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Alamitos Energy Center

(13-AFC-01)

Data Responses, Set 6

(Response to Data Requests 83 to 168)

Submitted to

California Energy Commission

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Introduction

Attached are AES Southland Development, LLC's (AES or the Applicant) responses to the California Energy Commission (CEC) Staff Data Request, Set 6 (numbers 83 through 168) regarding the Alamitos Energy Center (AEC) (13-AFC-01) Supplemental Application for Certification (SAFC).

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as the CEC presented them and are keyed to the Data Request numbers (83 through 168).

New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 83 would be numbered Table DR83-1. The first figure used in response to Data Request 90 would be Figure DR90-1, and so on. Figures or tables from the AEC SAFC that have been revised have "R" following the original number, indicating revision.

Additional tables, figures, or documents submitted in response to a data request (for example, supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of each discipline-specific section and are not sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

Project Description (83-104)

BACKGROUND

Staff has identified aspects of the project description that are unclear and raise questions about potential impacts across technical areas. Clarification would ensure staff's ability to assess the analysis contained in the Supplemental Application for Certification (SAFC) and conduct its own independent analysis.

DATA REQUEST

83. The SAFC references the same new 1,000-foot process/sanitary wastewater pipeline and the upgrading of approximately 4,000 feet of the existing offsite LBWD sewer line (AES 2015:1-3) as was in the Application for Certification (AFC) for the Alamitos Energy Center (AEC) file in December of 2013. The upgrading of the 4,000-foot section was eliminated from the 2013 AFC during the data adequacy review. Please clarify if the upgrading of approximately 4,000 feet of the existing offsite LBWD sewer line is still part of the proposed project.

Response: Upgrade of the 4,000 feet of the existing offsite City of Long Beach Water Department (LBWD) sewer line is no longer required.

84. The SAFC states that the AEC would eliminate the discharge of process/sanitary wastewater to the San Gabriel River (AES 2015:1-3). Please explain if this would require the removal or alteration of existing infrastructure, such as discharge gates?

Response: The elimination of the process/sanitary wastewater discharge to the San Gabriel River will not require the removal or alteration of the existing discharge gates as stormwater for both the AEC site and the Alamitos Generating Station (AGS) will continue to discharge stormwater through the existing, permitted outfalls. The northern most retention pond will be removed as part of AEC construction and stormwater will be directed to the remaining retention pond.

85. The SAFC states that AES would demolish "certain" buildings, foundations, and balance of equipment at Alamitos Generating Station (AGS) Unit 7 (AES 2015:1- 3). Use of the term "certain" implies that some Unit 7 components would not be demolished. Which buildings, foundations, and balance of equipment would be demolished?

Response: All of the AGS Unit 7 facilities will be removed to facilitate the construction of the combined-cycle power block. This includes a small building adjacent and to the north of Unit 7 that formerly housed the gas compressors for Unit 7. In addition, a small maintenance shop located between the retention ponds will be removed and demolished.

86. Also concerning the demolition of Unit 7 components, what are "other lines" and "ancillary equipment" (AES 2015:1-3, 5.3-3)?

Response: The AGS Unit 7 "other lines" and "ancillary equipment" describe utility lines (natural gas, water, etc.) and other equipment associated with Unit 7 that will be removed to facilitate the construction of the AEC.

87. AES proposes to demolish tank berms (AES 2015:5.3-3). Please identify which berms will be demolished on a site plan.

Response: Figure DR87-1 depicts the berms that will be removed and the creation of a new berm.

88. Section 1 of the SAFC states that one small maintenance shop would be demolished, whereas Section 2 states that two small maintenance shops would be demolished (AES 2015:1-3, 2-2). Please provide the number and location on a site plan of the maintenance shops that would be demolished.

Response: One maintenance shop will be demolished. Figure DR87-1 depicts the location of this maintenance shop. In addition, the gas compressor building for Unit 7 will be demolished.

89. The size of the AGS project site is given as both 71.1 acres and 71.3 acres (AES 2015:1-1, 2-4). Please confirm the AGS parcel size.

Response: The AGS project site is approximately 71 acres.

90. Please explain whether the natural gas compressor buildings and the gas pressure control station(s) mentioned in the SAFC are the same project components (AES 2015:1-3, 2-3, 2-4, Figure 2.1-2).

Response: The natural gas compressor buildings will also include gas pressure control stations.

91. Please explain whether the gas scrubber/filtering equipment and fuel gas filter/separator equipment mentioned in the SAFC are the same project components (AES 2015:2-4, Figure 2.1-2).

Response: The gas scrubber/filtering equipment and fuel gas filter/separator equipment are descriptions of the same project components.

92. AES proposes to build a 600,000-gallon onsite fire/service water storage tank (AES 2015:2-5). How far below existing grade would the contractor need to excavate to install the tank and any associated foundation?

Response: The water tank foundation design will be completed during the final design of the project. The tank will be supported on deep pile foundations (driven to 50 feet below grade) with the reinforced concrete pile cap installed at grade.

93. AES proposes to provide backup power for the proposed Alamitos Energy Center (AEC) by including a station battery system in the project design (AES 2015:2- 9). Where would AES install the station battery system? Would excavation be required to install the station battery system? How deep and wide would such excavation be?

Response: The battery station will be located in the Administrative building and will consist of either gel-cell or lithium ion batteries that are similar to automotive or computer batteries. The battery system will not require excavations beyond the requirements of the Administrative building.

94. The SAFC states that during construction and commissioning, AES would establish an electrical connection to the existing, onsite 66-kV power source (AES 2015:2-10). Would AES establish this connection by underground conduit, surface-laid cable, or overhead line?

Response: The existing, onsite power source will likely transition from an existing above ground power pole to underground to provide AEC power. This line will provide a permanent, redundant electrical supply.

95. Does AES propose to construct the generator step-up (GSU) transformers on concrete pads (≤10 feet below existing grade) supported by deep piles (~ 50 feet below existing grade)? Would AES conduct excavations to obtain material for the berms that would surround the GSU transformers? If so, where and to what depth and width would excavations be conducted?

Response: Final design of the generator step-up (GSU) foundations will be completed as part of the detailed design of the AEC and after a detailed geotechnical study of the site has been completed. The general design description referred to is a reasonable assumption for the GSU foundation. The "berms" referred to will act as secondary containment in the event of an accidental release and will be constructed of concrete as part of the GSU foundation and not earthen type berms using recovered material onsite.

96. AES proposes to construct a 340,000-gallon deionized water tank for operational service water storage (AES 2015:2-12). Would this water tank be supported on a concrete foundation with piles, or without? What would be the horizontal and vertical extent of excavation required to build the water tank?

Response: The water tank foundation design will be completed during the final design of the project. The tank will be supported on deep pile foundations (driven to 50 feet below grade) with the reinforced concrete pile cap installed at grade.

97. Is the proposed demineralized water storage tank (AES 2015:2-14) the same project component as the 340,000-gallon deionized water tank mentioned in the data request immediately above? If not, please identify its location on a site plan and explain if this water tank would be supported on a concrete foundation with piles, or without? What would be the horizontal and vertical extent of excavation required to build the water tank?

Response: The demineralized water storage tank and deionized water tank describe the same feature.

98. AES proposes to construct a condensate receiver, condensate storage tank, condensate pumps, and condensate transfer pumps (AES 2015:2-14, Figure 2.1- 2). Where would the condensate receiver be located? What would be the horizontal and vertical extent of excavation necessary to build these four project components?

Response: The condensate receiver, condensate pumps, and condensate transfer pump will be located near the condensate tank (See SAFC Figure 2.1-2, 2x1 FA Legend Item #84). The condensate tank foundation design will be completed during the final design of the project. The tank will be supported on deep pile foundations (driven to 50 feet below grade) with the reinforced concrete pile cap installed at grade. The foundation design for the condensate receiver, condensate pumps, and condensate transfer pump will be completed during the final design of the project.

99. How does AES propose to construct the ammonia storage tanks and injection grids? What would be the horizontal and vertical extent of excavation involved to construct each?

Response: The ammonia storage tanks will be supported on deep pile foundations (driven to 50 feet below grade) with the reinforced concrete foundation installed at grade with walls forming the required secondary spill protection. The ammonia injection grids are part of the Selective Catalytic Reduction (SCR) pollution control system located within the Heat Recovery Steam Generators (HRSG) of the combined-cycle units and the exhaust flue of the simple-cycle units.

100. Section 2.1.13.2 and 2.1.13.3 mention a new sewer line (AES 2015:2-16). Is this new sewer line the same project component as the proposed process/sanitary wastewater pipeline mentioned previously (AES 2015:1-3) in the SAFC?

Response: Yes. The new sewer line is the same project component as the process/sanitary wastewater pipeline.

101. The SAFC states that wastewaters would be collected in holding tanks or sumps (AES 2015:2-16). Please identify on a site plan where these proposed holding tanks or sumps would be located. Would excavation be required to construct these features? If so, what would the horizontal and vertical extent of excavation be?

Response: The gas turbine wash wastewater storage tank is an above ground tank (see SAFC Figure 2.1-2, 2x1 FA Legend #49). The foundation for this structure will be determined during final design.

102. AES proposes to install an underground station grounding grid (AES 2015:2-18). Please describe the manner of its installation and the depth of ground disturbance involved.

Response: The grounding grid is expected to be installed between 12 and 36 inches below grade, throughout the entire AEC site. The exact depth and location of the grounding grid will be determined during the final design of the project.

103. Please clarify if the construction of the AEC will last 56 or 57 months (see AES 2015:1-1, 2-19).

Response: The AEC construction schedule is approximately 56 months.

104. AES proposes to build two overhead transmission lines to tie the proposed AEC into the existing Southern California Edison substation north of the proposed project (AES 2015:3-1). Please identify on a site plan the location of the proposed transmission poles or towers that would be installed and identify the diameter of the pier foundations. How deep would the pier foundations be drilled below the existing grade?

Response: The location of the transmission structures are shown on Figure DR104-1. The transmission towers will require an augured excavation to approximately 50 feet below grade. A foundation form will be lowered into the excavation and reinforcing steel will be inserted prior to concrete being poured. The diameter of the augers will be between 4 and 6 feet in diameter. Electrical breakers and disconnect switches will be supported by driven piles (approximately 50 feet below grade) and a poured concrete foundation.

Legend

- AGS Boundary
- AEC Site
- Natural Gas Metering Station
- Berm Removal
- Berm Replacement
- Proposed New Process/ Sanitary Wastewater Pipeline to First Point of Interconnection

0 250 500 Feet

N

FIGURE DR87-1
AEC Data Response Set #6
Alamitos Energy Center
Long Beach, California
December 2015

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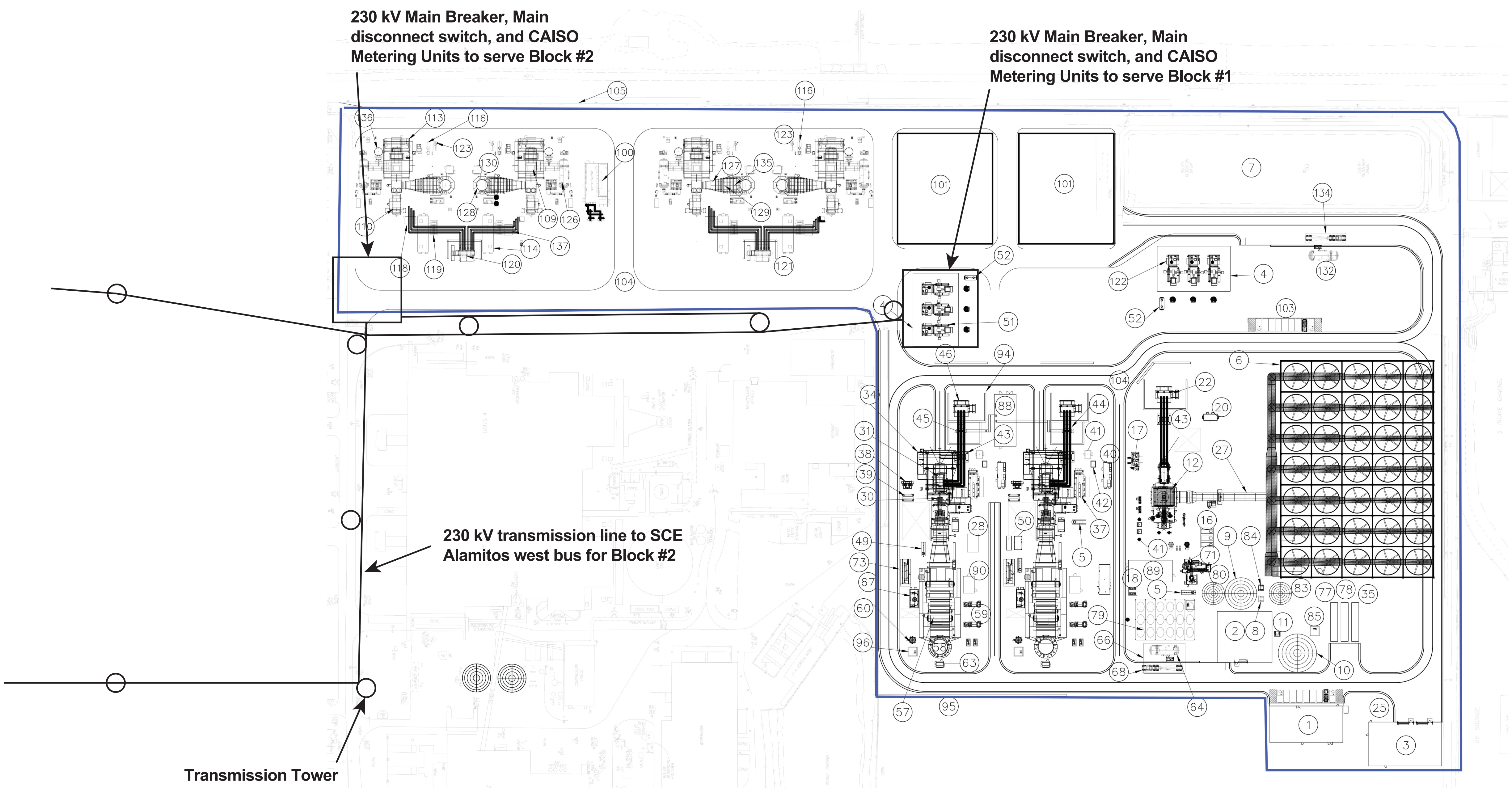

LMS 100 LEGEND	
NO.	DESCRIPTION
99	
100	MEDIUM VOLTAGE ELECTRICAL ENCLOSURE
101	FIN FAN COOLER
102	
103	PARKING AREA
104	ROADWAY
105	SITE FENCE
106	
107	
108	
109	COMBUSTION TURBINE
110	COMBUSTION TURBINE GENERATOR
111	
112	
113	AIR INLET FILTER
114	PACKAGED ELECTRICAL ELECTRONIC CONTROL CENTER (PEECC)
115	
116	FUEL GAS HEATER
117	
118	GENERATOR BREAKER
119	AUXILIARY TRANSFORMER
120	CTG STEP-UP TRANSFORMER
121	TRANSFORMER WALL
122	FUEL GAS COMPR. BUILDING
123	FUEL GAS REGULATOR
124	
125	
126	INTERCOOLER SKID
127	CTG EXHAUST DUCT
128	STACK
129	SCR
130	CONTINUOUS EMISSIONS MONITORING SYS. EQUIP.
131	
132	AMMONIA STORAGE TANK
133	AMMONIA INJECTION SKID
134	AMMONIA UNLOADING CONTAINMENT AREA
135	CO CATALYST (BY OWNER)
136	COMBUSTION TURBINE VBV SILENCER STACK
137	ISO-PHASE BUS DUCT

2X1 7FA LEGEND	
NO.	DESCRIPTION
1	ADMINISTRATION BUILDING
2	WATER TREATMENT BUILDING
3	WAREHOUSE BUILDING
4	GAS COMPRESSOR BUILDING
5	OIL/WATER SEPERATOR
6	AIR COOLED CONDENSER
7	RETENTION BASIN
8	DEMIN WATER PUMPS
9	DEMIN WATER STORAGE TANK
10	SERVICE WATER STORAGE TANK
11	SERVICE WATER PUMPS
12	STEAM TURBINE AND GENERATOR
13	
14	
15	
16	CONDENSATE PUMPS
17	STG LUBE OIL MODULE
18	CLOSED COOLING WATER PUMPS
19	
20	STG EXCITATION UNIT EQUIPMENT (GEC)
21	
22	STG STEP-UP TRANSFORMER
23	
24	
25	PARKING AREA
26	
27	ACC STEAM DUCT
28	CHEMICAL FEED CANOPY
29	
30	COMBUSTION TURBINE
31	COMBUSTION TURBINE GENERATOR
32	
33	
34	AIR INLET FILTER
35	HYDROGEN STORAGE
36	
37	PEECC
38	FUEL GAS FILTER/SEPERATOR
39	FUEL GAS STARTUP HEATER
40	UNIT EXCITATION/LCI EQUIPMENT
41	ISOLATION TRANSFORMER
42	EXCITATION TRANSFORMER
43	GENERATOR BREAKER
44	ISO PHASE BUS DUCT
45	AUXILIARY TRANSFORMER
46	CTG STEP-UP TRANSFORMER
47	
48	
49	WATER WASH DRAINS TANK
50	WATER WASH SKID
51	FUEL GAS COMPRESSORS
52	FUEL GAS COMPRESSOR DRAINS TANK
53	
54	
55	
56	
57	HRSG
58	STACK
59	BOILER FEEDWATER PUMPS
60	BLOWDOWN TANK
61	
62	
63	CEMS
64	AMMONIA STORAGE TANK
65	
66	AMMONIA CONTAINMENT AREA
67	AMMONIA INJECTION SKID
68	AMMONIA UNLOADING CONTAINMENT AREA
69	
70	
71	AUXILIARY BOILER AND ASSOCIATED EQUIPMENT
72	
73	IP WATER FUEL GAS HEATER
74	
75	
76	
77	C02 STORAGE TANK
78	NITROGEN STORAGE
79	AIR COOLED HEAT EXCHANGER
80	WASTE WATER TANK
81	
82	
83	CONDENSATE TANK
84	CONDENSATE TRANSFER PUMPS
85	RECYCLE SYSTEM SUMP
86	
87	
88	MEDIUM VOLTAGE ELECTRICAL ENCLOSURE
89	STG ELECTRICAL ENCLOSURE
90	HRSG ELECTRICAL ENCLOSURE
91	
92	
93	
94	TRANSFORMER WALL
95	ACOUSTICAL BARRIER
96	CEMS CABINET
97	
98	

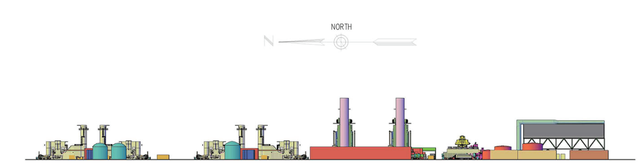
KEYPLAN

FIGURE DR104-1
Transmission Structure Locations
Alamitos Energy Center
Long Beach, California
October 2015

IS061013112817SAC Figure_DR104-1.ai tdaus 12.14.2015

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Air Quality (105-136)

PROJECT PERMITS

BACKGROUND

The proposed project would require a Preliminary Determination of Compliance (PDOC) and a Final Determination of Compliance (FDOC) from the South Coast Air Quality Management District (SCAQMD or District). Once available, these documents will be integrated into the staff analysis. Therefore, staff will need copies of all relevant correspondence between the applicant and the District in a timely manner in order to stay up to date on any permit issues that may arise during preparation of the Preliminary and Final DOCs.

DATA REQUEST

105. Please provide copies of all substantive District correspondence regarding the Alamitos Energy Center (AEC) within one week of submittal, receipt or reporting event. This includes PDOC and FDOC preparation documents including emails and reports of conversation. This request is to remain in effect until the final Energy Commission Decision has been adopted.

Response: Attachment DR105-1 presents all substantive correspondence between the Applicant and the South Coast Air Quality Management District (SCAQMD) that has not been docketed to date.

106. Please provide any subsequent updates to the schedule discussion in Section 5.1.11 (Permits and Permit Schedule) of the Supplemental Application for Certification (SAFC).

Response: The Applicant is working with SCAQMD to complete the permitting process and no additional updates are available at this time.

EMISSION ESTIMATES

BACKGROUND

Appendix 5.1A (Construction Emission Estimates) and Section 5.1B (Operational and Commission Emission Calculations) of the SAFC are used to document emission calculations. Staff needs the original spreadsheet files of these estimates with live embedded calculations to complete their review.

The tables included in Appendix 5.1A are labeled Huntington Beach Energy Project (HBEP). Staff needs to be certain the information included in the tables is for the Alamitos Energy Center.

AES Southland Development (AES-SD) submitted a Data Adequacy Supplement dated February 17, 2014 which noted that upgrading of the 4,000 feet of offsite sewer line was not required. Sections 2 (Project Description) and 5.1 (Air Quality) of the SAFC discuss the potential upgrade of 4,000 feet of existing wastewater pipeline and a new 1,000 foot process/sanitary wastewater pipeline. It is not clear if the pipeline upgrade is currently being proposed or if emissions from the pipeline activities are accounted for in the project emission estimates,

Section 5.1.6.1 (Criteria Pollutant and Greenhouse Gas Emission Estimates) states construction and site preparation activities are anticipated to last 56 months beginning in the first quarter of 2017 until the third quarter of 2021. The text further states the project will begin construction with the removal of former Unit 7 components to make room for construction and laydown area for the AEC combined cycle gas turbine (CCGT).

The tables included in Appendix 5.1A do not clearly account for emissions from site preparation including the laydown area preparation if needed, addition of the 1,000 foot process/sanitary wastewater pipeline, potential 4,000 foot wastewater pipeline upgrade, or removal of former Unit 7. The tables included in Appendix 5.1A identify emissions from the combined-cycle block construction and the simple-cycle block construction. A clearer accounting of the project construction emissions is needed to determine the estimated worst case emissions from different phases of the site preparation and construction of the power blocks.

DATA REQUESTS

107. Please provide the spreadsheet version of Appendix 5.1A and Appendix 5.1B work sheets with live, embedded formulas for the Alamitos Energy Center project.

Response: The spreadsheet versions of Appendix 5.1A and 5.1B are included with this submission on compact disc.

108. Please verify the information submitted in Appendix 5.1A is for the Alamitos Energy Center and correct the heading if applicable.

Response: The information submitted in Appendix 5.1A is for the AEC. The incorrect headers have been removed from the spreadsheets.

109. Please provide a hard copy of Appendix 5.1A. Please use 11 x 17 inch paper where applicable for larger tables.

Response: A hard copy of Appendix 5.1A on 11-by-17-inch paper is provided under separate cover.

110. Please clarify if the 4,000 foot sewer line will be upgraded as part of the updated project.

Response: The 4,000-foot sewer line will not be upgraded as part of the updated project.

111. Please clarify if the emissions from additional pipeline and pipeline upgrade project activities are included in the construction emission calculations.

Response: Construction emissions are not required because there are no additional pipeline and pipeline upgrade project activities, per the response to Data Request 110.

112. Please clarify if the site preparations emissions including the laydown area preparation and removal of Unit 7 components are included in the construction emission estimates.

Response: Appendix 5.1A has been revised to include emission estimates for the removal of Unit 7 and associated site preparation. The revised version has been provided in response to Data Requests 107 and 109.

113. Please include details of the specific construction activities differentiating the separate activities included in Appendix 5.1A tables similar to the original AFC in order to ensure completeness in the emission counting.

Response: Removal of Unit 7 will occur between January 2017 and May 2017. Construction of the AEC combined-cycle power block will occur between June 2017 and March 2020. Construction of the AEC simple-cycle power block will occur between May 2020 and August 2021. Emissions from each of these three phases are included in Appendix 5.1A.

114. Please indicate if there is the potential for the preparation of the adjacent offsite laydown area to overlap with the construction phase for the AEC.

Response: Preparation of the adjacent offsite laydown area may overlap with construction of the AEC's combined-cycle power block. However, as estimated as part of the Huntington Beach Energy Project Petition to Amend, emissions associated with preparation of the offsite laydown area are accounted for and considered minimal at less than one pound of particulate matter each month.

115. Please include any project updates in the emission calculations and worksheets provided and discuss if there any changes impacting worst-case project construction estimates.

Response: As noted in the response to Data Request 112, the construction emission calculations presented in Appendix 5.1A have been revised to include the removal of Unit 7 and associated site preparation. The inclusion of demolition emissions is reflected in the updated construction schedule, and did not change the maximum daily and annual emissions from the combined onsite and offsite construction activities.

COMMISSIONING EMISSION ESTIMATES

BACKGROUND

The SAFC included emission estimates from the combined-cycle turbines during commissioning. During commissioning short term emission rates are expected to be higher than operating emissions because operation occurs for a period without the emission control systems. The expected commissioning emissions for the GE 7FA.05s combined-cycle turbines were presented in Table 5.1B.1 of Appendix 5.1B. The same turbines are being proposed for the HBEP amendment. The NOx emission rates for combustion turbine generator (CTG) testing presented in Table 5.1B.1 is inconsistent with the information presented in the HBEP application to amend. Staff understands variations can occur depending on the specific site conditions. However the inconsistency with the nitrogen oxide (NOx) emission rates appears outside normal site condition variations.

The SAFC did not include a detailed discussion of the commissioning activities for the auxiliary boiler. Generally, during commissioning, boilers are tuned and the emission control systems tested. The expected emission from this period was not discussed in SAFC.

DATA REQUESTS

116. Please provide the basis for the NOx commissioning emission rate for CTG testing provided in Table 5.1B.1 of the SAFC. Please include supporting documentation.

Response: Table 5.1B.1 of Appendix 5.1B presents a combined work effort of the design engineer and the equipment vendors to estimate commissioning emission rates (including oxides of nitrogen [NO_X]). No additional documentation is available from either the equipment vendor or design engineer.

117. Please provide a detailed description of the commissioning and startup activities for the auxiliary boiler including duration and estimated emissions from each activity.

Response: The auxiliary boiler commissioning process includes first burner light-off, conditioning, establishing the air/fuel ratio curve, and establishing the SCR ammonia injection curve. The auxiliary boiler commissioning will occur over 5 days and will require up to 6 fired hours per day. The auxiliary boiler commissioning emissions will be the same as the auxiliary boiler cold startup emissions, presented in Table DR117-1 below.

TABLE DR117-1
Auxiliary Boiler Commissioning Emissions

Startup	**NO_X Pounds**	**CO Pounds**	**VOC Pounds**
Daily Emissions	8.44	8.68	9.36
Total Commissioning Emissions	42.2	43.4	46.8

Notes:
CO = carbon monoxide
VOC = volatile organic compounds

SCHEDULE DETAILS

BACKGROUND

The tables in Appendix 5.1A include construction emissions according to month. The tables detail the construction of the combined-cycle power block during months 1-34 and the construction of the simple-cycle power block during months 36-51. It is not clear if the tables line up with the timeline discussions in the SAFC, including Sections 5.1.1 (Setting) and 5.1.6.1 (Criteria Pollutant and Greenhouse Gas Emissions Estimates). The sections discuss construction and site preparation activities lasting for 56 months (please note Section 2.2 (Project

Construction) states construction through commercial operation is expected to last 57 months). The text discusses the removal of Unit 7 starting in the first quarter of 2017 and construction of the AEC CCGT starting in the second quarter of 2017. The text stated the AEC CCGT will be completed by the second quarter of 2020 and commencing operation in May of 2020. From this discussion the site preparation and construction of the combined-cycle block could be approximately 39 months. In addition it is not clear the timing of the commissioning with respect to these tables. A clearer accounting of the project schedule is needed to determine the estimated worst case emissions from different phases of the project and potential overlap.

Section 5.1.6.1 states maximum daily and annual emissions are based on the construction activities occurring 10 hours per day and 23 days per month. The emission estimate tables included in Appendix 5.1A reflect this assumption. Section 2.2.1 (Construction Schedule and Workforce) states the construction plan is based on a 10-hour workday Monday through Friday, and an 8-hour workday on Saturdays.

DATA REQUESTS

118. Please clarify the schedule for the project with all phases including expected start and end times. Please make sure this schedule lists the preparation of the laydown area if applicable, removal of Unit 7, operation of the existing AGS units 1-6 and the proposed auxiliary boiler commissioning. Please reconcile any scheduling discrepancies if applicable, including changes relative to the elimination of the 4,000-foot section of replaced/ upgraded sanitary sewer pipeline.

Response: The construction schedule presented in Table DR118-1 is the correct schedule, consistent with the schedule presented in Appendix 5.1A.

TABLE DR118-1
AEC Construction Schedule

Event	Duration [a]	Dates
Demolition of Unit 7	5 months (1 – 5)	January 2017 – May 2017
Auxiliary Boiler Commissioning	0.25 months	January 2020
Construction of Combined-cycle Power Block	34 months (6 – 39)	June 2017 – March 2020
Preparation / Use of Offsite Laydown Area	35 months (6 – 40)	June 2017 – April 2020
Construction of Simple-cycle Power Block	16 months (41 – 56)	May 2020 – August 2021

[a] The numbers provided in parenthesis correspond to the number of months after notice to proceed, which is assumed to be January 1, 2017.

119. Please review the schedule to determine if the proper time periods correlating to maximum emissions were used for the impact assessment.

Response: Per the construction schedule presented in Table DR118-1, none of the AEC demolition/construction activities overlap. Additionally, the work schedule presented as 10 hours per day, 23 days per month was shown to be the maximum allowable work schedule. Therefore, the appropriate time periods were used to assess the maximum emissions for the air quality impacts analysis.

120. Please verify the assumptions made to estimate the worst-case emissions for the different project phases. Please update the emission estimates using both the reviewed project schedule and construction activity timeframe if applicable and update the modeling as necessary

Response: The construction/demolition schedule presented in Appendix 5.1A is the correct schedule. As such, conservative assumptions were used in estimating the worst-case emissions for the different phases of AEC demolition and construction and updated modeling is not warranted.

CONSTRUCTION, COMMISSIONING AND OPERATION OVERLAP IMPACTS

BACKGROUND

The SAFC discusses potential overlap scenarios of the project phases. Section 5.1 (Air Quality) states existing Alamitos Generating Station (AGS) Units 1-6 will remain in operation through much of the AEC development and construction. Section 5.1.6.4 (Air Quality Impact Analysis Results) details the specifics of each scenario as follows:

- Overlap Scenario 1: Combined-cycle Power Block construction with simultaneous operation of existing AGS units 1-6; and,
- Overlap Scenario 2: Simple-Cycle Power Block construction with simultaneous operation of the AEC CCGT and existing Units 3, 4 and 6.

Both of the overlap scenarios mentioned above were modeled. The following additional overlap scenario was discussed but not modeled:

- Overlap Scenario 3: Operation of the AEC CCGT is expected to overlap with the commissioning of the AEC SCGT.

The first 2 scenarios modeled included the operation of existing AGS units 1-6. The text states the maximum rolling 24-month emissions from 2008-2012 were used from each AGS unit. Staff needs to understand why the most current emission data from units 1-6 was not used.

Section 5.1.6.4 states the third overlap scenario (staff is labeling overlap scenario 3) was not modeled because the impacts were addressed through the commissioning impacts analysis. The commissioning impact analysis for the simple cycle turbines also discussed in Section 5.1.6.4 assumed the maximum impact would occur while the four simple-cycle turbines were simultaneously undergoing commissioning activities while the two combined-cycle turbines were operating in steady state conditions. The scenario did not discuss the potential of one of the two combined-cycle turbines to start up or shutdown during the commissioning activities, or the potential of any of the existing AGS units to operate during the commissioning of the AEC SCGT.

Section 1.1 (Project Overview) and Section 2 (Project Description) specifies that Units 1, 2 and 5 will be retired once the AEC CCGT commences operation and Units 3, 4, and 6 will likely operate through at least December 31, 2020. Section 5.1.6.4 includes the operation of existing units 3, 4 and 6 during SCGT construction. Section 5.1.6.1 (Criteria Pollutant and Greenhouse Gas Emission Estimates) states the SCGT construction is scheduled between the second quarter of 2020 and the third quarter of 2021. As a result of the California State Water Resources Control Board's (SWRCB) Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Policy), AES has an implementation plan (IP) including a timeframe of the retirement of existing units. Per correspondence between the SWRCB and AES- Southland published on the SWRCB's website at http://www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/powerplants/alamitos/, the timing of the IP plan is subject to change. The documents reference a request that was made to extend the retirement date for some of the existing AES boilers. Staff needs to understand the potential for the existing AES boilers to continue operation past 2020 in order to determine potential for overlap scenarios.

DATA REQUESTS

121. Please provide an estimate of the emissions from the planned operation of existing AGS Units 1-6, during the entire construction, commissioning and operational phases of the proposed AEC. Please include any background information or assumptions used to make these estimates.

Response: The only planned operation of existing AGS Units 1-6 under the Applicant's control is for compliance emissions testing as required by the existing air permits. The operational dispatch of the existing AGS Units 1-6 is dictated by electrical reliability of the grid and energy requirements. If AGS is dispatched to provide electrical reliability services, the AGS units would be operated at the California Independent System Operator (CAISO) dispatch orders (specific units at specific operating rates). Likewise, if Southern California Edison (SCE) requires energy services for which the existing AGS units can meet demand consistent with the state loading order, then the AGS units will be dispatched to operate (specific units at specific operating rates). Therefore, the Applicant's best estimate of projected emissions is the historic emissions provided in response to Data Request 122.

