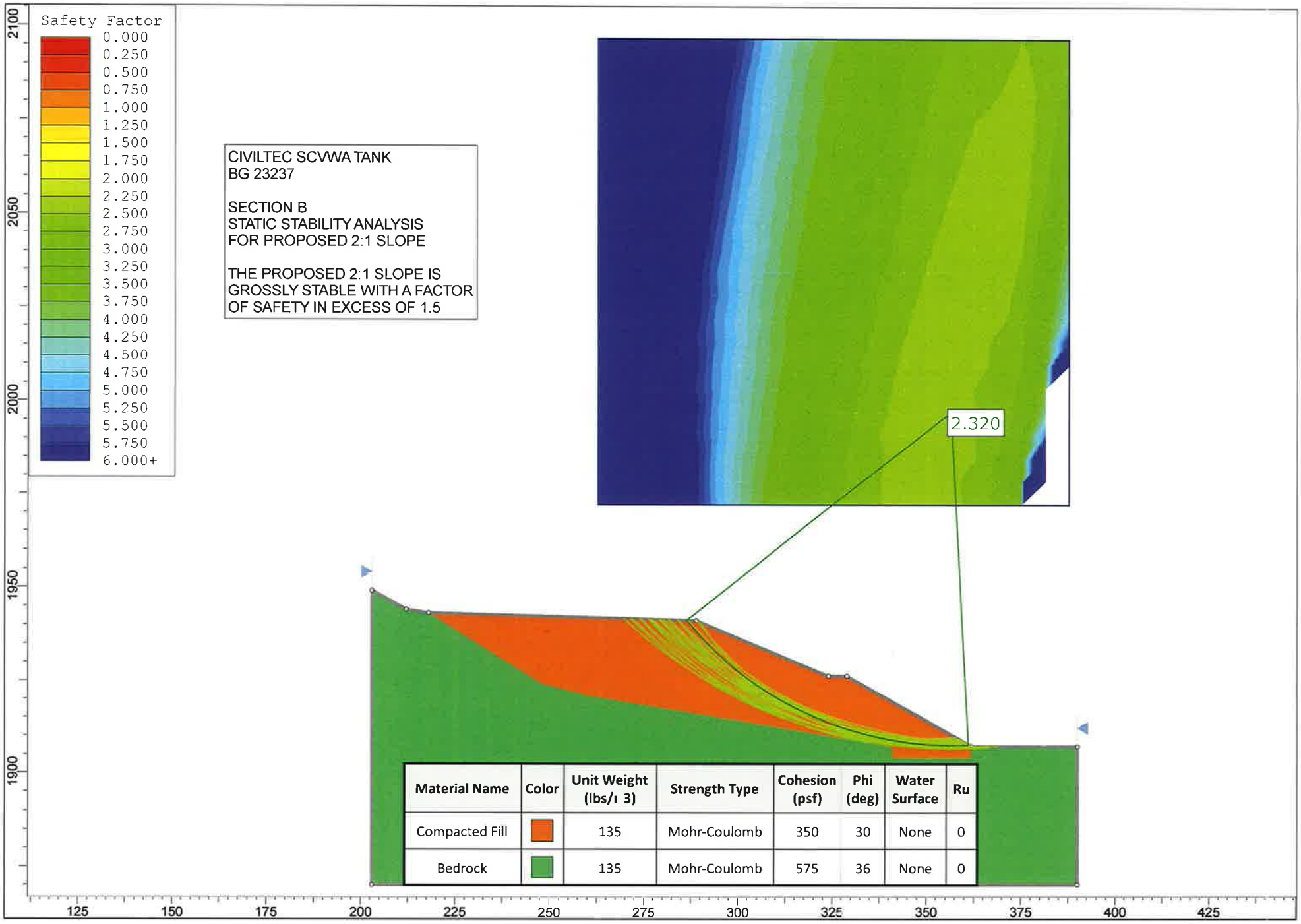
X	Y
600	1963
502	1963

External Boundary

X	Y
-50	1720
620	1720
620	1963
600	1963
502	1963
496	1963
483	1963
446	1945
405	1940
369	1930
357	1930
315	1907
304	1907
252	1880
226	1880
187	1860
176	1860
122	1830
114	1830
64	1806
55	1806
44	1802
22	1788
19	1784
0	1784
-50	1784

Material Boundary

X	Y
-50	1720
128	1776
225	1820
360	1884
479	1949
496	1963



Material Name	Color	Unit Weight (lbs/ı 3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Compacted Fill		135	Mohr-Coulomb	350	30	None	0
Bedrock		135	Mohr-Coulomb	575	36	None	0

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name:	23237 Section B Static
Slide Modeler Version:	7.038
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	8/19/2020, 11:42:05 AM

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Failure Direction:	Left to Right
Data Output:	Standard
Maximum Material Properties:	20
Maximum Support Properties:	20

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Grid Search
Radius Increment:	10
Composite Surfaces:	Disabled
Reverse Curvature:	Invalid Surfaces
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Material Properties

Property	Compacted Fill	Bedrock
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	135	135
Cohesion [psf]	350	575
Friction Angle [deg]	30	36
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	2.320140
Center:	356.513, 1996.819
Radius:	89.496
Left Slip Surface Endpoint:	286.502, 1941.070
Right Slip Surface Endpoint:	361.223, 1907.447
Resisting Moment:	7.15554e+006 lb-ft
Driving Moment:	3.0841e+006 lb-ft
Total Slice Area:	679.635 ft2
Surface Horizontal Width:	74.7213 ft
Surface Average Height:	9.0956 ft

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces:	4767
Number of Invalid Surfaces:	84

Error Codes:

Error Code -103 reported for 1 surface
Error Code -108 reported for 83 surfaces

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremelyhigh safety factors if the driving force is very small (0.1 is an arbitrary number).

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.32014

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.49443	180.03	-50.715	Compacted Fill	350	30	138.696	321.794	-48.8544	0	-48.8544	120.689	120.689
2	1.49443	524.11	-49.2269	Compacted Fill	350	30	184.853	428.885	136.632	0	136.632	350.99	350.99
3	1.49443	763.074	-47.7825	Compacted Fill	350	30	218.16	506.161	270.479	0	270.479	510.927	510.927
4	1.49443	958.186	-46.3771	Compacted Fill	350	30	246.204	571.228	383.177	0	383.177	641.511	641.511
5	1.49443	1137.93	-45.0071	Compacted Fill	350	30	272.578	632.418	489.161	0	489.161	761.806	761.806
6	1.49443	1303.41	-43.6691	Compacted Fill	350	30	297.348	689.889	588.705	0	588.705	872.55	872.55
7	1.49443	1455.56	-42.3604	Compacted Fill	350	30	320.577	743.784	682.052	0	682.052	974.372	974.372
8	1.49443	1595.22	-41.0783	Compacted Fill	350	30	342.321	794.233	769.435	0	769.435	1067.83	1067.83
9	1.49443	1723.1	-39.8209	Compacted Fill	350	30	362.632	841.357	851.054	0	851.054	1153.41	1153.41
10	1.49443	1839.86	-38.586	Compacted Fill	350	30	381.556	885.264	927.106	0	927.106	1231.55	1231.55
11	1.49443	1946.07	-37.3721	Compacted Fill	350	30	399.138	926.056	997.758	0	997.758	1302.61	1302.61
12	1.49443	2042.23	-36.1775	Compacted Fill	350	30	415.417	963.825	1063.18	0	1063.18	1366.96	1366.96
13	1.49443	2128.82	-35.0008	Compacted Fill	350	30	430.428	998.654	1123.5	0	1123.5	1424.9	1424.9
14	1.49443	2206.24	-33.8409	Compacted Fill	350	30	444.206	1030.62	1178.87	0	1178.87	1476.7	1476.7
15	1.49443	2274.86	-32.6965	Compacted Fill	350	30	456.782	1059.8	1229.41	0	1229.41	1522.62	1522.62
16	1.49443	2335.04	-31.5666	Compacted Fill	350	30	468.183	1086.25	1275.22	0	1275.22	1562.87	1562.87
17	1.49443	2387.07	-30.4502	Compacted Fill	350	30	478.434	1110.03	1316.42	0	1316.42	1597.68	1597.68
18	1.49443	2431.23	-29.3465	Compacted Fill	350	30	487.561	1131.21	1353.1	0	1353.1	1627.22	1627.22
19	1.49443	2467.79	-28.2546	Compacted Fill	350	30	495.584	1149.83	1385.34	0	1385.34	1651.68	1651.68
20	1.49443	2496.98	-27.1738	Compacted Fill	350	30	502.524	1165.93	1413.23	0	1413.23	1671.2	1671.2
21	1.49443	2519.01	-26.1033	Compacted Fill	350	30	508.399	1179.56	1436.83	0	1436.83	1685.93	1685.93
22	1.49443	2534.1	-25.0426	Compacted Fill	350	30	513.224	1190.75	1456.23	0	1456.23	1696.01	1696.01
23	1.49443	2542.4	-23.991	Compacted Fill	350	30	517.016	1199.55	1471.46	0	1471.46	1701.56	1701.56
24	1.49443	2544.11	-22.9479	Compacted Fill	350	30	519.788	1205.98	1482.61	0	1482.61	1702.68	1702.68
25	1.49443	2539.36	-21.9127	Compacted Fill	350	30	521.553	1210.08	1489.69	0	1489.69	1699.49	1699.49
26	1.49443	2581.59	-20.8851	Compacted Fill	350	30	530.425	1230.66	1525.35	0	1525.35	1727.74	1727.74
27	1.49443	2693.03	-19.8644	Compacted	350	30	549.905	1275.86	1603.63	0	1603.63	1802.31	1802.31

				Fill									
28	1.49443	2798.96	-18.8503	Compacted Fill	350	30	568.669	1319.39	1679.04	0	1679.04	1873.18	1873.18
29	1.49443	2871.5	-17.8423	Compacted Fill	350	30	582.409	1351.27	1734.25	0	1734.25	1921.72	1921.72
30	1.49443	2808.68	-16.8399	Compacted Fill	350	30	575.266	1334.7	1705.55	0	1705.55	1879.67	1879.67
31	1.49443	2723.5	-15.8428	Compacted Fill	350	30	564.54	1309.81	1662.45	0	1662.45	1822.65	1822.65
32	1.49443	2632.66	-14.8506	Compacted Fill	350	30	552.801	1282.58	1615.26	0	1615.26	1761.84	1761.84
33	1.49443	2536.25	-13.863	Compacted Fill	350	30	540.051	1252.99	1564.03	0	1564.03	1697.31	1697.31
34	1.49443	2434.33	-12.8796	Compacted Fill	350	30	526.297	1221.08	1508.76	0	1508.76	1629.1	1629.1
35	1.49443	2326.98	-11.8999	Compacted Fill	350	30	511.538	1186.84	1449.45	0	1449.45	1557.25	1557.25
36	1.49443	2214.25	-10.9239	Compacted Fill	350	30	495.777	1150.27	1386.11	0	1386.11	1481.8	1481.8
37	1.49443	2096.21	-9.95097	Compacted Fill	350	30	479.015	1111.38	1318.75	0	1318.75	1402.79	1402.79
38	1.49443	1972.89	-8.98097	Compacted Fill	350	30	461.251	1070.17	1247.36	0	1247.36	1320.26	1320.26
39	1.49443	1844.35	-8.01356	Compacted Fill	350	30	442.482	1026.62	1171.94	0	1171.94	1234.23	1234.23
40	1.49443	1710.62	-7.04845	Compacted Fill	350	30	422.707	980.739	1092.47	0	1092.47	1144.74	1144.74
41	1.49443	1571.74	-6.08534	Compacted Fill	350	30	401.921	932.514	1008.95	0	1008.95	1051.8	1051.8
42	1.49443	1427.74	-5.12396	Compacted Fill	350	30	380.121	881.935	921.341	0	921.341	955.426	955.426
43	1.49443	1278.65	-4.16402	Compacted Fill	350	30	357.301	828.988	829.628	0	829.628	855.641	855.641
44	1.49443	1124.48	-3.20525	Compacted Fill	350	30	333.453	773.658	733.795	0	733.795	752.468	752.468
45	1.49443	965.244	-2.24738	Compacted Fill	350	30	308.57	715.926	633.802	0	633.802	645.912	645.912
46	1.49443	800.966	-1.29013	Compacted Fill	350	30	282.643	655.771	529.611	0	529.611	535.977	535.977
47	1.49443	631.649	-0.333252	Compacted Fill	350	30	255.662	593.171	421.185	0	421.185	422.672	422.672
48	1.49443	457.296	0.623538	Compacted Fill	350	30	227.615	528.098	308.475	0	308.475	305.998	305.998
49	1.49443	277.907	1.5805	Compacted Fill	350	30	198.489	460.523	191.431	0	191.431	185.955	185.955
50	1.49443	93.4763	2.53791	Compacted Fill	350	30	168.272	390.414	69.999	0	69.999	62.5405	62.5405