122. Please provide the most recent (2013 and 2014) emission data for the AGS Units 1-6.

Response: Table DR122-1 presents the annual and two-year average emissions for carbon monoxide (CO), NO_X, particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), volatile organic compounds (VOC), sulfur dioxide (SO_2), and carbon dioxide equivalents (CO_2e) for all units and the total facility. These data were collected from the AGS's 2013 and 2014 Annual Emissions Reports, as submitted to the SCAQMD.

TABLE DR122-1
AGS Historic Emissions Estimate

Year	Unit	VOC	NO_X	SO_2	CO	$PM_{10}/PM_{2.5}$	CO_2e*	Fuel
				lb/yr			MT/year	MMscf/year
2013	1	441	0	132	23,163	227	11,925	221
2013	2	457	0	249	64,091	830	22,387	415
2013	3	7,289	0	2,302	108,183	6,905	199,176	3,836
2013	4	3,298	0	2,328	14,976	4,656	199,274	3,880
2013	5	4,005	0	3,042	430,872	6,084	281,437	5,070
2013	6	1,786	0	1,553	72,405	2,848	139,725	2,589
2014	1	621	2,296	186	43,095	320	16,966	311
2014	2	1,350	9,794	736	252,396	2,454	66,824	1,227
2014	3	9,796	39,237	3,094	42,794	9,281	281,051	5,156
2014	4	4,938	29,729	3,486	1,743	6,972	316,624	5,810
2014	5	603	2,798	458	75,627	916	41,622	763
2014	6	1,347	10,750	1,171	22,257	2,148	106,288	1,952
Total 2013		17,276	95,284	9,606	713,690	21,550	853,926	
Total 2014		18,656	94,604	9,131	437,913	22,090	829,376	
2-Year Average		17,966	94,944	9,369	575,802	21,820	841,651	

*CO_2e emissions were calculated using emission factors of 53.06 kg CO_2/MMBtu, 1 g CH_4/MMBtu, and 0.10 g N_2O/MMBtu, and global warming potentials of 25 for CH_4 and 298 for N_2O.

Notes:
CO_2 = carbon dioxide
g/MMBtu = gram(s) per million British thermal unit
kg/MMBtu = kilogram(s) per million British thermal unit
lb/yr = pound(s) per year
CH_4 = methane
MT/year = metric ton(s) per year
MMscf/year = million standard cubic feet per year
N_2O = nitrous oxide

123. Please provide explanation for why the most current emission data for the AGS Units 1-6 was not used in the overlap modeling.

Response: The worst-case emissions for the years 2008 through 2012 data were used to be consistent with the Application for Certification (AFC) filed December 2013 (13-AFC-01). This was a conservative approach as the modeled AGS emissions were higher than those presented in Table DR122-1 for all pollutants.

124. Please discuss if there are any pending or reasonably foreseeable requests to extend the expected OTC compliance date past 12/31/2020 for AGS Units 1-6.

Response: AES does not have any pending requests to extend the once-through cooling (OTC) compliance dates for existing AGS Units 1-6[1], and AES does not anticipate requesting an extension of the OTC compliance dates for existing AGS Units 1-6 assuming that the permitting, construction, and operation milestones for AEC are not delayed.

125. Please discuss the assumption to use steady state emissions from the combined-cycle turbines for short term emission impacts in the AEC CCGT commissioning modeling analysis.

Response: The text in Section 5.1.6.4 of the AEC SAFC for simple-cycle gas turbine (SCGT) commissioning states that the emissions used for the combined-cycle gas turbines (CCGTs) are those from Table 5.1-31 of the AEC SAFC. The emissions scenarios presented in Table 5.1-31 represent those scenarios resulting in the worst-case modeled impact for each pollutant and averaging time, and include startups and shutdowns where appropriate.

AUXILIARY BOILER EMISSIONS AND IMPACTS

BACKGROUND

Section 5.1.6 (Environmental Analysis) discusses the proposed operational scenario for the auxiliary boiler. Table 5.1-19 (Maximum Pollutant Emission Rates for Steady State Operation of One Auxiliary Boiler) includes the hourly emission rate for the proposed auxiliary boiler. The text states the auxiliary boiler emission rates for steady state operation were estimated based on the maximum heat input rating and the assumption the boiler would operate at 100 percent load. Table 5.33, Tables 5.1B.11 (the second table labeled 5.1B.11), and 5.1B.13, include hourly, monthly (Tables 5.1B.11 and 13 only) and annual emission rates for the auxiliary boiler. The monthly and annual emission rates in these tables are less than the maximum hourly rate. Table footnotes state the monthly emission rates assume 31 days of operation at the maximum hourly firing rate with two cold starts, 4 warm starts and 4 hot starts, and the annual emission rate assumes 8,760 hours of operation at the maximum hourly rate, with 24 cold starts, 48 warm starts, and 48 hot starts. However, the monthly and annual emission rates appear to be less than the stated operation at the maximum hourly emission rate.

Appendix 5.1C (Dispersion Modeling and Climate Information) includes tables containing the parameters used for the emission modeling. The auxiliary boiler information presented in the tables corresponds to the information presented in Table 5.1-33. The emission modeling for several scenarios includes the operation of the auxiliary boiler based on the annual hourly emission limits. In addition, commissioning emission rates for the auxiliary boiler were not included in Table 5.1C.2. It is not clear if the modeling scenarios took into account the maximum emission rates for the boiler for all scenarios.

DATA REQUESTS

126. Please provide a detailed calculation of the daily, monthly and annual emission rates for the auxiliary boiler. Please include all assumptions used for this calculation, including hours of operation and firing rates.

Response: The daily emissions are calculated as follows:

Daily Emissions (lb/day) = Maximum Monthly Emissions (lb/month) / 30 days/month

The maximum monthly emissions are calculated as follows:

Maximum Monthly NO_X, CO, or VOC Emissions (lb/month) = 2 Cold Startups per Month x Cold Startup Emissions (lb/event) + 4 Warm Startups per Month x Warm Startup Emissions (lb/event) + 4 Hot Startups per Month x Hot Startup Emissions (lb/event) + Maximum Monthly Fuel Consumption (26,327 MMBtu/month) x Emission Factor (lb/MMBtu)

Maximum Monthly SO_2, PM_{10}, or $PM_{2.5}$ Emissions (lb/month) = Emission Factor (lb/MMBtu) x {[2 Cold Startups per Month x Cold Startup Duration (min/event) x Cold Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [4 Warm Startups per Month x Warm Startup Duration (min/event) x Warm Startup Fuel Consumption (MMBtu/hr) / 60

[1] http://www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/powerplants/alamitos/docs/aes_042915.pdf

min/hr] + [4 Hot Startups per Month x Hot Startup Duration (min/event) x Hot Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [Maximum Monthly Fuel Consumption (26,327 MMBtu/month)]]}

The maximum annual emissions are calculated as follows:

Maximum Annual NO_X, CO, or VOC Emissions (lb/yr) = 24 Cold Startups per Year x Cold Startup Emissions (lb/event) + 48 Warm Startups per Year x Warm Startup Emissions (lb/event) + 48 Hot Startups per Year x Hot Startup Emissions (lb/event) + Maximum Annual Fuel Consumption (310,096 MMBtu/yr) x Emission Factor (lb/MMBtu)

Maximum Annual SO_2, PM_{10}, or $PM_{2.5}$ Emissions (lb/yr) = Emission Factor (lb/MMBtu) x Maximum Annual Fuel Consumption (310,096 MMBtu/yr)

127. Please provide an explanation of why the annual, monthly, and daily emission rates for the auxiliary boiler appear to be based on an hourly firing rate that is less than the maximum hourly firing rate.

Response: Per the above calculations, the annual and monthly emission rates are based on the maximum annual and maximum monthly firing rates, respectively. The daily emissions are derived from the monthly emissions, consistent with SCAQMD methodology.

128. Please provide a detailed explanation of activities and estimated emissions associated with the commissioning/initial startup of the auxiliary boiler.

Response: See the response to Data Request 117.

129. Please provide a detailed description of the auxiliary boiler operation for the different modeling operating scenarios including the emission rates.

Response: The auxiliary boiler operating profile consists of startups and steady-state operation at maximum load. The operating profile is not expected to include steady-state operation at partial load. The modeled operating scenarios presented in Table 5.1-33 of the AEC SAFC include the exhaust temperature and exhaust velocity associated with steady-state operation at maximum load and the emission rates calculated based on the following assumptions:

- 1-hour and 3-hour emission rates include operation at the maximum firing rate of 70.8 MMBtu/hr
- 8-hour emission rates include operation at the maximum firing rate of 70.8 MMBtu/hr with 1 cold startup
- Daily and annual emission rates include operation consistent with the response to Data Request 126

130. Please explain the auxiliary boiler operating assumptions used for modeling emission impacts. Please include a justification of how these operating assumptions represent worst case impacts from the auxiliary boiler operation.

Response: See the response to Data Request 129. The operating assumptions used to assess modeled short-term impacts from the auxiliary boiler were those for steady-state operation. This does not coincide with the worst-case impacts for the auxiliary boiler, but rather for the facility as a whole. The worst-case short-term modeled impacts for the facility occur when the CCGTs are in startup mode, and the auxiliary boiler is running at steady-state. Startup of the auxiliary boiler will occur prior to the startup of the CCGTs.

CUMULATIVE

BACKGROUND

Section 5.1.7 (Cumulative Effects) and Appendix 5.1F (Dispersion Modeling Protocol), of the SAFC describe the methodology for the cumulative effects analysis, but the SAFC does not include the analysis because a project list had not been provided by the District at the time the SAFC was prepared. The cumulative analysis should include all reasonably foreseeable projects within a six mile radius, i.e. projects that have received construction permits but are not yet operational, and those that are in the permitting process or can be reasonably expected to be in the permitting process in the near future. A complete impacts analysis should identify all existing and planned stationary sources that affect the baseline conditions and consider them in the modeling effort.

DATA REQUESTS

131. Please provide a copy of the applicant's correspondence to and from the District regarding existing and planned cumulative sources located within six miles of the project site.

Response: See Attachment DR131-1 for copies of correspondence with SCAQMD to date regarding existing and planned cumulative sources located within six miles of the project site.

132. Please provide a list of all sources to be considered in the cumulative air quality impact analysis for staff review and approval. Include a recommendation whether or not to include each source and the basis of this recommendation

Response: On October 23, 2015, the Applicant requested an updated list of projects that are within a 6-mile radius of the AEC and are either currently in the permitting process, undergoing California Environmental Quality Act (CEQA) review, or recently received a Permit to Construct from the SCAQMD. Per correspondence provided in response to Data Request 131, the SCAQMD has not yet provided the requested information. Therefore, the Applicant will continue to work with SCAQMD through the end of 2015 to collect the requested information. The Applicant will compile a source list based on the information obtained through the end of 2015, making conservative assumptions as necessary, and provide the source list to the CEC for review in January 2016. Specifically, the Applicant would value the CEC's input on the appropriateness of excluding specific sources (sources with negligible emissions, administrative permit amendments with no increase in air emissions, and VOC sources) and selecting modeled scenarios.[2]

133. Upon approval of the list of sources to be included in the cumulative air quality impact analysis, please provide the cumulative modeling and impact analysis.

Response: A cumulative air quality impact analysis will be prepared using the methodology presented in the *Dispersion Modeling Protocol for the Alamitos Energy Center* (see Appendix 5.1F of the AEC SAFC). The results of this analysis will be provided within 30 days of receipt of CEC comments on the source list provided in response to Data Request 132.

OPERATIONAL MITIGATION

BACKGROUND

AEC would be located in Long Beach, in Los Angeles County within the South Coast air basin. Los Angeles is in non-attainment with the state and federal ambient air quality standards for ozone and particulate matter less than 2.5 microns (PM2.5), and the state ambient air quality standard for particulate matter less than 10 microns (PM10). The California Energy Commission requires mitigation of impacts of emissions, including of pollutants and their precursors that are in non-attainment with state and federal air quality standards or may cause an exceedance of any ambient air quality standard. Therefore the California Energy Commission would likely require mitigation for PM10, PM2.5, sulfur oxide (SOx), nitrogen oxide (NOx), and volatile organic compound (VOC) emissions.

Under SCAQMD Rule 1304 Exemptions, AEC would not provide most of the SCAQMD Rule 1303 offsets directly for emissions from the combined-cycle gas turbines or the simple-cycle gas turbines. SCAQMD Rule 1304(a)(2) provides a source offset exemption for the replacement of utility steam boilers with combined-cycle gas turbine(s) or other qualifying cleaner generation turbine technologies. Under this offset exemption, the SCAQMD will be responsible for providing the bulk of the appropriate offsets for the proposed turbines.

[2] Emergency equipment is normally permitted for fewer than 50 testing hours per year. It is highly unlikely that these tests would coincide with the simultaneous startup of all six AEC turbines. Therefore, emergency equipment is not expected to be modeled for comparison to any 1-hour state or federal standards. This equipment will, however, be included in the modeling for all other averaging periods.

Section 5.1.8.2 (Operational Mitigation) discusses the emission offset requirements for AEC. The sections states AES is enabling 1094.7 megawatts (MW) of new generation by permanently retiring AGS Units 1 and 2 (175 MW each), Unit 3 (320 MWs) and Unit 5 (480 MW) for a total of 1,150 MWs of retirement.

As stated in Section 5.1.8.2, the auxiliary boiler is not eligible for the offset exemption under SCAQMD Rule 1304(a)(2). The section explains the SCAQMD offset requirements for the auxiliary boiler, but does not include the potential California Energy Commission mitigation requirements under CEQA.

DATA REQUESTS

134. Please explain the difference between the stated total MWs of retirement from AGS Units 1, 2, 3, and 5, and the stated total MWs enabled discussed in Section 5.1.8.2.

Response: Table DR134-1 presents the capacity of each proposed unit, the total capacity of the AEC, the existing generation proposed for retirement, and the existing generation not proposed for retirement. The purpose of this table is to clearly show the source of the megawatts (MWs) retired and MWs enabled, as discussed in Section 5.1.8.2 of the AEC SAFC. The electrical generating rates for the retired AGS units is based on the ratings included in the SCAQMD air permits for these units. The electrical generating rates for the AEC project are based on the maximum gross generating rates shown in Tables 5.1B.3 and 5.1B.7 of Appendix 5.1B of the SAFC, which have been revised and provided in Attachment DR134-1.

TABLE DR134-1

AEC Rule 1304(a)(2) Schedule

Project	Phase	First Fire or Shutdown Date	MW Gross
AEC	Combined-cycle Block [a]	10/1/2019	692.951
	AGS Unit 1 Retired	12/29/2019	175
	AGS Unit 2 Retired	12/29/2019	175
	AGS Unit 5 Retired	12/29/2019	480
	AGS Unit 3 Retired	12/31/2020	320
	Simple-cycle Block [b]	6/1/2021	401.751
	MW Installed		1,094.702
	MW Retired		1,150

[a] Based on 59 degrees Fahrenheit (°F) without evaporative coolers operating.

[b] Based on 59°F without evaporative coolers operating.

135. Please provide the retirement plan for existing AGS Units 1-6, including an approximated date of retirement for each unit.

Response: The Applicant is required to provide a decommissioning/retirement plan to the SCAQMD to demonstrate compliance with SCAQMD Rule 1304(a)(2), and will provide said plan prior to the SCAQMD's issuance of a Permit to Construct. The approved decommissioning/retirement plan will be provided to the CEC when completed.

136. Please discuss the proposed mitigation for the boiler and any other permitted emission source, emissions and potential impacts.

Response: The Applicant will provide mitigation for any AEC sources not covered by the exemption in SCAQMD Rule 1304(a)(2) in the form of emission reduction credits (ERCs). Attachment DR136-1 contains PM_{10} and VOC ERCs that have already been purchased to mitigate AEC's non-exempt offset requirements.

Attachment DR105-1
Substantive Correspondence with SCAQMD

AES Alamitos, LLC
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December 11, 2015

Mr. Andrew Y. Lee, P.E.
Senior Engineering Manager
Engineering and Compliance
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Re: Alamitos Energy Center Air Permit Application Completeness Response (Facility ID 115394)

Dear Mr. Lee:

AES Alamitos, LLC (AES) appreciates the South Coast Air Quality Management District's (SCAQMD) very thorough review of the Alamitos Energy Center (AEC) Permit Application. This letter provides the information the SCAQMD requested in your November 20, 2015 letter. The following information is presented in the same order as requested by the SCAQMD.

1. <u>CDs of Application Materials</u>

   SCAQMD received two hard copies of the Title V Permit to Operate Modification, Alamitos Energy Center, October 2015 (Application) and four sets of the five modeling CDs. SCAQMD's Prevention of Significant Deterioration Rule 1703(a)(3)(F) requires the SCAQMD to send a complete copy of the application package, once it is deemed complete, to the (1) US Department of Agriculture Forest Service; (2) U.S. EPA, Region IX; and (3) Federal Land Manager (FLM), National Park Service. (SCAQMD is aware that page 5.1-35 of the Application indicates the results of the visibility and deposition modeling, provided in Appendix 5.1G, were prepared as a separate document and submitted to the appropriate FLM for review and approval.) Please provide four copies of the Application on CD.

   Response: Attached are six (6) electronic copies (including two copies for your files) of the AEC Air Permit Application on compact discs and a copy of this response letter.

2. <u>Fees</u>

   The following provides an explanation for our understanding of the correct fees for the ammonia tanks and oil/water separators. Rule 301(b)(20) defines "identical equipment" to mean "any equipment which is to be operated by the same operator, and have the same equipment address, and have the same operating conditions and processing material to the extent that a single permit evaluation would be required for the set of equipment." This means the emissions from each identical equipment are required to be identical.

The two identical ammonia tanks were submitted as three identical tanks. The fees submitted and our corrections are shown below.

Storage Tank, Other	$1,521.32	
Storage Tank, Other (~~2~~ 1 Identical)	~~$1,521.32~~	**$ 760.66**
Expedited Processing Fee	$~~1,521.32~~	**$1,140.99**

Overpayment = $4563.96 (paid) - $3422.97 (two identical) = $1140.99

The two non-identical oil/water separators were submitted as two identical separators. As shown in Table 5.1B.17--Oil-Water Separator Calculations, the emissions are different for the two separators. Therefore, they are not identical. The fees submitted and our corrections are shown below.

Oil/Water Separator (>= 10,000 GPD) (<u>7FA.05</u>)	$3,835.06	
~~Oil/Water Separator (> 10,000 GPD) (1 Identical)~~	~~$1,917.53~~	
<u>Oil/Water Separator (<10,000 GPD) (LMS-100PB)</u>	**$<u>2,424.63</u>**	
Expedited Processing Fee	~~$2,876.30~~	**<u>$3129.85</u>**

Shortfall = $9389.54 (two non-identical) - $8628.89 (paid) = $760.65

Amount to be refunded = $1140.99 (storage tanks overpayment) - $760.65 (oil/water separators shortfall) = $380.34

a. Please confirm the above corrected fee calculations reflect the proposed equipment.

   Response: AES confirms that the above calculations are correct. However, due to new engineering information, the dimensions of the Selective Catalytic Reduction (SCR) systems and the warranty of the oxidation catalyst for the simple-cycle gas turbines (SCGT) have changed. As a result, the applicable Forms 400-E-5 and 400-E-12 have been revised and included in Attachment 2.

b. Please be aware that VOC emission reduction credits (ERCs) will be required for the 7FA.05 separator. The need for VOC ERCs was not mentioned in the Application.

   Response: AES commits to provide the required volatile organic compound (VOC) emission reduction credits (ERCs) for the auxiliary boiler and oil/water separator.

3. <u>Common Ownership</u>

In Appendix 5.1E, pages 1 - 2 of the Application cover letter, dated 10/23/2015, indicate all AES-owned electric steam utility boilers proposed for retirement, as set forth in Table 1- AES Rule 1304(a)(2) Schedule, are owned by wholly-owned subsidiaries of the AES Corporation. An attached organization chart illustrates the corporate structure and demonstrates the common ownership of AES Redondo Beach, LLC; AES Huntington Beach, LLC; and AES Alamitos, LLC, per the requirements of Rule 1304(a)(2).

Page 1-1 of the Application indicate AES Alamitos <u>Energy</u>, LLC (AES) will construct, own, and operate the AEC. Page 2-1 indicates AEC will be constructed on the site of the AES Alamitos <u>Energy</u>, LLC (AES) Alamitos Generating Station (AGS). Please explain why AES Alamitos <u>Energy</u>, LLC is not on the organization chart.

Response: Attachment 3 shows the corporate structure for the AES Corporation, AES Alamitos, LLC, AES Huntington Beach, LLC, AES Alamitos Energy, LLC, and AES Huntington Beach Energy, LLC. The AES Alamitos Energy, LLC was created specifically for development of the AEC project and is a wholly owned subsidiary of the AES Corporation. All of the AES entities shown in Attachment 3 are wholly owned subsidiaries of the AES Corporation.

4. Equipment Internal References

   As there are multiples of the following equipment, the equipment description on the facility permit will include the AES name or numbering for each equipment.

   a. Combined Cycle

      What are the AES name or numbering for the two turbines?

      Response: The combined-cycle gas turbines (CCGT) should be numbered CCGT-1 and CCGT-2.

   b. Simple Cycle

      What are the AES name or numbering for the four turbines?

      Response: The SCGT should be numbered SCGT-1, SCGT-2, SCGT-3, and SCGT-4.

   c. Ammonia Tank

      What are the AES name or numbering for the two tanks?

      Response: The 40,000-gallon ammonia storage tank should be numbered Tank-1 and the other ammonia storage tank should be numbered Tank-2.

   d. Oil/Water Separators

      What are the AES name or numbering for the two separators?

      Response: The oil/water separator associated with the CCGT should be numbered OWS-1 and the other oil/water separator should be number OWS-2.

5. Combined Cycle Power Block (CCGT) Commercial Operation

   Pages 1-5 and 2-20 indicate CCGT commercial operation will begin first quarter 2020. Pages 5.1-2, 5.1-11, 5.9-2, and 6-3 indicate a conflicting commercial operation date of second quarter 2020 (before May 1, 2020). Further, page 2 of the Application cover letter indicate AGS Units 1, 2, 5 will retire 12/29/2019, which supports the first quarter date. Please provide most recent estimate of the commercial operation date.

   Response: The expected unit retirement dates support the initial interconnection, first fire, and commissioning of the CCGT, which is expected to commence on December 31, 2019. The commercial operation date for the CCGT power block is April 1, 2020.

6. Turbines Ratings

   a. Combined Cycle Block (CCGT)

      Page 2 of the Application cover letter provides Table l-AES Rule 1304(a)(2) Schedule. The combined cycle block rating for the AEC is shown as 692.951 MW gross. Footnote c indicates this rating is based on 59°F without evaporative coolers operating.

      i. Footnote a to Table 1 indicates the basis for the Huntington Beach Energy Project (HBEP) combined cycle block is 65.8°F with evaporative coolers operating.

aa. Please explain the difference in the temperature basis between AEC (59°F*)* and HBEP (65.8°F*).*

Response: It is AES's understanding that the SCAQMD required the AEC's Rule 1304(a)(2) compliance demonstration to be based on the maximum gross output of the proposed equipment, regardless of ambient conditions. To this end, a review of the AEC electrical production rates over a range of site-specific ambient conditions and operating profiles was performed for the AEC and the Huntington Beach Energy Project (HBEP), and the maximum electrical production rates were presented in Table 1 of the Permit Application cover letter. For the AEC site, the 59 degrees Fahrenheit (°F) ambient conditions resulted in the highest electrical output; for the HBEP site, the 65°F ambient conditions resulted in the highest electrical output. Attachment 6 presents revised AEC Appendix 5.1B, Tables 5.1B.3 and 5.1B.7 showing the 59°F electrical production data, which was inadvertently omitted from the printed copy. Attachment 6 also includes the same tables from the HBEP Permit Application, which were submitted to the SCAQMD.

bb. Please explain the difference in evaporative coolers operation between AEC (without) and HBEP (with).

Response: The turbine inlet air evaporative coolers function identically at the AEC and HBEP and will be operated in a similar manner. Specifically, when ambient temperatures are warmer, the inlet air evaporative coolers will be engaged to mitigate the electrical performance degradation that occurs under warmer ambient temperatures.

ii. <u>Table 5.1B.3--Combined-Cycle: GE 7FA.05 Performance Data in Appendix 5.1B</u>. This table indicates that Case 1 yields the highest "Gross 2x1 Combined-Cycle, kW" of 692,905 kW at 28°F without inlet air coolers operating, with the turbines operating at max load. Case 5 provides conditions closest to the conditions listed in footnote c. For Case 5, the "Gross 2x1 Combined-Cycle, kW" is 684,653 kW at 65.3°F without inlet air coolers operating, with the turbines operating at max load.

aa. Please confirm footnote c to Table 1 is correct with respect to ambient temperature and the operation of the evaporative coolers.

Response: Footnote c to Table 1 is correct.

bb. Table 5.1B.3 provides performance data for 28°F, 65.3°F, and 107°F, but footnote c is based on 59°F. Therefore, Table 5.1B.3 cannot be used to reliably provide the gross and net ratings for the CTGs and steam turbine generator.

(1) Please provide the gross output for each CTG with the basis for temperature and coolers operation.

Response: Each AEC CCGT's gross output is 231.197 MW (or 462.394 MW for 2 CCGTs), the gross steam turbine output is 230.557 MW, and the total AEC CCGT power block gross output is 692.951 MW at a temperature of 59°F with a relative humidity of 60 percent and an atmospheric pressure of 14.7 pounds per square inch with evaporative coolers off.

Each HBEP CCGT's gross output is 232.073 MW (or 464.146 MW for 2 CCGTs), the gross steam turbine output is 229.676 MW, and the total HBEP CCGT power block gross output is 693.822 MW at a temperature of 65.8°F with a relative humidity of

58 percent and an atmospheric pressure of 14.68 pounds per square inch with evaporative coolers on.

(2) Please provide the corresponding net output for each CTG.

Response: Each AEC CCGG's net output is 230.459 MW (or 460.918 MW for 2 CCGTs), the net steam turbine output is 215.402 MW, and the total AEC CCGT power block net output is 676.320 MW at a temperature of 59°F with a relative humidity of 60 percent and an atmospheric pressure of 14.7 pounds per square inch with evaporative coolers off.

(3) Each HBEP combined-cycle CTG's net output is 231.335 MWs (or 462.67 MW for 2 CTGs), the steam turbine net output is 219.01 MWst, and the total AEC CCGT net output is 681.68 MWs at a temperature of 65.8 °F with a relative humidity of 58 percent, an atmospheric pressure of 14.68 pounds per square inch with evaporative coolers on.Please provide the associated gross output for the steam turbine generator for the same basis.

Response: The AEC steam turbine's gross output is 230.557 MW at a temperature of 59°F with a relative humidity of 60 percent and an atmospheric pressure of 14.7 pounds per square inch with evaporative coolers off.

The HBEP steam turbine's gross output is 229.676 MW at a temperature of 65.8°F with a relative humidity of 58 percent and an atmospheric pressure of 14.68 pounds per square inch with evaporative coolers on.

(4) Please provide the corresponding net output for the steam turbine generator.

Response: The AEC steam turbine's net output is 215.402 MW at a temperature of 59°F with a relative humidity of 60 percent and an atmospheric pressure of 14.7 pounds per square inch with evaporative coolers off.

The HBEP steam turbine's net output is 219.01 MW at a temperature of 65.8°F with a relative humidity of 58 percent and an atmospheric pressure of 14.68 pounds per square inch with evaporative coolers on.

(5) Are the combined ratings of the two CTGs and steam turbine generator equal to 692.951 MW gross?

Response: The combined ratings of AEC's two CCGTs and steam turbine generator is 692.951 MW gross.

b. <u>Simple Cycle Block (SCGT)</u>

In Table 1, the simple cycle block rating is shown as 401.751 MW gross. Footnote d indicates the rating is based on 59°F without evaporative coolers operating.

i. Footnote b indicates the basis for the Huntington Beach Energy Project (HBEP) simple cycle block is 65.8°F with evaporative coolers operating.

aa. Please explain the difference in temperature between AEC (59°F) and HBEP (65.8°F).

Response: As shown in Attachment 6, the HBEP electrical production at 59°F ambient conditions (Case 12 – ISO condition) shows the gross kilowatts (kW) for one SCGT as 100,438, whereas electrical production at the 65.8°F ambient conditions (Case 4) is

100,814 kW. The reason for this difference is attributed to the higher relative humidity at the 65.8°F ambient conditions.

bb. Please explain the difference in evaporative coolers operation between AEC (without) and HBEP (with).

Response: The turbine inlet air evaporative coolers function identically at the AEC and HBEP and will be operated in a similar manner. Specifically, when ambient temperatures are warmer and humidity is lower, the inlet air evaporative coolers will be engaged to mitigate the electrical performance degradation that occurs under warmer ambient temperatures.

ii. Table 5.1B.7-Simple Cycle: GE LMS-100PB Performance Data in Appendix 5.1B This table indicates that Case 1 yields the highest "4 LMS-I00PB Gross, kW" at 401,268 kW at 28°F without inlet air coolers operating, with the turbines operating at 100% load. Case 5 provides conditions closest to the conditions described in footnote d. For Case 5, the "4 LMS-100PB Gross, kW" is 395,152 kW at 65.3°F without inlet air coolers operating, with the turbines operating at 100% load.

aa. Please confirm footnote d to Table 1 is correct with respect to ambient temperature and the operation of the evaporative coolers.

Response: Footnote d to Table 1 is correct.

bb. Table 5.1B.7 provides performance data for 28°F, 65.3°F, and 107°F, but footnote d is based on 59°F. Therefore, Table 5.1B.7 cannot be used to reliably provide the gross rating for the CTGs.

(1) Please provide the gross output for each CTG with the basis for temperature and operation of coolers.

Response: As noted previously, Attachment 6 presents revised AEC Appendix 5.1B, Table 5.1B.7 showing the same performance data previously submitted for 28°F, 65.3°F, and 107°F, with the addition of the 59°F electrical production data.

Each AEC SCGT's gross output is 100.438 MWs (or 401.751 MW for 4 SCGTs) at a temperature of 59°F with a relative humidity of 60 percent and an atmospheric pressure of 14.7 pounds per square inch with evaporative coolers off.

Each HBEP SCGT's gross output is 100.814 MW (or 201.628 MW for 2 SCGTs) at a temperature of 65.8°F with a relative humidity of 58.32 percent and an atmospheric pressure of 14.68 pounds per square inch with evaporative coolers on.

(2) Please provide the corresponding net output for each CTG.

Response: Each AEC SCGT's net output is 99.087 MW (or 386.712 MW for 4 SCGTs) at a temperature of 59°F with a relative humidity of 60 percent and an atmospheric pressure of 14.7 pounds per square inch with evaporative coolers off.

Each HBEP SCGT's net output is 99.355 MW (or 193.565 MW for 2 SCGTs) at a temperature of 65.8°F with a relative humidity of 58.32 percent and an atmospheric pressure of 14.68 pounds per square inch with evaporative coolers on.

(3) Are the combined ratings of the four CTGs equal to 401.751 MW gross?

Response: The combined gross rating of the four AEC SCGTs is 401.751 MW.

7. Combined-Cycle Turbine VOC Emission Rate

In Appendix 5.1E, the Nooter/Eriksen letter, dated 6/5/15, paragraph 1.2 indicates the CO vendor guarantees the CO catalyst system will oxidize the VOC content of the exhaust gas to a maximum of 1.0 ppmvd at 15% O_2. In Appendix 5.1-D, page 2-11 correctly proposes a combined-cycle level of 2.0 ppm as BACT, based on SCAQMD's Method 25.3- Determination of Low Concentration Non-Methane Non-Ethane Organic Compound Emissions for Clean Fueled Combustion Sources. On page 5.1-16, Table 5.1-15-Maximum Pollutant Emission Rates for Operation of One GE 7FA.5 Turbine indicates the maximum rates for VOC are 2 ppmvd at 15% O_2 and 1.58 lb/hr. On page 5.1-20, Table 5.1-23-AEC Facility Emissions indicates the combined-cycle VOC hourly emission rate is 1.58 lb/hr per GE 7FA.05. According to Table 5.1B.3--Combined-Cycle: GE 7FA.05 Performance Data in Appendix 5.1B, the 1.58 lb/hr corresponds to 0.55 ppmvd (dry, 15% O_2) at 28°F with inlet cooling off, with turbines operating at maximum load. Footnote 5 indicates CO catalyst VOC destruction rate of 50% is assumed.

a. Please explain why a 50% VOC destruction rate is reasonable.

   Response: U.S. Environmental Protection Agency's (EPA) *AP-42*, Section 3.1 notes that "The performance of these oxidation catalyst systems on combustion turbines results in 90-plus percent control of CO and about 85 to 90 percent control of formaldehyde. Similar emission reductions are expected on other HAP pollutants." As most of the hazardous air pollutants (HAPs) emitted by the AES combustion turbines are also VOCs, assuming a 50 percent VOC destruction rate presents a conservative estimate of emissions.

b. For Table 5.1B.3, please revise the hourly VOC emission rates to be based on the BACT level of 2 ppmvd (dry, 15% O_2).

   Response: Attachment 6 presents a revised AEC Appendix 5.1B, Table 5.1B.3 with the revised hourly VOC emission rates based on 2 parts per million by volume, dry (ppmvd) at 15 percent oxygen (O_2).

c. For Table 5.1-14--GE 7FA.05 Startup/Shutdown Emission Rates on page 5.1-16, please adjust the startup and shutdown rates to be consistent with a normal operation rate of 2 ppmvd (dry, 15% O_2).

   Response: Below is a revised Table 5.1-14 using a normal operation VOC emission rate of 2 ppmvd at 15 percent O_2.

TABLE 5.1-14R

GE 7FA.05 Startup/Shutdown Emission Rates [a]

	NO_x	CO	VOC	SO_2 [b]	PM_{10}	$PM_{2.5}$
Cold Start						
Startup (lb/event/turbine)	61.0	325	36.0	—	—	—
Startup (lb/hr/turbine)	61.0	325	36.0	< 4.86	< 8.50	< 8.50
Warm Start [c]						
Startup (lb/event/turbine)	17.0	137	25.0	—	—	—
Startup (lb/hr/turbine)	25.2	142	**27.9**	< 4.86	< 8.50	< 8.50
Hot Start [c]						
Startup (lb/event/turbine)	17.0	137	25.0	—	—	—

TABLE 5.1-14R

GE 7FA.05 Startup/Shutdown Emission Rates [a]

	NO_x	CO	VOC	SO_2 [b]	PM_{10}	$PM_{2.5}$
Startup (lb/hr/turbine)	25.2	142	**27.9**	< 4.86	< 8.50	< 8.50
Shutdown [c]						
Shutdown (lb/event/turbine)	10.0	133	32.0	—	—	—
Shutdown (lb/hr/turbine)	18.2	138	**34.9**	< 4.86	< 8.50	< 8.50

[a] Maximum emission rates were based on an ambient temperature of 20°F. Startup and shutdown emission rates at other ambient temperatures are provided in Appendix 5.1B.

[b] The maximum SO_2 hourly emission rate is based on a fuel sulfur concentration of 0.75 grain of sulfur per 100 dry standard cubic feet (dscf) of natural gas.

[c] The NO_x, CO, and VOC emissions for the balance of the hour for a warm start, hot start, and shutdown event were based on the hourly emission rate for 100 percent load at 28°F.

Notes:

CO = carbon monoxide

NO_X = oxides of nitrogen

PM_{10} = particulate matter with aerodynamic diameter less than or equal to 10 microns

$PM_{2.5}$ = particulate matter with aerodynamic diameter less than or equal to 2.5 microns

lb/event/turbine = pound(s) per event per turbine

lb/hr/turbine = pound(s) per hour per turbine

SO_2 = sulfur dioxide

8. Cold, Warm, Hot Startup Definitions

   a. Combined Cycle Turbines

      i. Please define "cold start."

         Response: A cold start occurs when the combustion turbine has been shutdown for 48 hours or more.

      ii. Please define ''warm start."

         Response: A warm start occurs when the combustion turbine has being shutdown for more than 10 hours, but less than 48 hours.

      iii. Please define "hot start."

         Response: A hot start occurs when the combustion turbine has being shutdown for less than 10 hours.

   b. Auxiliary Boiler

      i. Please define "cold start."

         Response: A cold start occurs when the auxiliary boiler has been shutdown for 48 hours or more.

      ii. Please define ''warm start."

         Response: A warm start occurs when the auxiliary boiler has being shutdown for more than 10 hours, but less than 48 hours.

      iii. Please define "hot start."

Response: A hot start occurs when the auxiliary boiler has being shutdown for less than 10 hours.

9. <u>SCR and CO Oxidation Catalyst Specifications and Guarantees</u>

   a. <u>Combined Cycle</u>

      i. <u>SCR</u>

         aa. Form 400-E-5 indicates the ammonia injection rate is 242.0 lb/hr. As there will be a D12 condition that requires a flow meter and specifies a flow rate range, please provide the flow rate range in lb/hr or gal/hr.

         Response: The CCGT ammonia injection rate is 44.0 to 242.0 pounds per hour (lb/hr).

         bb. What is the maximum allowable pressure drop across the catalyst?

         Response: The maximum allowable pressure drop across the SCR system is 1.6 inches of water column.

   b. <u>Simple Cycle</u>

      i. <u>SCR</u>

         aa. Form 400-E-5 indicates the ammonia injection rate is 180 lb/hr. As there will be a D12 condition that requires a flow meter and specifies a flow rate range, please provide the flow rate range in lb/hr or gal/hr.

         Response: The SCGT ammonia injection rate is 110 to 180 lb/hr.

         bb. What is the maximum allowable pressure drop across the catalyst?

         Response: The maximum allowable pressure drop across the SCR system is 120 inches of water column.

         cc. Please provide a guarantee for the life of the catalyst.

         Response: The SCR system has a guaranteed life of 24,000 hours, or 3 years. See Attachment 9 for guarantee.

      ii. <u>CO Oxidation Catalyst</u>

         aa. Please provide a guarantee for the life of the catalyst.

         Response: The Oxidation Catalyst has a guaranteed life of 7 to 12 years. See Attachment 9 for guarantee.

   c. <u>Auxiliary Boiler</u>

      i. <u>SCR</u>

         aa. What is the maximum allowable pressure drop across the catalyst?

         Response: The maximum allowable pressure drop across the SCR system is 2.0 inches of water column.

         bb. In Appendix 5.1B, Table 5.1B.12 indicates the catalyst life is three years, but does not provide a guarantee. Please provide a guarantee for the life of the catalyst.

Response: The SCR system has a guaranteed life of 24,000 hours, or 3 years. See Attachment 9 for guarantee.

10. Auxiliary Boiler

a. Preliminary Selection

In Appendix 5.1B, Table 5.1B.11-Auxiliary Boiler: Performance Data, footnote 3 on page 1 states: "Auxiliary boiler sizing reflects conservative design assumptions for use in establishing permit limits. Final equipment size and selection (based on major equipment OEM selection) during detailed design phase will likely reduce aux boiler size to ~50-60 MMBtu/hr."

SCAQMD provides clarification that the make, model, rating and emissions limits for permitting purposes are based on the actual boiler selected. If a different boiler is selected after the SCAQMD has performed a substantial evaluation on the proposed boiler, a new application will be required to be submitted.

Response: AES proposes to install a Babcock & Wilcox (B&W), Model FM 103-88 auxiliary boiler. Since this is a different manufacturer than what was originally proposed, a revised Form 400-E-9a has been included in Attachment 2, along with the revised forms noted previously. The B&W, Model FM 103-88 is of the same specifications as the originally proposed Rentech boiler, including emissions, exhaust flow, heat input, and steam production.

b. Process Description

In Appendix 5.1D, page 1-1 indicates the auxiliary boiler will be used to reduce the startup duration of the combined-cycle power block, thereby reducing air emissions. Page 3-3 indicates the auxiliary boiler will facilitate fast start capabilities of the combined-cycle block. No further details were provided regarding the operation of the boiler.

i. Please provide a process description for the auxiliary boiler, including a step-by-step description of how the boiler assists with the fast start of the combined-cycle block.

Response: The auxiliary boiler shall be used to provide enhanced startup times by maintaining the steam cycle in a ready state through the provision of steam for heat recovery steam generator (HRSG) sparging, turbine steam seals, steam pipe warming, condenser deareating steam, and for steam to the fuel gas heater. Prior to a CCGT startup, the auxiliary boiler will increase load from the minimum turndown rate to the maximum load and the produced steam will be directed to the system for HRSG sparging, turbine seals, pipe warming, condenser deareating, and to the fuel gas heater. Once the CCGT completes a startup and the steam turbine reaches maximum output, the auxiliary boiler will reduce load to the minimum turndown firing rate. If extended periods of CCGT outage are expected, the auxiliary boiler could be shutdown until a start of the CCGT is expected.

ii. In Appendix 5.1B, Table 5.1B.13-Auxiliary Boiler: Summary of Operation Emissions--Criteria Pollutants, footnote d indicates the annual emissions assume 8,760 hours of operation at the maximum hourly firing rate, with 24 cold starts, 48 warm starts, and 48 hot starts. Does this mean the boiler is operated continuously?

Response: Under the worst-case maximum monthly emissions scenario for the auxiliary boiler, it is assumed the boiler will be continuously operated to maintain the CCGT in a ready state condition. Under actual operating conditions, the auxiliary boiler would be used only to maintain steam system readiness and could be shut down and taken offline after startup of the CCGT and the steam systems have reached maximum output.

c. Dispersion Modeling

i. On page 5.1-33, Table 5.1-33-Auxiliary Boiler Emission Rates and Stack Parameters indicates the maximum 1-hour NOx and CO emission rates are based on normal operation at the maximum firing rate. Please explain why a startup event was excluded.

Response: The auxiliary boiler was not modeled in startup mode as part of the worst-case operational modeling scenarios for 1-hour nitrogen dioxide (NO_2) and 1-hour carbon monoxide (CO) because startup of the auxiliary boiler does not occur concurrently with the worst-case emission scenario and only occurs prior to startup of one of the CCGTs. Additionally, steady-state operation of the auxiliary boiler has a higher hourly CO emission rate (2.83 lb/hr) than during startup (1.53 lb/hr).

The total facility NO_2 emissions from the startup of the auxiliary boiler without operation of the CCGTs would be a maximum of 45.6 lb/hr (22.1 lb/hr from each of the two SCGTs and 1.5 lb/hr from auxiliary boiler startup). This emissions scenario is much lower than the scenario presented in the worst-case operational modeling scenario, which assumes steady-state auxiliary boiler operation, cold startup of two CCGTs, and startup of two SCGTs, totaling 167 lb/hr of NO_2 emissions. Therefore, modeling startup of the auxiliary boiler with startup and/or operation of the SCGTs for the 1-hour modeling scenarios is not provided since it does not represent worst-case emissions or air quality impacts.

d. Specifications

Please provide manufacturer's specifications, including the following information:

i. A more specific model number than "D-Type" listed on the Form 400-E-9a.

Response: See the response to 10(a) above.

ii. Emissions levels prior to control by SCR.

Response: The auxiliary boiler's pre-SCR emission concentration is 10 ppmvd at 3 percent O_2 or 0.012 pounds per million British thermal units (lb/MMBtu) (high heating value).

iii. General description of boiler construction features and operation.

Response: The auxiliary boiler will be delivered to the site mostly assembled on a structural steel skid, with the exception of the exhaust stack, boiler feed water pumps, and SCR system. After the auxiliary boiler foundations are poured and cured, the auxiliary boiler skid will be mounted to the foundation, the SCR system and exhaust stack will be erected, and the utilities (boiler feed water, electrical, control systems, and natural gas) will be connected. After verifying the subsystems (electrical, control, water/steam, and natural gas) are functional, the auxiliary boiler is ready for commissioning.

e. Commissioning

i. Please explain whether the boiler will be "commissioned" or otherwise emit emissions at AEC, in addition to regular operation and cold, warm, and hot startups.

Response: The auxiliary boiler will be commissioned, where the commissioning process includes first burner light-off, conditioning, establishing the air/fuel ratio curve, and establishing the SCR ammonia injection curve.

ii. If so, please provide duration and emissions for the "commissioning" period.

Response: The auxiliary boiler commissioning will occur over 5 days and will require up to 6 fired hours per day. The auxiliary boiler commissioning emissions will be the same as the auxiliary boiler cold startup emissions, presented in Table 10-1 below.

TABLE 10-1
Auxiliary Boiler Commissioning Emissions

Startup	NO_X Pounds	CO Pounds	VOC Pounds
Daily Emissions	8.44	8.68	9.36
Total Commissioning Emissions	42.2	43.4	46.8

11. Auxiliary Boiler 30-Day Averages

a. In Appendix 5.1E, the Cleaver Brooks letter, dated 6/10/15, provides guaranteed stack emissions rates for NOx (post-SCR), CO, VOC, PM_{10}, and ammonia slip. The hourly rates presented in Table 5.1B.11-Auxiliary Boiler: Performance Data in Appendix 5.1B were based on the guaranteed emission rates, with the exception of VOC. VOC was guaranteed for 0.003 Ib/MMBtu, but the hourly rates were based on 0.004 Ib/MMBtu to apparently provide a safety margin. The bases for the hourly emissions rates are clear.

SCAQMD is unable to reproduce the monthly and daily emissions in Table 5.1B.11. Pursuant to New Source Review requirements, the monthly emissions, 30-day averages, and ERCs for each pollutant are required to be based on maximum monthly emissions for that pollutant, including commissioning emissions, if any. Please provide detailed emissions calculations for the monthly emissions and 30-day averages.

Response: The daily emissions in Table 5.1B.11 are calculated as follows:

Daily Emissions (lb/day) = Maximum Monthly Emissions (lb/month) / 30 days/month

The maximum monthly emissions in Table 5.1B.11 are calculated as follows:

Maximum Monthly NO_X, CO, or VOC Emissions (lb/month) = 2 Cold Startups per Month x Cold Startup Emissions (lb/event) + 4 Warm Startups per Month x Warm Startup Emissions (lb/event) + 4 Hot Startups per Month x Hot Startup Emissions (lb/event) + Maximum Monthly Fuel Consumption (26,327 MMBtu/month) x Emission Factor (lb/MMBtu)

Maximum Monthly SO_2, PM_{10}, or $PM_{2.5}$ Emissions (lb/month) = Emission Factor (lb/MMBtu) x {[2 Cold Startups per Month x Cold Startup Duration (min/event) x Cold Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [4 Warm Startups per Month x Warm Startup Duration (min/event) x Warm Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [4 Hot Startups per Month x Hot Startup Duration (min/event) x Hot Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [Maximum Monthly Fuel Consumption (26,327 MMBtu/month)]}

12. Turbines Toxic Emissions and Rule 1401 Health Risk Assessment

a. <u>Toxic Emissions</u>

In Appendix 5.1B, Table 5.1B.6-Combined-Cycle: Summary of Operation Emissions–Air Toxics and Table 5.1B.10-Simple Cycle: Summary of Operation Emissions-Air Toxics present air toxics emissions summaries.

i. The PAHs emission factor should be 0.90 E-06 lb/lMMBtu, instead of the 2.2 E-06 Ib/MMBtu shown in the tables. The reason is that naphthalene needs to be subtracted from the total PAHs because naphthalene is considered separately. (2.2 E-06-1.3 E-06 = 0.90 E-06.)

Response: The polycyclic aromatic hydrocarbon (PAH) emission factor was updated to a value of 8.74E-07 lb/MMBtu, derived from 9.18E-04 pound(s) per million standard cubic feet (lb/MMscf) using the SCAQMD default natural gas heat content of 1,050 million British thermal unit(s) per million standard cubic feet (MMBtu/MMscf). This emission factor excludes the contribution of naphthalene, as recommended.

ii. As requested by SCAQMD, the formaldehyde emission factor of 3.6 E-04 lb/MMBtu is based on AP-42, Section 3.1, Background Information, Table 3.4-1-Summary of Emission Factors for Natural Gas-Fired Gas Turbines, for formaldehyde controlled by CO catalyst, April 2000.

From the same Table 3.4-1, please use the following updated emission factors that incorporates CO catalyst control.

Pollutant	Emissions Factors
Acetaldehyde	1.76 E-04/MMBtu, or 1.80 E-01 lb/MMscf
Acrolein	3.62 E-06/MMBtu, or 3.69 E-03 lb/MMscf
Benzene	3.26 E-06/MMBtu, or 3.33 E-03 lb/MMscf

Response: The acetaldehyde, acrolein, and benzene emission factors were updated as recommended. The SCAQMD default natural gas heat content of 1,050 MMBtu/MMscf was used to convert the emission factors from units of lb/MMscf to lb/MMBtu. As such, the formaldehyde emission factor used in the analysis was also updated to a value of 3.50E-04 lb/MMBtu, derived from 3.67E-01 lb/MMscf.

The revised summary of the air toxics emissions resulting from operation of the AEC combustion turbines is presented in Table 12-1 below. These estimates conservatively assume that the CCGT operates 4,100 hours per turbine per year with 500 startups and shutdowns (estimated at 512 hours) per turbine per year and that the SCGT operates 2,000 hours per turbine per year with 500 startups and shutdowns (estimated at 348 hours) per turbine per year.

TABLE 12-1
Air Toxic Emission Rates Modeled for AEC Operation: Combustion Turbines

Pollutant [a]	CAS Registry Number	AEC CCGT Emissions (per turbine)		AEC SCGT Emissions (per turbine)	
		lb/hr [b]	lb/yr [b]	lb/hr [c]	lb/yr [c]
Ammonia [d]	7664417	15.3	69,582	6.09	14,309
Acetaldehyde	75070	0.39	1,779	0.15	354
Acrolein	107028	0.0080	36.5	0.0031	7.26

TABLE 12-1

Air Toxic Emission Rates Modeled for AEC Operation: Combustion Turbines

Pollutant [a]	CAS Registry Number	AEC CCGT Emissions (per turbine)		AEC SCGT Emissions (per turbine)	
		lb/hr [b]	lb/yr [b]	lb/hr [c]	lb/yr [c]
Benzene	71432	0.0072	32.9	0.0028	6.55
1,3-Butadiene	106990	0.0010	4.34	0.00037	0.86
Ethylbenzene	100414	0.071	322	0.027	64.1
Formaldehyde	50000	0.80	3,626	0.31	722
Naphthalene	91203	0.0029	13.1	0.0011	2.62
PAHs [e]	1151	0.0010	4.54	0.00038	0.90
Propylene Oxide	75569	0.063	289	0.025	58.2
Toluene	108883	0.29	1,314	0.11	262
Xylenes	1330207	0.14	645	0.055	128

[a] Emission rates recommended by SCQAMD, with the exception of ammonia. Units of lb/MMBtu calculated by dividing lb/MMscf by a gas heat content of 1,050 MMBtu/MMscf.

[b] Hourly emission rates are based on a maximum turbine heat input of 2,275 MMBtu/hr (high heat value). The annual emission rates are based on 4,612 hours of turbine operation with an average annual heat input of 2,250 MMBtu/hr.

[c] Hourly emission rates are based on a maximum turbine heat input of 879 MMBtu/hr (high heat value). The annual emission rates are based on 2,358 hours of turbine operation with an average annual heat input of 876 MMBtu/hr.

[d] Based on the operating exhaust ammonia limit of 5 ppmvd at 15 percent O_2 and an F-factor of 8,710.

[e] Per Section 3.1.4.3 of *AP-42*[1], PAH emissions were assumed to be controlled up to 50 percent through the use of an oxidation catalyst.

Notes:

CAS	=	Chemical Abstracts Service
lb/yr	=	pound(s) per year

b. Rule 1401 Health Risk Assessment

i. Please revise the proposed health risk assessment to incorporate the above emission factor changes.

Response: A revised summary of the excess cancer risk, chronic health index, and acute health index at the point of maximum impact (PMI) locations, as well as the maximum predicted public health impacts for worker, residential, and sensitive receptors, has been included in Tables 12-2 and 12-3. In accordance with SCAQMD Rule 1401, the results in Table 12-2 represent the predicted risk for each individual emission unit, while the results in Table 12-3 represent a comparison of the total predicted AEC impact to the SCAQMD California Environmental Quality Act (CEQA) significance thresholds. The revised HARP 2 modeling files used to conduct the health risk assessment are provided with this submission on compact disc.

1 EPA. 2000. *AP-42, Compilation of Air Pollutant Emission Factors*. Chapter 3, Section 3.1, Stationary Gas Turbines. Volume 1. Fifth Edition.

As shown in Table 12-2, the CCGT's predicted impacts exceed the incremental increase in cancer risk threshold of 1 in 1 million; therefore, T-BACT will be required for these units. The SCGTs and auxiliary boiler do not trigger the regulatory requirement for Best Available Control Technology for Toxics (T-BACT) as their predicted impacts are below the incremental increase in cancer risk threshold of 1 in 1 million. Although not required in all cases, the emission control technologies included in the AEC for all emission sources are considered to be T-BACT. All sources have predicted impacts below the chronic and acute hazard index of 1.0.

TABLE 12-2
Health Risk Assessment Summary: Individual Units [a]

Risk [b]	AEC CCGT-1	AEC CCGT-2	AEC SCGT-1	AECSCGT-2	AECSCGT-3	AEC SCGT-4	Auxiliary Boiler
Cancer Risk at the PMI [c] (per million)	0.67	0.67	0.053	0.054	0.054	0.053	0.051
Cancer Risk at the MEIR [c] (per million)	0.48	0.46	0.048	0.048	0.047	0.047	0.015
Cancer Risk at a Sensitive Receptor [c] (per million)	0.47	0.48	0.022	0.023	0.026	0.026	0.010
Cancer Risk at the MEIW [d] (per million)	0.024	0.024	0.0019	0.0019	0.0019	0.0019	0.0015
Chronic Hazard Index at the PMI	0.0017	0.0017	0.00014	0.00014	0.00014	0.00014	0.000069
Chronic Hazard Index at the MEIR	0.0012	0.0012	0.00012	0.00012	0.00012	0.00012	0.000020
Chronic Hazard Index at a Sensitive Receptor	0.0012	0.0012	0.000057	0.000058	0.000066	0.000068	0.000014
Chronic Hazard Index at the MEIW	0.0017	0.0017	0.00014	0.00014	0.00014	0.00014	0.000069
Acute Hazard Index at the PMI	0.0066	0.0067	0.0024	0.0039	0.0024	0.0024	0.00031
Acute Hazard Index at the MEIR	0.0066	0.0066	0.0017	0.0017	0.0017	0.0017	0.00020
Acute Hazard Index at a Sensitive Receptor	0.0058	0.0053	0.0015	0.0015	0.0015	0.0016	0.000065
Acute Hazard Index at the MEIW	0.0066	0.0067	0.053	0.0039	0.0024	0.0024	0.00031

[a] The results in Table 12-2 represent the predicted excess risk for each individual emission unit in accordance with SCAQMD Rule 1401.

[b] A source with an excess cancer risk less than 1 in 1 million individuals is considered to be less than significant. A source with an excess cancer risk less than 10 in 1 million is considered less than significant if T-BACT is installed. A chronic or acute hazard index less than 1.0 for each source is considered to be a less-than-significant health risk.

[c] Cancer risk values are based on the Draft Risk Management Policy (RMP) methodology.

[d] Cancer risk values are based on the Office of Environmental Health Hazard Assessment (OEHHA) Derived methodology.

A risk analysis was also performed to evaluate the potential facility-wide impacts. The potential health impacts at the PMI, maximum exposed individual resident (MEIR), maximum exposed individual worker (MEIW), and maximum exposed sensitive receptor resulting from AEC operation are summarized in Table 12-3. It should be noted that the maximum impacts reported in Table 12-3 represent the maximum predicted impacts at one receptor from all sources combined. In contrast, the maximum impacts reported for each individual source in Table 12-2 may occur at different receptors. Therefore, the AEC totals in Table 12-2 are not directly additive and should not be directly compared to the results presented in Table 12-3.

TABLE 12-3
Health Risk Assessment Summary: Facility [a]

Risk [b]	Receptor Number	Receptor Coordinates (UTM, m)		Value
		Easting	Northing	
Cancer Risk at the PMI [c] (per million)	681	398450	3736900	1.4
Cancer Risk at the MEIR [c] (per million)	688	398800	3736900	1.1
Cancer Risk at a Sensitive Receptor [c] (per million)	19405	397913	3737192	1.0
Cancer Risk at the MEIW [d] (per million)	681	398450	3736900	0.052
Chronic Hazard Index at the PMI	681	398450	3736900	0.0036
Chronic Hazard Index at the MEIR	688	398800	3736900	0.0028
Chronic Hazard Index at a Sensitive Receptor	19405	397913	3737192	0.0026
Chronic Hazard Index at the MEIW	681	398450	3736900	0.0036
Acute Hazard Index at the PMI	597	397900	3736750	0.019
Acute Hazard Index at the MEIR	769	397700	3737100	0.018
Acute Hazard Index at a Sensitive Receptor	19405	397913	3737192	0.017
Acute Hazard Index at the MEIW	597	397900	3736750	0.019

[a] The results in Table 12-3 represent the combined predicted risk for all five combustion units operating simultaneously.

[b] A facility with an excess cancer risk less than 10 in 1 million individuals is considered to be less than significant. A chronic or acute hazard index less than 1.0 for the facility is considered to be a less-than-significant health risk.

[c] Cancer risk values are based on the Draft RMP methodology.

[d] Cancer risk values are based on the OEHHA Derived methodology.

Notes:

m = meter(s)

UTM = Universal Transverse Mercator

As shown in Table 12-3, predicted impacts for the AEC are below the significance thresholds of 10 in 1 million for excess cancer risk and chronic and acute hazard index of 1.0. Therefore, the predicted health risks associated with the AEC will be less than significant.

Because the predicted cancer risk, per individual unit, is greater than 1 in 1 million, the cancer burden was calculated for each census block receptor consistent with SCAQMD guidance[2]. The cancer burden for the AEC was estimated at 1.8 x 10^{-9}, which is well below the significance threshold of 0.5. Therefore, the AEC will not significantly increase cancer burden in the vicinity of the project site.

13. Auxiliary Boiler Toxic Emissions and Rule 1401 Health Risk Assessment

    a. Toxic Emissions

    In Appendix 5.1B, Table 5.1B-14-Auxiliary Boiler: Summary of Operation Emissions–Air Toxics presents the air toxics emissions summary.

    i. The emission factors used are from Tables 1.4-3 and 1.4-4 of AP-42. Please use the following emission factors from the Ventura County Air Pollution Control District for natural gas fired external combustion equipment rated 10 - 100 MMBtu/hr:

Pollutants	Emissions Factors, lb/MMcf
Benzene	0.0058
Formaldehyde	0.0123
PAHs (excluding naphthalene)	0.0001
Naphthalene	0.0003
Acetaldehyde	0.0031
Acrolein	0.0027
Propylene	0.5300
Toluene	0.0265
Xylene	0.0197
Ethyl Benzene	0.0069
Hexane	0.0046

Response: The auxiliary boiler air toxics emission factors were updated as recommended. The SCAQMD default natural gas heat content of 1,050 MMBtu/MMscf was used to convert the emission factors from units of lb/MMscf to lb/MMBtu.

The revised summary of the air toxics emissions resulting from operation of the AEC auxiliary boiler is presented in Table 13-1 below. The maximum hourly emissions were estimated based on the maximum heat input rating. The annual emissions were estimated based on 120 startups and 310,096 MMBtu of fuel consumption per year.

TABLE 13-1
Air Toxic Emission Rates Modeled for AEC Operation: Auxiliary Boiler

		Auxiliary Boiler Emissions	
Pollutant [a]	CAS Registry Number	lb/hr [b]	lb/yr [b]
Benzene	71432	3.91E-04	1.71E+00

[2] SCAQMD. 2015. *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588)*. June.

TABLE 13-1

Air Toxic Emission Rates Modeled for AEC Operation: Auxiliary Boiler

		Auxiliary Boiler Emissions	
Pollutant [a]	**CAS Registry Number**	**lb/hr [b]**	**lb/yr [b]**
Formaldehyde	50000	8.29E-04	3.63E+00
PAHs	1151	6.74E-06	2.95E-02
Naphthalene	91203	2.02E-05	8.86E-02
Acetaldehyde	75070	2.09E-04	9.16E-01
Acrolein	107028	1.82E-04	7.97E-01
Toluene	108883	1.79E-03	7.83E+00
Xylene	1330207	1.33E-03	5.82E+00
Ethylbenzene	100414	4.65E-04	2.04E+00
Hexane	110543	3.10E-04	1.36E+00

[a] Emission rates recommended by SCAQMD.

[b] Emission rates are based on the auxiliary boiler operating at a maximum hourly heat input of 70.8 MMBtu/hr (high heat value) and a maximum monthly heat input of 26,327 MMBtu/hr (high heat value), with two cold starts, four warm starts, and four hot starts per month.

ii. Please explain the derivation of the Maximum Annual Heat Input of 310,096 MMBtu/yr (HHV).

Response: The maximum annual heat input was calculated as follows:

Maximum Annual Heat Input (MMBtu/yr) = [24 Cold Startups per Year x Cold Startup Duration (min/event) x Cold Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [48 Warm Startups per Month x Warm Startup Duration (min/event) x Warm Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [48 Hot Startups per Month x Hot Startup Duration (min/event) x Hot Startup Fuel Consumption (MMBtu/hr) / 60 min/hr] + [Maximum Monthly Fuel Consumption (26,327 MMBtu/month) x 12 months/year]}

b. Rule 1401 Health Risk Assessment

i. Please revise the proposed health risk assessment to incorporate the above emission factor changes.

Response: See the response to request 12(b)(i).

14. <u>Turbines Combustor Tuning</u>

a. <u>Combined Cycle Turbines</u>

i. In Appendix 5.1B, Table 5.1B.1-Summary of Commissioning Emission Estimates: Combined-Cycle Turbines does not mention combustor tuning. Please confirm no tuning will be required after commissioning.

Response: No combustor tuning is required after commissioning.

ii. If tuning is required, please describe the combustor tuning events anticipated as the facility ages.

Response: No combustor tuning is required after commissioning.

iii. iv., and v. Please provide the same information as requested for Simple Cycle Turbines below.

Response: No combustor tuning is required after commissioning.

b. Simple Cycle Turbines

i. In Table 5.1B.2-Summary of Commissioning Emission Estimates: Simple-Cycle Turbines, footnote 1 indicates that after commissioning, tuning is expected to occur twice a year. Please confirm the footnote is correct.

Response: Combustion tuning is not required and the footnote is incorrect.

ii. If tuning is required, please describe the combustor tuning events anticipated as the facility ages.

Response: See the response to request 14(b)(i).

iii. The draft permit will include three A195 conditions that will require BACT levels for NOx, CO, and VOC except during commissioning, startup, and shutdown periods. If an exemption for a specific number of hours needs to be added for "combustor tuning events" or other type of "maintenance", please specify the following:

aa. Definition for "combustor tuning events," "maintenance," or whichever term is proposed.

Response: No combustor tuning or maintenance is required after commissioning.

bb. Total number of hours required.

Response: See the response to request 14(b)(iii)(aa).

cc. Emissions for the total number of hours. Typically, the total number of hours is assumed to take place at one time.

Response: See the response to request 14(b)(iii)(aa).

iv. Are the emissions rates from combustor tuning events expected to exceed the modeled emission rates in the Application?

Response: See the response to request 14(b)(iii)(aa).

15. Table 5.1-23-AEC Facility Emissions

On pages 5.1-20 to 5.1-21, Table 5.1-23 provide a summary of AEC facility emissions, with the footnotes providing the bases for the emissions.

a. Footnote a indicates that hourly SO_2 emissions are based on a maximum fuel sulfur content of 0.75 grain per 100 dscf of natural gas, whereas daily monthly, and annual SO_2 emissions are based on an average fuel sulfur content of 0.25 grain per 100 dscf of natural gas. This conflicts with footnotes e to Tables 5.1B.5 and 5.1B.9 in Appendix 5.1B. Footnotes e indicate hourly, daily, and monthly SO_2 emissions are based on 0.75 grain per 100 dscf of natural gas, whereas annual SO_2 emissions are based on of 0.25 grain per 100 dscf of natural gas.

Please confirm footnotes e, not footnote a, is correct.

Response: Both footnotes are correct. The daily emissions presented in Table 5.1-23 are calculated from the maximum monthly emissions, and the maximum monthly emissions are based on the annual average fuel sulfur content because these emissions are used to determine compliance requirements for the Regional Clean Air Incentives Market (RECLAIM) program. The emissions presented in Tables 5.1B.5 and 5.1B.9 reflect the worst-case daily and monthly emissions for each operating scenario, based on the peak hourly fuel sulfur content, and are used to ensure a conservative modeling assessment.

b. Footnote c indicates the maximum hourly VOC, CO, and NOx emissions for a GE 7FA.05 are based on a cold start. This conflicts with footnote a to Table 5.1B.5. Footnote a indicates the hourly emissions are for the turbine in normal operation only, excluding startup or shutdown emissions.

   Please confirm footnote a, not footnote c, is correct.

   Response: Footnote c is incorrect. The 1-hour emission rates presented in Table 5.1-23 are the maximum hourly steady-state emission rates per General Electric (GE) 7FA.05, consistent with the values presented in Table 5.1B.5.

c. Footnote d indicates the maximum hourly VOC, CO, and NOx emissions for a GE LMS-100 are based on one hot startup, one shutdown, and the balance of the hour at full load at 28°F. This conflicts with footnote a to Table 5.1B.9. Footnote a indicates the hourly emissions are for the turbine in normal operation only, excluding startup or shutdown emissions.

   Please confirm footnote a, not footnote d, is correct.

   Response: Footnote d is incorrect. The 1-hour emission rates presented in Table 5.1-23 are the maximum hourly steady-state emission rates per GE LMS-100, consistent with the values presented in Table 5.1B.9.

d. Footnote g indicates that for the GE 7FA.05s and GE LMS-100s, the maximum monthly emissions include steady-state operation at 100 percent load and 65.3°F.

   Please explain why the maximum monthly emissions are based on 65.3°F, instead of 28°F.

   Response: The maximum monthly emissions are based on the annual average operating scenario because these emissions are used to determine compliance requirements for RECLAIM.

16. <u>Turbines 30-Day Averages</u>

   a. <u>Combined Cycle Turbine</u>

      In Appendix 5.1B, Table 5.1B.5–Combined-Cycle: Summary of Operation Emissions –Criteria Pollutants, footnote c indicates the monthly emission rates assume 31 days and include 2 cold starts, 15 warm starts, 45 hot starts, and 62 shutdowns per month. Pursuant to New Source Review requirements, the monthly emissions and 30-day averages for <u>each</u> pollutant are required to be based on <u>maximum</u> monthly emissions for that pollutant, including commissioning emissions.

      Since the commissioning period for each turbine is 996 hours (more than one month), maximum emissions for three different months are required to be calculated.

      i. <u>First Month</u>

aa. Regarding Table 5.1B.1-Summary of Commissioning Emission Estimates: Combined-Cycle Turbines, please explain which steps will be completed the first month.