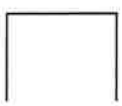
Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.32014

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	286.502	1941.07	0	0	0
2	287.996	1939.24	-296.248	0	0
3	289.491	1937.51	-335.36	0	0
4	290.985	1935.86	-215.451	0	0
5	292.48	1934.3	17.9359	0	0
6	293.974	1932.8	342.318	0	0
7	295.469	1931.37	738.36	0	0
8	296.963	1930.01	1189.34	0	0
9	298.457	1928.71	1680.76	0	0
10	299.952	1927.46	2199.98	0	0
11	301.446	1926.27	2735.99	0	0
12	302.941	1925.13	3279.15	0	0
13	304.435	1924.04	3821.04	0	0
14	305.93	1922.99	4354.31	0	0
15	307.424	1921.99	4872.54	0	0
16	308.918	1921.03	5370.15	0	0
17	310.413	1920.11	5842.27	0	0
18	311.907	1919.23	6284.74	0	0
19	313.402	1918.39	6693.97	0	0
20	314.896	1917.59	7066.94	0	0
21	316.391	1916.82	7401.11	0	0
22	317.885	1916.09	7694.42	0	0
23	319.379	1915.39	7945.2	0	0
24	320.874	1914.73	8152.2	0	0
25	322.368	1914.09	8314.54	0	0
26	323.863	1913.49	8431.65	0	0
27	325.357	1912.92	8509.79	0	0
28	326.852	1912.38	8554.91	0	0
29	328.346	1911.87	8562.84	0	0
30	329.84	1911.39	8527.82	0	0
31	331.335	1910.94	8440.72	0	0
32	332.829	1910.51	8303.18	0	0
33	334.324	1910.12	8118.2	0	0
34	335.818	1909.75	7889.01	0	0
35	337.313	1909.41	7619.08	0	0
36	338.807	1909.09	7312.09	0	0
37	340.301	1908.8	6971.94	0	0
38	341.796	1908.54	6602.79	0	0
39	343.29	1908.31	6208.99	0	0
40	344.785	1908.09	5795.16	0	0
41	346.279	1907.91	5366.14	0	0
42	347.774	1907.75	4927.03	0	0
43	349.268	1907.62	4483.17	0	0
44	350.762	1907.51	4040.17	0	0
45	352.257	1907.42	3603.91	0	0
46	353.751	1907.37	3180.54	0	0
47	355.246	1907.33	2776.53	0	0
48	356.74	1907.32	2398.62	0	0
49	358.235	1907.34	2053.89	0	0
50	359.729	1907.38	1749.76	0	0
51	361.223	1907.45	0	0	0

List Of Coordinates

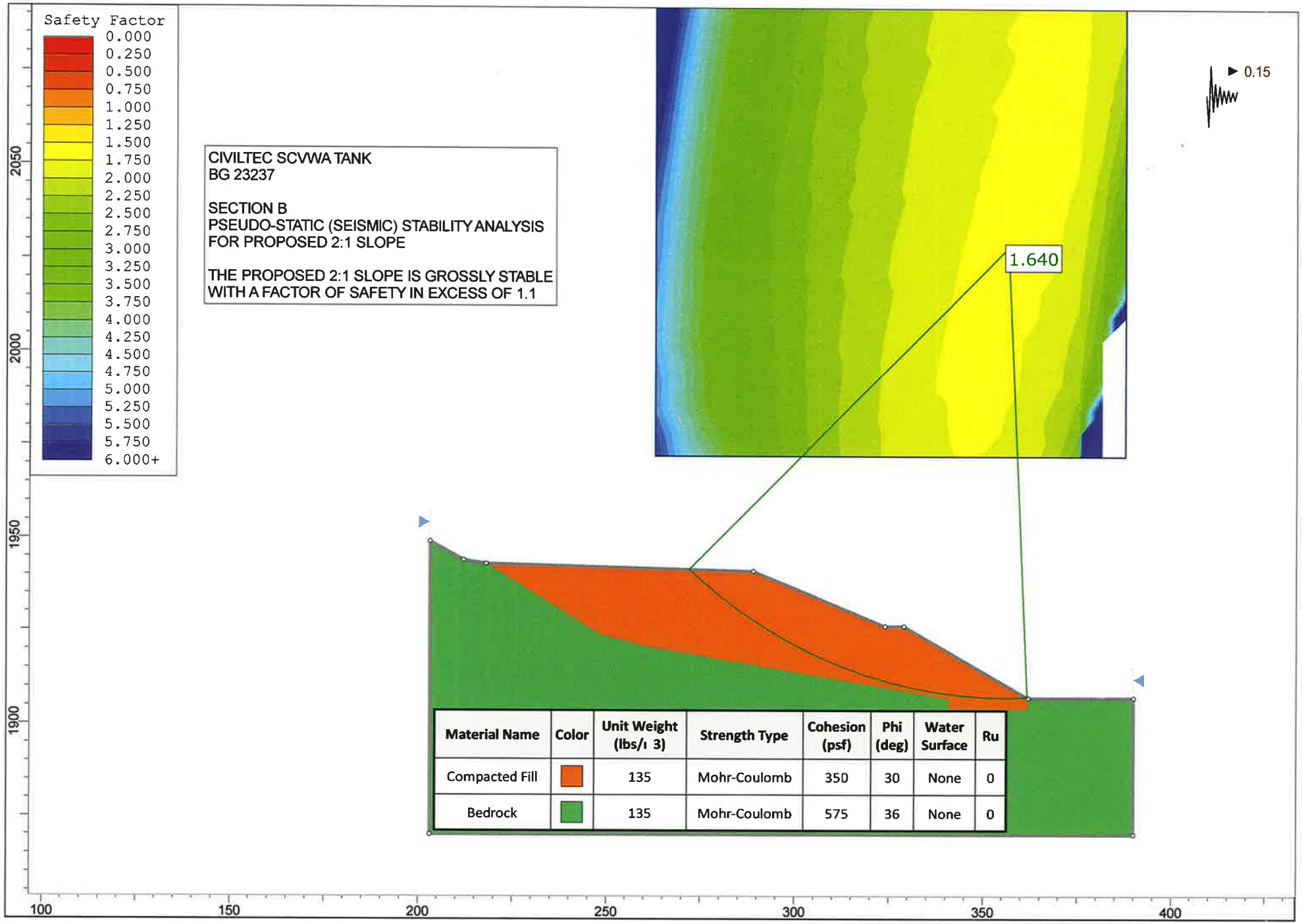
External Boundary



X	Y
203	1870
390	1870
390	1907
362	1907
329	1926
324	1926
289	1941
218	1943
212	1944
203	1949

Material Boundary

X	Y
218	1943
248	1924
259	1921
341	1907
341	1904
362	1904
362	1907


Safety Factor
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0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
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3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
CIVILTEC SCVWA TANK
BG 23237
SECTION B
PSEUDO-STATIC (SEISMIC) STABILITY ANALYSIS
FOR PROPOSED 2:1 SLOPE
THE PROPOSED 2:1 SLOPE IS GROSSLY STABLE
WITH A FACTOR OF SAFETY IN EXCESS OF 1.1
1.640
0.15
2050
2000
1950
1900
100
150
200
250
300
350
400
Material Name | Color | Unit Weight (lbs/ı 3) | Strength Type | Cohesion (psf) | Phi (deg) | Water Surface | Ru
Compacted Fill | 135 | Mohr-Coulomb | 350 | 30 | None | 0
Bedrock | 135 | Mohr-Coulomb | 575 | 36 | None | 0

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name:	23237 Section B Seismic
Slide Modeler Version:	7.038
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	8/19/2020, 11:42:05 AM

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Failure Direction:	Left to Right
Data Output:	Standard
Maximum Material Properties:	20
Maximum Support Properties:	20

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Grid Search
Radius Increment:	10
Composite Surfaces:	Disabled
Reverse Curvature:	Invalid Surfaces
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

Seismic Load Coefficient (Horizontal): 0.15

Material Properties

Property	Compacted Fill	Bedrock
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	135	135
Cohesion [psf]	350	575
Friction Angle [deg]	30	36
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	1.639880
Center:	356.513, 2028.051
Radius:	121.020
Left Slip Surface Endpoint:	271.948, 1941.480
Right Slip Surface Endpoint:	361.749, 1907.145
Resisting Moment:	1.28196e+007 lb-ft
Driving Moment:	7.81744e+006 lb-ft
Total Slice Area:	1008.51 ft2
Surface Horizontal Width:	89.8011 ft
Surface Average Height:	11.2305 ft

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces:	4781
Number of Invalid Surfaces:	70

Error Codes:

Error Code -103 reported for 1 surface

Error Code -108 reported for 69 surfaces

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.63988

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.79602	202.23	-43.7401	Compacted Fill	350	30	189.32	310.463	-68.4806	0	-68.4806	112.692	112.692
2	1.79602	598.364	-42.5743	Compacted Fill	350	30	249.927	409.851	103.665	0	103.665	333.278	333.278
3	1.79602	978.294	-41.4299	Compacted Fill	350	30	309.183	507.023	271.972	0	271.972	544.84	544.84
4	1.79602	1342.88	-40.3053	Compacted Fill	350	30	367.099	601.998	436.473	0	436.473	747.854	747.854
5	1.79602	1692.87	-39.1992	Compacted Fill	350	30	423.686	694.795	597.203	0	597.203	942.743	942.743
6	1.79602	2028.97	-38.1102	Compacted Fill	350	30	478.961	785.438	754.199	0	754.199	1129.89	1129.89
7	1.79602	2351.78	-37.0372	Compacted Fill	350	30	532.935	873.95	907.507	0	907.507	1309.65	1309.65
8	1.79602	2661.89	-35.9792	Compacted Fill	350	30	585.624	960.353	1057.16	0	1057.16	1482.32	1482.32
9	1.79602	2959.79	-34.9352	Compacted Fill	350	30	637.041	1044.67	1203.21	0	1203.21	1648.19	1648.19
10	1.79602	3223.66	-33.9043	Compacted Fill	350	30	683.668	1121.13	1335.64	0	1335.64	1795.12	1795.12
11	1.79602	3345.46	-32.8858	Compacted Fill	350	30	708.117	1161.23	1405.09	0	1405.09	1862.94	1862.94
12	1.79602	3435.03	-31.8788	Compacted Fill	350	30	727.561	1193.11	1460.31	0	1460.31	1912.81	1912.81
13	1.79602	3514.04	-30.8828	Compacted Fill	350	30	745.401	1222.37	1510.99	0	1510.99	1956.8	1956.8
14	1.79602	3582.82	-29.8969	Compacted Fill	350	30	761.66	1249.03	1557.17	0	1557.17	1995.08	1995.08
15	1.79602	3641.68	-28.9208	Compacted Fill	350	30	776.357	1273.13	1598.91	0	1598.91	2027.85	2027.85
16	1.79602	3690.89	-27.9537	Compacted Fill	350	30	789.512	1294.7	1636.28	0	1636.28	2055.25	2055.25
17	1.79602	3730.73	-26.9953	Compacted Fill	350	30	801.14	1313.77	1669.31	0	1669.31	2077.43	2077.43
18	1.79602	3761.42	-26.0449	Compacted Fill	350	30	811.259	1330.37	1698.04	0	1698.04	2094.51	2094.51
19	1.79602	3783.2	-25.1022	Compacted Fill	350	30	819.88	1344.51	1722.54	0	1722.54	2106.63	2106.63
20	1.79602	3796.28	-24.1667	Compacted Fill	350	30	827.018	1356.21	1742.81	0	1742.81	2113.9	2113.9
21	1.79602	3800.84	-23.238	Compacted Fill	350	30	832.683	1365.5	1758.9	0	1758.9	2116.44	2116.44
22	1.79602	3797.08	-22.3157	Compacted Fill	350	30	836.884	1372.39	1770.83	0	1770.83	2114.33	2114.33
23	1.79602	3785.14	-21.3995	Compacted Fill	350	30	839.635	1376.9	1778.64	0	1778.64	2107.68	2107.68
24	1.79602	3765.2	-20.489	Compacted	350	30	840.94	1379.04	1782.34	0	1782.34	2096.57	2096.57