Response: CTG Testing and a portion of Steam Blows will be completed within the first month. Commissioning emissions per CCTG for the first month are presented in Attachment 16.

ii. Second Month

aa. The remaining steps from Table 5.1B.1 will be completed in the second month. In addition, please provide the number of normal operating hours, cold starts, warm starts, hot starts, and shutdowns that will take place after the commissioning is completed.

Response: The combined-cycle commissioning period will extend over a period of 6 full months, and will not overlap with steady-state operation of the CCTGs. Therefore, the schedule of commissioning activities for months 2 through 6 are as follows:

- Month 2: The remainder of Steam Blows, Set Unit HRSG & Steam Safety Valves, DLN Emissions Tuning, Emissions Tuning, Emissions Tuning, and a portion of Verify STG on Tuning Gear
- Month 3: The remainder of Verify STG on Tuning Gear, CT Base Load Testing/Tuning, Load Test STG/Combined-cycle (2x1) Tuning, and a portion of STG Load Test/Combined-cycle Tuning
- Month 4: The remainder of STG Load Test/Combined-cycle Tuning, RATA/Pre-performance Testing/Source Testing, Source Testing & Drift Test Day 1, and a portion of Source Testing & Drift Test Day 2
- Month 5: The remainder of Source Testing & Drift Test Day 2, Source Testing & Drift Test Day 3, Source Testing & Drift Test Day 4, Source Testing & Drift Test Day 5, Source Testing & Drift Test Day 6, Source Testing & Drift Test Day 7, and a portion of Performance Testing
- Month 6: The remainder of Performance Testing and CALISO Certification & Testing/PPA Testing

Commissioning emissions per CCTG for the second through sixth month are presented in Attachment 16.

iii. Third Month

aa. Please confirm the monthly emissions will be as described in footnote c to Table 5.1B.5.

Response: Monthly emissions during steady-state operation of the CCTGs will be as described in footnote c to Table 5.1B.5, and will begin in the first month following completion of commissioning activities.

b. Simple Cycle Turbine

In Appendix 5.1B, Table 5.1B.9-Simple-Cycle: Summary of Operation Emissions–Criteria Pollutants, footnote c indicates the monthly emission rates assume 31 days and include 62 startups and 62 shutdowns per month. As explained above, the commissioning emissions are required to be considered.

Since the commissioning period for each turbine is 280 hours (less than one month), maximum emissions for two different months are required to be calculated.

i. First Month

aa. Regarding Table 5.1B.2-Summary of Commissioning Emission Estimates: Simple-Cycle Turbines, please confirm all steps will be completed in the first month.

Response: The simple-cycle commissioning period will extend over a period of 3 full months, and will not overlap with steady-state operation of the SCGTs. Therefore, the schedule of commissioning activities are as follows:

- Month 1: Unit Testing (Full Speed No Load, FSNL), Unit DLN Emissions Tuning, Unit Emissions Tuning, Unit Base Load Testing, Refire Unit, and a portion of Unit Source Testing & Drift Test Day 1-5/RATA/Pre-performance Testing/Part 60/75 Certification and Source Testing
- Month 2: A portion of Unit Source Testing & Drift Test Day 1-5/RATA/Pre-performance Testing/Part 60/75 Certification and Source Testing
- Month 3: The remainder of Unit Source Testing & Drift Test Day 1-5/RATA/Pre-performance Testing/Part 60/75 Certification and Source Testing, Unit Water Wash & Performance Preparation, Unit Performance Testing, and Unit CALISO Certification

Commissioning emissions per SCTG for the first through third month are presented in Attachment 16.

bb. In addition, please provide the number of normal operating hours, startups and shutdowns that will take place after the commissioning is completed.

Response: As indicated above, simple-cycle commissioning activities will not occur in the same month as steady-state operation of the SCTGs.

ii. Second Month

aa. Please confirm the monthly emissions will be as described in footnote c to Table 5.1B.9.

Response: Monthly emissions during steady-state operation of the SCTGs will be as described in footnote c to Table 5.1B.9, and will begin in the first month following completion of commissioning activities.

17. Greenhouse Gas (GHG) Global Warming Potentials and Emission Factors

In Appendix 5.1B, Table 5.1B.16 is comprised of three tables. Footnote a to the GHG Netting table indicates the global warming potentials used to calculate the CO_2 equivalents were from Table B.1 of TCR's 2015 *Climate Registry Default Emission Factors.* SCAQMD uses the global warming potentials from Table A-1 to Subpart A of 40 CFR Part 98 Global Warming Potentials, as amended by 79 FR 73779, 12/11/14. Currently, both sources indicate the global warming potential of CH_4 is 25 and N_2O is 298.

Footnotes a and b to the GHG Emission Factors table indicate the GHG emission factors are from TCR's 2015 *Climate Registry Default Emission Factors.* SCAQMD uses emission factors for CO_2, CH_4, and N_2O from the US EPA website, Emission Factors for Greenhouse Gas Inventories, Table 1-Stationary Combustion Emission Factors, revised April 4, 2014. Consequently, the following emission factors will be used in the PDOC and FDOC for all natural-gas fired equipment: CO_2, 53.06 kg CO_2/MMBtu; CH_4, 1 g CH_4/MMBtu; and N_2O, 0.10 g N_2O/MMBtu.

Response: Attachment 17 presents a revised version of AEC Appendix 5.1B, Table 5.1B.16, which has been revised to reflect the emission factors and global warming potentials recommended by SCAQMD.

18. SF_6 Emissions Calculations

On page 5.1-22, Table 5.1-25-Estimated Annual Greenhouse Gas Emissions from AEC, footnote a indicates SF_6 emissions from 12 circuit breakers are included.

a. Page 2-3 indicates the CCGT and SCGT each has one 230-kV interconnection to the existing SCE switch yard but do not provide any details. In Appendix 5.1B, Table 5.1B.18-SF6 Calculations lists twelve electrical breakers. Please provide a discussion regarding which interconnection(s) or equipment each of the twelve electrical breakers serves.

Response: Each generator includes an 18-kilovolt (kV) circuit breaker, for a total of 7. The CCGT power block includes a single, 230-kV circuit breaker and each SCGT includes a 230-kV circuit breaker, for a total of 5. See Table 18-1 below for additional clarification.

TABLE 18-1
AEC Electric Breakers

AEC Electric Breakers	AEC Unit
1200A 230 kV	SCGT-1
1200A 230 kV	SCGT-2
1200A 230 kV	SCGT-3
3000A 230 kV	CCGT-1, CCGT-2, and Steam Turbine
10000A 18 kV	CCGT-1
10000A 18 kV	CCGT-2
10000A 18 kV	Steam Turbine
2000A 230 kV	SCGT-4
GCB 18 kV	SCGT-1
GCB 18 kV	SCGT-2
GCB 18 kV	SCGT-3
GCB 18 kV	SCGT-4

b. A F52 condition will require leak detection equipment and impose an emissions limit on the total CO_2e emissions from all circuit breakers. The emissions calculations in the Application are based on a 0.1% annual leak limit. Please confirm the emissions limit is to be based on the 0.1% annual leak limit without a safety margin.

Response: The emissions limit should be based on the 1.0 percent annual leak limit allowed by the *Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear* (17 California Code of Regulations 95350 – 95359). Table 5.1B.18 from the AEC Air Permit Application has been revised accordingly, and included in Attachment 18.

19. PSD Cumulative Impacts of AEC and Competing Sources

Page 5.1-40 states: "The cumulative impacts of the AEC and competing sources were assessed for all receptors where the AEC impacts alone exceeded the 1-hour NO_2 SIL of 7.52 μg/m^3. Based on a comparison of these results to the 1-hour NO_2 NAAQS of 188 μg/m^3, it was determined that there were receptors where the contributions from the AEC combined with those from competing sources and representative background concentrations exceeded the 1-hour NO_2 NAAQS. Therefore, AERMOD-generated output files were reviewed to assess the contribution of the AEC's emissions at each of the receptors where an exceedance of the 1-hour NO_2 NAAQS was modeled. The files show that the maximum contribution from the AEC to any modeled exceedance was less than the 1-hour NO_2 Class II SIL of 7.52 μg/m^3. Therefore, the AEC's contribution to each modeled exceedance is less than significant and would not cause or contribute to any modeled exceedance of the 1-hour NO_2 NAAQS."

In Appendix 5.1C, Table 5.1C.11–Competing Source Results shows "All (Max. Impact)" for 2006, 2007, 2008, 2009, and 2011. The impacts ranged from 99 to 108. For clarification, please add information to the table to show the maximum impacts and background concentrations exceed 188 μg/m^3.

Response: Table 19-1 presents the maximum contribution to a modeled exceedance of the National Ambient Air Quality Standard (NAAQS) from each facility modeled as part of the Prevention of Significant Deterioration (PSD) competing source assessment, as well as the maximum modeled impact from all competing sources combined with the 3-year average, 98th percentile background concentration. As indicated, the maximum modeled impact combined with the background does exceed the 1-hour NO_2 NAAQS of 188 microgram(s) per cubic meter (μg/m^3). However, the maximum contribution from the AEC is less than the 1-hour NO_2 SIL of 7.52 μg/m^3, which is assumed to not cause or contribute to a violation of the 1-hour NO_2 NAAQS.

TABLE 19-1
Competing Source Results

	1-hour NO_2 Concentrations (μg/m^3) [a]				
Combustion Sources	**2006**	**2007**	**2008**	**2009**	**2011**
AEC [b]	6.54	6.36	6.76	6.87	6.75
Haynes Generating Station [b]	48.0	48.0	48.0	48.0	48.0
Beta Offshore [b]	0.36	0.61	0.33	0.37	0.73
Shipping Lanes [b]	101	104	105	102	97.8
All Sources [c]	105	108	108	105	99
Background Concentration [d]			140		
All Sources with Background Concentration [e]			245		

[a] The maximum 1-hour NO_2 concentrations include an ambient NO_2 ratio of 0.80[3].
[b] Maximum contributions are the highest of the 8th through 25th high.
[c] Maximum impacts are the high-8th-high.

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[3] EPA. 2011. *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO2 National Ambient Air Quality Standard*. EPA Office of Air Quality Planning and Standards. March 1.

TABLE 19-1
Competing Source Results

	1-hour NO_2 Concentrations ($\mu g/m^3$) [a]				
Combustion Sources	**2006**	**2007**	**2008**	**2009**	**2011**

[d] 3-year average, 98th percentile background concentration.

[e] 5-year average of the high-8th-high modeled concentrations combined with the 3-year average, 98th percentile background concentration.

20. Rule 1304.1 Estimated Fees

Please provide the "Average Last 2 Years of Existing Units(s) Actual Generation (MWh/yr)" for AGS Units 1, 2, and 5, which will be retired, to allow an estimate of the total annual fee to be calculated. Please include data for actual generation by year and unit. An explanation will be included to explain the total annual fee is an estimate and will be finalized once the date of permits issuance, if the permits are approved, is established.

Response: Table 20-1 presents the annual electrical production in megawatt-hours (MWh) on a gross and net basis for Alamitos Generating Station (AGS) Units 1, 2, and 5 for 2013 and 2014. The electrical production data were collected from the California Energy Commission's CEC-1304 report.

TABLE 20-1
AGS 2-Year Average Electrical Production

	2013		2014		2-Year Average	
Unit	**MWh Gross**	**MWh Net**	**MWh Gross**	**MWh Net**	**MWh Gross**	**MWh Net**
1	17,923	15,645	22,414	22,103	20,168	18,874
2	30,766	26,094	85,834	82,964	58,300	54,529
5	510,029	489,433	74,250	71,345	292,139	280,389

Source: http://energyalmanac.ca.gov/electricity/web_qfer/

21. AGS Actual Emissions for Past Two Years

For the AGS, please provide the actual emissions for 2013 and 2014, and the two-year average, for CO, NOx, PM_{10}, $PM_{2.5}$, ROG, SOx, and **CO_2e** for all units and the total facility.

Response: Table 21-1 presents the annual and two-year average emissions for CO, NO_X, PM_{10}, $PM_{2.5}$, reactive organic gases (ROG), sulfur dioxide (SO_2), and carbon dioxide equivalents (CO_2e) for all units and the total facility. These data were collected from the AGS's 2013 and 2014 Annual Emissions Reports, as submitted to the SCAQMD.

TABLE 21-1
AGS Historic Emissions Estimate

		ROG	NO_X	SO_2	CO	$PM_{10}/PM_{2.5}$	CO_2e*	Fuel
Year	**Unit**			**lb/yr**			**MT/year**	**MMscf/year**
2013	1	441	0	132	23,163	227	11,925	221
2013	2	457	0	249	64,091	830	22,387	415
2013	3	7,289	0	2,302	108,183	6,905	199,176	3,836
2013	4	3,298	0	2,328	14,976	4,656	199,274	3,880

2013	5	4,005	0	3,042	430,872	6,084	281,437	5,070
2013	6	1,786	0	1,553	72,405	2,848	139,725	2,589
2014	1	621	2,296	186	43,095	320	16,966	311
2014	2	1,350	9,794	736	252,396	2,454	66,824	1,227
2014	3	9,796	39,237	3,094	42,794	9,281	281,051	5,156
2014	4	4,938	29,729	3,486	1,743	6,972	316,624	5,810
2014	5	603	2,798	458	75,627	916	41,622	763
2014	6	1,347	10,750	1,171	22,257	2,148	106,288	1,952
Total 2013		17,276	95,284	9,606	713,690	21,550	853,926	
Total 2014		18,656	94,604	9,131	437,913	22,090	829,376	
2-Year Average		17,966	94,944	9,369	575,802	21,820	841,651	

*CO_2e emissions calculated using emission factors of 53.06 kg CO_2/MMBtu, 1 g CH_4/MMBtu, and 0.10 g N_2O/MMBtu, and global warming potentials of 25 for CH_4 and 298 for N_2O.

Notes:

CO_2 = carbon dioxide

g/MMBtu = gram(s) per million British thermal unit

kg/MMBtu = kilogram(s) per million British thermal unit

CH_4 = methane

N_2O = nitrous oxide

Please let me or Jerry Salamy know if you have any additional questions.

Sincerely,

Stephen O'Kane
Vice-President
AES Southland Development, LLC
AES Alamitos, LLC
AES Alamitos Energy, LLC

Attachments

cc: Jennifer Didlo/AES
Jeff Harris/ESH
Jerry Salamy/CH2M HILL

Attachment 2
Revised SCAQMD Forms

South Coast Air Quality Management District

Form 400-E-5
Selective Catalytic Reduction (SCR) System, Oxidation Catalyst, and Ammonia Catalyst

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944
Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): AES Alamitos, LLC

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 115394

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site): 690 N. Studebaker Road, Long Beach, CA 90803

(●) Fixed Location ( ) Various Locations

Section B - Equipment Description

Selective Catalytic Reduction (SCR)	
SCR Catalyst	Manufacturer: Cormetech Catalyst Active Material: Titanium/Vanadium/Tungsten Model Number: CMHT Type: Ceramic Honeycomb Size of Each Layer or Module: L: 11 ft. 6 in. W: 4 ft. 11 in. H: 11 ft. ___ in. No. of Layers or Modules: 1 Total Volume: 621.96 cu. ft. Total Weight: 78000 lbs.
Reducing Agent	( ) Urea ( ) Anhydrous Ammonia (●) Aqueous Ammonia 19.0 % Injection Rate: 180 lb/hr
Reducing Agent Storage*	Diameter: 13 ft. ___ in. Height: 45 ft. ___ in. Capacity: 30000 gal Pressure Setting: 50 psia * A separate permit may be needed for the storage equipment.
Space Velocity	Gas Flow Rate/Catalyst Volume: 37147 per hour
Area Velocity	Gas Flow Rate/Wetted Catalyst Surface Area: 182639 ft/hr
Manufacturer's Guarantee	NO_x: 2.5 ppm $\%O_2$: 15 NO_x: ___ gm/bhp-hr Ammonia Slip: 5 ppm @ 15 $\%O_2$
Catalyst Life	3 years (expected)
Cost	Capital Cost: $526,442.00 Installation Cost: $52,020.00 Catalyst Replacement Cost: 592664.
Oxidation Catalyst	
Oxidation Catalyst	Manufacturer: BASF Corp. Catalyst Active Material: Platinum Group Metals Model Number: Camet Type: Corrugated SS Foil w/ Catalytic Washcoat Size of Each Layer or Module: L: 2 ft. 1.5 in. W: ___ ft. 2.5 in. H: 2 ft. ___ in. No. of Layers or Modules: 187 Total Volume: 165.57 cu. ft. Total Weight: ___ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: 139539 per hour
Manufacturer's Guarantee	VOC: 2 ppm VOC: ___ gm/bhp-hr $\%O_2$: 15 CO: 4 ppm CO: ___ gm/bhp-hr $\%O_2$: 15
Catalyst Life	7-12 years (expected)
Cost	Capital Cost: 619038 Installation Cost: 46818 Catalyst Replacement Cost: 504844

South Coast Air Quality Management District

Form 400-E-5

Selective Catalytic Reduction (SCR) System, Oxidation Catalyst, and Ammonia Catalyst

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section B - Equipment Description (cont.)

	Ammonia Catalyst
Ammonia Catalyst	Manufacturer: ______ Catalyst Active Material: ______ Model Number: ______ Type: ______ Size of Each Layer or Module: L: ____ ft. ____ in. W: ____ ft. ____ in. H: ____ ft. ____ in. No. of Layers or Modules: ______ Total Volume: ______ cu. ft. Total Weight: ______ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: ______ per hour
Manufacturer's Guarantee	NH_3: ______ ppm $\%O_2$: ______
Catalyst Life	______ years (expected)
Cost	Capital Cost: ______ Installation Cost: ______ Catalyst Replacement Cost: ______

Section C - Operation Information

Operating Temperature	Minimum Inlet Temperature: 500 °F (from cold start) Maximum Temperature: 870 °F (SCR) (500-1250F OxCat) Warm-up Time: ______ hr. 30 min. (maximum)
Operating Schedule	Normal: 24 hours/day 7 days/week 52 weeks/yr Maximum: 24 hours/day 7 days/week 52 weeks/yr

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info	Signature: S. O'Kane	Date: 12/9/15	Name: Stephen O'Kane
	Title: Manager	Company Name: AES Alamitos, LLC	Phone #: 5624937840 Fax #: 5624937320 Email: stephen.okane@AES.com
Contact Info	Name: Same as above.		Phone #: Fax #:
	Title:	Company Name:	Email:

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South Coast Air Quality Management District

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Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): AES Alamitos, LLC

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 115394

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site): 690 N. Studebaker Road, Long Beach, CA 90803

◉ Fixed Location ○ Various Locations

Section B - Equipment Description

Selective Catalytic Reduction (SCR)	
SCR Catalyst	Manufacturer: Cormetech — Catalyst Active Material: Titanium/Vanadium/Tungsten Model Number: CMHT — Type: Ceramic Honeycomb Size of Each Layer or Module: L: 11 ft. 6 in. W: 4 ft. 11 in. H: 11 ft. ___ in. No. of Layers or Modules: 1 — Total Volume: 621.96 cu. ft. — Total Weight: 78000 lbs.
Reducing Agent	○ Urea ○ Anhydrous Ammonia ◉ Aqueous Ammonia 19.0 % — Injection Rate: 180 lb/hr
Reducing Agent Storage*	Diameter: 13 ft. ___ in. Height: 45 ft. ___ in. Capacity: 30000 gal Pressure Setting: 50 psia — * A separate permit may be needed for the storage equipment.
Space Velocity	Gas Flow Rate/Catalyst Volume: 37147 per hour
Area Velocity	Gas Flow Rate/Wetted Catalyst Surface Area: 182639 ft/hr
Manufacturer's Guarantee	NOx: 2.5 ppm %O_2: 15 — NOx: ___ gm/bhp-hr — Ammonia Slip: 5 ppm @ 15 %O_2
Catalyst Life	3 years (expected)
Cost	Capital Cost: $526,442.00 — Installation Cost: $52,020.00 — Catalyst Replacement Cost: 592664.
Oxidation Catalyst	
Oxidation Catalyst	Manufacturer: BASF Corp. — Catalyst Active Material: Platinum Group Metals Model Number: Camet — Type: Corrugated SS Foil w/ Catalytic Washcoat Size of Each Layer or Module: L: 2 ft. 1.5 in. W: ___ ft. 2.5 in. H: 2 ft. ___ in. No. of Layers or Modules: 187 — Total Volume: 165.57 cu. ft. — Total Weight: ___ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: 139539 per hour
Manufacturer's Guarantee	VOC: 2 ppm — VOC: ___ gm/bhp-hr — %O_2: 15 CO: 4 ppm — CO: ___ gm/bhp-hr — %O_2: 15
Catalyst Life	7-12 years (expected)
Cost	Capital Cost: 619038 — Installation Cost: 46818 — Catalyst Replacement Cost: 504844

South Coast Air Quality Management District

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Section B - Equipment Description (cont.)

Ammonia Catalyst	
Ammonia Catalyst	Manufacturer: ____ Catalyst Active Material: ____ Model Number: ____ Type: ____ Size of Each Layer or Module: L: ____ ft. ____ in. W: ____ ft. ____ in. H: ____ ft. ____ in. No. of Layers or Modules: ____ Total Volume: ____ cu. ft. Total Weight: ____ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: ____ per hour
Manufacturer's Guarantee	NH_3: ____ ppm $\%O_2$: ____
Catalyst Life	____ years (expected)
Cost	Capital Cost: ____ Installation Cost: ____ Catalyst Replacement Cost: ____

Section C - Operation Information

Operating Temperature	Minimum Inlet Temperature: 500 °F (from cold start) Maximum Temperature: 870 °F (SCR) Warm-up Time: ____ hr. 30 min. (maximum) (500-1250F OxCat)
Operating Schedule	Normal: 24 hours/day 7 days/week 52 weeks/yr Maximum: 24 hours/day 7 days/week 52 weeks/yr

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info	Signature: SOKane Date: 12/9/15 Title: Manager Company Name: AES Alamitos, LLC	Name: Stephen O'Kane Phone #: 5624937840 Fax #: 5624937320 Email: stephen.okane@AES.com
Contact Info	Name: Same as above. Title: Company Name:	Phone #: Fax #: Email:

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(•) Fixed Location ( ) Various Locations

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Selective Catalytic Reduction (SCR)

SCR Catalyst	Manufacturer: Cormetech; Catalyst Active Material: Titanium/Vanadium/Tungsten Model Number: CMHT; Type: Ceramic Honeycomb Size of Each Layer or Module: L: 11 ft. 6 in. W: 4 ft. 11 in. H: 11 ft. ___ in. No. of Layers or Modules: 1; Total Volume: 621.96 cu. ft.; Total Weight: 78000 lbs.
Reducing Agent	( ) Urea ( ) Anhydrous Ammonia (•) Aqueous Ammonia 19.0 %; Injection Rate: 180 lb/hr
Reducing Agent Storage*	Diameter: 13 ft. ___ in. Height: 45 ft. ___ in. Capacity: 30000 gal Pressure Setting: 50 psia * A separate permit may be needed for the storage equipment.
Space Velocity	Gas Flow Rate/Catalyst Volume: 37147 per hour
Area Velocity	Gas Flow Rate/Wetted Catalyst Surface Area: 182639 ft/hr
Manufacturer's Guarantee	NOx: 2.5 ppm %O_2: 15; NOx: ___ gm/bhp-hr; Ammonia Slip: 5 ppm @ 15 %O_2
Catalyst Life	3 years (expected)
Cost	Capital Cost: $526,442.00; Installation Cost: $52,020.00; Catalyst Replacement Cost: 592664.

Oxidation Catalyst

Oxidation Catalyst	Manufacturer: BASF Corp.; Catalyst Active Material: Platinum Group Metals Model Number: Camet; Type: Corrugated SS Foil w/ Catalytic Washcoat Size of Each Layer or Module: L: 2 ft. 1.5 in. W: ___ ft. 2.5 in. H: 2 ft. ___ in. No. of Layers or Modules: 187; Total Volume: 165.57 cu. ft.; Total Weight: ___ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: 139539 per hour
Manufacturer's Guarantee	VOC: 2 ppm; VOC: ___ gm/bhp-hr; %O_2: 15 CO: 4 ppm; CO: ___ gm/bhp-hr; %O_2: 15
Catalyst Life	7-12 years (expected)
Cost	Capital Cost: 619038; Installation Cost: 46818; Catalyst Replacement Cost: 504844

South Coast Air Quality Management District

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Section B - Equipment Description (cont.)

Ammonia Catalyst	
Ammonia Catalyst	Manufacturer: ____ Catalyst Active Material: ____ Model Number: ____ Type: ____ Size of Each Layer or Module: L: ____ ft. ____ in. W: ____ ft. ____ in. H: ____ ft. ____ in. No. of Layers or Modules: ____ Total Volume: ____ cu. ft. Total Weight: ____ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: ____ per hour
Manufacturer's Guarantee	NH_3: ____ ppm %O_2: ____
Catalyst Life	____ years (expected)
Cost	Capital Cost: ____ Installation Cost: ____ Catalyst Replacement Cost: ____

Section C - Operation Information

Operating Temperature	Minimum Inlet Temperature: 500 °F (from cold start) Maximum Temperature: 870 °F (SCR) Warm-up Time: ____ hr. 30 min. (maximum) (500-1250F OxCat)
Operating Schedule	Normal: 24 hours/day 7 days/week 52 weeks/yr Maximum: 24 hours/day 7 days/week 52 weeks/yr

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info	Signature: SOKane Date: 12/9/15 Title: Manager Company Name: AES Alamitos, LLC	Name: Stephen O'Kane Phone #: 5624937840 Fax #: 5624937320 Email: stephen.okane@AES.com
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Selective Catalytic Reduction (SCR)

SCR Catalyst	Manufacturer: Cormetech; Catalyst Active Material: Titanium/Vanadium/Tungsten Model Number: CMHT; Type: Ceramic Honeycomb Size of Each Layer or Module: L: 11 ft. 6 in. W: 4 ft. 11 in. H: 11 ft. ___ in. No. of Layers or Modules: 1; Total Volume: 621.96 cu. ft.; Total Weight: 78000 lbs.
Reducing Agent	( ) Urea ( ) Anhydrous Ammonia (•) Aqueous Ammonia 19.0 %; Injection Rate: 180 lb/hr
Reducing Agent Storage*	Diameter: 13 ft. ___ in. Height: 45 ft. ___ in. Capacity: 30000 gal Pressure Setting: 50 psia; * A separate permit may be needed for the storage equipment.
Space Velocity	Gas Flow Rate/Catalyst Volume: 37147 per hour
Area Velocity	Gas Flow Rate/Wetted Catalyst Surface Area: 182639 ft/hr
Manufacturer's Guarantee	NOx: 2.5 ppm %O_2: 15; NOx: ___ gm/bhp-hr; Ammonia Slip: 5 ppm @ 15 %O_2
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Oxidation Catalyst	Manufacturer: BASF Corp.; Catalyst Active Material: Platinum Group Metals Model Number: Camet; Type: Corrugated SS Foil w/ Catalytic Washcoat Size of Each Layer or Module: L: 2 ft. 1.5 in. W: ___ ft. 2.5 in. H: 2 ft. ___ in. No. of Layers or Modules: 187; Total Volume: 165.57 cu. ft.; Total Weight: ___ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: 139539 per hour
Manufacturer's Guarantee	VOC: 2 ppm; VOC: ___ gm/bhp-hr; %O_2: 15 CO: 4 ppm; CO: ___ gm/bhp-hr; %O_2: 15
Catalyst Life	7-12 years (expected)
Cost	Capital Cost: 619038; Installation Cost: 46818; Catalyst Replacement Cost: 504844

Form 400-E-5

Selective Catalytic Reduction (SCR) System, Oxidation Catalyst, and Ammonia Catalyst

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Section B - Equipment Description (cont.)

Ammonia Catalyst	
Ammonia Catalyst	Manufacturer: ______ Catalyst Active Material: ______ Model Number: ______ Type: ______ Size of Each Layer or Module: L: ____ ft. ____ in. W: ____ ft. ____ in. H: ____ ft. ____ in. No. of Layers or Modules: ______ Total Volume: ______ cu. ft. Total Weight: ______ lbs.
Space Velocity	Gas Flow Rate/Catalyst Volume: ______ per hour
Manufacturer's Guarantee	NH_3: ______ ppm %O_2: ______
Catalyst Life	______ years (expected)
Cost	Capital Cost: ______ Installation Cost: ______ Catalyst Replacement Cost: ______

Section C - Operation Information

Operating Temperature	Minimum Inlet Temperature: 500 °F (from cold start) Maximum Temperature: 870 °F (SCR) (500-1250F OxCat) Warm-up Time: ______ hr. 30 min. (maximum)
Operating Schedule	Normal: 24 hours/day 7 days/week 52 weeks/yr Maximum: 24 hours/day 7 days/week 52 weeks/yr

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South Coast Air Quality Management District
Form 400-E-12
Gas Turbine

South Coast AQMD

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

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◉ Fixed Location ○ Various Locations

Section B - Equipment Description

Turbine	**Manufacturer:** General Electric **Model:** LMS-100PB **Serial No.:** TBD **Size (based on Higher Heating Value - HHV):** **Manufacturer Maximum Input Rating:** ______ MMBTU/hr ______ kWh **Manufacturer Maximum Output Rating:** 879.00 MMBTU/hr 98,966.00 kWh
Function (Check all that apply)	☒ Electrical Generation ☐ Driving Pump/Compressor ☐ Emergency Peaking Unit ☒ Steam Generation ☐ Exhaust Gas Recovery ☐ Other (specify): ______
Cycle Type	◉ Simply Cycle ○ Regenerative Cycle ○ Combined Cycle ○ Other (specify): ______
Combustion Type	○ Tubular ◉ Can-Annular ○ Annular
Fuel (Turbine)	☒ Natural Gas ☐ LPG ☐ Digester Gas* ☐ Landfill Gas* ☐ Propane ☐ Refinery Gas* ☐ Other*: ______ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).
Heat Recovery Steam Generator (HRSG)	**Steam Turbine Capacity:** ______ MW **Low Pressure Steam Output Capacity:** ______ lb/hr @ ______ °F **High Pressure Steam Output Capacity:** ______ lb/hr @ ______ °F **Superheated Steam Output Capacity:** ______ lb/hr @ ______ °F
Duct Burner	**Manufacturer:** ______ **Model:** ______ **Number of burners:** ______ **Rating of each burner (HHV):** ______ **Type:** ○ Low NOx (please attach manufacturer's specifications) ○ Other: ______ Show all heat transfer surface locations with the HRSG and temperature profile
Fuel (Duct Burner)	○ Natural Gas ○ LPG ○ Digester Gas* ○ Landfill Gas* ○ Propane ○ Refinery Gas* ○ Other*: ______ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

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Form 400-E-12

Gas Turbine

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Section B - Equipment Description (Cont.)

Air Pollution Control

○ Selective Catalytic Reduction (SCR)* ○ Selective Non-Catalytic Reduction (SNCR)*

◉ Oxidation Catalyst* ○ Other (specify)*: ______

○ Steam/Water Injection: Injection Rate: ______ lbs. water/lbs. fuel, or ______ mole water/mole fuel

* Separate application is required.

Capital Cost: 619038 Installation Cost: 46818 Annual Operating Cost: ______

Oxidation Catalyst Data (If Applicable)

Manufacturer: BASF Corp. Model: Camet

Catalyst Dimensions: Length: 2 ft. 1.5 in. Width: ______ ft. 2.5 in. Height: 2 ft. ______ in.

Catalyst Cell Density: ______ cells/sq.in. Pressure Drop Across Catalyst: 2

Manufacturer's Guarantee: CO Control Efficiency: ______ % Catalyst Life: 7-12 yrs

VOC Control Efficiency: ______ % Operating Temp. Range: 500-1250 °F

Space Velocity (gas flow rate/catalyst volume): 139539 Area Velocity (gas flow/wetted catalyst surface area): 29071

VOC Concentration into Catalyst: 4 PPMVD@ 15%O_2 CO Concentration inot Catalyst: 125 PPMVD@ 15%O_2

Section C - Operation Information

On-line Emissions Data

Pollutants	Maximum Emissions Before Control*		Maximum Emissions After Control	
	PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour
ROG			2.0	2.30
NOx			2.5	8.26
CO			4.0	8.05
PM_{10}				6.23
SOx				1.63
NH_3			5.0	6.09

* Based on temperature, fuel consumption, and MW output.

Reference (attach data):

☒ Manufacturer Emission Data ☐ EPA Emission Factors ☐ AQMD Emission Factors ☐ Source Test

Stack or Vent Data

Stack Height: 80 ft. ______ in. Stack Diameter: 13 ft. 6 in.

Exhaust Temperature: 981 °F Exhaust Pressure: ______ inches water column

Exhaust Flow Rate: 938000 CFM Oxygen Level: 14.7 %

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Gas Turbine
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Section C - Operation Information (cont.)

Startup Data	No. of Startups per day: 2		No. of Startups per year: 500		Duration of each startup: 0.5 hrs.	
Shutdown Data	No. of Shutdowns per day: 2		No. of Shutdowns per year: 500		Duration of each Shutdown: 0.22 hrs.	
Startup and Shutdown Emissions Data	Pollutants	Startup Emissions		Shutdown Emissions		
		PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour	
	ROG		3.95		4.86	
	NOx		20.7		9.56	
	CO		19.4		34.4	
	PM_{10}		6.23		6.23	
	SOx		1.62		1.62	
	NH_3					

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS): CEMS Make: TBD
CEMS Model: TBD

Will the CEMS be used to measure both on-line and startup/shutdown emissions? ◉ Yes ○ No

The following parameters will be continuously monitored:

☒ NOx ☒ CO ☒ O_2
☒ Fuel Flow Rate ☒ Ammonia Injection Rate ☐ Other (specify): ______
☒ Ammonia Stack Concentration: Ammonia CEMS Make: TBD
Ammonia CEMS Model: TBD

Operating Schedule

	hours/day	days/week	weeks/yr
Normal:	24	7	52
Maximum:	24	7	52

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info	Signature: [signature]	Date: 12/9/15	Name: Stephen O'Kane	
	Title: Manager	Company Name: AES Alamitos, LLC	Phone #: 5624937840	Fax #: 5624937320
			Email: stephen.okane@AES.com	
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Turbine	**Manufacturer:** General Electric **Model:** LMS-100PB **Serial No.:** TBD **Size (based on Higher Heating Value - HHV):** **Manufacturer Maximum Input Rating:** ______ MMBTU/hr ______ kWh **Manufacturer Maximum Output Rating:** 879.00 MMBTU/hr 98,966.00 kWh
Function (Check all that apply)	☒ Electrical Generation ☐ Driving Pump/Compressor ☐ Emergency Peaking Unit ☒ Steam Generation ☐ Exhaust Gas Recovery ☐ Other (specify): ______
Cycle Type	◉ Simply Cycle ○ Regenerative Cycle ○ Combined Cycle ○ Other (specify): ______
Combustion Type	○ Tubular ◉ Can-Annular ○ Annular
Fuel (Turbine)	☒ Natural Gas ☐ LPG ☐ Digester Gas* ☐ Landfill Gas* ☐ Propane ☐ Refinery Gas* ☐ Other*: ______ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).
Heat Recovery Steam Generator (HRSG)	**Steam Turbine Capacity:** ______ MW **Low Pressure Steam Output Capacity:** ______ lb/hr @ ______ °F **High Pressure Steam Output Capacity:** ______ lb/hr @ ______ °F **Superheated Steam Output Capacity:** ______ lb/hr @ ______ °F
Duct Burner	**Manufacturer:** ______ **Model:** ______ **Number of burners:** ______ **Rating of each burner (HHV):** ______ **Type:** ○ Low NOx (please attach manufacturer's specifications) ○ Other: ______ Show all heat transfer surface locations with the HRSG and temperature profile
Fuel (Duct Burner)	○ Natural Gas ○ LPG ○ Digester Gas* ○ Landfill Gas* ○ Propane ○ Refinery Gas* ○ Other*: ______ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

South Coast Air Quality Management District
Form 400-E-12
Gas Turbine
This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section B - Equipment Description (Cont.)

Air Pollution Control

○ Selective Catalytic Reduction (SCR)* ○ Selective Non-Catalytic Reduction (SNCR)*

◉ Oxidation Catalyst* ○ Other (specify)*: ____

○ Steam/Water Injection: Injection Rate: ____ lbs. water/lbs. fuel, or ____ mole water/mole fuel

* Separate application is required.

Capital Cost: 619038 Installation Cost: 46818 Annual Operating Cost: ____

Oxidation Catalyst Data (If Applicable)

Manufacturer: BASF Corp. Model: Camet

Catalyst Dimensions: Length: 2 ft. 1.5 in. Width: ____ ft. 2.5 in. Height: 2 ft. ____ in.

Catalyst Cell Density: ____ cells/sq.in. Pressure Drop Across Catalyst: 2

Manufacturer's Guarantee: CO Control Efficiency: ____ % Catalyst Life: 7-12 yrs

VOC Control Efficiency: ____ % Operating Temp. Range: 500-1250 °F

Space Velocity (gas flow rate/catalyst volume): 139539 Area Velocity (gas flow/wetted catalyst surface area): 29071

VOC Concentration into Catalyst: 4 PPMVD@ 15%O_2 CO Concentration inot Catalyst: 125 PPMVD@ 15%O_2

Section C - Operation Information

On-line Emissions Data

Pollutants	Maximum Emissions Before Control *		Maximum Emissions After Control	
	PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour
ROG			2.0	2.30
NOx			2.5	8.26
CO			4.0	8.05
PM_{10}				6.23
SOx				1.63
NH_3			5.0	6.09

* Based on temperature, fuel consumption, and MW output.

Reference (attach data):

☒ Manufacturer Emission Data ☐ EPA Emission Factors ☐ AQMD Emission Factors ☐ Source Test

Stack or Vent Data

Stack Height: 80 ft. ____ in. Stack Diameter: 13 ft. 6 in.

Exhaust Temperature: 981 °F Exhaust Pressure: ____ inches water column

Exhaust Flow Rate: 938000 CFM Oxygen Level: 14.7 %

South Coast Air Quality Management District

Form 400-E-12

Gas Turbine

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Section C - Operation Information (cont.)

Startup Data: No. of Startups per day: 2 No. of Startups per year: 500 Duration of each startup: 0.5 hrs.

Shutdown Data: No. of Shutdowns per day: 2 No. of Shutdowns per year: 500 Duration of each Shutdown: 0.22 hrs.

Startup and Shutdown Emissions Data

Pollutants	Startup Emissions		Shutdown Emissions	
	PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour
ROG		3.95		4.86
NOx		20.7		9.56
CO		19.4		34.4
PM_{10}		6.23		6.23
SOx		1.62		1.62
NH_3				

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS): CEMS Make: TBD

CEMS Model: TBD

Will the CEMS be used to measure both on-line and startup/shutdown emissions? ◉ Yes ○ No

The following parameters will be continuously monitored:

☒ NOx ☒ CO ☒ O_2

☒ Fuel Flow Rate ☒ Ammonia Injection Rate ☐ Other (specify): ____

☒ Ammonia Stack Concentration: Ammonia CEMS Make: TBD

Ammonia CEMS Model: TBD

Operating Schedule

Normal:	24 hours/day	7 days/week	52 weeks/yr
Maximum:	24 hours/day	7 days/week	52 weeks/yr

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: SOKane Date: 12/9/15

Title: Manager Company Name: AES Alamitos, LLC

Name: Stephen O'Kane

Phone #: 5624937840 Fax #: 5624937320

Email: stephen.okane@AES.com

Contact Info

Name: Same as above.

Title: Company Name:

Phone #: Fax #:

Email:

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South Coast Air Quality Management District

Form 400-E-12
Gas Turbine

South Coast AQMD

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Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): AES Alamitos, LLC

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 115394

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site): 690 N. Studebaker Road, Long Beach, CA 90803

◉ Fixed Location ○ Various Locations

Section B - Equipment Description

Turbine	Manufacturer: General Electric Model: LMS-100PB Serial No.: TBD Size (based on Higher Heating Value - HHV): Manufacturer Maximum Input Rating: ______ MMBTU/hr ______ kWh Manufacturer Maximum Output Rating: 879.00 MMBTU/hr 98,966.00 kWh
Function (Check all that apply)	☒ Electrical Generation ☐ Driving Pump/Compressor ☐ Emergency Peaking Unit ☒ Steam Generation ☐ Exhaust Gas Recovery ☐ Other (specify): ______
Cycle Type	◉ Simply Cycle ○ Regenerative Cycle ○ Combined Cycle ○ Other (specify): ______
Combustion Type	○ Tubular ◉ Can-Annular ○ Annular
Fuel (Turbine)	☒ Natural Gas ☐ LPG ☐ Digester Gas* ☐ Landfill Gas* ☐ Propane ☐ Refinery Gas* ☐ Other*: ______ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).
Heat Recovery Steam Generator (HRSG)	Steam Turbine Capacity: ______ MW Low Pressure Steam Output Capacity: ______ lb/hr @ ______ °F High Pressure Steam Output Capacity: ______ lb/hr @ ______ °F Superheated Steam Output Capacity: ______ lb/hr @ ______ °F
Duct Burner	Manufacturer: ______ Model: ______ Number of burners: ______ Rating of each burner (HHV): ______ Type: ○ Low NOx (please attach manufacturer's specifications) ○ Other: ______ Show all heat transfer surface locations with the HRSG and temperature profile
Fuel (Duct Burner)	○ Natural Gas ○ LPG ○ Digester Gas* ○ Landfill Gas* ○ Propane ○ Refinery Gas* ○ Other*: ______ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

South Coast Air Quality Management District
Form 400-E-12
Gas Turbine
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Section B - Equipment Description (Cont.)

Air Pollution Control

- ○ Selective Catalytic Reduction (SCR)*
- ○ Selective Non-Catalytic Reduction (SNCR)*
- ◉ Oxidation Catalyst*
- ○ Other (specify)*: ______
- ○ Steam/Water Injection: Injection Rate: ______ lbs. water/lbs. fuel, or ______ mole water/mole fuel

* Separate application is required.

Capital Cost: 619038 Installation Cost: 46818 Annual Operating Cost: ______

Oxidation Catalyst Data (If Applicable)

Manufacturer: BASF Corp. Model: Camet

Catalyst Dimensions: Length: 2 ft. 1.5 in. Width: ______ ft. 2.5 in. Height: 2 ft. ______ in.

Catalyst Cell Density: ______ cells/sq.in. Pressure Drop Across Catalyst: 2

Manufacturer's Guarantee: CO Control Efficiency: ______ % Catalyst Life: 7-12 yrs

VOC Control Efficiency: ______ % Operating Temp. Range: 500-1250 °F

Space Velocity (gas flow rate/catalyst volume): 139539 Area Velocity (gas flow/wetted catalyst surface area): 29071

VOC Concentration into Catalyst: 4 PPMVD@ 15%O_2 CO Concentration inot Catalyst: 125 PPMVD@ 15%O_2

Section C - Operation Information

On-line Emissions Data

Pollutants	Maximum Emissions Before Control *		Maximum Emissions After Control	
	PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour
ROG			2.0	2.30
NOx			2.5	8.26
CO			4.0	8.05
PM_{10}				6.23
SOx				1.63
NH_3			5.0	6.09

* Based on temperature, fuel consumption, and MW output.

Reference (attach data):

- ☒ Manufacturer Emission Data
- ☐ EPA Emission Factors
- ☐ AQMD Emission Factors
- ☐ Source Test

Stack or Vent Data

Stack Height: 80 ft. ______ in. Stack Diameter: 13 ft. 6 in.

Exhaust Temperature: 981 °F Exhaust Pressure: ______ inches water column

Exhaust Flow Rate: 938000 CFM Oxygen Level: 14.7 %

South Coast Air Quality Management District

Form 400-E-12

Gas Turbine

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section C - Operation Information (cont.)

Startup Data	No. of Startups per day: 2 No. of Startups per year: 500 Duration of each startup: 0.5 hrs.
Shutdown Data	No. of Shutdowns per day: 2 No. of Shutdowns per year: 500 Duration of each Shutdown: 0.22 hrs.

Startup and Shutdown Emissions Data

Pollutants	Startup Emissions		Shutdown Emissions	
	PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour
ROG		3.95		4.86
NOx		20.7		9.56
CO		19.4		34.4
PM_{10}		6.23		6.23
SOx		1.62		1.62
NH_3				

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS): CEMS Make: TBD

CEMS Model: TBD

Will the CEMS be used to measure both on-line and startup/shutdown emissions? ◉ Yes ○ No

The following parameters will be continuously monitored:

☒ NOx ☒ CO ☒ O_2

☒ Fuel Flow Rate ☒ Ammonia Injection Rate ☐ Other (specify): ______

☒ Ammonia Stack Concentration: Ammonia CEMS Make: TBD

Ammonia CEMS Model: TBD

Operating Schedule

Normal:	24 hours/day	7 days/week	52 weeks/yr
Maximum:	24 hours/day	7 days/week	52 weeks/yr

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: S O'Kane Date: 12/9/15

Name: Stephen O'Kane

Title: Manager Company Name: AES Alamitos, LLC

Phone #: 5624937840 Fax #: 5624937320

Email: stephen.okane@AES.com

Contact Info

Name: Same as above.

Title: Company Name:

Phone #: Fax #:

Email:

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South Coast Air Quality Management District

Form 400-E-12

Gas Turbine

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Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): AES Alamitos, LLC

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 115394

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site): 690 N. Studebaker Road, Long Beach, CA 90803

(•) Fixed Location ( ) Various Locations

Section B - Equipment Description

Turbine	Manufacturer: General Electric; Model: LMS-100PB; Serial No.: TBD Size (based on Higher Heating Value - HHV): Manufacturer Maximum Input Rating: ____ MMBTU/hr ____ kWh Manufacturer Maximum Output Rating: 879.00 MMBTU/hr 98,966.00 kWh
Function (Check all that apply)	[X] Electrical Generation [ ] Driving Pump/Compressor [ ] Emergency Peaking Unit [X] Steam Generation [ ] Exhaust Gas Recovery [ ] Other (specify): ____
Cycle Type	(•) Simply Cycle ( ) Regenerative Cycle ( ) Combined Cycle ( ) Other (specify): ____
Combustion Type	( ) Tubular (•) Can-Annular ( ) Annular
Fuel (Turbine)	[X] Natural Gas [ ] LPG [ ] Digester Gas* [ ] Landfill Gas* [ ] Propane [ ] Refinery Gas* [ ] Other*: ____ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).
Heat Recovery Steam Generator (HRSG)	Steam Turbine Capacity: ____ MW Low Pressure Steam Output Capacity: ____ lb/hr @ ____ °F High Pressure Steam Output Capacity: ____ lb/hr @ ____ °F Superheated Steam Output Capacity: ____ lb/hr @ ____ °F
Duct Burner	Manufacturer: ____ Model: ____ Number of burners: ____ Rating of each burner (HHV): ____ Type: ( ) Low NOx (please attach manufacturer's specifications) ( ) Other: ____ Show all heat transfer surface locations with the HRSG and temperature profile
Fuel (Duct Burner)	( ) Natural Gas ( ) LPG ( ) Digester Gas* ( ) Landfill Gas* ( ) Propane ( ) Refinery Gas* ( ) Other*: ____ * (If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content).

South Coast Air Quality Management District
Form 400-E-12
Gas Turbine
This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section B - Equipment Description (Cont.)

Air Pollution Control

○ Selective Catalytic Reduction (SCR)* ○ Selective Non-Catalytic Reduction (SNCR)*
◉ Oxidation Catalyst* ○ Other (specify)*: ____
○ Steam/Water Injection: Injection Rate: ____ lbs. water/lbs. fuel, or ____ mole water/mole fuel
* Separate application is required.
Capital Cost: 619038 Installation Cost: 46818 Annual Operating Cost: ____

Oxidation Catalyst Data (If Applicable)

Manufacturer: BASF Corp. Model: Camet
Catalyst Dimensions: Length: 2 ft. 1.5 in. Width: ____ ft. 2.5 in. Height: 2 ft. ____ in.
Catalyst Cell Density: ____ cells/sq.in. Pressure Drop Across Catalyst: 2
Manufacturer's Guarantee: CO Control Efficiency: ____ % Catalyst Life: 7-12 yrs
VOC Control Efficiency: ____ % Operating Temp. Range: 500-1250 °F
Space Velocity (gas flow rate/catalyst volume): 139539 Area Velocity (gas flow/wetted catalyst surface area): 29071
VOC Concentration into Catalyst: 4 PPMVD@ 15%O_2 CO Concentration inot Catalyst: 125 PPMVD@ 15%O_2

Section C - Operation Information

On-line Emissions Data

Pollutants	Maximum Emissions Before Control *		Maximum Emissions After Control	
	PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour
ROG			2.0	2.30
NOx			2.5	8.26
CO			4.0	8.05
PM_{10}				6.23
SOx				1.63
NH_3			5.0	6.09

* Based on temperature, fuel consumption, and MW output.

Reference (attach data):
☒ Manufacturer Emission Data ☐ EPA Emission Factors ☐ AQMD Emission Factors ☐ Source Test

Stack or Vent Data

Stack Height: 80 ft. ____ in. Stack Diameter: 13 ft. 6 in.
Exhaust Temperature: 981 °F Exhaust Pressure: ____ inches water column
Exhaust Flow Rate: 938000 CFM Oxygen Level: 14.7 %

South Coast Air Quality Management District

Form 400-E-12

Gas Turbine

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section C - Operation Information (cont.)

Startup Data: No. of Startups per day: 2 No. of Startups per year: 500 Duration of each startup: 0.5 hrs.

Shutdown Data: No. of Shutdowns per day: 2 No. of Shutdowns per year: 500 Duration of each Shutdown: 0.22 hrs.

Startup and Shutdown Emissions Data

Pollutants	Startup Emissions		Shutdown Emissions	
	PPM@15% O_2, dry	lb/hour	PPM@15% O_2, dry	lb/hour
ROG		3.95		4.86
NOx		20.7		9.56
CO		19.4		34.4
PM_{10}		6.23		6.23
SOx		1.62		1.62
NH_3				

Monitoring and Reporting

Continuous Emission Monitoring System (CEMS): CEMS Make: TBD

CEMS Model: TBD

Will the CEMS be used to measure both on-line and startup/shutdown emissions? (●) Yes ( ) No

The following parameters will be continuously monitored:

- [x] NOx
- [x] CO
- [x] O_2
- [x] Fuel Flow Rate
- [x] Ammonia Injection Rate
- [ ] Other (specify):
- [x] Ammonia Stack Concentration: Ammonia CEMS Make: TBD

Ammonia CEMS Model: TBD

Operating Schedule

Normal: 24 hours/day 7 days/week 52 weeks/yr

Maximum: 24 hours/day 7 days/week 52 weeks/yr

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: S O'Kane Date: 12/9/15

Title: Manager Company Name: AES Alamitos, LLC

Name: Stephen O'Kane

Phone #: 5624937840 Fax #: 5624937320

Email: stephen.okane@AES.com

Contact Info

Name: Same as above.

Title: Company Name:

Phone #: Fax #:

Email:

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South Coast Air Quality Management District

Form 400-E-9a
External Combustion: Boiler/Heater

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section A - Operator Information

Facility Name (Business Name of Operator That Appears On Permit): AES Alamitos, LLC

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 115394

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site): 690 N. Studebaker Road, Long Beach, CA 90803

◉ Fixed Location ○ Various Locations

Section B - Equipment Description

Boiler/Heater	Manufacturer: B&W — Model: FM 103-88 — Serial No.: TBD Max. Heat Input Rating (Higher Heating Value - HHV): 71000000 BTU per hour Boiler Type: ◉ Water-Tube ○ Fire-Tube
Burner	Manufacturer: JZHC/Coen — Model: RMB Number of burners: 1 — Rating of each burner (HHV): 63 Type: ◉ Low NOx (please attach manufacturer's specifications) ○ Other:
Blower	HP: 75
Fuel Type	Primary Fuel: ◉ Natural Gas ○ LPG ○ Refinery Gas* ○ Digester Gas* ○ Landfill Gas* ○ Other*: ○ Fuel Oil (Specify Grade): If Digester or Landfill Gas, List Higher Heating Value: Secondary or Stand-by Fuel: ○ Natural Gas ○ LPG ○ Refinery Gas* ○ Digester Gas* ○ Landfill Gas* ○ Other*: ○ Fuel Oil (Specify Grade): If Digester or Landfill Gas, List Higher Heating Value: * If Digester Gas, Landfill Gas, Refinery Gas, and/or Other are checked, attach fuel analysis indicating higher heating value and sulfur content.
Type Of Controls (Check All That Apply)	☐ Low NOx Burner ☒ Flue Gas Recirculation ☐ Oxygen Trim ☐ CO Catalyst[1] ☒ Selective Catalytic Reduction (SCR)[1] ☐ Thermal DeNOx (Selective Non-Catalytic Reduction, SNCR)[1] ☐ Other (specify): [1] A separate permit is required, please see Form 400-E-GI for instructions.
Fuel Usage	Average Load ____ % OR Average Firing Rate (HHV): 71 MMBTU/hr

Section C - Process Description

Operating Parameters	Turn Down Ratio: 0.25	Percent Excess Air: 3 %	
Operating Schedule	Normal: 12 hours/day	7 days/week	52 weeks/yr
	Maximum: 12 hours/day	7 days/week	52 weeks/yr

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info	Signature: S O'Kane — Date: 12/11/15 Title: Manager — Company Name: AES Alamitos, LLC	Name: Stephen O'Kane Phone #: 5624937840 — Fax #: 5624937320 Email: stephen.okane@AES.com
Contact Info	Name: Same as above. Title: — Company Name:	Phone #: — Fax #: Email:

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Check here if you claim that this form or its attachments contain confidential trade secret information. ☐

South Coast Air Quality Management District

Form 400-E-9a
Emission Calculations

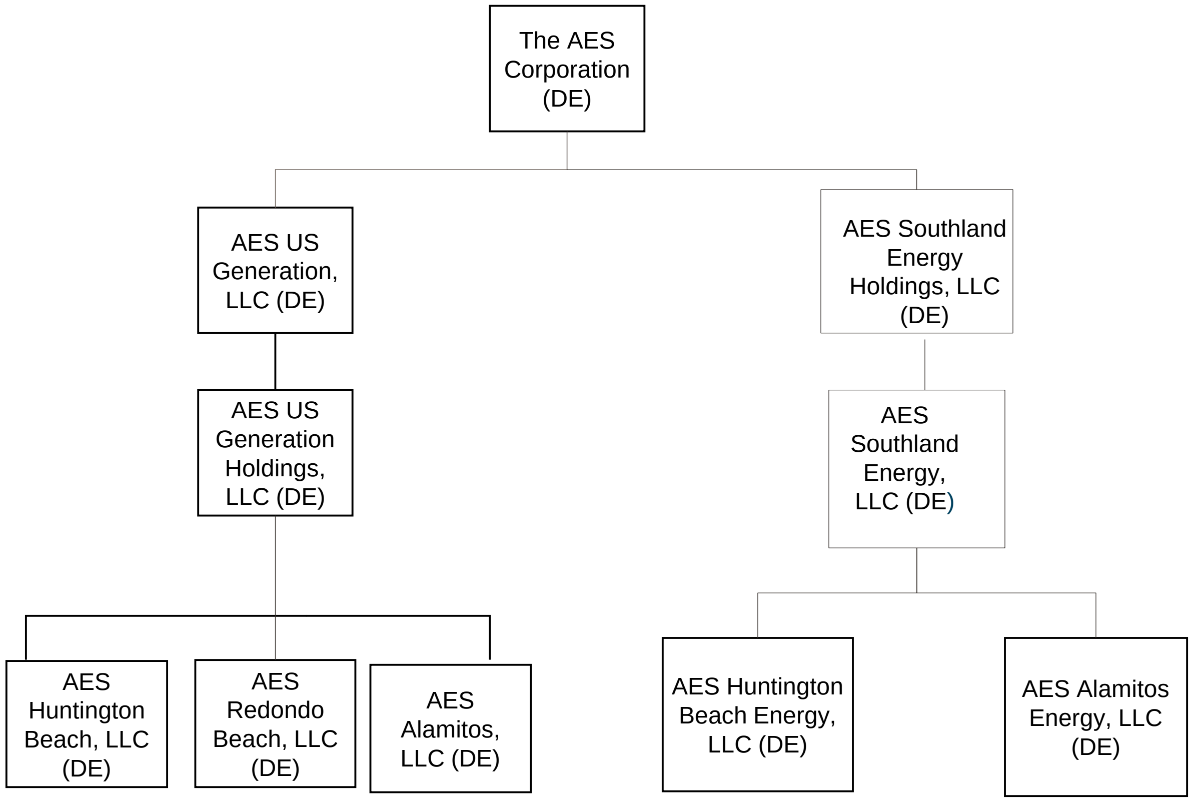
Given

Rating:	71000000	BTU/hour
HHV:	1050	BTU/ft^3
Operating Schedule:	11.75	hours/day
	7	days/week
	30	days/month
	52	weeks/year
	365	days/year
Fuel Usage:	67429	ft^3/hour
	835764	ft^3/day
	25072933	ft^3/month

Calculations

	EF	EF	HOURLY	DAILY	30 DAY AVE.	30 DAY NSR	ANNUAL
	lbs/mmcf	lb./mmbtu	lbs./day	lbs./day	lbs./day	lbs./day	lbs./yr
ROG	4.20	0.004	3.33	4.16	4.16	4.16	1473
NOx	6.30	0.006	4.99	5.80	5.80	5.80	2054
SOx	0.71	0.00068	0.57	0.60	0.60	0.60	211
CO	42.0	0.04	33.3	35.0	35.0	35.0	12384
PM_{10}	4.52	0.0043	3.58	3.77	3.77	3.77	1333

Attachment 3
AES Organization Chart


The AES Corporation (DE)
AES US Generation, LLC (DE)
AES US Generation Holdings, LLC (DE)
AES Huntington Beach, LLC (DE)
AES Redondo Beach, LLC (DE)
AES Alamitos, LLC (DE)
AES Southland Energy Holdings, LLC (DE)
AES Southland Energy, LLC (DE)
AES Huntington Beach Energy, LLC (DE)
AES Alamitos Energy, LLC (DE)

Attachment 6
CCGT and SCGT Performance Data

Alamitos Energy Center
Table 5.1B.3R
Combined-Cycle: GE 7FA.05 Performance Data
December 2015

Alamitos 2x1 7FA emissions data

Case Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
CTG Model	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05
CTG Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
CTG Load (as % of emissions compliant load range)	max	average	min	max	max	average	min	max	max	average	min	max	average	min
CTG Inlet Air Cooling	Off	Off	Off	On	Off	Off	Off	On	Off	Off	Off	Off	Off	Off
Fuel Sulfur Content (grains/100 standard cubic feet)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Ambient Conditions	Low	Low	Low	Average	Average	Average	Average	High	High	High	High	ISO	ISO	ISO
Ambient Temperature, F	28.0	28.0	28.0	65.3	65.3	65.3	65.3	107	107	107	107	59.0	59.0	59.0
Ambient Relative Humidity, %	76%	76%	76%	87%	87%	87%	87%	11%	11%	11%	11%	60%	60%	60%
Atmospheric Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Combustion Turbine Performance														
CTG Inlet Air Conditioning Effectiveness, % (ONE CTG)	N/A	N/A	N/A	90%	N/A	N/A	N/A	90%	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Loss, in. H_2O	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95
Exhaust Loss, in. H_2O	15.2	10.0	6.55	14.9	14.9	9.26	6.08	14.6	12.1	7.84	6.22	15.0	9.47	6.09
CTG Load Level (percent of Base Load)	BASE	75%	45%	BASE	BASE	75%	44%	BASE	BASE	75%	48%	BASE	75%	44%
Gross CTG Output, kW (ONE CTG)	236,645	177,484	106,017	229,659	227,708	170,781	101,102	217,778	194,136	145,602	92,797	231,197	173,398	101,727
Gross CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,671	9,122	11,742	8,834	8,867	9,184	11,660	8,918	9,035	9,639	12,136	8,790	9,126	11,615
Gross CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	9,614	10,114	13,019	9,795	9,832	10,183	12,928	9,888	10,018	10,688	13,456	9,746	10,119	12,878
Net CTG Output, kW (ONE CTG)	235,907	176,746	105,279	228,921	226,970	170,043	100,364	217,040	193,398	144,864	92,059	230,459	172,660	100,989
Net CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,698	9,160	11,824	8,862	8,896	9,224	11,746	8,948	9,069	9,688	12,233	8,818	9,165	11,700
Net CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	9,644	10,157	13,111	9,827	9,864	10,227	13,023	9,922	10,056	10,742	13,564	9,777	10,162	12,973
CTG Heat Input, MMBtu/h (LHV) (ONE CTG)	2,052	1,619	1,245	2,029	2,019	1,568	1,179	1,942	1,754	1,403	1,126	2,032	1,582	1,182
CTG Heat Input, MMBtu/h (HHV) (ONE CTG)	2,275	1,795	1,380	2,250	2,239	1,739	1,307	2,153	1,945	1,556	1,249	2,253	1,755	1,310
CTG Exhaust Flow, 10^3 lb/h (ONE CTG)	4,368	3,533	2,802	4,296	4,298	3,378	2,702	4,266	3,858	3,074	2,731	4,310	3,421	2,702
CTG Exhaust Temperature, F (ONE CTG)	1,104	1,112	1,215	1,142	1,142	1,153	1,215	1,119	1,162	1,204	1,215	1,139	1,144	1,215
Gross 2x1 Combined-Cycle, kW	692,905	529,868	355,002	688,980	684,653	519,700	342,082	628,950	569,016	435,703	307,722	692,951	524,659	342,458
Net 2x1 Combined-Cycle, kW	680,779	516,621	344,352	672,444	668,221	505,408	331,820	612,912	554,506	423,721	297,721	676,320	510,231	332,184
Gross STG Output, kW	219,615	174,900	142,968	229,662	229,237	178,138	139,878	193,394	180,744	144,499	122,128	230,557	177,863	139,004
GT Exhaust Composition % Weight (ONE CTG)														
O_2	13.85%	14.07%	14.35%	13.58%	13.64%	13.75%	14.30%	13.88%	14.08%	14.04%	14.91%	13.72%	13.90%	14.40%
CO_2	6.10%	5.95%	5.77%	6.13%	6.10%	6.03%	5.67%	5.91%	5.91%	5.93%	5.36%	6.12%	6.01%	5.68%
H_2O	5.12%	5.00%	4.85%	6.08%	6.01%	5.95%	5.66%	6.04%	5.25%	5.27%	4.81%	5.52%	5.43%	5.17%
N_2	73.58%	73.62%	73.67%	72.86%	72.90%	72.92%	73.03%	72.82%	73.41%	73.41%	73.57%	73.28%	73.31%	73.41%
Ar	1.25%	1.25%	1.25%	1.24%	1.24%	1.24%	1.24%	1.24%	1.25%	1.25%	1.25%	1.24%	1.24%	1.25%
Fuel Sulfur Content (grains/100 standard cubic feet)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Catalyst Inlet Exhaust Analysis - % Mole Basis - Wet (ONE CTG / HRSG TRAIN)														
Ar	0.89%	0.89%	0.89%	0.88%	0.88%	0.88%	0.88%	0.88%	0.89%	0.89%	0.89%	0.88%	0.88%	0.89%
CO_2	3.94%	3.85%	3.73%	3.94%	3.92%	3.88%	3.65%	3.80%	3.81%	3.83%	3.47%	3.95%	3.88%	3.67%
H_2O	8.08%	7.90%	7.67%	9.55%	9.43%	9.35%	8.90%	9.48%	8.28%	8.31%	7.60%	8.70%	8.56%	8.15%
N_2	74.72%	74.80%	74.89%	73.57%	73.65%	73.69%	73.86%	73.52%	74.47%	74.46%	74.74%	74.25%	74.30%	74.46%
O_2	12.31%	12.52%	12.77%	12.01%	12.07%	12.16%	12.66%	12.27%	12.50%	12.47%	13.26%	12.17%	12.33%	12.79%
Ave Mol Wt (based on % mol)	28.5	28.5	28.5	28.3	28.3	28.3	28.3	28.3	28.4	28.4	28.5	28.4	28.4	28.4
Total														
SO_2, lb/hr (after SO_2 oxidation)	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
SO_3, lb/hr (after SO_2 oxidation)	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
Stack Exit Temperature, F	216	178	170	213	215	175	170	221	223	198	184	209	174	170
Stack Diameter, ft (estimated)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Stack Flow, 10^3 lb/h	4,368	3,533	2,802	4,296	4,298	3,378	2,702	4,266	3,858	3,074	2,731	4,310	3,421	2,702
Stack Flow, 10^3 acfm	1,264	964	755	1,244	1,248	923	731	1,251	1,129	867	752	1,237	930	729
Stack Exit Velocity, ft/s	67.0	51.2	40.0	66.0	66.2	48.9	38.8	66.3	59.9	46.0	39.9	65.6	49.3	38.7
NO_X (Catalyst Inlet), ppmvd (dry, 15% O_2)	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
CO (Catalyst Inlet), ppmvd (dry, 15% O_2)	7.08	7.27	7.52	6.97	7.01	7.10	7.59	7.24	7.31	7.28	8.12	7.02	7.17	7.62
VOC (Catalyst Inlet), ppmvd (dry, 15% O_2)	1.10	1.13	1.17	1.08	1.09	1.10	1.18	1.13	1.14	1.13	1.26	1.09	1.11	1.19
Stack NO_X Emissions with the Effects of Selective Catalytic Reduction (SCR) (ONE CTG / HRSG TRAIN)														

Alamitos Energy Center
Table 5.1B.3R
Combined-Cycle: GE 7FA.05 Performance Data
December 2015