				Fill									
25	1.79602	3737.39	-19.5838	Compacted Fill	350	30	840.799	1378.81	1781.95	0	1781.95	2081.08	2081.08
26	1.79602	3701.86	-18.6838	Compacted Fill	350	30	839.226	1376.23	1777.49	0	1777.49	2061.29	2061.29
27	1.79602	3658.72	-17.7885	Compacted Fill	350	30	836.226	1371.31	1768.96	0	1768.96	2037.26	2037.26
28	1.79602	3608.09	-16.8976	Compacted Fill	350	30	831.799	1364.05	1756.38	0	1756.38	2009.06	2009.06
29	1.79602	3550.11	-16.0109	Compacted Fill	350	30	825.945	1354.45	1739.77	0	1739.77	1976.77	1976.77
30	1.79602	3581.48	-15.1282	Compacted Fill	350	30	835.97	1370.89	1768.23	0	1768.23	1994.24	1994.24
31	1.79602	3695.64	-14.2491	Compacted Fill	350	30	860.941	1411.84	1839.16	0	1839.16	2057.8	2057.8
32	1.79602	3795.83	-13.3735	Compacted Fill	350	30	883.595	1448.99	1903.5	0	1903.5	2113.57	2113.57
33	1.79602	3718.67	-12.501	Compacted Fill	350	30	874.186	1433.56	1876.78	0	1876.78	2070.6	2070.6
34	1.79602	3561.04	-11.6314	Compacted Fill	350	30	849.928	1393.78	1807.88	0	1807.88	1982.83	1982.83
35	1.79602	3396.53	-10.7646	Compacted Fill	350	30	824.109	1351.44	1734.54	0	1734.54	1891.22	1891.22
36	1.79602	3225.2	-9.90022	Compacted Fill	350	30	796.725	1306.53	1656.77	0	1656.77	1795.82	1795.82
37	1.79602	3047.11	-9.03813	Compacted Fill	350	30	767.771	1259.05	1574.53	0	1574.53	1696.65	1696.65
38	1.79602	2862.31	-8.17811	Compacted Fill	350	30	737.238	1208.98	1487.8	0	1487.8	1593.75	1593.75
39	1.79602	2670.85	-7.31993	Compacted Fill	350	30	705.116	1156.3	1396.56	0	1396.56	1487.14	1487.14
40	1.79602	2472.76	-6.4634	Compacted Fill	350	30	671.393	1101	1300.78	0	1300.78	1376.84	1376.84
41	1.79602	2268.09	-5.60832	Compacted Fill	350	30	636.058	1043.06	1200.41	0	1200.41	1262.87	1262.87
42	1.79602	2056.85	-4.75449	Compacted Fill	350	30	599.094	982.443	1095.42	0	1095.42	1145.25	1145.25
43	1.79602	1839.09	-3.90172	Compacted Fill	350	30	560.489	919.135	985.771	0	985.771	1024	1024
44	1.79602	1614.81	-3.04981	Compacted Fill	350	30	520.223	853.104	871.404	0	871.404	899.121	899.121
45	1.79602	1384.05	-2.19858	Compacted Fill	350	30	478.28	784.321	752.265	0	752.265	770.627	770.627
46	1.79602	1146.81	-1.34783	Compacted Fill	350	30	434.637	712.752	628.304	0	628.304	638.53	638.53
47	1.79602	903.094	-0.49738	Compacted Fill	350	30	389.272	638.359	499.453	0	499.453	502.832	502.832
48	1.79602	652.919	0.352961	Compacted Fill	350	30	342.162	561.104	365.643	0	365.643	363.535	363.535
49	1.79602	396.279	1.20338	Compacted Fill	350	30	293.279	480.943	226.8	0	226.8	220.64	220.64
50	1.79602	133.171	2.05406	Compacted Fill	350	30	242.597	397.83	82.8444	0	82.8444	74.1435	74.1435

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.63988

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	271.948	1941.48	0	0	0
2	273.744	1939.76	-427.215	0	0
3	275.54	1938.11	-615.055	0	0
4	277.336	1936.53	-592.231	0	0
5	279.132	1935	-384.847	0	0
6	280.928	1933.54	-16.7208	0	0
7	282.724	1932.13	490.342	0	0
8	284.52	1930.77	1116.32	0	0
9	286.316	1929.47	1842.77	0	0
10	288.112	1928.22	2652.68	0	0
11	289.908	1927.01	3521.2	0	0
12	291.704	1925.85	4383.55	0	0
13	293.5	1924.73	5223.94	0	0
14	295.296	1923.66	6036.02	0	0
15	297.092	1922.62	6814.16	0	0
16	298.888	1921.63	7553.38	0	0
17	300.684	1920.68	8249.3	0	0
18	302.48	1919.76	8898.08	0	0
19	304.276	1918.89	9496.41	0	0
20	306.072	1918.04	10041.5	0	0
21	307.868	1917.24	10530.9	0	0
22	309.664	1916.47	10962.7	0	0
23	311.46	1915.73	11335.4	0	0
24	313.256	1915.03	11647.8	0	0
25	315.052	1914.36	11899.1	0	0
26	316.848	1913.72	12089	0	0
27	318.644	1913.11	12217.4	0	0
28	320.44	1912.53	12284.4	0	0
29	322.236	1911.99	12290.7	0	0
30	324.032	1911.47	12237.2	0	0
31	325.829	1910.99	12132.3	0	0
32	327.625	1910.53	11980.1	0	0
33	329.421	1910.1	11776.1	0	0
34	331.217	1909.7	11512	0	0
35	333.013	1909.33	11188.8	0	0
36	334.809	1908.99	10811.2	0	0
37	336.605	1908.68	10384.1	0	0
38	338.401	1908.39	9912.74	0	0
39	340.197	1908.14	9402.69	0	0
40	341.993	1907.91	8859.76	0	0
41	343.789	1907.7	8290.12	0	0
42	345.585	1907.53	7700.26	0	0
43	347.381	1907.38	7096.98	0	0
44	349.177	1907.25	6487.46	0	0
45	350.973	1907.16	5879.21	0	0
46	352.769	1907.09	5280.13	0	0
47	354.565	1907.05	4698.48	0	0
48	356.361	1907.03	4142.95	0	0
49	358.157	1907.04	3622.63	0	0
50	359.953	1907.08	3147.04	0	0
51	361.749	1907.14	0	0	0

List Of Coordinates

External Boundary

X	Y
203	1870
390	1870
390	1907
362	1907
329	1926
324	1926
289	1941
218	1943
212	1944
203	1949

Material Boundary

X	Y
218	1943
248	1924
259	1921
341	1907
341	1904
362	1904
362	1907

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
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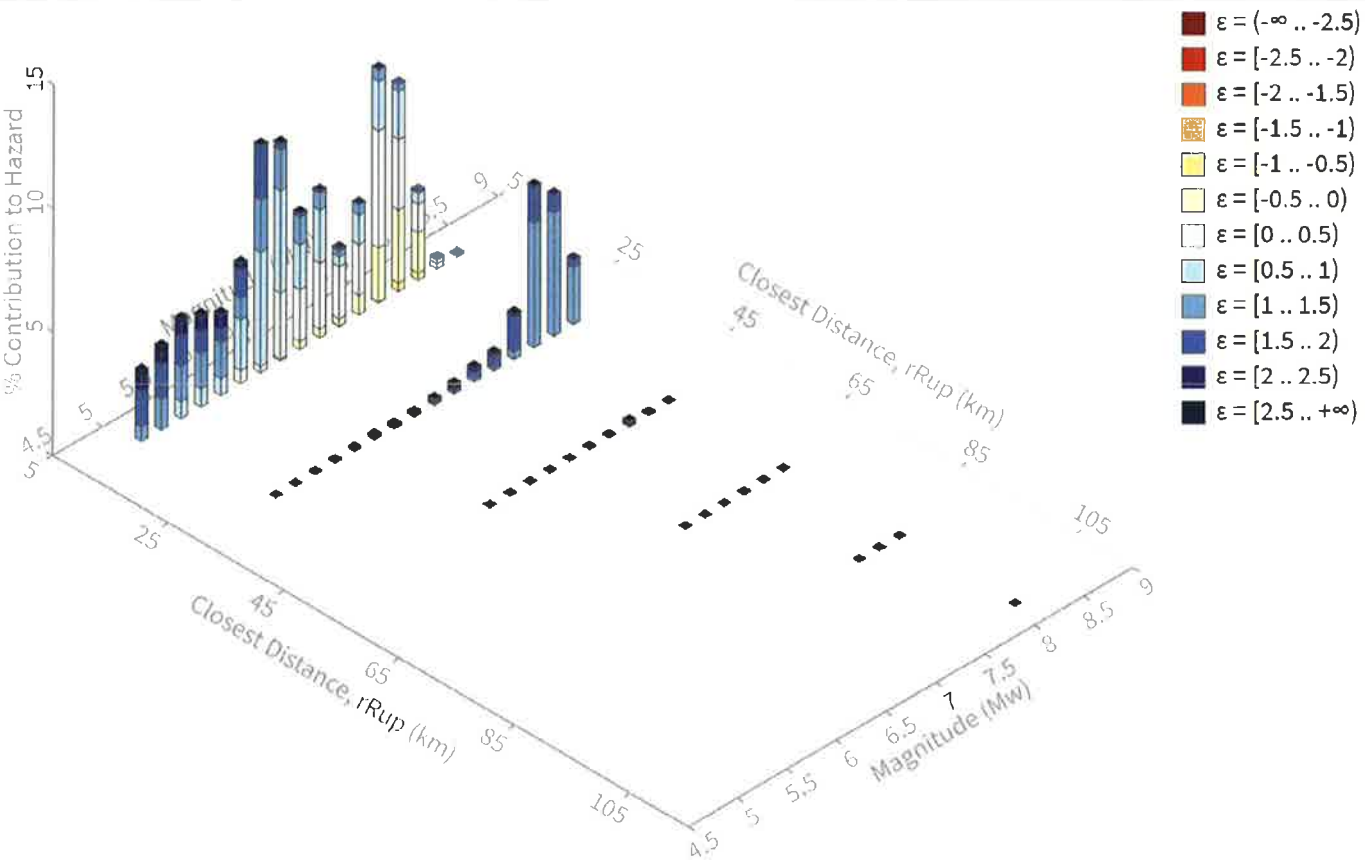
SEISMIC HAZARD DEAGGREGATION CHART
(Probability of Exceedance: 10% in 50 years)

BG: 23237 CLIENT: CIVILTEC SCVWA TANK

ENGINEER: JET

REFERENCE: USGS, 2017, Earthquake Hazards Program, Beta - Unified Hazard Tool, Seismic Hazard Deaggregation, Conterminous U.S. 2014 (Update) (v4.2.0) Edition, https://earthquake.usgs.gov/hazards/interactive/index.php.