Alamitos 2x1 7FA emissions data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NO_X, ppmvd (dry, 15% O_2)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
NO_X, ppmvd (dry)	2.90	2.83	2.75	3.01	2.99	2.95	2.79	2.92	2.84	2.85	2.59	2.95	2.90	2.74
NO_X, ppmvw (wet)	2.69	2.63	2.55	2.74	2.73	2.70	2.56	2.66	2.62	2.63	2.40	2.71	2.67	2.54
NO_X, lb/h as NO_2	16.5	13.0	10.0	16.3	16.2	12.6	9.47	15.6	14.1	11.3	9.05	16.3	12.7	9.49
NO_X, lb/MMBtu (LHV) as NO_2	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
NO_X, lb/MMBtu (HHV) as NO_2	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072
SCR NH_3 slip, ppmvd (dry, 15% O_2)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
SCR NH_3 slip, lb/h	15.3	12.0	9.26	15.1	15.0	11.7	8.77	14.4	13.0	10.4	8.38	15.1	11.8	8.79
Ammonia Use, lb/h	43.0	34.0	26.1	42.5	42.3	32.9	24.7	40.7	36.8	29.4	23.6	42.6	33.2	24.8
Stack CO Emissions with the Effects of Catalytic Reduction (CO Catalyst) (ONE CTG / HRSG TRAIN)														
CO, ppmvd (dry, 15% O_2)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
CO, ppmvd (dry)	2.90	2.83	2.75	3.01	2.99	2.95	2.79	2.92	2.84	2.85	2.59	2.95	2.90	2.74
CO, ppmvw (wet)	2.69	2.63	2.55	2.74	2.73	2.70	2.56	2.66	2.62	2.63	2.40	2.71	2.67	2.54
CO, lb/h	10.0	7.92	6.09	9.93	9.88	7.67	5.77	9.50	8.58	6.87	5.51	9.94	7.74	5.78
CO, lb/MMBtu (LHV)	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049
CO, lb/MMBtu (HHV)	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
Stack SO_2 Emissions (ONE CTG / HRSG TRAIN)														
Assumed SO_2 oxidation rate in CO Catalyst for SO_3 calculation, vol%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Assumed SO_2 oxidation rate in SCR for SO_3 calculation, vol%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
SO_2, ppmvd (dry, 15% O_2)	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.37	0.37	0.36	0.37	0.37	0.36
SO_2, ppmvd (dry)	0.54	0.52	0.51	0.55	0.54	0.54	0.50	0.53	0.52	0.52	0.47	0.54	0.53	0.50
SO_2, ppmvw (wet)	0.49	0.48	0.47	0.49	0.49	0.49	0.46	0.48	0.48	0.48	0.43	0.50	0.49	0.46
SO_2, lb/h	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
SO_2, lb/MMBtu (LHV)	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
SO_2, lb/MMBtu (HHV)	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
Stack VOC Emissions with the Effects of Catalytic Reduction (CO Catalyst) (ONE CTG / HRSG TRAIN)														
VOC, ppmvd (dry, 15% O_2)	0.55	0.57	0.58	0.54	0.55	0.55	0.59	0.56	0.57	0.57	0.63	0.55	0.56	0.59
VOC, ppmvd (dry)	0.80	0.80	0.80	0.81	0.81	0.82	0.82	0.82	0.81	0.81	0.82	0.81	0.81	0.81
VOC, ppmvw (wet)	0.74	0.74	0.75	0.74	0.74	0.75	0.76	0.75	0.75	0.75	0.76	0.74	0.74	0.75
VOC, lb/h as CH_4 (includes VOC correction to 2.0 ppmvd @ 15% O_2)	5.75	4.54	3.49	5.68	5.66	4.39	3.30	5.44	4.92	3.93	3.16	5.69	4.43	3.31
VOC, lb/MMBtu (LHV)	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028
VOC, lb/MMBtu (HHV)	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
PM_{10} from the CTG and Duct Burner														
PM_{10} Emissions - Front and Back Half Catch														
PM_{10}, lb/h (from the CTG)	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
PM_{10}, lb/h (from the Burner)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM_{10}, lb/h (total from CTG and Burner)	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
PM_{10} with the Effects of SO_2 Oxidation [includes $(NH_4)_2$-(SO_4)] (ONE CTG / HRSG TRAIN)														
PM_{10} Emissions - Front and Back Half Catch														
PM_{10}, lb/h (incl. Ammonium Sulfate, assuming 100% conversion from SO_3)	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
PM_{10}, lb/MMBtu (LHV)	0.0041	0.0053	0.0068	0.0042	0.0042	0.0054	0.0072	0.0044	0.0048	0.0061	0.0075	0.0042	0.0054	0.0072
PM_{10}, lb/MMBtu (HHV)	0.0037	0.0047	0.0062	0.0038	0.0038	0.0049	0.0065	0.0039	0.0044	0.0055	0.0068	0.0038	0.0048	0.0065
$PM_{2.5}$ with the Effects of SO_2 Oxidation [includes $(NH_4)_2$-(SO_4)] (ONE CTG / HRSG TRAIN)														
$PM_{2.5}$ Emissions - Front and Back Half Catch														
$PM_{2.5}$, lb/h	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
$PM_{2.5}$, lb/MMBtu (LHV)	0.0041	0.0053	0.0068	0.0042	0.0042	0.0054	0.0072	0.0044	0.0048	0.0061	0.0075	0.0042	0.0054	0.0072
$PM_{2.5}$, lb/MMBtu (HHV)	0.0037	0.0047	0.0062	0.0038	0.0038	0.0049	0.0065	0.0039	0.0044	0.0055	0.0068	0.0038	0.0048	0.0065
Total Effects of SO_2 Oxidation (ONE CTG / HRSG TRAIN)														
Total SO_2 to SO_3 conversion rate for SO_3 calculation, %vol	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Amount of SO_2 converted to SO_3 for SO_3 calculation, lb/h	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
Maximum Stack Ammonium Sulfate [$(NH_4)_2$-(SO_4)] (assuming 100% conversion from SO_3), lb/h	10.0	7.91	6.08	9.92	9.87	7.67	5.76	9.49	8.57	6.86	5.50	9.93	7.73	5.78
Maximum Stack H_2SO_4 (assuming 100% conversion from SO_3 to H_2SO_4), lb/h	7.44	5.87	4.52	7.36	7.33	5.69	4.28	7.05	6.36	5.09	4.09	7.37	5.74	4.29

Alamitos Energy Center
Table 5.1B.3R
Combined-Cycle: GE 7FA.05 Performance Data
December 2015

Alamitos 2x1 7FA emissions data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Notes:

1. Dry air composition is as follows:
   - N_2: 78.1%
   - O_2: 21.0%
   - Ar: 0.9%
   - CO_2: 0.03%
2. Estimated emissions based on GE performance runs provided by AES on 12/23, "AES_EXTERNAL_12_22_2014_Alamitos.xlsx" and "AES_EXTERNAL_12_22_2014_Huntington Beach.xlsx"
3. As the CTG performance and emissions information utilized does not reflect guaranteed values currently offered by GE, it is recommended that additional and suitable margin be applied to the values to account for differences between expected and guaranteed CTG emissions values.
4. Ammonium sulfates created downstream of the SCR are included in front half particulates and front & back half particulates. It is assumed that 100% SO_3 is converted to ammonium sulfates in order to account for "worst case" particulate emissions.
5. CO catalyst VOC destruction rate of 50% is assumed.
6. Sulfur content in fuel gas is assumed to be 0.75 grains/100 SCF.
7. As OEM project specific information is not available, an SO_2 to SO_3 conversion rate of 100% is assumed. Use of a high conversion rate is recommended for purposes of establishing permit limitations and emissions levels to provide additional margin.
8. Ammonia use is calculated with 19% aqueous ammonia and factors in ammonia slip.
9. Information presented is not reflective of emissions control equipment guaranteed performance levels as this information is not presently available. Engineer reserves the ability to adjust information to reflect guaranteed and OEM specific information when available.
10. Information presented is intended to reflect a conservative approach to estimated stack emissions; however, no additional margin has been applied to the emissions rates.
11. Steam turbine and combined-cycle performance information presented is preliminary and for information purposes. Information is subject to change based on equipment supplier feedback and equipment selection.
12. No margin has been included in the information provided. It is recommended that additional margin be added for the purposes of establishing permit limitations.

Alamitos Energy Center
Table 5.1B.7R
Simple-Cycle: GE LMS-100PB Performance Data
December 2015

Alamitos Energy Center LMS-100PB Emissions Data

Case Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
GE Case Number	100	101	102	103	104	105	106	122	123	124	125	130	131	132
CTG Model	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB
CTG Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
CTG Load Level (percent of Base Load)	100	75	50	100	100	75	50	100	100	75	50	100	75	50
CTG Inlet Air Cooling	Off	Off	Off	On	Off	Off	Off	On	Off	Off	Off	Off	Off	Off
Ambient Conditions	Low	Low	Low	Average	Average	Average	Average	High	High	High	High	ISO	ISO	ISO
Ambient Temperature, F	28.0	28.0	28.0	65.3	65.3	65.3	65.3	107	107	107	107	59	59	59
Ambient Relative Humidity, %	76.3	76.3	76.3	86.8	86.8	86.8	86.8	10.7	10.7	10.7	10.7	60.0	60.0	60.0
Atmospheric Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Combustion Turbine Performance														
Inlet Loss, in. H_2O	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Exhaust Loss, in. H_2O	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Gross CTG Output, kW (ONE CTG)	100,317	75,011	49,671	99,215	98,788	73,878	48,916	82,840	70,821	52,867	34,887	100,438	75,030	49,740
Gross CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	7,893	8,592	10,032	7,950	7,960	8,618	10,073	8,312	8,747	9,715	11,594	7,915	8,590	10,020
Gross CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	8,761	9,538	11,135	8,825	8,836	9,566	11,181	9,226	9,710	10,783	12,869	8,785	9,535	11,122
Net CTG Output, kW (ONE CTG)	98,966	73,661	48,321	97,864	97,437	72,527	47,565	81,489	69,470	51,516	33,536	99,087	73,679	48,389
Net CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,001	8,750	10,312	8,060	8,070	8,778	10,359	8,449	8,917	9,969	12,061	8,023	8,748	10,299
Net CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	8,881	9,712	11,446	8,946	8,958	9,744	11,498	9,379	9,898	11,066	13,388	8,905	9,710	11,432
CTG Heat Input, MMBtu/h (LHV) (ONE CTG)	792	645	498	789	786	637	493	689	619	514	404	795	645	498
CTG Heat Input, MMBtu/h (HHV) (ONE CTG)	879	715	553	876	873	707	547	764	688	570	449	882	715	553
CTG Exhaust Flow, 10^3 lb/h (ONE CTG)	1,755	1,479	1,161	1,726	1,721	1,463	1,152	1,525	1,385	1,176	938	1,745	1,478	1,162
CTG Exhaust Temperature, F (ONE CTG)	789	816	888	797	798	814	883	837	868	908	981	794	815	885
4 LMS-100PB Gross, KW	401,268	300,045	198,686	396,860	395,152	295,511	195,663	331,360	283,284	211,467	139,549	401,751	300,120	198,958
4 LMS-100PB Gross Heat Rate, Btu/kWh (LHV)	7,893	8,592	10,032	7,950	7,960	8,618	10,073	8,312	8,747	9,715	11,594	7,915	8,590	10,020
Gross Heat Rate, Btu/kWh (LHV) (ONE CTG)	7,893	8,592	10,032	7,950	7,960	8,618	10,073	8,312	8,747	9,715	11,594	7,915	8,590	10,020
Aux Load and Transformer Losses	15,007	13,122	11,245	14,957	14,926	13,025	11,178	13,691	12,804	11,453	10,071	15,039	13,122	11,247
Net KW's for 4 LMS-100PB	386,261	286,924	187,440	381,903	380,226	282,485	184,485	317,669	270,480	200,014	129,478	386,712	286,998	187,711
Net Plant Heat Rate (all 4 LMS-100PB), Btu/kWh (LHV)	8,200	8,985	10,633	8,261	8,272	9,015	10,683	8,670	9,161	10,271	12,496	8,223	8,983	10,620
Net Plant Heat Rate (all 4 LMS-100PB), Btu/kWh (HHV)	9,102	9,974	11,803	9,170	9,182	10,007	11,858	9,623	10,169	11,401	13,870	9,127	9,971	11,788
CTG Exhaust Composition % Weight - Wet (ONE CTG)														
O_2	14.3	14.6	14.7	14.0	14.0	14.4	14.5	14.0	14.3	14.5	14.6	14.1	14.5	14.6
CO_2	5.84	5.64	5.55	5.91	5.91	5.63	5.53	5.84	5.78	5.65	5.58	5.89	5.64	5.55
H_2O	4.89	4.73	4.66	5.70	5.71	5.60	5.53	5.95	5.14	5.03	4.97	5.32	5.12	5.04
N_2	73.7	73.8	73.8	73.1	73.1	73.1	73.1	72.9	73.5	73.6	73.6	73.4	73.5	73.5
Ar	1.26	1.26	1.26	1.25	1.25	1.25	1.25	1.24	1.25	1.25	1.25	1.25	1.25	1.25
Catalyst Inlet Exhaust Analysis - % Mole Basis - Wet (ONE CTG / HRSG TRAIN)														
Ar	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89	0.89	0.90	0.90
CO_2	3.77	3.65	3.59	3.80	3.80	3.62	3.56	3.77	3.75	3.66	3.61	3.78	3.65	3.59
H_2O	7.73	7.48	7.37	8.97	8.97	8.80	8.70	9.07	7.98	7.80	7.70	7.87	7.61	7.50
N_2	74.9	75.0	75.0	73.9	73.9	73.9	74.0	73.8	74.7	74.7	74.8	74.8	74.9	74.9
O_2	12.7	13.0	13.1	12.4	12.4	12.7	12.9	12.4	12.7	12.9	13.0	12.6	12.9	13.1
Ave Mol Wt (based on % mol)	28.4	28.5	28.5	28.3	28.3	28.3	28.3	28.3	28.4	28.4	28.4	28.4	28.4	28.4
Stack Exit Temperature, F	789	816	888	797	798	814	883	837	868	908	981	794	815	885
Stack Diameter, ft (estimated)	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Stack Flow, 10^3 lb/h	1,755	1,479	1,161	1,726	1,721	1,463	1,152	1,525	1,385	1,176	938	1,745	1,478	1,162
Stack Flow, 10^3 acfm	938	807	670	933	931	802	665	852	789	689	579	939	808	670
Stack Exit Velocity, ft/s	109	94.0	78.0	109	108	93.3	77.4	99.2	91.8	80.3	67.4	109.3	94.1	78.0
NO_X (Catalyst Inlet), ppmvd (dry, 15% O_2)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
CO (Catalyst Inlet), ppmvd (dry, 15% O_2)	100	100	125	100	100	100	125	100	100	100	125	100	100	125
VOC (Catalyst Inlet), ppmvd (dry, 15% O_2)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Estimated Maximum Emissions (at CTG Exhaust) x (GE Data, One CTG)														

Alamitos Energy Center
Table 5.1B.7R
Simple-Cycle: GE LMS-100PB Performance Data
December 2015

Alamitos Energy Center LMS-100PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NO_X, ppmvd (15% O_2)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
NO_X as NO_2, lb/hr	82.3	67.0	51.8	82.0	81.7	66.2	51.2	71.5	64.4	53.4	42.0	82.6	67.0	51.8
CO, ppmvd (15% O_2)	100	100	125	100	100	100	125	100	100	100	125	100	100	125
CO, lb/hr	200	163	158	200	199	161	156	174	157	130	128	201	163	158
VOC, ppmvd (15% O_2)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
VOC, lb/hr	4.59	3.74	2.89	4.57	4.56	3.69	2.86	3.99	3.59	2.98	2.34	4.61	3.74	2.89
Fuel Sulfur Content, gr/100 scf	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
PM_{10}, lb/hr	4.33	0.00	0.00	4.33	4.33	0.00	0.00	4.33	4.33	0.00	0.00	4.33	0.00	0.00
SO_2, lb/hr	1.62	1.32	1.02	1.62	1.61	1.31	1.01	1.41	1.27	1.05	0.83	1.63	1.32	1.02
SO_3, lb/hr	0.11	0.09	0.07	0.11	0.11	0.09	0.07	0.09	0.08	0.07	0.05	0.11	0.09	0.07
Estimated Maximum Emissions (at Stack) x (GE Data, One CTG)														
NO_X, ppmvd (15% O_2)	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
NO_X as NO_2, lb/hr	8.23	6.70	5.18	8.20	8.17	6.62	5.12	7.15	6.44	5.34	4.20	8.26	6.70	5.18
CO, ppmvd (15% O_2)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
CO, lb/hr	8.01	6.52	5.04	7.98	7.96	6.44	4.99	6.97	6.27	5.20	4.09	8.05	6.52	5.04
VOC, ppmvd (15% O_2)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
VOC, lb/hr	2.30	1.87	1.44	2.29	2.28	1.85	1.43	2.00	1.80	1.49	1.17	2.30	1.87	1.44
NH_3, ppmvd (15% O_2)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
NH_3, lb/hr	6.09	4.96	3.83	6.07	6.05	4.90	3.79	5.30	4.77	3.95	3.11	6.12	4.96	3.83
PM_{10}, lb/hr	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	0.00	0.00
Sulfur, Stack Ammonium Sulfate and PM Calculations with 0.75 grain/100 scf Sulfur - PEC Calculation (One CTG)														
Fuel Sulfur Content, gr/100 scf	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Fuel Molecular Weight, lbm/lbmol	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7
Fuel Flow, lb/hr	38,300	31,176	24,101	38,151	38,035	30,795	23,833	33,304	29,965	24,842	19,565	38,451	31,176	24,106
SCFM Fuel (LHV)	14,480	11,787	9,112	14,424	14,380	11,643	9,011	12,591	11,329	9,392	7,397	14,537	11,787	9,114
Elemental Sulfur Molar Weight	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
SO_2 Molar Weight	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1
SO_3 Molar Weight	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1
Ammonium Sulfate Molar Weight	132	132	132	132	132	132	132	132	132	132	132	132	132	132
H_2SO_4 Molar Weight	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1
Elemental Sulfur in Fuel, lb/hr	0.62	0.51	0.39	0.62	0.62	0.50	0.39	0.54	0.49	0.40	0.32	0.62	0.51	0.39
Moles of Sulfur in Fuel, lbmol/hr	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.01
% Sulfur Oxidized to SO_2, assumed	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
% Sulfur Oxidized to SO_3, assumed	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Conservative SO_2 Calculation at CTG Exhaust, 90% oxidation assumption, lb/hr	1.12	0.91	0.70	1.11	1.11	0.90	0.69	0.97	0.87	0.72	0.57	1.12	0.91	0.70
Conservative SO_3 Calculation at CTG Exhaust, 10% oxidation assumption, lb/hr	0.15	0.13	0.10	0.15	0.15	0.12	0.10	0.13	0.12	0.10	0.08	0.16	0.13	0.10
SO_2 Moles at Catalyst Inlet	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01
Assumed SO_2 oxidation rate in CO Catalyst for SO_3 calculation, vol%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%
Assumed SO_2 oxidation rate in SCR for SO_3 calculation, vol%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SO_3, lb/hr created in CO Catalyst	0.60	0.49	0.38	0.60	0.60	0.48	0.37	0.52	0.47	0.39	0.31	0.60	0.49	0.38
SO_3, lb/hr created in SCR Catalyst	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00
SO_3, lb/hr from Catalysts	0.61	0.50	0.38	0.61	0.61	0.49	0.38	0.53	0.48	0.40	0.31	0.61	0.50	0.38
Total SO_3, lb/hr (Catalysts plus initial fuel SO_3)	0.77	0.62	0.48	0.76	0.76	0.62	0.48	0.67	0.60	0.50	0.39	0.77	0.62	0.48
Maximum Stack Ammonium Sulfate [$(NH_4)_2$-(SO_4)] (assuming 100% conversion from SO_3), lb/h	1.26	1.03	0.79	1.26	1.25	1.02	0.79	1.10	0.99	0.82	0.65	1.27	1.03	0.80
Maximum Stack H_2SO_4 (assuming 100% conversion from SO_3 to H_2SO_4), lb/h	0.94	0.76	0.59	0.93	0.93	0.75	0.58	0.82	0.73	0.61	0.48	0.94	0.76	0.59
Total PM_{10} at Stack, lb/h per 1 LMS-100PB	5.60	1.03	0.79	5.59	5.59	1.02	0.79	5.43	5.32	0.82	0.65	5.60	1.03	0.80
Catalyst Ammonia Usage - PEC Calculation (One CTG)														
Total Catalyst NO_X Removal, lb/hr	74.0	60.3	46.6	73.8	73.5	59.5	46.1	64.4	57.9	48.0	37.8	74.3	60.3	46.6
NO_X Removal Efficiency, %	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
NO_X Molar Weight	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
NH_3 Molar Weight	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0

Alamitos Energy Center
Table 5.1B.7R
Simple-Cycle: GE LMS-100PB Performance Data
December 2015

Alamitos Energy Center LMS-100PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NH_3 required for NO_X Removal, lb/hr	27.4	22.3	17.2	27.3	27.2	22.0	17.0	23.8	21.4	17.7	14.0	27.5	22.3	17.2
NH_3 Slip (assumed to be NH_3 in Stack), lb/hr	6.09	4.96	3.83	6.07	6.05	4.90	3.79	5.30	4.77	3.95	3.11	6.12	4.96	3.83
Total Ammonia Usage	33.5	27.2	21.1	33.3	33.2	26.9	20.8	29.1	26.2	21.7	17.1	33.6	27.2	21.1
19% Aqueous Ammonia Solution, lb NH_3/ft^3	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Aqueous Ammonia Usage, gph per 1 LMS-100PB	22.8	18.5	14.3	22.7	22.6	18.3	14.2	19.8	17.8	14.8	11.6	22.8	18.5	14.3
19% Aqueous Ammonia Usage, lb/hr per CTG	176	144	111	176	175	142	110	153	138	114	90	177	144	111
THE BELOW IS FROM GE PERFORMANCE AND EMISSIONS 2.10.15														
Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)														
AR	1.26	1.26	1.26	1.25	1.25	1.25	1.25	1.24	1.25	1.25	1.25	1.25	1.25	1.25
N_2	73.7	73.8	73.8	73.1	73.1	73.1	73.1	72.9	73.5	73.6	73.6	73.4	73.5	73.5
O_2	14.3	14.6	14.7	14.0	14.0	14.4	14.5	14.0	14.3	14.5	14.6	14.1	14.5	14.6
CO_2	5.84	5.64	5.55	5.91	5.91	5.63	5.53	5.84	5.78	5.65	5.58	5.89	5.64	5.55
H_2O	4.89	4.73	4.66	5.70	5.71	5.60	5.53	5.95	5.14	5.03	4.97	5.32	5.12	5.04
SO_2														
CO	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
HC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)														
AR	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
N_2	81.2	81.0	81.0	81.2	81.2	81.1	81.0	81.2	81.1	81.1	81.0	81.2	81.1	81.0
O_2	13.7	14.0	14.1	13.6	13.6	14.0	14.1	13.7	13.8	14.0	14.1	13.6	14.0	14.1
CO_2	4.09	3.94	3.88	4.18	4.18	3.97	3.90	4.14	4.06	3.96	3.91	4.15	3.96	3.89
H_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO_2	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CO	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
HC	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	----------	----------	----------	----------	----------	----------	----------
Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)														
AR	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89
N_2	74.9	75.0	75.0	73.9	73.9	73.9	74.0	73.6	74.6	74.6	74.7	74.4	74.5	74.6
O_2	12.7	13.0	13.1	12.4	12.4	12.7	12.9	12.4	12.7	12.9	13.0	12.5	12.8	13.0
CO_2	3.77	3.65	3.59	3.80	3.80	3.62	3.56	3.75	3.73	3.65	3.61	3.80	3.64	3.58
H_2O	7.73	7.48	7.37	8.97	8.97	8.80	8.70	9.34	8.10	7.94	7.85	8.38	8.07	7.96
SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
HC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Amended Huntington Beach Energy Project
Table 5.1B.3
Combined Cycle: GE 7FA.05 Performance Data
September 2015

Huntington Beach 2x1 7FA.05 Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CTG Model	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05
CTG Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
CTG Load (as % of emissions compliant load range)	max	average	min	max	max	average	min	max	max	average	min	max	average	min
CTG Inlet Air Cooling	Off	Off	Off	On	Off	Off	Off	On	Off	Off	Off	Off	Off	Off
Fuel Sulfur Content (grains/100 standard cubic feet)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Ambient Conditions	Low	Low	Low	Average	Average	Average	Average	High	High	High	High	ISO	ISO	ISO
Ambient Temperature, F	32	32	32	65.8	65.8	65.8	65.8	110	110	110	110	59	59	59
Ambient Relative Humidity, %	87%	87%	87%	58%	58%	58%	58%	8%	8%	8%	8%	60%	60%	60%
Atmospheric Pressure, psia	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68
Combustion Turbine Performance														
CTG Inlet Air Conditioning Effectiveness, % (ONE CTG)	N/A	N/A	N/A	90%	N/A	N/A	N/A	90%	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Loss, in. H_2O	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95
Exhaust Loss, in. H_2O	15.2	9.9	6.6	15.0	15.0	9.3	6.1	14.5	11.8	7.7	6.2	15.0	9.5	6.1
CTG Load Level (percent of Base Load)	BASE	75%	45%	BASE	BASE	75%	44%	BASE	BASE	75%	48%	BASE	75%	44%
Gross CTG Output, kW (ONE CTG)	236,140	177,105	105,791	232,073	227,061	170,296	100,815	215,890	190,222	142,667	90,926	231,197	173,398	101,727
Gross CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,683	9,128	11,742	8,789	8,865	9,179	11,662	8,921	9,065	9,710	12,245	8,790	9,126	11,615
Gross CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	9,628	10,061	12,942	9,687	9,771	10,117	12,854	9,833	9,991	10,702	13,496	9,688	10,059	12,802
Net CTG Output, kW (ONE CTG)	235,402	176,367	105,053	231,335	226,323	169,558	100,077	215,152	189,484	141,929	90,188	230,459	172,660	100,989
Net CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,710	9,166	11,825	8,817	8,894	9,219	11,748	8,952	9,100	9,761	12,345	8,818	9,165	11,700
Net CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	9,658	10,103	13,033	9,718	9,803	10,161	12,949	9,866	10,030	10,758	13,607	9,719	10,102	12,896
CTG Heat Input, MMBtu/h (LHV) (ONE CTG)	2,050	1,617	1,242	2,040	2,013	1,563	1,176	1,926	1,724	1,385	1,113	2,032	1,582	1,182
CTG Heat Input, MMBtu/h (HHV) (ONE CTG)	2,273	1,782	1,369	2,248	2,219	1,723	1,296	2,123	1,901	1,527	1,227	2,240	1,744	1,302
CTG Exhaust Flow, 10^3 lb/h (ONE CTG)	4,360	3,523	2,803	4,302	4,307	3,381	2,705	4,268	3,797	3,042	2,719	4,310	3,421	2,702
CTG Exhaust Temperature, F (ONE CTG)	1,109	1,117	1,215	1,141	1,141	1,152	1,215	1,112	1,167	1,209	1,215	1,139	1,144	1,215
Gross 2x1 Combined Cycle, kW	693,629	529,542	354,818	693,822	683,688	518,034	342,069	625,183	559,852	428,984	302,758	693,333	524,422	343,014
Net 2x1 Combined Cycle, kW	681,490	520,275	348,609	681,680	671,723	508,968	336,083	614,242	550,055	421,477	297,460	681,200	515,245	337,011
Gross STG Output, kW	221,349	175,332	143,236	229,676	229,566	177,442	140,439	193,403	179,408	143,650	120,906	230,939	177,626	139,560
GT Exaust Composition % Weight (ONE CTG)														
O_2	13.82%	14.04%	14.35%	13.60%	13.77%	13.87%	14.41%	13.97%	14.11%	14.09%	14.99%	13.72%	13.90%	14.40%
CO_2	6.11%	5.96%	5.76%	6.16%	6.07%	6.00%	5.65%	5.86%	5.90%	5.91%	5.32%	6.12%	6.01%	5.68%
H_2O	5.20%	5.09%	4.92%	5.87%	5.62%	5.57%	5.28%	5.97%	5.15%	5.16%	4.68%	5.52%	5.43%	5.17%
N_2	73.51%	73.55%	73.61%	73.02%	73.18%	73.20%	73.31%	72.86%	73.49%	73.48%	73.66%	73.28%	73.31%	73.41%
Ar	1.25%	1.25%	1.25%	1.24%	1.24%	1.24%	1.24%	1.24%	1.25%	1.25%	1.25%	1.24%	1.24%	1.25%
Fuel Sulfur Content (grains/100 standard cubic feet)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Catalyst Inlet Exhaust Analysis - % Mole Basis - Wet (ONE CTG/HRSG TRAIN)														
Ar	0.89%	0.89%	0.89%	0.88%	0.88%	0.88%	0.88%	0.88%	0.89%	0.89%	0.89%	0.88%	0.88%	0.89%
CO_2	3.95%	3.85%	3.72%	3.96%	3.91%	3.87%	3.64%	3.77%	3.81%	3.82%	3.44%	3.95%	3.88%	3.67%
H_2O	8.21%	8.03%	7.78%	9.23%	8.85%	8.77%	8.33%	9.37%	8.12%	8.14%	7.40%	8.70%	8.56%	8.15%
N_2	74.62%	74.69%	74.80%	73.84%	74.10%	74.13%	74.30%	73.58%	74.59%	74.58%	74.88%	74.25%	74.30%	74.46%
O_2	12.28%	12.48%	12.77%	12.04%	12.21%	12.30%	12.79%	12.35%	12.54%	12.52%	13.34%	12.17%	12.33%	12.79%
Ave Mol Wt (based on % mol)	28.44	28.45	28.46	28.33	28.36	28.37	28.40	28.29	28.43	28.43	28.48	28.38	28.39	28.42
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
SO_2, lb/hr (after SO_2 oxidation)	4.86	3.83	2.94	4.83	4.77	3.70	2.79	4.56	4.09	3.28	2.64	4.82	3.75	2.80
SO_3, lb/hr (after SO_2 oxidation)	4.86	3.83	2.94	4.83	4.77	3.70	2.79	4.56	4.09	3.28	2.64	4.82	3.75	2.80
Stack Exit Temperature, F	216	178	170	213	215	175	170	221	223	198	184	209	174	170
Stack Diameter, ft (estimated)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Stack Flow, 10^3 lb/h	4,360	3,523	2,803	4,302	4,307	3,381	2,705	4,268	3,797	3,042	2,719	4,310	3,421	2,702
Stack Flow, 10^3 acfm	1261.9	961.9	755.3	1244.4	1248.0	921.4	730.7	1250.8	1110.5	857.1	748.6	1236.8	930.0	729.3
Stack Exit Velocity, ft/s	66.95	51.03	40.07	66.02	66.21	48.88	38.76	66.36	58.91	45.47	39.71	65.62	49.34	38.69
NO_X (Catalyst Inlet), ppmvd (dry, 15% O_2)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
CO (Catalyst Inlet), ppmvd (dry, 15% O_2)	7.07	7.25	7.53	6.96	7.08	7.16	7.65	7.31	7.33	7.31	8.18	7.03	7.18	7.62

Amended Huntington Beach Energy Project
Table 5.1B.3
Combined Cycle: GE 7FA.05 Performance Data
September 2015

Huntington Beach 2x1 7FA.05 Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
VOC (Catalyst Inlet), ppmvd (dry, 15% O_2)	1.10	1.13	1.17	1.08	1.10	1.11	1.19	1.14	1.14	1.14	1.27	0.95	0.96	1.11
Stack NO_X Emissions with the Effects of Selective Catalytic Reduction (SCR) (ONE CTG/HRSG TRAIN)														
NO_X, ppmvd (dry, 15% O2)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NO_X, ppmvd (dry)	2.91	2.85	2.75	3.00	2.94	2.91	2.74	2.89	2.83	2.83	2.56	2.95	2.90	2.74
NO_X, ppmvw (wet)	2.69	2.63	2.55	2.74	2.70	2.67	2.53	2.64	2.62	2.62	2.38	2.71	2.67	2.54
NO_X, lb/h as NO_2	16.48	12.99	9.98	16.39	16.17	12.56	9.45	15.48	13.86	11.13	8.95	16.33	12.72	9.49
NO_X, lb/MMBtu (LHV) as NO_2	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
NO_X, lb/MMBtu (HHV) as NO_2	0.0072	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073	0.0073
SCR NH_3 slip, ppmvd (dry, 15% O_2)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SCR NH_3 slip, lb/h	15.25	12.02	9.24	15.17	14.97	11.62	8.74	14.32	12.82	10.30	8.28	15.11	11.77	8.79
Ammonia Use, lb/h	43.00	33.90	26.05	42.77	42.21	32.78	24.66	40.39	36.16	29.05	23.35	42.62	33.19	24.78
Stack CO Emissions with the Effects of Catalytic Reduction (CO Catalyst) (ONE CTG / HRSG TRAIN)														
CO, ppmvd (dry, 15% O_2)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CO, ppmvd (dry)	2.91	2.85	2.75	3.00	2.94	2.91	2.74	2.89	2.83	2.83	2.56	2.95	2.90	2.74
CO, ppmvw (wet)	2.69	2.63	2.55	2.74	2.70	2.67	2.53	2.64	2.62	2.62	2.38	2.71	2.67	2.54
CO, lb/h	10.03	7.91	6.08	9.98	9.85	7.65	5.75	9.42	8.44	6.78	5.45	9.94	7.74	5.78
CO, lb/MMBtu (LHV)	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049
CO, lb/MMBtu (HHV)	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
Stack SO_2 Emissions (ONE CTG / HRSG TRAIN)														
Assumed SO_2 oxidation rate in CO Catalyst for SO_3 calculation, vol%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Assumed SO_2 oxidation rate in SCR for SO_3 calculation, vol%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
SO_2, ppmvd (dry, 15% O_2)	0.37	0.37	0.37	0.36	0.37	0.37	0.37	0.36	0.37	0.37	0.37	0.37	0.37	0.36
SO_2, ppmvd (dry)	0.54	0.52	0.51	0.55	0.54	0.54	0.50	0.53	0.52	0.52	0.47	0.54	0.53	0.50
SO_2, ppmvw (wet)	0.49	0.48	0.47	0.49	0.49	0.49	0.46	0.48	0.48	0.48	0.43	0.50	0.49	0.46
SO_2, lb/h	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
SO_2, lb/MMBtu (LHV)	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
SO_2, lb/MMBtu (HHV)	0.0021	0.0022	0.0022	0.0021	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022
Stack VOC Emissions with the Effects of Catalytic Reduction (CO Catalyst) (ONE CTG / HRSG TRAIN)														
VOC, ppmvd (dry, 15% O_2)	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6
VOC, ppmvd (dry)	0.80	0.80	0.81	0.81	0.81	0.81	0.82	0.82	0.81	0.81	0.81	0.70	0.70	0.76
VOC, ppmvw (wet)	0.74	0.74	0.75	0.74	0.74	0.75	0.75	0.75	0.75	0.75	0.76	0.64	0.64	0.70
VOC, lb/h as CH_4 (includes VOC correction as applied to CTG)	1.58	1.28	1.02	1.55	1.55	1.22	0.98	1.53	1.38	1.10	0.99	1.35	1.07	0.92
VOC, lb/MMBtu (LHV)	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0009	0.0007	0.0007	0.0008
VOC, lb/MMBtu (HHV)	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0008	0.0007	0.0007	0.0007	0.0008	0.0006	0.0006	0.0007
PM_{10} from the GT and Duct Burner														
PM_{10} Emissions - Front and Back Half Catch														
PM_{10}, lb/h (from the CTG)	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
PM_{10}, lb/h (from the Burner)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM_{10}, lb/h (total from CTG and Burner)	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
PM_{10} with the Effects of SO_2 Oxidation [includes $(NH_4)_2$-(SO_4)] (ONE CTG / HRSG TRAIN)														
PM_{10} Emissions - Front and Back Half Catch														
PM_{10}, lb/h (incl. Ammonium Sulfate, assuming 100% conversion from SO_3)	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
PM_{10}, lb/MMBtu (LHV)	0.0044	0.0056	0.0072	0.0044	0.0045	0.0058	0.0077	0.0047	0.0052	0.0065	0.0081	0.0044	0.0057	0.0076
PM_{10}, lb/MMBtu (HHV)	0.0040	0.0051	0.0066	0.0040	0.0041	0.0052	0.0069	0.0042	0.0047	0.0059	0.0073	0.0040	0.0052	0.0069
$PM_{2.5}$ with the Effects of SO_2 Oxidation [includes $(NH_4)_2$-(SO_4)] (ONE CTG / HRSG TRAIN)														
$PM_{2.5}$ Emissions - Front and Back Half Catch														
$PM_{2.5}$, lb/h	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
$PM_{2.5}$, lb/MMBtu (LHV)	0.0044	0.0056	0.0072	0.0044	0.0045	0.0058	0.0077	0.0047	0.0052	0.0065	0.0081	0.0044	0.0057	0.0076
$PM_{2.5}$, lb/MMBtu (HHV)	0.0040	0.0051	0.0066	0.0040	0.0041	0.0052	0.0069	0.0042	0.0047	0.0059	0.0073	0.0040	0.0052	0.0069