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 475 yrs
Exceedance rate: 0.0021052632 yr^{-1}
PGA ground motion: 0.53853618 g

Recovered targets

Return period: 505.93703 yrs
Exceedance rate: 0.0019765305 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.12 %

Mean (over all sources)

m: 6.9
r: 12.8 km
ε_0: 0.92 σ

Mode (largest m-r bin)

m: 7.51
r: 10.69 km
ε_0: 0.28 σ
Contribution: 9.44 %

Mode (largest m-r-ε_0 bin)

m: 7.91
r: 24.26 km
ε_0: 1.42 σ
Contribution: 5.02 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

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AERIAL VICINITY MAP

BG: 23237 CIVILTEC

CONSULTANT : JET/JWB

DRAWN BY : AS

SCALE: 1" = 300'

REFERENCE: LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING, GIS-NET, 2013, http://gis.planning.lacounty.gov/GIS-NET_Public/Viewer.html

BYER GEOTECHNICAL INC.
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REGIONAL GEOLOGIC MAP

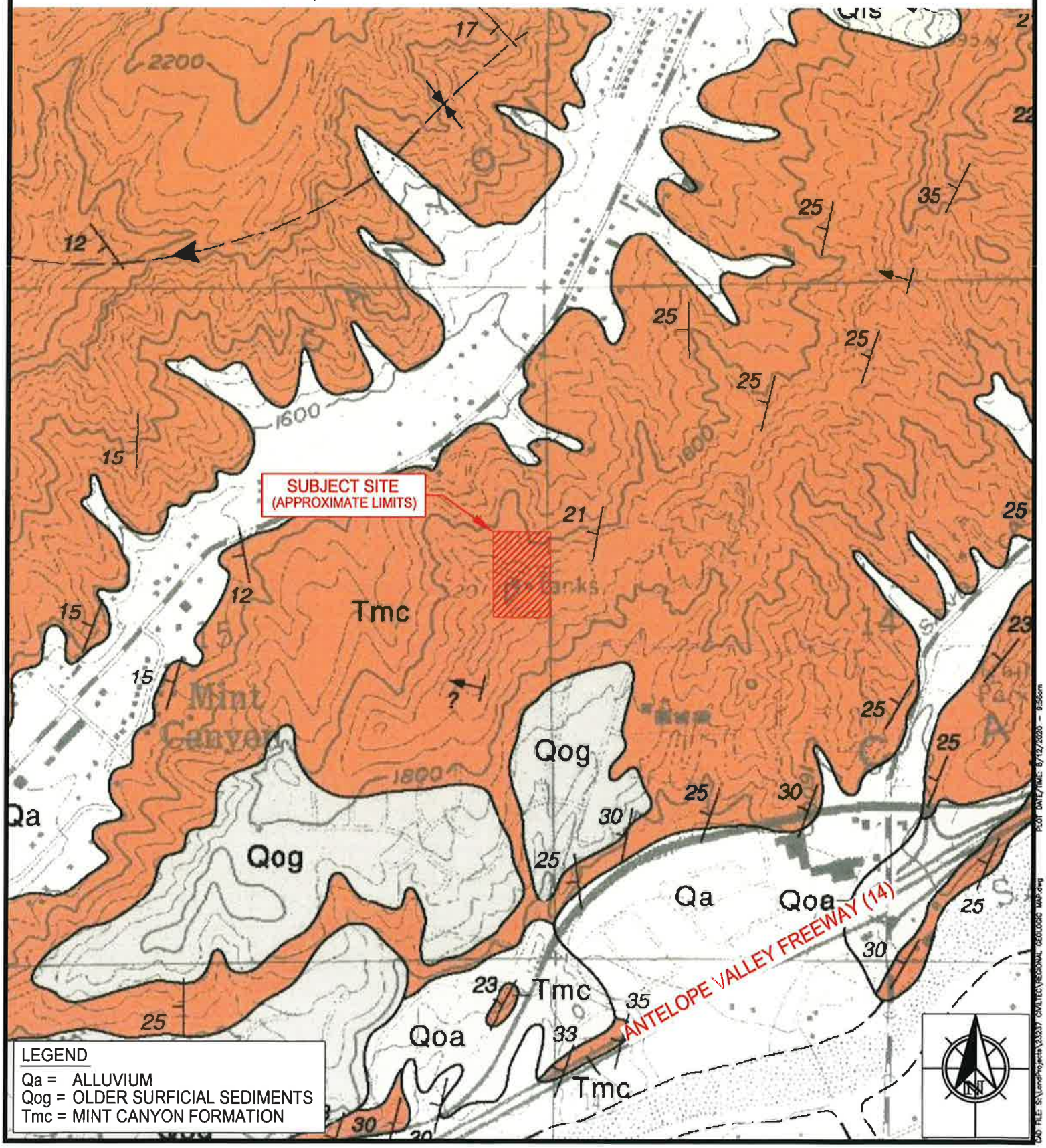
BG: 23237 CIVILTEC

CONSULTANT : JET/JWB

DRAWN BY : AS

SCALE: 1" = 1000'

REFERENCE: DIBBLEE, T.W. (1996), GEOLOGIC MAP OF THE MINT CANYON QUADRANGLES, LOS ANGELES, CALIFORNIA DIBBLEE GEOLOGICAL FOUNDATION, MAP DF-57.



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REGIONAL TOPOGRAPHIC MAP

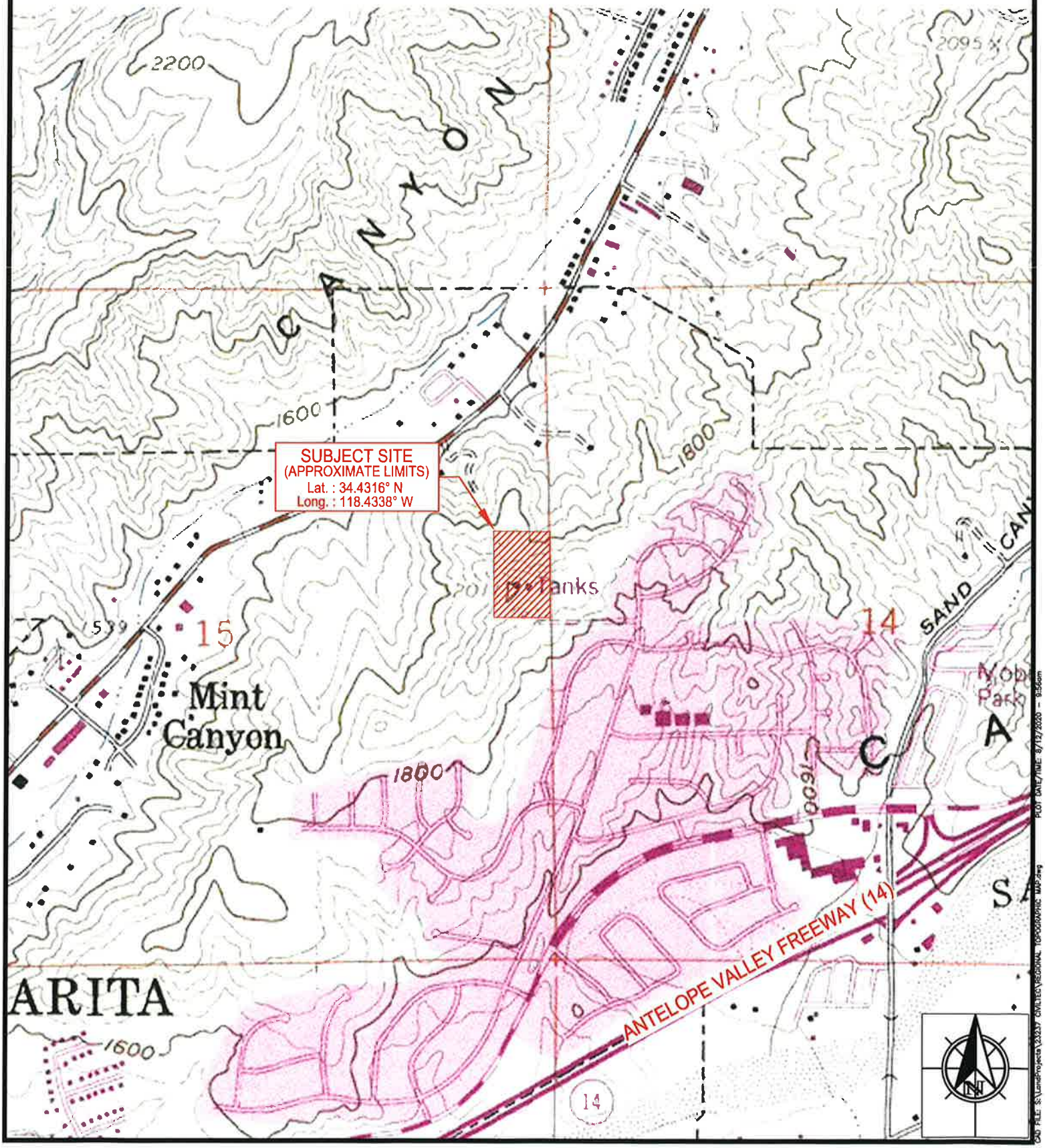
BG: 23237 CIVILTEC

CONSULTANT : JET/JWB

DRAWN BY : AS

SCALE: 1" = 1000'

REFERENCE: USGS TOPOGRAPHIC MAP, MINT CANYON 7.5-MINUTE SERIES QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA CREATED 1981.



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REGIONAL FAULT MAP

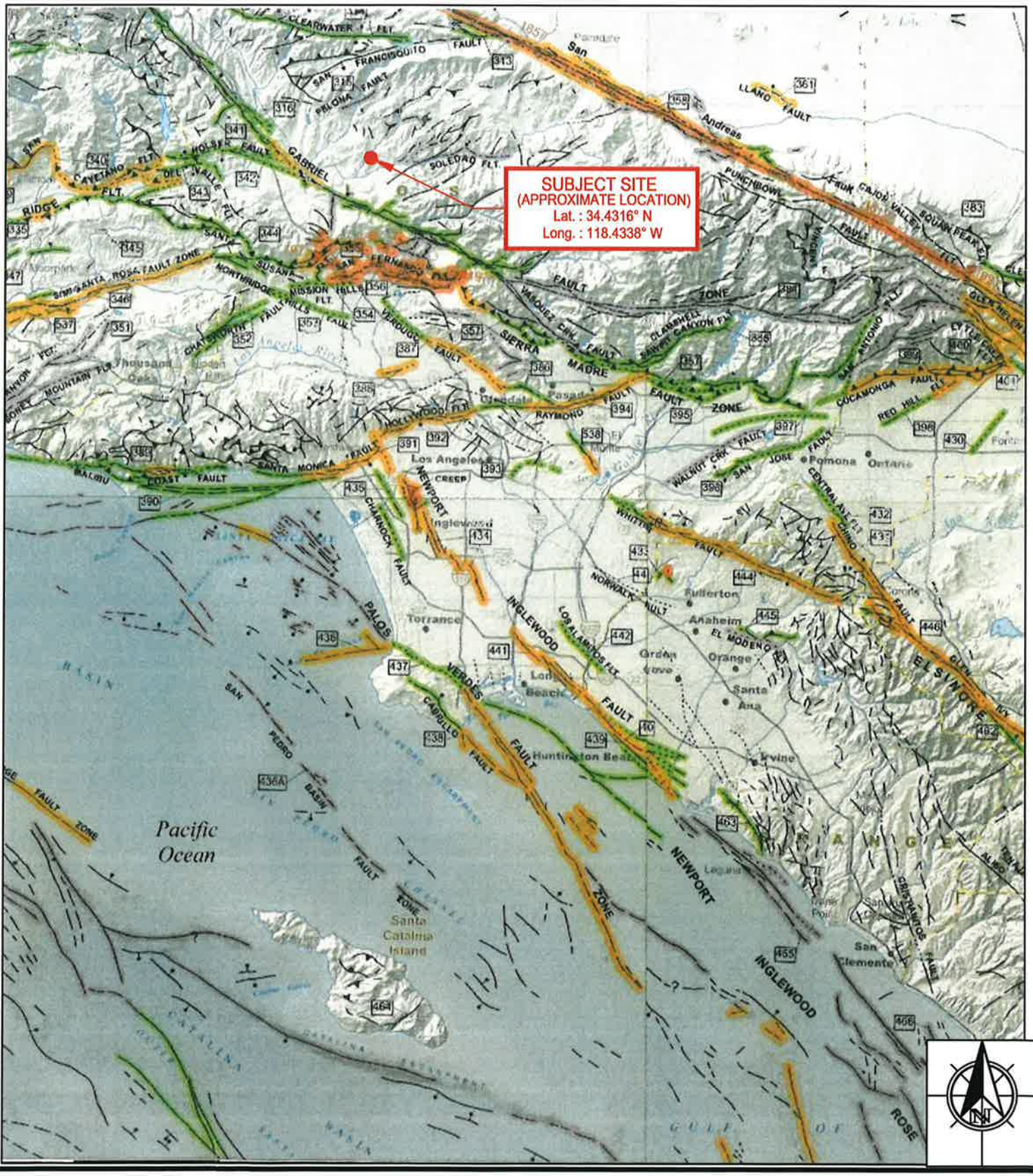
BG: 23237 CIVILTEC

CONSULTANT : JET/JWB

DRAWN BY : AS

SCALE: 1" = 12 MILES

REFERENCE: JENNINGS, C.W., AND BRYANT, W.A.,2010, FAULT ACTIVITY MAP OF CALIFORNIA GEOLOGICAL SURVEY, 150th ANNIVERSARY, MAP No 6.



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1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

SEISMIC HAZARD ZONES MAP

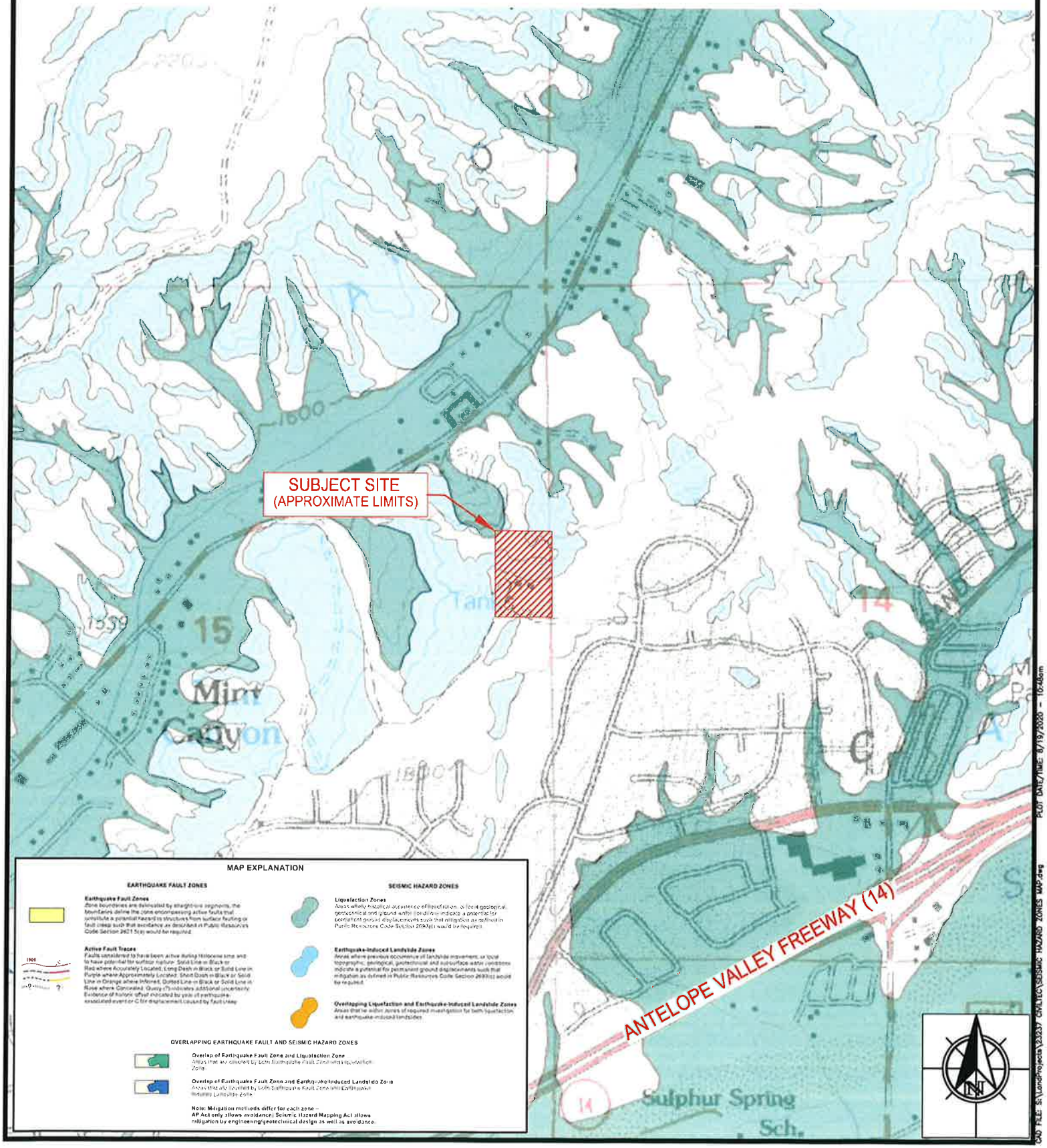
BG: 23237 CIVILTEC

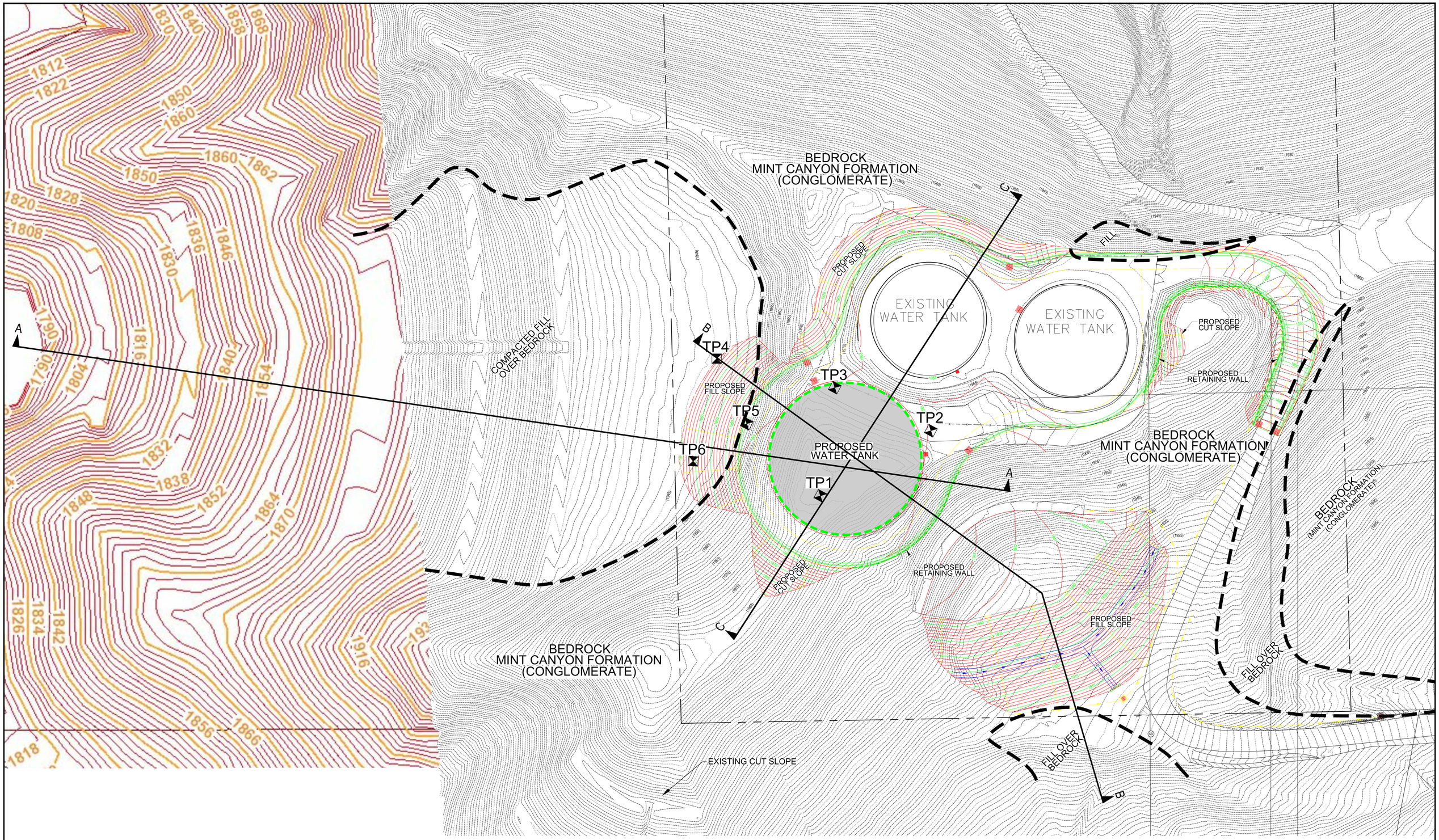
CONSULTANT : JET/JWB

DRAWN BY : AS

SCALE: 1" = 1000'

REFERENCE: EARTHQUAKE ZONES OF REQUIRED INVESTIGATION MINT CANYON QUADRANGLE; SEISMIC HAZARD ZONES, DATED MARCH 25, 1999.





LEGEND

TP6 LOCATION AND NUMBER OF HAND-DUG TEST PIT

GEOLOGIC CONTACT

C C LINE OF CROSS SECTION

GRAPHIC SCALE

20 15 10 5 0 10 20 40

(IN FEET)

1 inch = 20 ft.

AUGUST 25, 2020

REFERENCE: DEANE TANK SITE PLANNING CONCEPTUAL GRADING PLAN SINGLE AND DUAL TANK DESIGN PREPARED BY CIVILTEC ENGINEERING, INC., DATED 08/15/2020.