Amended Huntington Beach Energy Project
Table 5.1B.3
Combined Cycle: GE 7FA.05 Performance Data
September 2015

Huntington Beach 2x1 7FA.05 Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total Effects of SO_2 Oxidation (ONE CTG / HRSG TRAIN)														
Total SO_2 to SO_3 conversion rate for SO_3 calculation, %vol	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Amount of SO_2 converted to SO_3 for SO_3 calculation, lb/h	4.86	3.83	2.94	4.83	4.77	3.70	2.79	4.56	4.09	3.28	2.64	4.82	3.75	2.80
Maximum Stack Ammonium Sulfate [$(NH_4)_2$-(SO_4)] (assuming 100% conversion from SO_3), lb/h	10.02	7.90	6.07	9.97	9.84	7.64	5.75	9.41	8.43	6.77	5.44	9.93	7.73	5.78
Maximum Stack H_2SO_4 (assuming 100% conversion from SO_3 to H_2SO_4), lb/h	7.44	5.87	4.51	7.40	7.30	5.67	4.27	6.99	6.26	5.03	4.04	7.37	5.74	4.29

Notes:

1. Dry air composition is as follows:
   N_2: 78.1%
   O_2: 21.0%
   Ar: 0.9%
   CO_2: 0.03%
2. Estimated emissions based on GE performance runs provided by AES on 12/23/14, 'AES_EXTERNAL_12_22_2014_Huntington Beach.xlsx'.
3. As the CTG performance and emissions information utilized does not reflect guaranteed values currently offered by GE, it is recommended that additional and suitable margin be applied to the values to account for differences between expected and guaratneed CTG emissions values.
4. Ammonium sulfates created downstream of the SCR are included in front half particulates and front and back half particulates. It is assumed that 100% SO_3 is converted to ammonium sulfates in order to account for "worst case" particulate emissions.
5. CO catalyst VOC destruction rate of 50% is assumed.
6. Sulfur content in fuel gas is assumed to be 0.75 grains/100 SCF.
7. As OEM project specific information is not available, an SO_2 to SO_3 conversion rate of 100% is assumed. Use of a high conversion rate is recommended for purposes of establishing permit limitations and emissions levels to provide additional margin.
8. Ammonia use is calculated with 19% aqueous ammonia and factors in ammonia slip.
9. Information presented is not reflective of emissions control equipment guaranteed performance levels as this information is not presently available. Engineer reserves the ability to adjust information to reflect guaranteed and OEM specific information when available.
10. Information presented is intended to reflect a conservative approach to estimated stack emissions; however, no additional margin has been applied to the emissions rates.
11. Steam turbine and combined cycle performance information presented is preliminary and for information purposes only. Information is subject to change based on equipment supplier feedback and equipment selection.
12. No margin has been included in the information provided. It is recommended that additional margin be added for the purposes of establishing permit limitations.
13. $PM_{10/2.5}$ emission rate of 9.0 lb/hr provided by AES.

Amended Huntington Beach Energy Project
Table 5.1B.7
Simple Cycle: LMS 100PB Performance Data
September 2015

Huntington Beach LMS100 PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
GE Case Number	111	112	113	114	115	116	117	126	127	128	129	130	131	132
CTG Model	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB
CTG Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
CTG Load Level (percent of Base Load)	100	75	50	100	100	75	50	100	100	75	50	100	75	50
CTG Inlet Air Cooling	Off	Off	Off	On	Off	Off	off	On	Off	Off	Off	Off	Off	Off
Ambient Conditions	Low	Low	Low	Average	Average	Average	Average	High	High	High	High	ISO	ISO	Iso
Ambient Temperature, F	32	32	32	65.8	65.8	65.8	65.8	110	110	110	110	59	59	59
Ambient Relative Humidity, %	86.72	86.72	86.72	58.32	58.32	58.32	58.32	7.95	7.95	7.95	7.95	60	60	60
Atmospheric Pressure, psia	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68
Combustion Turbine Performance														
Inlet Loss, in. H_2O	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Exhaust Loss, in. H_2O	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Gross CTG Output, kW (ONE CTG)	100,393	75,069	49,715	100,814	98,827	73,908	48,935	77,501	66,189	49,388	32,564	100,438	75,030	49,740
Gross CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	7,896	8,588	10,026	7,911	7,955	8,627	10,084	8,562	8,950	9,976	11,938	7,915	8,590	10,020
Gross CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	8,765	9,533	11,129	8,781	8,830	9,576	11,193	9,504	9,935	11,073	13,251	8,785	9,535	11,122
Net CTG Output, kW (ONE CTG)	98,934	73,610	48,256	99,355	97,368	72,448	47,476	76,041	64,730	47,929	31,105	98,978	73,571	48,280
Net CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,012	8,759	10,329	8,027	8,074	8,801	10,394	8,726	9,152	10,279	12,498	8,031	8,761	10,322
Net CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	8,894	9,722	11,465	8,910	8,962	9,769	11,537	9,686	10,158	11,410	13,873	8,915	9,724	11,458
CTG Heat Input, MMBtu/h (LHV) (ONE CTG)	793	645	498	798	786	638	493	664	592	493	389	795	645	498
CTG Heat Input, MMBtu/h (HHV) (ONE CTG)	880	716	553	885	873	708	548	737	658	547	432	882	715	553
CTG Exhaust Flow, 10^3 lb/h (ONE CTG)	1,754	1,479	1,162	1,746	1,724	1,463	1,151	1,473	1,329	1,128	901	1,745	1,478	1,162
CTG Exhaust Temperature, F (ONE CTG)	789	816	887	794	798	817	887	848	883	925	997	794	815	885
2 LMS100 PB Gross Kw	200,786	150,139	99,430	201,628	197,654	147,815	97,871	155,001	132,378	98,777	65,129	200,876	150,060	99,479
Gross Heat Rate, CTG (LHV)	7,896	8,588	10,026	7,911	7,955	8,627	10,084	8,562	8,950	9,976	11,938	7,915	8,590	10,020
Gross Heat Rate, 2 CTGs (LHV)	7,896	8,588	10,026	7,911	7,955	8,627	10,084	8,562	8,950	9,976	11,938	7,915	8,590	10,020
Aux Load and Transformer Losses	8,036	7,090	6,153	8,063	7,990	7,046	6,122	7,203	6,757	6,122	5,468	8,047	7,089	6,153
Net KW's for 2 LMS100 PB	192,750	143,048	93,277	193,565	189,664	140,770	91,749	147,798	125,621	92,654	59,661	192,829	142,971	93,327
Net Plant Heat Rate (all 2 LMS100 PB) (LHV)	8,225	9,014	10,687	8,241	8,290	9,059	10,757	8,979	9,431	10,635	13,032	8,245	9,016	10,680
Net Plant Heat Rate (all 2 LMS100 PB) (HHV)	9,130	10,006	11,863	9,147	9,202	10,056	11,940	9,967	10,469	11,805	14,466	9,152	10,008	11,855
CTG Exaust Composition % Weight - Wet (ONE CTG)														
O_2	14.23	14.55	14.68	14.00	14.05	14.44	14.58	14.05	14.33	14.50	14.61	14.09	14.47	14.61
CO_2	5.85	5.64	5.55	5.91	5.90	5.64	5.55	5.82	5.77	5.65	5.58	5.89	5.64	5.55
H_2O	4.98	4.82	4.75	5.64	5.47	5.26	5.19	5.90	5.02	4.93	4.87	5.32	5.12	5.04
N_2	73.65	73.71	73.74	73.18	73.30	73.38	73.40	72.95	73.60	73.63	73.65	73.42	73.49	73.51
Ar	1.26	1.26	1.26	1.25	1.25	1.25	1.25	1.24	1.25	1.26	1.26	1.25	1.25	1.25
Catalyst Inlet Exhaust Analysis - % Mole Basis - Wet (ONE CTG/HRSG TRAIN)														
Ar	0.89	0.90	0.90	0.88	0.89	0.89	0.89	0.88	0.89	0.89	0.89	0.89	0.89	0.89
CO_2	3.78	3.65	3.59	3.80	3.80	3.64	3.58	3.74	3.73	3.65	3.61	3.80	3.64	3.58
H_2O	7.87	7.61	7.50	8.87	8.61	8.29	8.17	9.27	7.93	7.78	7.70	8.38	8.07	7.96
N_2	74.77	74.88	74.92	74.01	74.21	74.34	74.39	73.66	74.69	74.75	74.78	74.39	74.51	74.56
O_2	12.65	12.94	13.06	12.39	12.45	12.81	12.94	12.42	12.73	12.89	12.99	12.50	12.85	12.97
Ave Mol Wt (based on % mol)	28.43	28.44	28.45	28.32	28.35	28.37	28.38	28.27	28.42	28.42	28.43	28.37	28.39	28.40
Stack Exit Temperature, F	789	816	887	794	798	817	887	848	883	925	997	794	815	885
Stack Diameter, ft (estimated)	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50
Stack Flow, 10^3 lb/h	1754	1479	1162	1746	1724	1463	1151	1473	1329	1128	901	1745	1478	1162
Stack Flow, 10^3 acfm	938.19	807.64	669.81	941.44	930.92	801.79	665.26	829.75	764.69	669.05	562.16	939.11	807.80	669.92
Stack Exit Velocity, ft/s	109.18	94.01	77.96	108.66	108.40	93.34	77.45	96.61	89.04	77.90	65.46	109.35	94.06	78.00
NO_X (Catalyst Inlet), ppmvd (dry, 15% O_2)	25	25	25	25	25	25	25	25	25	25	25	25	25	25
CO (Catalyst Inlet), ppmvd (dry, 15% O_2)	100	100	125	100	100	100	125	100	100	100	125	100	100	125
VOC (Catalyst Inlet), ppmvd (dry, 15% O_2)	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Estimated Maximum Emissions (at CTG Exhaust) x (GE Data, One CTG)														

Amended Huntington Beach Energy Project
Table 5.1B.7
Simple Cycle: LMS 100PB Performance Data
September 2015

Huntington Beach LMS100 PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NO_X, ppmvd (15% O_2)	25	25	25	25	25	25	25	25	25	25	25	25	25	25
NO_X as NO_2, lb/hr	82.37	66.99	51.79	82.88	81.69	66.25	51.27	68.95	61.55	51.19	40.39	82.60	66.97	51.78
CO, ppmvd (15% O_2)	100	100	125	100	100	100	125	100	100	100	125	100	100	125
CO, lb/hr	200.59	163.15	157.66	201.83	198.95	161.35	156.09	167.91	149.91	124.67	122.97	201.16	163.10	157.64
VOC, ppmvd (15% O_2)	4	4	4	4	4	4	4	4	4	4	4	4	4	4
VOC, lb/hr	4.60	3.74	2.89	4.62	4.56	3.70	2.86	3.85	3.43	2.86	2.25	4.61	3.74	2.89
Fuel Sulfur Content, gr/100 scf	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
PM_{10}, lb/hr	4.33	0.00	0.00	4.33	4.33	0.00	0.00	4.33	4.33	0.00	0.00	4.33	0.00	0.00
SO_2, lb/hr	1.63	1.32	1.02	1.64	1.61	1.31	1.01	1.36	1.22	1.01	0.80	1.63	1.32	1.02
SO_3, lb/hr	0.11	0.09	0.07	0.11	0.11	0.09	0.07	0.09	0.08	0.07	0.05	0.11	0.09	0.07
Estimated Maximum Emissions (at Stack) x (GE Data, One CTG)														
NO_X, ppmvd (15% O_2)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
NO_X as NO_2, lb/hr	8.24	6.70	5.18	8.29	8.17	6.63	5.13	6.89	6.16	5.12	4.04	8.26	6.70	5.18
CO, ppmvd (15% O_2)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
CO, lb/hr	8.02	6.53	5.05	8.07	7.96	6.45	4.99	6.72	6.00	4.99	3.93	8.05	6.52	5.04
VOC, ppmvd (15% O_2)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
VOC, lb/hr	2.30	1.87	1.44	2.31	2.28	1.85	1.43	1.92	1.72	1.43	1.13	2.30	1.87	1.44
NH_3, ppmvd (15% O_2)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
NH_3, lb/hr	6.10	4.96	3.83	6.14	6.05	4.91	3.80	5.10	4.56	3.79	2.99	6.12	4.96	3.83
PM_{10}, lb/hr	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	1.54	1.19
Sulfur, Stack Ammonium Sulfate and PM Calculations with 0.75 grain/100 scf Sulfur - PEC Calculation (One CTG)														
Fuel Sulfur Content, gr/100 scf	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Fuel Molecular Weight, lbm/lbmol	16.73	16.73	16.73	16.73	16.73	16.73	16.73	16.73	16.73	16.73	16.73	16.73	16.73	16.73
Fuel Flow, lb/hr	38,341	31,185	24,109	38,579	38,026	30,842	23,868	32,096	28,655	23,831	18,804	38,451	31,176	24,106
SCFM Fuel (LHV)	14,496	11,790	9,115	14,586	14,377	11,660	9,024	12,135	10,834	9,010	7,109	14,537	11,787	9,114
Elemental Sulfur Molar Weight	32.06	32.06	32.06	32.06	32.06	32.06	32.06	32.06	32.06	32.06	32.06	32.06	32.06	32.06
SO_2 Molar Weight	64.06	64.06	64.06	64.06	64.06	64.06	64.06	64.06	64.06	64.06	64.06	64.06	64.06	64.06
SO_3 Molar Weight	80.06	80.06	80.06	80.06	80.06	80.06	80.06	80.06	80.06	80.06	80.06	80.06	80.06	80.06
Ammonium Sulfate Molar Weight	132.14	132.14	132.14	132.14	132.14	132.14	132.14	132.14	132.14	132.14	132.14	132.14	132.14	132.14
H_2SO_4 Molar Weight	98.08	98.08	98.08	98.08	98.08	98.08	98.08	98.08	98.08	98.08	98.08	98.08	98.08	98.08
Elemental Sulfur in Fuel, lb/hr	0.93	0.76	0.59	0.94	0.92	0.75	0.58	0.78	0.70	0.58	0.46	0.93	0.76	0.59
Moles of Sulfur in Fuel, lbmol/hr	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.03	0.02	0.02
% Sulfur Oxidized to SO_2, assumed	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
% Sulfur Oxidized to SO_3, assumed	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Conservative SO_2 Calculation at CTG Exhaust, 90% oxidation assumption, lb/hr	1.68	1.36	1.05	1.69	1.66	1.35	1.04	1.40	1.25	1.04	0.82	1.68	1.36	1.05
Conservative SO_3 Calculation at CTG Exhaust, 10% oxidation assumption, lb/hr	0.23	0.19	0.15	0.23	0.23	0.19	0.14	0.19	0.17	0.14	0.11	0.23	0.19	0.15
SO_2 Moles at Calayst Inlet	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.03	0.02	0.02
Assumed SO_2 oxidation rate in CO Catalyst for SO_3 calculation, vol%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%
Assumed SO_2 oxidation rate in SCR for SO_3 calculation, vol%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SO_3, lb/hr created in CO Catalyst	0.905	0.74	0.57	0.91	0.90	0.73	0.56	0.76	0.68	0.56	0.44	0.91	0.74	0.57
SO_3, lb/hr created in SCR Catalyst	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
SO_3, lb/hr from Catalysts	0.92	0.75	0.58	0.92	0.91	0.74	0.57	0.77	0.69	0.57	0.45	0.92	0.75	0.58
Total SO_3, lb/hr (Catalysts plus initial fuel SO_3)	1.149	0.93	0.72	1.16	1.14	0.92	0.72	0.96	0.86	0.71	0.56	1.15	0.93	0.72
Maximum Stack Ammonium Sulfate [$(NH_4)_2$-(SO_4)] (assuming 100% conversion from SO_3), lb/h	1.90	1.54	1.19	1.91	1.88	1.53	1.18	1.59	1.42	1.18	0.93	1.90	1.54	1.19
Maximum Stack H_2SO_4 (assuming 100% conversion from SO_3 to H_2SO_4), lb/h	1.41	1.15	0.89	1.42	1.40	1.13	0.88	1.18	1.05	0.88	0.69	1.41	1.14	0.89
Total PM_{10} at Stack, lb/h per 1 LMS100 PB	6.23	1.54	1.19	6.24	6.21	1.53	1.18	5.92	5.75	1.18	0.93	6.24	1.54	1.19
Catalyst Ammonia Usage - PEC Calculation (One CTG)														
Total Catalyst NO_X Removal, lb/hr	74.13	60.29	46.61	74.59	73.52	59.63	46.15	62.05	55.40	46.07	36.35	74.34	60.27	46.61
NO_X Removal Efficiency, %	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
NO_X Molar Weight	46	46	46	46	46	46	46	46	46	46	46	46	46	46

Amended Huntington Beach Energy Project
Table 5.1B.7
Simple Cycle: LMS 100PB Performance Data
September 2015

Huntington Beach LMS100 PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NH_3 Molar Weight	17	17	17	17	17	17	17	17	17	17	17	17	17	17
NH_3 required for NO_X Removal, lb/hr	27.40	22.28	17.23	27.57	27.17	22.04	17.05	22.93	20.47	17.03	13.44	27.47	22.28	17.22
NH_3 Slip (assumed to be NH_3 in Stack), lb/hr	6.10	4.96	3.83	6.14	6.05	4.91	3.80	5.10	4.56	3.79	2.99	6.12	4.96	3.83
Total Ammonia Usage	33.49	27.24	21.06	33.70	33.22	26.94	20.85	28.04	25.03	20.82	16.43	33.59	27.23	21.06
19% Aqueous Ammonia Solution, lb NH_3/ft^3	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Total Aqueous Ammonia Usage, gph per 1 LMS100 PB	22.78	18.52	14.32	22.92	22.59	18.32	14.18	19.07	17.02	14.16	11.17	22.84	18.52	14.32
19% Aqueous Ammonia Usage, lb/hr per CTG	176.51	143.56	110.99	177.61	175.07	141.98	109.88	147.76	131.91	109.71	86.56	177.01	143.52	110.97
THE BELOW IS FROM GE PERFORMANCE AND EMISSIONS 2.10.15														
Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)												0	0	0
AR	1.26	1.26	1.26	1.25	1.25	1.25	1.25	1.24	1.25	1.26	1.26	1.25	1.25	1.25
N_2	73.65	73.71	73.74	73.18	73.30	73.38	73.40	72.95	73.60	73.63	73.65	73.42	73.49	73.51
O_2	14.23	14.55	14.68	14.00	14.05	14.44	14.58	14.05	14.33	14.50	14.61	14.09	14.47	14.61
CO_2	5.85	5.64	5.55	5.91	5.90	5.64	5.55	5.82	5.77	5.65	5.58	5.89	5.64	5.55
H_2O	4.98	4.82	4.75	5.64	5.47	5.26	5.19	5.90	5.02	4.93	4.87	5.32	5.12	5.04
SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
HC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)												0.00	0.00	0.00
AR	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
N_2	81.16	81.05	81.00	81.22	81.21	81.06	81.01	81.18	81.12	81.06	81.02	81.20	81.06	81.00
O_2	13.73	14.00	14.12	13.60	13.62	13.97	14.09	13.68	13.83	13.98	14.07	13.65	13.98	14.10
CO_2	4.10	3.95	3.88	4.17	4.16	3.97	3.90	4.13	4.05	3.96	3.91	4.15	3.96	3.89
H_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO_2	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.02
CO	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
HC	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	----------	0.00	----------	----------	----------	----------	----------
Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)												0.00	0.00	0.00
AR	0.89	0.90	0.90	0.88	0.89	0.89	0.89	0.88	0.89	0.89	0.89	0.89	0.89	0.89
N_2	74.77	74.88	74.92	74.01	74.21	74.34	74.39	73.66	74.69	74.75	74.78	74.39	74.51	74.56
O_2	12.65	12.94	13.06	12.39	12.45	12.81	12.94	12.42	12.73	12.89	12.99	12.50	12.85	12.97
CO_2	3.78	3.65	3.59	3.80	3.80	3.64	3.58	3.74	3.73	3.65	3.61	3.80	3.64	3.58
H_2O	7.87	7.61	7.50	8.87	8.61	8.29	8.17	9.27	7.93	7.78	7.70	8.38	8.07	7.96
SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
HC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Attachment 9
Selective Catalytic Reduction System and Oxidation Catalyst Guarantees

From: Nivens, John A.
To: Dan Perlin
Subject: Cormetech Standard Catalyst Life Expectancy
Date: Monday, December 07, 2015 1:09:14 PM

Dan,

Cormetech's standard SCR Catalyst life expectancy guarantee for the AES's turbines and auxiliary boiler is 3 years or 24,000 hours.

Regards,

John A. Nivens
Cormetech, Inc.
Office: 919-287-7254
Cell: 919-815-1343
nivensja@cormetech.com

From: Robert F Zeiss <robert.zeiss@basf.com>
Sent: Monday, December 07, 2015 1:38 PM
To: Dan Perlin
Subject: RE: Warranty Statement

We typically state 7-12 years expected life, but we have many installations that have been in service 15-20 years.

Bob Zeiss
Power Industry Sales Manager, Clean Air Business Unit

Phone: 732-205-6640 Mobile: 848-248-6902 Fax: 732-205-5687 E-Mail: robert.zeiss@basf.com
Postal Address: 25 Middlesex/Essex Turnpike, Iselin, NJ 08830, 0770

BASF Corporation
BASF suports the worldwide Responsible Care® initiative of the chemical industry

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From: Dan Perlin
Sent: 12/7/2015 1:36 PM
To: Stanley S Mack
Cc: Robert F Zeiss
Subject: RE: Warranty Statement

Stan, Robert,

Thank you for providing the warranty information for your CO catalyst. I have a request for something simpler as well. Our client, AES, has a request from the California Energy Commission to provide a manufacturer's guaranteed standard life expectancy for a CO Catalyst. Our application would be a GE LMS100 and 7FA, as well as a gas-fired Auxiliary Boiler. I've seen standard expected figures such as 3 years/24,000 hours for CO Cats and SCR's. Is this what BASF guarantees? An email from one of you stating the guaranteed life would suffice, and if you could include an email signature with your name, position, and company name. If you could provide this by the end of the day, I would greatly appreciate it.

Thank you,

Dan

Daniel Perlin, P.E. | Sr. Mechanical Engineer | **Power Engineers Collaborative, LLC**
100 S. Wacker Dr., Suite 1100, Chicago, Illinois 60606
Office (312) 466-1540 x175 | Cell (217) 721-4757| www.pecllc.com

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From: Stanley S Mack [mailto:stan.mack@basf.com]
Sent: Friday, December 04, 2015 1:41 PM
To: Dan Perlin <dperlin@pecllc.com>
Cc: Robert F Zeiss <robert.zeiss@basf.com>
Subject: Warranty Statement

Dear Daniel

Thank you for your inquiry for a warranty for a typical LMS100 turbine application, a generic form of which is attached.

If you have a project on which you are working we would be happy to provide a quotation. I've copied Bob Zeiss, Power Sales Manager, on this and you can reach out to him for any information.

Best Regards,

Stan Mack
Business Manager
Member ICAC

Phone: +1 732 205-6174 Mobile: 732-688-4820 E-Mail: stan.mack@basf.com
Postal Address: BASF Corporation, Iselin, 08830 Iselin, USA

150 years
BASF - We create chemistry

BASF Corporation
100 Park Avenue
Florham Park, NJ 07932
USA

Attachment 16
Monthly Commissioning Emissions Estimates

Alamitos Energy Center
Attachment 16, Table 1
Summary of Commissioning Emission Estimates: Combined-Cycle Turbines
December 2015

Activity	Duration (hr)	CTG Load (%)	Cumulative Hours	Commissioning Month	Total Abated Emissions (lb)				
					NO_X	CO	VOC	SO_2 [2]	$PM_{10/2.5}$ [2]
CTG Testing (Full Speed No Load, FSNL)	48	10	48	1	6,240	91,200	12,960	233	408
Steam Blows [1]	120	40	168	1/2	8,190	3,888	360	583	1,020
Set Unit HRSG & Steam Safety Valves	12	40	180	2	819	389	36.0	58.3	102
Steam Blows - Restoration									
DLN Emissions Tuning	12	50	192	2	567	285	24.0	58.3	102
Emissions Tuning	12	60	204	2	630	298	24.0	58.3	102
Emissions Tuning	12	80	216	2	756	350	30.0	58.3	102
Restart CTGs and Run HRSG in Bypass Mode. STG Bypass Valve Tuning. HRSG Blow Down and Drum Tuning									
Verify STG on Turning Gear. Establish Vacuum in ACC Ext Bypass Blowdown to ACC (Combined Blows). Commence Tuning on ACC Controls. Finalize Bypass Valve Tuning. ACC Cleaning.	168	80	384	2/3	2,328	1,078	273	816	1,428
CT Base Load Testing/Tuning	24	100	408	3	388	182	46.8	117	204
Load Test STG / Combined-Cycle (2X1) Tuning	48	50	456	3	499	251	62.4	233	408
STG Load Test/Combined-Cycle Tuning	96	80	552	3/4	1,331	616	156	467	816
RATA / Pre-performance Testing / Source Testing	84	80	636	4	1,164	539	137	408	714
Source Testing & Drift Test Day 1	24	50	660	4	249	125	31.2	117	204
Source Testing & Drift Test Day 2	24	50	684	4/5	249	125	31.2	117	204
Source Testing & Drift Test Day 3	24	50	708	5	249	125	31.2	117	204
Source Testing & Drift Test Day 4	24	50	732	5	249	125	31.2	117	204
Source Testing & Drift Test Day 5	24	50	756	5	249	125	31.2	117	204
Source Testing & Drift Test Day 6	24	50	780	5	249	125	31.2	117	204
Source Testing & Drift Test Day 7	24	50	804	5	249	125	31.2	117	204
Performance Testing	132	100	936	5/6	2,134	1,004	257	642	1,122
CALISO Certification & Testing / PPA Testing	60	75	996	6	804	371	97.5	292	510
Total for One CTG	**996**				**27,597**	**101,328**	**14,682**	**4,841**	**8,466**
Total for Two CTGs (One 2x1 Block)	**1,992**				**55,194**	**202,656**	**29,364**	**9,681**	**16,932**

Notes:

1. Part Load removal efficiencies for NO_X, VOC, and CO require validation from HRSG and catalyst supplier.

2. SO_2 and $PM_{10/2.5}$ emissions during commissioning are expected to be no greater than full load operations. Therefore, emissions were calculated using the maximum hourly emission rates for normal operation, as summarized below.

Maximum Emission Rates	lb/hr
SO_2	4.86
$PM_{10/2.5}$	8.50

Commissioning Schedule

Months of Commissioning	6
Hours per Month per Turbine	166

Commissioning Month	Total Abated Emissions per Turbine (lb)				
	NO_X	CO	VOC	SO_2 [2]	$PM_{10/2.5}$ [2]
Commissioning Month 1	14,294	95,023	13,314	807	1,411
Commissioning Month 2	4,516	2,131	309	807	1,411
Commissioning Month 3	2,190	1,036	262	807	1,411
Commissioning Month 4	2,204	1,032	261	807	1,411
Commissioning Month 5	1,876	929	233	807	1,411
Commissioning Month 6	2,518	1,177	304	807	1,411

Alamitos Energy Center
Attachment 16, Table 2
Summary of Commissioning Emission Estimates: Simple-Cycle Turbines
December 2015

Activity	Duration (hr)	CTG Load (%)	Cumulative Hours	Commissioning Month	Total Abated Emissions (lb)				
					NO_X	CO	VOC	SO_2 [2]	$PM_{10/2.5}$ [2]
Unit 1 Testing (Full Speed No Load, FSNL)	4	5	4	1	160	976	20.3	6.48	24.9
Unit 1 DLN Emissions Tuning [1]	12	100	16	1	246	1,080	36.7	19.4	74.8
Unit 1 Emissions Tuning [1]	12	75	28	1	198	869	32.2	19.4	74.8
Unit 1 Base Load Testing	12	75	40	1	198	869	13.7	19.4	74.8
No Operation									
Install Temporary Emissions Test Equipment									
Refire Unit 1	12	100	52	1	246	1,080	36.7	19.4	74.8
Unit 1 Source Testing & Drift Test Day 1-5; RATA / Pre-performance Testing / Part 60 / 75 Certification and Source Testing	168	100	220	1/2/3	3,444	15,120	513	272	1,047
Unit 1 Water Wash & Performance Preparation	24	100	244	3	492	2,160	73.3	38.9	150
Unit 1 Performance Testing	24	100	268	3	492	2,160	73.3	38.9	150
Install Temporary Emissions Test Equipment									
Unit 1 CALISO Certification	12	100	280	3	246	1,080	36.7	19.4	74.8
Total for One CTG	**280**				**5,722**	**25,395**	**836**	**454**	**1,744**
Total for Four CTGs	**1,120**				**22,889**	**101,579**	**3,345**	**1,814**	**6,978**

Notes:
1. After commissioning, tuning is expected to occur twice a year.
2. SO_2 and $PM_{10/2.5}$ emissions during commissioning are expected to be no greater than full load operations. Therefore, emissions were calculated using the maximum hourly emission rates for normal operation, as summarized below.

Maximum Emission Rates	lb/hr
SO_2	1.62
$PM_{10/2.5}$	6.23

Commissioning Schedule

Months of Commissioning	3
Hours per Month per Turbine	93

Commissioning Month	Total Abated Emissions per Turbine (lb)				
	NO_X	CO	VOC	SO_2 [2]	$PM_{10/2.5}$ [2]
Commissioning Month 1	1,896	8,595	266	151	581
Commissioning Month 2	1,913	8,400	285	151	581
Commissioning Month 3	1,913	8,400	285	151	581

Attachment 17
Revised Facility GHG Operation Emissions

Alamitos Energy Center
Table 5.1B.16R
Summary of Facility Operation Emissions – Greenhouse Gas Pollutants
December 2015

Facility Heat Input

GE 7FA.05 Natural Gas Use (PTE):	20,749,400	MMBtu/yr
GE LMS-100PB Natural Gas Use (PTE):	8,259,098	MMBtu/yr
Auxiliary Boiler Natural Gas Use (PTE):	310,096	MMBtu/yr
AEC Total Natural Gas Use (PTE):	29,318,594	MMBtu/yr

GHG Netting

Pollutant	AEC PTE Emissions (metric tons/year)
CO_2	1,555,645
CH_4	29.3
N_2O	2.9
CO_2 Equivalent (Total) [a]	1,557,251

Notes:

[a] The following global warming potentials were used to estimate CO_2 Equivalents, per Table A-1 of 40 CFR Part 98, Subpart A:

CH_4 = 25

N_2O = 298

GHG Emission Factors [a]

Pollutant	Combined-Cycle Emission Factor (kg/MMBtu)	Simple-Cycle Emission Factor (kg/MMBtu)	Boiler Emission Factor (kg/MMBtu)
CO_2	53.06	53.06	53.06
CH_4	0.001	0.001	0.001
N_2O	0.0001	0.0001	0.0001

Notes:

[a] Emission factors from Table 1 of EPA's *Emission Factors for Greenhouse Gas Inventories* (EPA, 2014).