BYER GEOTECHNICAL INC.
1601 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.9747 FAX

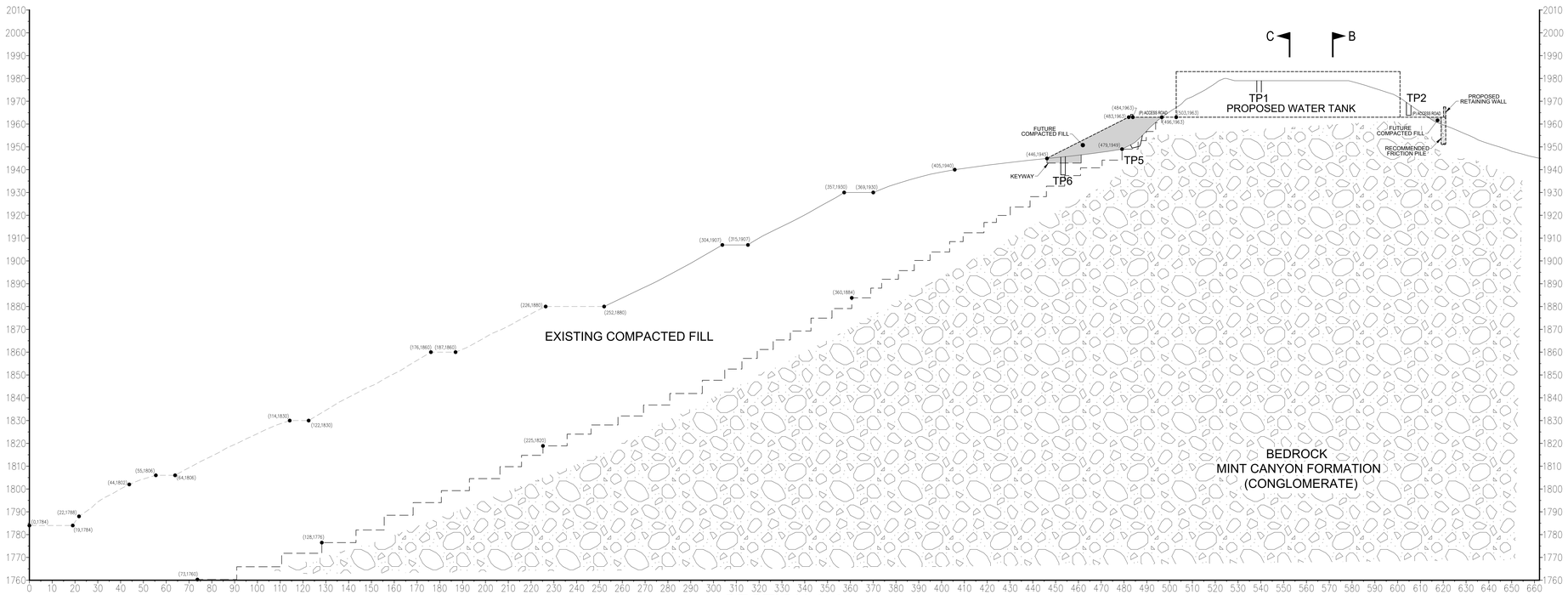
GEOLOGIC MAP

BG: 23237 CIVILTEC

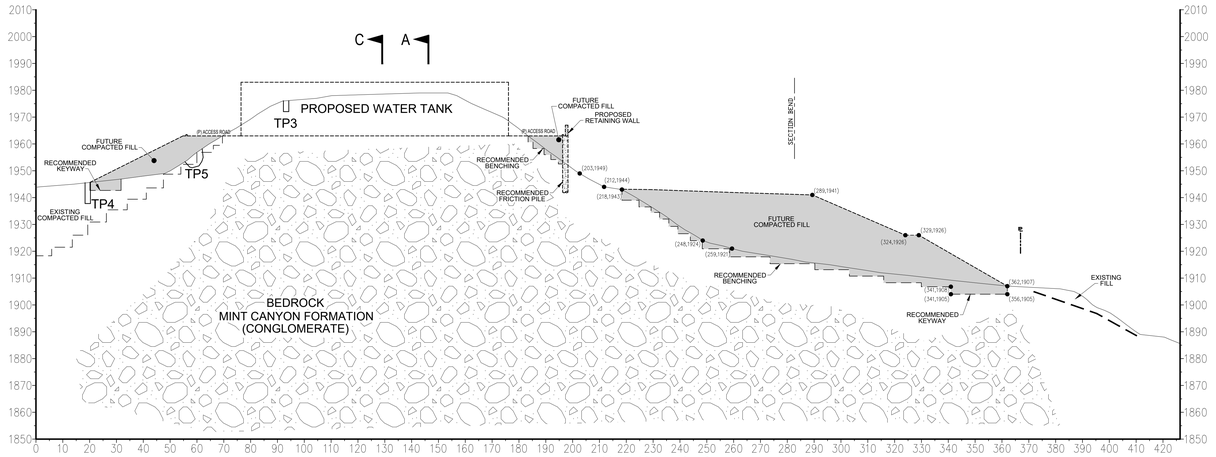
CONSULTANT: JET/JWB

DRAWN BY: AS

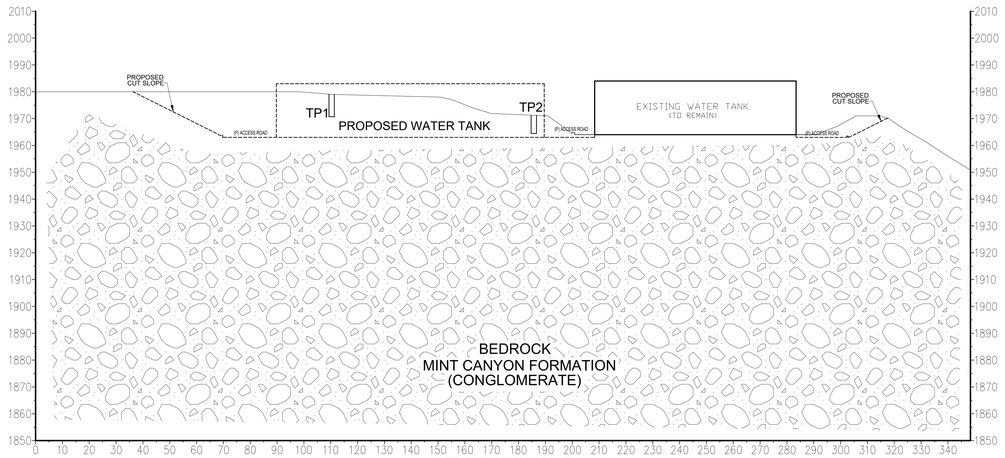
SCALE: 1" = 20'



SECTION A-A



SECTION B-B



SECTION C-C

AUGUST 25, 2020

BYER GEOTECHNICAL INC.
1800 E. CARY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9950 TEL
818.543.3737 FAX

SECTIONS A, B, & C

BG: 23237 CIVILTEC

CONSULTANT: JWB

DRAWN BY: AS

SCALE: 1" = 20'

APPENDIX F

Noise Measurement Data

Monitoring Location: Site 1
Monitoring Date: 10/28/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
13:08:31	49.3	58.4	37.7
13:09:31	50.8	58.0	38.5
13:10:31	41.1	47.1	37.8
13:11:31	37.2	40.4	35.6
13:12:31	37.1	39.4	35.2
13:13:31	44.8	56.5	35.3
13:14:31	37.3	39.5	35.3
13:15:31	44.7	57.2	36.0
13:16:31	52.6	65.7	37.0
13:17:31	54.3	63.0	37.6
13:18:31	51.9	63.5	38.6
13:19:31	41.1	46.2	38.5
13:20:31	56.3	66.1	39.5
13:21:31	50.3	60.0	37.0
13:22:31	40.5	46.2	37.0
13:23:31	45.9	46.8	41.5

15-minute LAeq **49.7**

Monitoring Location: Site 2
Monitoring Date: 10/28/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
13:26:34	37.6	49.5	35.8
13:27:34	39.7	53.3	34.0
13:28:34	35.4	37.9	33.5
13:29:34	39.2	46.8	34.1
13:30:34	40.9	48.5	37.9
13:31:34	40.8	44.0	38.1
13:32:34	41.4	46.2	38.1
13:33:34	40.0	42.2	37.4
13:34:34	38.1	40.1	35.6
13:35:34	38.0	45.8	35.7
13:36:34	39.6	44.2	36.0
13:37:34	37.8	40.1	36.3
13:38:34	41.3	45.5	37.8
13:39:34	39.8	49.8	34.9
13:40:34	51.2	63.9	39.6
13:41:34	42.1	42.9	41.3

15-minute LAeq **42.4**

Monitoring Location: Site 3
Monitoring Date: 10/28/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
14:05:46	56.8	61.9	41.3
14:06:46	52.3	62.7	43.7
14:07:46	55.0	62.3	47.3
14:08:46	51.5	57.2	47.9
14:09:46	64.4	75.2	39.6
14:10:46	59.4	74.6	37.8
14:11:46	53.9	62.9	36.3
14:12:46	37.1	40.6	34.6
14:13:46	38.9	42.3	35.7
14:14:46	40.2	44.4	36.5
14:15:46	40.2	46.0	37.3
14:16:46	39.3	44.8	36.5
14:17:46	40.5	45.4	36.7
14:18:46	46.0	55.4	40.3
14:19:46	46.9	56.3	37.6
14:20:46	41.4	43.8	40.0

15-minute LAeq **55.1**

Monitoring Location: Site 4
Monitoring Date: 10/28/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
14:23:20	35.1	49.9	31.5
14:24:20	32.8	35.9	31.4
14:25:20	32.4	33.5	31.3
14:26:20	33.5	35.8	32.3
14:27:20	34.4	36.5	32.5
14:28:20	36.3	41.3	34.3
14:29:20	37.9	41.2	35.0
14:30:20	35.0	36.3	34.0
14:31:20	34.7	39.1	33.2
14:32:20	34.4	36.1	33.0
14:33:20	40.1	45.7	34.3
14:34:20	35.4	39.4	33.1
14:35:20	35.9	40.4	33.8
14:36:20	41.6	53.3	34.3
14:37:20	39.5	49.1	33.3
14:38:20	38.6	42.2	39.0

15-minute LAeq **37.0**

Monitoring Location: Site 5
Monitoring Date: 10/28/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
14:43:26	47.8	51.9	39.0
14:44:26	46.1	53.7	37.0
14:45:26	51.0	58.4	39.8
14:46:26	46.3	51.6	40.6
14:47:26	45.4	54.3	39.3
14:48:26	44.8	51.1	35.4
14:49:26	40.7	44.8	37.4
14:50:26	43.1	48.2	40.2
14:51:26	43.6	48.0	39.4
14:52:26	48.0	56.4	42.7
14:53:26	50.5	60.1	41.1
14:54:26	47.4	56.7	38.7
14:55:26	46.1	53.2	39.3
14:56:26	44.4	49.3	39.4
14:57:26	47.4	59.3	39.6
14:58:26	39.5	42.6	39.3

15-minute LAeq **46.7**

Monitoring Location: Site 6
Monitoring Date: 10/28/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
13:45:35	55.5	62.9	42.9
13:46:35	51.5	61.6	42.9
13:47:35	52.6	59.8	42.1
13:48:35	67.1	77.9	41.0
13:49:35	43.7	46.9	41.3
13:50:35	46.5	56.5	41.9
13:51:35	49.5	58.3	43.8
13:52:35	46.8	54.3	43.0
13:53:35	54.8	59.2	45.0
13:54:35	54.0	64.4	41.2
13:55:35	56.3	66.5	42.4
13:56:35	45.8	53.9	41.1
13:57:35	44.5	49.7	41.3
13:58:35	53.7	65.2	43.7
13:59:35	53.0	58.2	42.3
14:00:35	43.9	44.4	43.2

15-minute LAeq **56.7**

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat ########
Case Descı Demolition

---- Receptor #1 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residentia	49.7	49.7	49.7

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50	0
Excavator	No	40		80.7	50	0
Excavator	No	40		80.7	50	0
Excavator	No	40		80.7	50	0
Dozer	No	40		81.7	50	0
Dozer	No	40		81.7	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	89.6	86.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residentia	42.4	42.4	42.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	350	0
Excavator	No	40		80.7	350	0
Excavator	No	40		80.7	350	0
Excavator	No	40		80.7	350	0
Dozer	No	40		81.7	350	0
Dozer	No	40		81.7	350	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	72.7	65.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	72.7	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residentia	55.1	55.1	55.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	415	0

Excavator	No	40	80.7	415	0
Excavator	No	40	80.7	415	0
Excavator	No	40	80.7	415	0
Dozer	No	40	81.7	415	0
Dozer	No	40	81.7	415	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	71.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	62.3	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	62.3	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	62.3	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.2	68.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 4	Residentia	37	37	37

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	460	0
Excavator	No	40		80.7	460	0
Excavator	No	40		80.7	460	0
Excavator	No	40		80.7	460	0
Dozer	No	40		81.7	460	0
Dozer	No	40		81.7	460	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	70.3	63.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.3	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 5	Residentia	46.7	46.7	46.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	485	0
Excavator	No	40		80.7	485	0
Excavator	No	40		80.7	485	0
Excavator	No	40		80.7	485	0
Dozer	No	40		81.7	485	0
Dozer	No	40		81.7	485	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	69.8	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	61.9	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Dozer		61.9	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	69.8	66.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 6	Residentia	56.7	56.7	56.7

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Concrete Saw	No	20		89.6	460	0
Excavator	No	40		80.7	460	0
Excavator	No	40		80.7	460	0
Excavator	No	40		80.7	460	0
Dozer	No	40		81.7	460	0
Dozer	No	40		81.7	460	0

			Results											
	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	70.3	63.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.3	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat ########
Case Descı Grading

---- Receptor #1 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residentia	49.7	49.7	49.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crusher	No	40		86.5	50	0
Dump Truck	No	40		76.5	50	0
Dozer	No	40		81.7	50	0
Scraper	No	40		83.6	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crusher	86.5	82.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	76.5	72.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.5	85.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residentia	42.4	42.4	42.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crusher	No	40		86.5	350	0
Dump Truck	No	40		76.5	350	0
Dozer	No	40		81.7	350	0
Scraper	No	40		83.6	350	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crusher	69.6	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	59.5	55.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	66.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.6	68.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residentia	55.1	55.1	55.1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crusher	No	40		86.5	415	0
Dump Truck	No	40		76.5	415	0
Dozer	No	40		81.7	415	0
Scraper	No	40		83.6	415	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq

Crusher	68.1	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	58.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	65.2	61.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.1	67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 4	Residentia	37	37	37

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crusher	No	40		86.5	460	0
Dump Truck	No	40		76.5	460	0
Dozer	No	40		81.7	460	0
Scraper	No	40		83.6	460	0

	Results													
	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crusher	67.2	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	57.2	53.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	64.3	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.2	66.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 5	Residentia	46.7	46.7	46.7

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crusher	No	40		86.5	485	0
Dump Truck	No	40		76.5	485	0
Dozer	No	40		81.7	485	0
Scraper	No	40		83.6	485	0

	Results													
	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crusher	66.8	62.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	56.7	52.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	61.9	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	63.8	59.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.8	65.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 6	Residentia	56.7	56.7	56.7

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crusher	No	40		86.5	460	0
Dump Truck	No	40		76.5	460	0
Dozer	No	40		81.7	460	0
Scraper	No	40		83.6	460	0

	Results		
	Calculated (dBA)	Noise Limits (dBA)	Noise Limit Exceedance (dBA)

			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crusher	67.2	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	57.2	53.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	64.3	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.2	66.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat ########
Case Descr Building Construction

---- Receptor #1 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residentia	49.7	49.7	49.7

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residentia	42.4	42.4	42.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	350	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	63.6	55.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.6	55.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residentia	55.1	55.1	55.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	415	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	62.2	54.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	62.2	54.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residentia	37	37	37

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	460	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	61.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 5	Residentia	46.7	46.7	46.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	485	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	60.8	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.8	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 6	Residentia	56.7	56.7	56.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	460	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	61.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat ########
Case Descı Paving

---- Receptor #1 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residentia	49.7	49.7	49.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	50	0
Paver	No	50		77.2	50	0
All Other Equipment >	No	50	85		50	0
All Other Equipment >	No	50	85		50	0
Roller	No	20		80	50	0
Roller	No	20		80	50	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	85	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	85	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85	86.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residentia	42.4	42.4	42.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	350	0
Paver	No	50		77.2	350	0
All Other Equipment >	No	50	85		350	0
All Other Equipment >	No	50	85		350	0
Roller	No	20		80	350	0
Roller	No	20		80	350	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	68.1	65.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	68.1	65.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	63.1	56.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	63.1	56.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.1	69.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residentia	55.1	55.1	55.1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	415	0

Paver	No	50		77.2	415	0
All Other Equipment >	No	50	85		415	0
All Other Equipment >	No	50	85		415	0
Roller	No	20		80	415	0
Roller	No	20		80	415	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	58.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	58.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	66.6	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	66.6	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	61.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	61.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.6	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 4	Residentia	37	37	37

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	460	0
Paver	No	50		77.2	460	0
All Other Equipment >	No	50	85		460	0
All Other Equipment >	No	50	85		460	0
Roller	No	20		80	460	0
Roller	No	20		80	460	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	57.9	54.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	57.9	54.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	65.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	65.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	60.7	53.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	60.7	53.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.7	66.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 5	Residentia	46.7	46.7	46.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	485	0
Paver	No	50		77.2	485	0
All Other Equipment >	No	50	85		485	0
All Other Equipment >	No	50	85		485	0
Roller	No	20		80	485	0
Roller	No	20		80	485	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	57.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	57.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	65.3	62.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	65.3	62.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	60.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roller		60.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	65.3	66.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 6	Residentia	56.7	56.7	56.7

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Paver	No	50		77.2	460	0
Paver	No	50		77.2	0	0
All Other Equipment :	No	50	85		0	0
All Other Equipment :	No	50	85		0	0
Roller	No	20		80	0	0
Roller	No	20		80	0	0

			Results													
	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)							
			Day		Evening		Night		Day		Evening		Night			
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Paver	61.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Paver	0		0		0		0		0		0		0		0	
All Other Equipment > 5 HP	0		0		0		0		0		0		0		0	
All Other Equipment > 5 HP	0		0		0		0		0		0		0		0	
Roller	0		0		0		0		0		0		0		0	
Roller	0		0		0		0		0		0		0		0	
Total	61.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat ########
Case Descr Architectural Coating

---- Receptor #1 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 1	Residentia	49.7	49.7	49.7

			Equipment			
	Impact		Spec Lmax	Actual Lmax	Receptor Distance	Estimated Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 2	Residentia	42.4	42.4	42.4

			Equipment			
	Impact		Spec Lmax	Actual Lmax	Receptor Distance	Estimated Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	350	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	60.8	56.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.8	56.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 3	Residentia	55.1	55.1	55.1

			Equipment			
	Impact		Spec Lmax	Actual Lmax	Receptor Distance	Estimated Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	415	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 4	Residentia	37	37	37

			Equipment			
	Impact		Spec Lmax	Actual Lmax	Receptor Distance	Estimated Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	460	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	58.4	54.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	58.4	54.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 5	Residentia	46.7	46.7	46.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	485	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	57.9	54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	57.9	54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 6	Residentia	56.7	56.7	56.7

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	460	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	58.4	54.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	58.4	54.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Meridian Consultants LLC

Deane Tank Project
Construction Vibration Model
(50 feet)

Rev: 11-12-2012

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	50	0.031	0.008	78
Jackhammer		1	0.035	50	0.012	0.003	70
Large bulldozer		1	0.089	50	0.031	0.008	78
Loaded trucks		1	0.076	50	0.027	0.007	77
Pile Drive (impact)		1	0.644	50	0.228	0.057	95
Vibratory Roller		1	0.210	50	0.074	0.019	85
Small bulldozer		1	0.003	50	0.001	0.000	48

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, pg. 12-12.**

-Fragile Buildings- 0.20 in/sec

Meridian Consultants LLC

Deane Tank Project
Construction Vibration Model
(350 feet)

Rev: 11/12/2012

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	350	0.002	0.000	53
Jackhammer		1	0.035	350	0.001	0.000	44
Large bulldozer		1	0.089	350	0.002	0.000	53
Loaded trucks		1	0.076	350	0.001	0.000	51
Pile Drive (impact)		1	0.644	350	0.012	0.003	70
Vibratory Roller		1	0.210	350	0.004	0.001	60
Small bulldozer		1	0.003	350	0.000	0.000	23

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, pg. 12-12.**

-Fragile Buildings- 0.20 in/sec

Meridian Consultants LLC

Deane Tank Project
Construction Vibration Model
(415 feet)

Rev: 11-12-2012

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	415	0.001	0.000	50
Jackhammer		1	0.035	415	0.001	0.000	42
Large bulldozer		1	0.089	415	0.001	0.000	50
Loaded trucks		1	0.076	415	0.001	0.000	49
Pile Drive (impact)		1	0.644	415	0.010	0.002	68
Vibratory Roller		1	0.210	415	0.003	0.001	58
Small bulldozer		1	0.003	415	0.000	0.000	21

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, pg. 12-12.**

-Fragile Buildings- 0.20 in/sec

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	460	0.001	0.000	49
Jackhammer		1	0.035	460	0.000	0.000	41
Large bulldozer		1	0.089	460	0.001	0.000	49
Loaded trucks		1	0.076	460	0.001	0.000	48
Pile Drive (impact)		1	0.644	460	0.008	0.002	66
Vibratory Roller		1	0.210	460	0.003	0.001	56
Small bulldozer		1	0.003	460	0.000	0.000	20

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, pg. 12-12.**

-Fragile Buildings- 0.20 in/sec

Meridian Consultants LLC

Deane Tank Project
Construction Vibration Model
(485 feet)

Rev: 11/12/2012

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	485	0.001	0.000	48
Jackhammer		1	0.035	485	0.000	0.000	40
Large bulldozer		1	0.089	485	0.001	0.000	48
Loaded trucks		1	0.076	485	0.001	0.000	47
Pile Drive (impact)		1	0.644	485	0.008	0.002	66
Vibratory Roller		1	0.210	485	0.002	0.001	56
Small bulldozer		1	0.003	485	0.000	0.000	19

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, pg. 12-12.**

-Fragile Buildings- 0.20 in/sec

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	460	0.001	0.000	49
Jackhammer		1	0.035	460	0.000	0.000	41
Large bulldozer		1	0.089	460	0.001	0.000	49
Loaded trucks		1	0.076	460	0.001	0.000	48
Pile Drive (impact)		1	0.644	460	0.008	0.002	66
Vibratory Roller		1	0.210	460	0.003	0.001	56
Small bulldozer		1	0.003	460	0.000	0.000	20

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, pg. 12-12.**

-Fragile Buildings- 0.20 in/sec

APPENDIX G

AB 52 Consultation Letters

Water Resources & Outreach 26501 Summit Circle, Santa Clarita, CA 91350-3049

(661) 297-1600 | yourSCVwater.com

October 14, 2020

Fernandeño Tataviam Band of Mission Indians
Attn: Kimia Fatehi
Tribal Historic and Cultural Preservation Department
1019 Second Street, Suite 1
San Fernando, CA 91340

Subject: Notice of Proposed Project Pursuant to Public Resources Code Section 21090.3.1 ("AB 52"), *Deane Tank Site Expansion Project*

Dear Ms. Fatehi:

This letter is to inform you that the Santa Clarita Valley Water Agency (SCVWA) is planning the Deane Tank Site Expansion Project (the proposed Project) as described below. Per AB 52, the tribe has the right to consult on a proposed public or private project prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report.

The SCVWA is planning to design and build additional storage capacity in the Deane Pressure Zone, located on parcel APN 2839-002-902 west of Winterdale Drive and south of Sierra Highway in the City of Santa Clarita, California. The rectangular project parcel is approximately 6.7 acres in size on top of a hill with access to the site provided through a paved roadway located within an easement off Winterdale Drive near the intersection of Nearview Drive.

The purpose of the proposed Project is to supplement existing water service at the Deane Pressure Zone which is deficient in storage by 4.22 million-gallons (MG), and new development within the Deane Pressure Zone has increased the deficiency. For reference, the portion of the Skyline Ranch development within the Deane Pressure Zone equates to an additional 0.87 MG of storage needed, while the Sand Canyon Plaza development adds another 0.65 MG of storage needed. Together, the total additional storage volume required is 5.66 MG.

SCVWA has proposed an additional tank for the Deane Tank site to supplement the storage shortage at the Deane Pressure Zone. A single 100-foot diameter reservoir will be constructed with 29 feet operation water depth, providing an additional 1.70 MG capacity. The water supply for the new tank will be delivered from the two existing pump stations located north of the site on Sierra Highway- the Linda Vista Pump Station and Honby House Pump Station. These two pump stations currently supply water to the existing tanks at the project parcel and pipes from these stations will eventually be tied to the new piping on the site. The discharge pipeline from these pump stations is aligned along the north facing slope at the site.

To stay consistent with the existing floor elevation onsite, the ground elevation for the new tank will be cut and graded to match the elevation of the existing tanks. Existing utilities onsite will remain operational during the construction of the new tank. Related proposed Project components include utilities, a 20 feet wide asphalt paved access roadway around all tanks, drainage system around the

tank site and the access roadway, potential retaining walls, and an extra fill pad to assist with balancing earthwork.

The proposed Project will be evaluated pursuant to the California Environmental Quality Act (CEQA). An Initial Study/Mitigated Negative Declaration will evaluate the potential environmental impacts associated with implementing the proposed Project.

You have 30 calendar days from receipt of this letter to notify us in writing that you would like to consult on the Project. Please provide the lead contact person's contact information in your response.

Should the Fernandeño Tataviam Band of Mission Indians elect to engage in the consultation process, please provide written comments to the following address:

Santa Clarita Valley Water Agency
26501 Summit Circle
Santa Clarita, CA 91350
Attn.: Rick Vasilopulos, Water Resources Planner

Should you have any questions, you can contact Mr. Rick Vasilopulos via email at rvasilopulos@scvwa.org or (661) 705-7912.

Sincerely,

Rick Vasilopulos
Water Resources Planner

Cc: Orlando Moreno, P.E., Civil Engineer

Deane Tank Expansion Project Site

Water Resources & Outreach 26501 Summit Circle, Santa Clarita, CA 91350-3049

(661) 297-1600 | yourSCVwater.com

October 14, 2020

Gabrieleño Band of Mission Indians-Kizh Nation
Attn: Andrew Salas, Chairman
P.O. Box 393
Covina, CA 91723

Subject: Notice of Proposed Project Pursuant to Public Resources Code Section 21090.3.1 ("AB 52"), *Deane Tank Site Expansion Project*

Dear Mr. Salas:

This letter is to inform you that the Santa Clarita Valley Water Agency (SCVWA) is planning the Deane Tank Site Expansion Project (the proposed Project) as described below. Per AB 52, the tribe has the right to consult on a proposed public or private project prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report.

The SCVWA is planning to design and build additional storage capacity in the Deane Pressure Zone, located on parcel APN 2839-002-902 west of Winterdale Drive and south of Sierra Highway in the City of Santa Clarita, California. The rectangular project parcel is approximately 6.7 acres in size on top of a hill with access to the site provided through a paved roadway located within an easement off Winterdale Drive near the intersection of Nearview Drive.

The purpose of the proposed Project is to supplement existing water service at the Deane Pressure Zone which is deficient in storage by 4.22 million-gallons (MG), and new development within the Deane Pressure Zone has increased the deficiency. For reference, the portion of the Skyline Ranch development within the Deane Pressure Zone equates to an additional 0.87 MG of storage needed, while the Sand Canyon Plaza development adds another 0.65 MG of storage needed. Together, the total additional storage volume required is 5.66 MG.

SCVWA has proposed an additional tank for the Deane Tank site to supplement the storage shortage at the Deane Pressure Zone. A single 100-foot diameter reservoir will be constructed with 29 feet operation water depth, providing an additional 1.70 MG capacity. The water supply for the new tank will be delivered from the two existing pump stations located north of the site on Sierra Highway- the Linda Vista Pump Station and Honby House Pump Station. These two pump stations currently supply water to the existing tanks at the project parcel and pipes from these stations will eventually be tied to the new piping on the site. The discharge pipeline from these pump stations is aligned along the north facing slope at the site.

To stay consistent with the existing floor elevation onsite, the ground elevation for the new tank will be cut and graded to match the elevation of the existing tanks. Existing utilities onsite will remain operational during the construction of the new tank. Related proposed Project components include utilities, a 20 feet wide asphalt paved access roadway around all tanks, drainage system around the tank site and the access roadway, potential retaining walls, and an extra fill pad to assist with balancing earthwork.

The proposed Project will be evaluated pursuant to the California Environmental Quality Act (CEQA). An Initial Study/Mitigated Negative Declaration will evaluate the potential environmental impacts associated with implementing the proposed Project.

You have 30 calendar days from receipt of this letter to notify us in writing that you would like to consult on the Project. Please provide the lead contact person's contact information in your response.

Should the Fernandeño Tataviam Band of Mission Indians elect to engage in the consultation process, please provide written comments to the following address:

Santa Clarita Valley Water Agency
26501 Summit Circle
Santa Clarita, CA 91350
Attn.: Rick Vasilopulos, Water Resources Planner

Should you have any questions, you can contact Mr. Rick Vasilopulos via email at rvasilopulos@scvwa.org or (661) 705-7912.

Sincerely,

Rick Vasilopulos
Water Resources Planner

Cc: Orlando Moreno, P.E., Civil Engineer

Deane Tank Expansion Project Site

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OCT 16 2020

10/16/2020

Sent To: Anthony Morales

Street and Apt. No., or PO Box No.: P.O. Box 693

City, State, ZIP+4®: San Gabriel, CA 91778

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☐ Adult Signature Restricted Delivery	$
Postage	$0.55
Total Postage and Fees	$4.10

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10/16/2020

Sent To: Kimia Fatehi

Street and Apt. No., or PO Box No.: 1019 Second St Suite 2

City, State, ZIP+4®: San Fernando, CA 91340

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Thermal, CA 92274

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☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.55
Total Postage and Fees	$4.10

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OCT 16 2020

10/16/2020

Sent To: Michael Miselz

Street and Apt. No., or PO Box No.: P.O. Box 1160

City, State, ZIP+4®: Thermal, CA 92274

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Covina, CA 91723

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☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.55
Total Postage and Fees	$4.10

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OCT 16 2020

10/16/2020

Sent To: Andrew Salas

Street and Apt. No., or PO Box No.: P.O. Box 393

City, State, ZIP+4®: Covina, CA 91723

PS Form 3800, April 2015 PSN 7530-02-000-9047 — See Reverse for Instructions

Water Resources & Outreach 26501 Summit Circle, Santa Clarita, CA 91350-3049

(661) 297-1600 | yourSCVwater.com

October 14, 2020

San Gabriel Band of Mission Indians
Attn: Anthony Morales, Chief
P.O. Box 693
San Gabriel, CA 91778

Subject: Notice of Proposed Project Pursuant to Public Resources Code Section 21090.3.1 ("AB 52"), *Deane Tank Site Expansion Project*

Dear Mr. Morales:

This letter is to inform you that the Santa Clarita Valley Water Agency (SCVWA) is planning the Deane Tank Site Expansion Project (the proposed Project) as described below. Per AB 52, the tribe has the right to consult on a proposed public or private project prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report.

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Santa Clarita Valley Water Agency
26501 Summit Circle
Santa Clarita, CA 91350
Attn.: Rick Vasilopulos, Water Resources Planner

Should you have any questions, you can contact Mr. Rick Vasilopulos via email at rvasilopulos@scvwa.org or (661) 705-7912.

Sincerely,

Rick Vasilopulos
Water Resources Planner

Cc: Orlando Moreno, P.E., Civil Engineer

Deane Tank Expansion Project Site

Water Resources & Outreach 26501 Summit Circle, Santa Clarita, CA 91350-3049

(661) 297-1600 | yourSCVwater.com

October 14, 2020

Torres Martinez Desert Cahuilla Indians
Attn: Michael Mirelez, Cultural Resource Coordinador
P.O. Box 1160
Thermal, CA 92274

Subject: Notice of Proposed Project Pursuant to Public Resources Code Section 21090.3.1 ("AB 52"), *Deane Tank Site Expansion Project*

Dear Mr. Mirelez:

This letter is to inform you that the Santa Clarita Valley Water Agency (SCVWA) is planning the Deane Tank Site Expansion Project (the proposed Project) as described below. Per AB 52, the tribe has the right to consult on a proposed public or private project prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report.

The SCVWA is planning to design and build additional storage capacity in the Deane Pressure Zone, located on parcel APN 2839-002-902 west of Winterdale Drive and south of Sierra Highway in the City of Santa Clarita, California. The rectangular project parcel is approximately 6.7 acres in size on top of a hill with access to the site provided through a paved roadway located within an easement off Winterdale Drive near the intersection of Nearview Drive.

The purpose of the proposed Project is to supplement existing water service at the Deane Pressure Zone which is deficient in storage by 4.22 million-gallons (MG), and new development within the Deane Pressure Zone has increased the deficiency. For reference, the portion of the Skyline Ranch development within the Deane Pressure Zone equates to an additional 0.87 MG of storage needed, while the Sand Canyon Plaza development adds another 0.65 MG of storage needed. Together, the total additional storage volume required is 5.66 MG.

SCVWA has proposed an additional tank for the Deane Tank site to supplement the storage shortage at the Deane Pressure Zone. A single 100-foot diameter reservoir will be constructed with 29 feet operation water depth, providing an additional 1.70 MG capacity. The water supply for the new tank will be delivered from the two existing pump stations located north of the site on Sierra Highway- the Linda Vista Pump Station and Honby House Pump Station. These two pump stations currently supply water to the existing tanks at the project parcel and pipes from these stations will eventually be tied to the new piping on the site. The discharge pipeline from these pump stations is aligned along the north facing slope at the site.

To stay consistent with the existing floor elevation onsite, the ground elevation for the new tank will be cut and graded to match the elevation of the existing tanks. Existing utilities onsite will remain operational during the construction of the new tank. Related proposed Project components include utilities, a 20 feet wide asphalt paved access roadway around all tanks, drainage system around the tank site and the access roadway, potential retaining walls, and an extra fill pad to assist with balancing earthwork.

The proposed Project will be evaluated pursuant to the California Environmental Quality Act (CEQA). An Initial Study/Mitigated Negative Declaration will evaluate the potential environmental impacts associated with implementing the proposed Project.

You have 30 calendar days from receipt of this letter to notify us in writing that you would like to consult on the Project. Please provide the lead contact person's contact information in your response.

Should the Fernandeño Tataviam Band of Mission Indians elect to engage in the consultation process, please provide written comments to the following address:

Santa Clarita Valley Water Agency
26501 Summit Circle
Santa Clarita, CA 91350
Attn.: Rick Vasilopulos, Water Resources Planner

Should you have any questions, you can contact Mr. Rick Vasilopulos via email at rvasilopulos@scvwa.org or (661) 705-7912.

Sincerely,

Rick Vasilopulos
Water Resources Planner

Cc: Orlando Moreno, P.E., Civil Engineer

Deane Tank Expansion Project Site