Attachment 18
Revised Sulfur Hexafluoride Emissions Estimates

Alamitos Energy Center
Table 5.1B.18R
SF_6 Calculations
December 2015

Project Data [a]		Calculation Factors		Annual Emissions		
AEC Electric Breakers [a]	Total SF_6 (lbs)	Annual Leak Rate [b]	SF_6 GWP [c]	Annual SF_6 Emissions (lbs/year)	Annual SF_6 Emissions (metric tons/year)	CO_2e (metric tons/year)
1200A 230 kV	230	1.0%	22,800	2.30	0.00104	23.8
1200A 230 kV	230	1.0%	22,800	2.30	0.00104	23.8
1200A 230 kV	230	1.0%	22,800	2.30	0.00104	23.8
3000A 230 kV	230	1.0%	22,800	2.30	0.00104	23.8
10000A 18 kV	25.0	1.0%	22,800	0.25	0.000113	2.59
10000A 18 kV	25.0	1.0%	22,800	0.25	0.000113	2.59
10000A 18 kV	25.0	1.0%	22,800	0.25	0.000113	2.59
2000A 230 kV	216	1.0%	22,800	2.16	0.000980	22.3
GCB 18 kV	24.0	1.0%	22,800	0.24	0.000109	2.48
GCB 18 kV	24.0	1.0%	22,800	0.24	0.000109	2.48
GCB 18 kV	24.0	1.0%	22,800	0.24	0.000109	2.48
GCB 18 kV	24.0	1.0%	22,800	0.24	0.000109	2.48
Total	**1,307**	**1.0%**	**22,800**	**13.1**	**0.00593**	**135**

Notes:

[a] Project data provided in 'Alamtios and HB SF6_arb.xlsx' and 'Alamitos and HB SF6 LMS 100.xlsx'. Electrical breakers include three 18-kilovolt transmission breakers, five 230-kilvolt transmission breakers, and four 18-kilovolt generator circuit breakers.

[b] As allowed by the *Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear* (17 CCR 95350-95359).

[c] GWP from Table B.1 of TCR's *2015 Climate Registry Default Emission Factors* (TCR, 2015).

Attachment DR131-1
Correspondence with SCAQMD Regarding Cumulative Sources

Dunavent, Andrew/SDO

From: Dunavent, Andrew/SDO
Sent: Friday, October 23, 2015 11:46 AM
To: 'PublicRecordsRequests@aqmd.gov'
Cc: Engel, Elyse/SJC
Subject: AEC - Public Records Request
Attachments: AEC_SCAQMD_PRR_6Miles_20151023.pdf

Hi,

Please find our Public Records Request attached. Please be sure to read the Memo attached within it and let me know if you have any questions.

Thanks,

Andrew Dunavent
Environmental Engineer I
(619) 272-7223
Andrew.dunavent@ch2m.com

CH2M
402 W. Broadway, Suite 1450
San Diego, CA 92101

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

Information Management
Public Records Unit

Direct Dial: (909) 396-3700
FAX: (909) 396-3330

PUBLIC RECORDS REQUEST FORM

PRU Office Use Only
CONTROL NUMBER

ATTENTION REQUESTOR: To expedite your request for District records, please fill out this form completely, and identify specifically the type of records you are requesting. Please limit your request to one facility or one site address for each request form filed, and three requested items per form. Additional forms or pages can be used if requesting information for more than one facility or for records not identified on this form. Requests should reasonably describe identifiable records prepared, owned, used, or retained by the District. Public Records Unit staff is available to assist you in identifying those records in the District's possession. The District is not required by law to create a new record or list from an existing record.

REQUESTOR INFORMATION

NAME: Andrew Dunavent		DATE: 10/23/2015
COMPANY: CH2M HILL		
MAILING ADDRESS: 402 W. Broadway, Suite 1450		
CITY: San Diego	STATE: CA	ZIP CODE: 92101
PHONE NUMBER: (619) 272-7223	FAX NUMBER: (619) 687-0111	
EMAIL ADDRESS: Andrew.dunavent@ch2m.com		

REQUESTED RECORDS (*3 items per form*)

☐ Applications (APPLS)	☐ Complaints	☐ Asbestos Notifications/Records
☐ Permits to Operate (P/O)	☐ Site Inspection Reports (I/R)	☐ Facility Potential to Emit (PTE)
☐ Equipment List Report (EQL)	☐ Emissions Summary	☐ Facility Positive Balance (NSR)
☐ Notices of Violation (NOV)	☐ Source Test Reports (S/T RPTS)	☐ Toxic-Health Risk Assessment (HRA)
☐ Notices to Comply (N/C)	☐ Air Monitoring Data	✔ Other (describe below or on additional pages):

See attached memo.

TIME PERIOD OF DOCUMENTS REQUESTED From: June 3, 2014 To: Present

REQUESTED FACILITY INFORMATION (If Applicable)

FACILITY NAME:		
FACILITY ADDRESS:		
CITY:	STATE:	ZIP CODE:
FACILITY I.D. NO. (if known):	APPL. AND/OR PERMIT NO. (if known):	

***Direct cost of duplication**: $.15 per page for paper copies (first 10 pages free) and $5.00 per copied audio tape. No charge for copied Diskettes or CDs. Transfer of gathered electronic records onto CD or Diskette typically costs $10.00 each, but costs will vary (see Instructions for Requesting Records).*

✔ I wish to inspect the requested records, where applicable, or receive the requested records electronically at no charge. I do not want copies produced at this time.

☐ I request that the SCAQMD contact me prior to copying the requested records if the cost exceeds $20.00.

☐ I would like copies of the requested records and I hereby agree to reimburse the SCAQMD for the direct cost of duplication in accordance with Gov. Code Sec. 6253(b).

Andrew Dunavent

Signature of Requestor

Note: After a preliminary estimate, advance payment may be required.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

INSTRUCTIONS FOR REQUESTING RECORDS

(California Public Records Act, Govt. Code Sections 6250-6276.48)

1. In order to expedite your request, requests for records should be in writing. Requests will be processed in the order in which they are received. A Public Records Request Form can be faxed to you by calling (909) 396-3700 and following the menu options. A form is also available on the A.Q.M.D.'s web page at *http://*www.aqmd.go*v*. Select the "Contact Us" menu, followed by the "Public Records" menu. Requests may be submitted by facsimile to (909) 396-3330, or by email to PublicRecordsRequests@aqmd.gov.

2. Requests must be for records prepared, owned, used, or retained by the District (Gov. Code Sec. 6252(e)). Requests should be for clearly identifiable records. If necessary, the District will assist the requestor in making a request that describes reasonably identifiable records (Gov. Code Sec. 6253.1). Copies will not be provided if disclosure would infringe upon a copyright, trade secret, or is otherwise exempt in accordance with state law.

3. A search for facility records can only be conducted by one or all of the following:

   Facility Name, Address, or Identification Number;

   Facility Application Number, or Permit to Operate Number; or

   Facility Notice of Violation/Notice to Comply Number.

4. You will be notified by mail within ten (10) days whether your request seeks copies of disclosable public records prepared, owned, used, or retained by this agency. In most cases, your request will be completed within 3-4 weeks.

5. If the search for records finds the records voluminous, you will be notified of the approximate number of pages and/or length of time it will take to process your request.

6. If the records you requested have been marked confidential by the source of the record, you will be notified and given the option of continuing with the District's trade secret process.

7. If your request is to review records, rather than receive copies, the District will notify you once the records are gathered, and arrangements will be made for your review.

8. The charge for the direct cost of duplication is as follows: Paper Copies, $0.15/page each over 10 pages (first 10 pages are free); Copied CD's or Copied Diskettes, no charge; and Copied Audio Tapes, $5.00 each. When records are requested in electronic format, the requestor shall bear the cost of producing a copy of the record, including the cost to construct the record and the cost of programming and computer services necessary to produce a copy of the record when either of the following applies: (1) the District would be required to produce a copy of an electronic record and the record is one that is produced only at otherwise regularly scheduled intervals, or (2) the request would require data compilation, extraction, or programming to produce the record. (Gov. Code Sec. 6253.9(b)). The transfer of gathered electronic records onto CD or Diskette typically cost $10.00 each. An invoice will accompany your records when completed.

9. For further clarification please refer to the California Public Records Act (California Gov. Code Sec. 6250 et seq.) and/or the District's Guidelines for Implementing the California Public Records Act. The Guidelines are available in the lobby of the District Headquarters or on the District's web site at www.aqmd.gov.

If you have questions pertaining to the submittal of a Public Records Act request, you may contact the Public Records Unit, **(909) 396-3700, Tuesday through Friday, 7:00 a.m. to 5:30 p.m. Our Fax number is (909) 396-3330. Our email address is PublicRecordsRequests@aqmd.gov.**

Public Records Request for Cumulative Source Information for the Alamitos Energy Center

PREPARED FOR: Public Records South Coast Air Quality Management District

PREPARED BY: Andrew Dunavent/CH2M HILL
Elyse Engel/CH2M HILL

Copied To: Jerry Salamy/CH2M HILL

DATE: October 23, 2015

PROJECT NUMBER: 491232

CH2M HILL Engineers, Inc. (CH2M HILL) is currently working on the preparation of a Supplemental Application for Certification (SAFC) for the Alamitos Energy Center (AEC). The AEC will meet the demand for new generation in the Los Angeles basin local electrical reliability area caused in large part by the closure of the San Onofre Nuclear Generating Station and anticipated retirement of over 4,000 megawatts (MW) of older, natural-gas-fired generation currently using once-through ocean water cooling (OTC). The AEC will also enable attainment of California's Renewable Energy Portfolio Standards by providing fast-starting and stopping, flexible, controllable generation with the ability to ramp up and down through a wide range of electrical output to allow the integration of intermittent, renewable energy into the electrical grid.

AES Alamitos, LLC (AES) proposes to construct the AEC at the existing AES Alamitos Generating Station site, which is located at 690 N. Studebaker Road, Long Beach, CA 90803. The AEC will consist of one two-on-one combined-cycle power block and one simple-cycle power block with a net generating capacity of 1,040 MW. The combined-cycle power block will consist of two General Electric (GE) 7FA.05 natural-gas-fired combustion turbines, two unfired heat recovery steam generators, one steam turbine generator, one auxiliary boiler, one air-cooled condenser, and related ancillary equipment. The simple-cycle power block will consist of four GE LMS-100 natural-gas-fired combustion turbines with air-cooled fin-fan coolers and related ancillary equipment. The AEC combined-cycle combustion turbines were selected by Southern California Edison in its Local Capacity Requirements Request for Offer on November 5, 2014, and the simple-cycle combustion turbines will meet the capacity needs anticipated to be identified in future California Public Utilities Commission Long-term Procurement Plans.

A cumulative air quality modeling impact analysis will be required by the California Energy Commission (CEC) as part of the SAFC process. Prior to completing the cumulative impact analysis, the CEC requests that the Project Owner contact the respective air districts to obtain the appropriate source information. Therefore, on behalf of AES, CH2M HILL would like to request a list of all stationary sources (including their physical address) of new or modified emissions since June 2014 which meet each of the following criteria:

1) Sources that are located within a six-mile radius of the AEC,
2) Sources that have recently received construction permits but are not yet operational or are currently in the permitting process (such as the New Source Review or California Environmental Quality Act permitting process), and
3) Sources that have a potential to emit five tons or more per year of nitrogen oxides (NOx), carbon monoxide (CO), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), or sulfur oxides (SOx).

Based on the three criteria above, it is anticipated that the following sources would be excluded from the cumulative impact analysis: sources emitting only volatile organic compounds (VOC), equipment shutdowns, permit-exempt equipment registrations, rule compliance, permit renewals, or replacement/system upgrades.

A list of zip codes within a six-mile radius of the AEC is attached. **Note that a similar request was submitted on April 2, 2014, and deemed complete on June 3, 2014. As such, CH2M HILL requests that the South Coast Air Quality Management District only consider sources that may have received construction permits or entered into the permitting process since June 3, 2014.**

If you have any questions regarding this request or if there are additional data request forms required, please contact Andrew Dunavent (andrew.dunavent@ch2m.com) at (619) 272-7223 or Elyse Engel (elyse.engel@ch2m.com) at (669) 800-1012 .

Alamitos Energy Center (AEC)
List of Zip Codes within a 6-mile Radius of AEC
October 2015

City	Zip Code
Buena Park	90620
La Palma	90623
Cypress	90630
Stanton	90680
Artesia	90701
Cerritos	90703
Lakewood	90712
Lakewood	90713
Lakewood	90715
Hawaiian Gardens	90716
Rossmoor	90720
Seal Beach	90740
Sunset Beach	90742
Surfside	90743
Signal Hill	90755
Long Beach	90802
Long Beach	90803
Long Beach	90804
Long Beach	90806
Long Beach	90807
Long Beach	90808
Long Beach	90813
Long Beach	90814
Long Beach	90815
Long Beach	90822
Long Beach	90831
Long Beach	90840
Long Beach	90844
Huntington Beach	92647
Huntington Beach	92648
Huntington Beach	92649
Midway City	92655
Westminster	92683
Anaheim	92804
Garden Grove	92841
Garden Grove	92845

Dunavent, Andrew/SDO

From: Lisa Ramos <lramos1@aqmd.gov>
Sent: Tuesday, November 03, 2015 6:22 AM
To: Dunavent, Andrew/SDO; OB PR Support NA Docs
Subject: Request for Records from the South Coast Air Quality Management District #83631,

ANDREW DUNAVENT
401 W BROADWAY
SAN DIEGO, CA 92101-

RE: Request for Records
Control #: 83631
Request: LIST OF STATIONARY SOURCES OF NEW OR MODIFIED EMISSIONS SINCE JUNE 2014 WITHIN 6 MI. OF THE ALAMITO ENERGY CENTER, PER ATTACHED MEMO.

Your request for records has been recieved by the Public Records Unit and has been assigned for processing.

Should you have any questions or need additional information, please do not hesitate to contact me at (909) 396-3700, Tuesday through Friday, between the hours of 8:00 a.m. 4:30 p.m. Please reference your Control Number listed above in all communications and correspondence.

Sincerely,

LISA RAMOS

For Colleen Paine
Public Records Coordinator

Dunavent, Andrew/SDO

From: Dunavent, Andrew/SDO
Sent: Tuesday, November 10, 2015 12:43 PM
To: 'Lisa Ramos'
Subject: RE: Request for Records from the South Coast Air Quality Management District #83631,

Hi Lisa,

I hope you week is going well. I am following up about a status update regarding my Request for Records (Control # 83631). I can only imagine how busy things can get at the APCD. If you have an idea of the timeframe for the request or a status update, I would greatly appreciate it.

Thanks and have a nice day,

Andrew Dunavent
Environmental Engineer I
(619) 272-7223
Andrew.dunavent@ch2m.com

CH2M
402 W. Broadway, Suite 1450
San Diego, CA 92101
-----Original Message-----
From: Lisa Ramos [mailto:lramos1@aqmd.gov]
Sent: Tuesday, November 03, 2015 6:22 AM
To: Dunavent, Andrew/SDO <Andrew.Dunavent@ch2m.com>; OB PR Support NA Docs <ob_pr_support_na_docs@aqmd.gov>
Subject: Request for Records from the South Coast Air Quality Management District #83631,

ANDREW DUNAVENT
401 W BROADWAY
SAN DIEGO, CA 92101-

RE: Request for Records
Control #: 83631
Request: LIST OF STATIONARY SOURCES OF NEW OR MODIFIED EMISSIONS SINCE JUNE 2014 WITHIN 6 MI. OF THE ALAMITO ENERGY CENTER, PER ATTACHED MEMO.

Your request for records has been recieved by the Public Records Unit and has been assigned for processing.

Should you have any questions or need additional information, please do not hesitate to contact me at (909) 396-3700, Tuesday through Friday, between the hours of 8:00 a.m. 4:30 p.m. Please reference your Control Number listed above in all communications and correspondence.

Sincerely,

LISA RAMOS

For Colleen Paine
Public Records Coordinator

Dunavent, Andrew/SDO

From: Lisa Ramos <lramos1@aqmd.gov>
Sent: Tuesday, December 01, 2015 8:14 AM
To: Dunavent, Andrew/SDO
Cc: OB PR Support NA Docs
Subject: RE: Request for Records from the South Coast Air Quality Management District #83631,

Andrew Dunavent

Your request is still routed to our Engineering Department. I sent them a reminder & will send the document as soon as it becomes available.

Lisa Ramos
South Coast A.QM.D
Public Records Unit
909.396.3211

-----Original Message-----
From: Andrew.Dunavent@ch2m.com [mailto:Andrew.Dunavent@ch2m.com]
Sent: Monday, November 23, 2015 9:03 AM
To: Lisa Ramos
Cc: Elyse.Engel@ch2m.com
Subject: RE: Request for Records from the South Coast Air Quality Management District #83631,

Hi Lisa,

I am following up about a status update regarding my Request for Records (Control # 83631) If you have an idea of the timeframe for the request or a status update, I would greatly appreciate it.

Thanks and have a nice day,

Andrew Dunavent, EIT
Environmental Engineer
CH2M
402 W. Broadway, Suite 1450
San Diego, CA 92101
Office Phone (619) 272-7223
Cell Phone (707) 372-7810

-----Original Message-----
From: Lisa Ramos [mailto:lramos1@aqmd.gov]
Sent: Tuesday, November 03, 2015 6:22 AM
To: Dunavent, Andrew/SDO <Andrew.Dunavent@ch2m.com>; OB PR Support NA Docs <ob_pr_support_na_docs@aqmd.gov>
Subject: Request for Records from the South Coast Air Quality Management District #83631,

ANDREW DUNAVENT
401 W BROADWAY
SAN DIEGO, CA 92101-

RE: Request for Records
Control #: 83631
Request: LIST OF STATIONARY SOURCES OF NEW OR MODIFIED EMISSIONS SINCE JUNE 2014 WITHIN 6 MI. OF THE ALAMITO ENERGY CENTER, PER ATTACHED MEMO.

Your request for records has been recieved by the Public Records Unit and has been assigned for processing.

Should you have any questions or need additional information, please do not hesitate to contact me at (909) 396-3700, Tuesday through Friday, between the hours of 8:00 a.m. 4:30 p.m. Please reference your Control Number listed above in all communications and correspondence.

Sincerely,

LISA RAMOS

For Colleen Paine
Public Records Coordinator

Attachment DR134-1
CCGT and SCGT Performance Data

Alamitos Energy Center
Table 5.1B.3R
Combined-Cycle: GE 7FA.05 Performance Data
December 2015

Alamitos 2x1 7FA emissions data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CTG Model	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05	7FA.05
CTG Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
CTG Load (as % of emissions compliant load range)	max	average	min	max	max	average	min	max	max	average	min	max	average	min
CTG Inlet Air Cooling	Off	Off	Off	On	Off	Off	Off	On	Off	Off	Off	Off	Off	Off
Fuel Sulfur Content (grains/100 standard cubic feet)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Ambient Conditions	Low	Low	Low	Average	Average	Average	Average	High	High	High	High	ISO	ISO	ISO
Ambient Temperature, F	28.0	28.0	28.0	65.3	65.3	65.3	65.3	107	107	107	107	59.0	59.0	59.0
Ambient Relative Humidity, %	76%	76%	76%	87%	87%	87%	87%	11%	11%	11%	11%	60%	60%	60%
Atmospheric Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Combustion Turbine Performance														
CTG Inlet Air Conditioning Effectiveness, % (ONE CTG)	N/A	N/A	N/A	90%	N/A	N/A	N/A	90%	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Loss, in. H_2O	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95
Exhaust Loss, in. H_2O	15.2	10.0	6.55	14.9	14.9	9.26	6.08	14.6	12.1	7.84	6.22	15.0	9.47	6.09
CTG Load Level (percent of Base Load)	BASE	75%	45%	BASE	BASE	75%	44%	BASE	BASE	75%	48%	BASE	75%	44%
Gross CTG Output, kW (ONE CTG)	236,645	177,484	106,017	229,659	227,708	170,781	101,102	217,778	194,136	145,602	92,797	231,197	173,398	101,727
Gross CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,671	9,122	11,742	8,834	8,867	9,184	11,660	8,918	9,035	9,639	12,136	8,790	9,126	11,615
Gross CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	9,614	10,114	13,019	9,795	9,832	10,183	12,928	9,888	10,018	10,688	13,456	9,746	10,119	12,878
Net CTG Output, kW (ONE CTG)	235,907	176,746	105,279	228,921	226,970	170,043	100,364	217,040	193,398	144,864	92,059	230,459	172,660	100,989
Net CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,698	9,160	11,824	8,862	8,896	9,224	11,746	8,948	9,069	9,688	12,233	8,818	9,165	11,700
Net CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	9,644	10,157	13,111	9,827	9,864	10,227	13,023	9,922	10,056	10,742	13,564	9,777	10,162	12,973
CTG Heat Input, MMBtu/h (LHV) (ONE CTG)	2,052	1,619	1,245	2,029	2,019	1,568	1,179	1,942	1,754	1,403	1,126	2,032	1,582	1,182
CTG Heat Input, MMBtu/h (HHV) (ONE CTG)	2,275	1,795	1,380	2,250	2,239	1,739	1,307	2,153	1,945	1,556	1,249	2,253	1,755	1,310
CTG Exhaust Flow, 10^3 lb/h (ONE CTG)	4,368	3,533	2,802	4,296	4,298	3,378	2,702	4,266	3,858	3,074	2,731	4,310	3,421	2,702
CTG Exhaust Temperature, F (ONE CTG)	1,104	1,112	1,215	1,142	1,142	1,153	1,215	1,119	1,162	1,204	1,215	1,139	1,144	1,215
Gross 2x1 Combined-Cycle, kW	692,905	529,868	355,002	688,980	684,653	519,700	342,082	628,950	569,016	435,703	307,722	692,951	524,659	342,458
Net 2x1 Combined-Cycle, kW	680,779	516,621	344,352	672,444	668,221	505,408	331,820	612,912	554,506	423,721	297,721	676,320	510,231	332,184
Gross STG Output, kW	219,615	174,900	142,968	229,662	229,237	178,138	139,878	193,394	180,744	144,499	122,128	230,557	177,863	139,004
GT Exhaust Composition % Weight (ONE CTG)														
O_2	13.85%	14.07%	14.35%	13.58%	13.64%	13.75%	14.30%	13.88%	14.08%	14.04%	14.91%	13.72%	13.90%	14.40%
CO_2	6.10%	5.95%	5.77%	6.13%	6.10%	6.03%	5.67%	5.91%	5.91%	5.93%	5.36%	6.12%	6.01%	5.68%
H_2O	5.12%	5.00%	4.85%	6.08%	6.01%	5.95%	5.66%	6.04%	5.25%	5.27%	4.81%	5.52%	5.43%	5.17%
N_2	73.58%	73.62%	73.67%	72.86%	72.90%	72.92%	73.03%	72.82%	73.41%	73.41%	73.57%	73.28%	73.31%	73.41%
Ar	1.25%	1.25%	1.25%	1.24%	1.24%	1.24%	1.24%	1.24%	1.25%	1.25%	1.25%	1.24%	1.24%	1.25%
Fuel Sulfur Content (grains/100 standard cubic feet)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Catalyst Inlet Exhaust Analysis - % Mole Basis - Wet (ONE CTG / HRSG TRAIN)														
Ar	0.89%	0.89%	0.89%	0.88%	0.88%	0.88%	0.88%	0.88%	0.89%	0.89%	0.89%	0.88%	0.88%	0.89%
CO_2	3.94%	3.85%	3.73%	3.94%	3.92%	3.88%	3.65%	3.80%	3.81%	3.83%	3.47%	3.95%	3.88%	3.67%
H_2O	8.08%	7.90%	7.67%	9.55%	9.43%	9.35%	8.90%	9.48%	8.28%	8.31%	7.60%	8.70%	8.56%	8.15%
N_2	74.72%	74.80%	74.89%	73.57%	73.65%	73.69%	73.86%	73.52%	74.47%	74.46%	74.74%	74.25%	74.30%	74.46%
O_2	12.31%	12.52%	12.77%	12.01%	12.07%	12.16%	12.66%	12.27%	12.50%	12.47%	13.26%	12.17%	12.33%	12.79%
Ave Mol Wt (based on % mol)	28.5	28.5	28.5	28.3	28.3	28.3	28.3	28.3	28.4	28.4	28.5	28.4	28.4	28.4
Total														
SO_2, lb/hr (after SO_2 oxidation)	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
SO_3, lb/hr (after SO_2 oxidation)	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
Stack Exit Temperature, F	216	178	170	213	215	175	170	221	223	198	184	209	174	170
Stack Diameter, ft (estimated)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Stack Flow, 10^3 lb/h	4,368	3,533	2,802	4,296	4,298	3,378	2,702	4,266	3,858	3,074	2,731	4,310	3,421	2,702
Stack Flow, 10^3 acfm	1,264	964	755	1,244	1,248	923	731	1,251	1,129	867	752	1,237	930	729
Stack Exit Velocity, ft/s	67.0	51.2	40.0	66.0	66.2	48.9	38.8	66.3	59.9	46.0	39.9	65.6	49.3	38.7
NO_X (Catalyst Inlet), ppmvd (dry, 15% O_2)	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
CO (Catalyst Inlet), ppmvd (dry, 15% O_2)	7.08	7.27	7.52	6.97	7.01	7.10	7.59	7.24	7.31	7.28	8.12	7.02	7.17	7.62
VOC (Catalyst Inlet), ppmvd (dry, 15% O_2)	1.10	1.13	1.17	1.08	1.09	1.10	1.18	1.13	1.14	1.13	1.26	1.09	1.11	1.19
Stack NO_X Emissions with the Effects of Selective Catalytic Reduction (SCR) (ONE CTG / HRSG TRAIN)														

Alamitos Energy Center
Table 5.1B.3R
Combined-Cycle: GE 7FA.05 Performance Data
December 2015

Alamitos 2x1 7FA emissions data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NO_X, ppmvd (dry, 15% O_2)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
NO_X, ppmvd (dry)	2.90	2.83	2.75	3.01	2.99	2.95	2.79	2.92	2.84	2.85	2.59	2.95	2.90	2.74
NO_X, ppmvw (wet)	2.69	2.63	2.55	2.74	2.73	2.70	2.56	2.66	2.62	2.63	2.40	2.71	2.67	2.54
NO_X, lb/h as NO_2	16.5	13.0	10.0	16.3	16.2	12.6	9.47	15.6	14.1	11.3	9.05	16.3	12.7	9.49
NO_X, lb/MMBtu (LHV) as NO_2	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
NO_X, lb/MMBtu (HHV) as NO_2	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072
SCR NH_3 slip, ppmvd (dry, 15% O_2)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
SCR NH_3 slip, lb/h	15.3	12.0	9.26	15.1	15.0	11.7	8.77	14.4	13.0	10.4	8.38	15.1	11.8	8.79
Ammonia Use, lb/h	43.0	34.0	26.1	42.5	42.3	32.9	24.7	40.7	36.8	29.4	23.6	42.6	33.2	24.8
Stack CO Emissions with the Effects of Catalytic Reduction (CO Catalyst) (ONE CTG / HRSG TRAIN)														
CO, ppmvd (dry, 15% O_2)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
CO, ppmvd (dry)	2.90	2.83	2.75	3.01	2.99	2.95	2.79	2.92	2.84	2.85	2.59	2.95	2.90	2.74
CO, ppmvw (wet)	2.69	2.63	2.55	2.74	2.73	2.70	2.56	2.66	2.62	2.63	2.40	2.71	2.67	2.54
CO, lb/h	10.0	7.92	6.09	9.93	9.88	7.67	5.77	9.50	8.58	6.87	5.51	9.94	7.74	5.78
CO, lb/MMBtu (LHV)	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049
CO, lb/MMBtu (HHV)	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
Stack SO_2 Emissions (ONE CTG / HRSG TRAIN)														
Assumed SO_2 oxidation rate in CO Catalyst for SO_3 calculation, vol%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Assumed SO_2 oxidation rate in SCR for SO_3 calculation, vol%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
SO_2, ppmvd (dry, 15% O_2)	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.37	0.37	0.36	0.37	0.37	0.36
SO_2, ppmvd (dry)	0.54	0.52	0.51	0.55	0.54	0.54	0.50	0.53	0.52	0.52	0.47	0.54	0.53	0.50
SO_2, ppmvw (wet)	0.49	0.48	0.47	0.49	0.49	0.49	0.46	0.48	0.48	0.48	0.43	0.50	0.49	0.46
SO_2, lb/h	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
SO_2, lb/MMBtu (LHV)	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
SO_2, lb/MMBtu (HHV)	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
Stack VOC Emissions with the Effects of Catalytic Reduction (CO Catalyst) (ONE CTG / HRSG TRAIN)														
VOC, ppmvd (dry, 15% O_2)	0.55	0.57	0.58	0.54	0.55	0.55	0.59	0.56	0.57	0.57	0.63	0.55	0.56	0.59
VOC, ppmvd (dry)	0.80	0.80	0.80	0.81	0.81	0.82	0.82	0.82	0.81	0.81	0.82	0.81	0.81	0.81
VOC, ppmvw (wet)	0.74	0.74	0.75	0.74	0.74	0.75	0.76	0.75	0.75	0.75	0.76	0.74	0.74	0.75
VOC, lb/h as CH_4 (includes VOC correction to 2.0 ppmvd @ 15% O_2)	5.75	4.54	3.49	5.68	5.66	4.39	3.30	5.44	4.92	3.93	3.16	5.69	4.43	3.31
VOC, lb/MMBtu (LHV)	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028
VOC, lb/MMBtu (HHV)	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
PM_{10} from the CTG and Duct Burner														
PM_{10} Emissions - Front and Back Half Catch														
PM_{10}, lb/h (from the CTG)	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
PM_{10}, lb/h (from the Burner)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM_{10}, lb/h (total from CTG and Burner)	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
PM_{10} with the Effects of SO_2 Oxidation [includes $(NH_4)_2$-(SO_4)] (ONE CTG / HRSG TRAIN)														
PM_{10} Emissions - Front and Back Half Catch														
PM_{10}, lb/h (incl. Ammonium Sulfate, assuming 100% conversion from SO_3)	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
PM_{10}, lb/MMBtu (LHV)	0.0041	0.0053	0.0068	0.0042	0.0042	0.0054	0.0072	0.0044	0.0048	0.0061	0.0075	0.0042	0.0054	0.0072
PM_{10}, lb/MMBtu (HHV)	0.0037	0.0047	0.0062	0.0038	0.0038	0.0049	0.0065	0.0039	0.0044	0.0055	0.0068	0.0038	0.0048	0.0065
$PM_{2.5}$ with the Effects of SO_2 Oxidation [includes $(NH_4)_2$-(SO_4)] (ONE CTG / HRSG TRAIN)														
$PM_{2.5}$ Emissions - Front and Back Half Catch														
$PM_{2.5}$, lb/h	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
$PM_{2.5}$, lb/MMBtu (LHV)	0.0041	0.0053	0.0068	0.0042	0.0042	0.0054	0.0072	0.0044	0.0048	0.0061	0.0075	0.0042	0.0054	0.0072
$PM_{2.5}$, lb/MMBtu (HHV)	0.0037	0.0047	0.0062	0.0038	0.0038	0.0049	0.0065	0.0039	0.0044	0.0055	0.0068	0.0038	0.0048	0.0065
Total Effects of SO_2 Oxidation (ONE CTG / HRSG TRAIN)														
Total SO_2 to SO_3 conversion rate for SO_3 calculation, %vol	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Amount of SO_2 converted to SO_3 for SO_3 calculation, lb/h	4.86	3.84	2.95	4.81	4.78	3.72	2.79	4.60	4.16	3.33	2.67	4.82	3.75	2.80
Maximum Stack Ammonium Sulfate [$(NH_4)_2$-(SO_4)] (assuming 100% conversion from SO_3), lb/h	10.0	7.91	6.08	9.92	9.87	7.67	5.76	9.49	8.57	6.86	5.50	9.93	7.73	5.78
Maximum Stack H_2SO_4 (assuming 100% conversion from SO_3 to H_2SO_4), lb/h	7.44	5.87	4.52	7.36	7.33	5.69	4.28	7.05	6.36	5.09	4.09	7.37	5.74	4.29

Alamitos Energy Center
Table 5.1B.3R
Combined-Cycle: GE 7FA.05 Performance Data
December 2015

Alamitos 2x1 7FA emissions data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Notes:

1. Dry air composition is as follows:
   - N_2: 78.1%
   - O_2: 21.0%
   - Ar: 0.9%
   - CO_2: 0.03%
2. Estimated emissions based on GE performance runs provided by AES on 12/23, "AES_EXTERNAL_12_22_2014_Alamitos.xlsx" and "AES_EXTERNAL_12_22_2014_Huntington Beach.xlsx"
3. As the CTG performance and emissions information utilized does not reflect guaranteed values currently offered by GE, it is recommended that additional and suitable margin be applied to the values to account for differences between expected and guaranteed CTG emissions values.
4. Ammonium sulfates created downstream of the SCR are included in front half particulates and front & back half particulates. It is assumed that 100% SO_3 is converted to ammonium sulfates in order to account for "worst case" particulate emissions.
5. CO catalyst VOC destruction rate of 50% is assumed.
6. Sulfur content in fuel gas is assumed to be 0.75 grains/100 SCF.
7. As OEM project specific information is not available, an SO_2 to SO_3 conversion rate of 100% is assumed. Use of a high conversion rate is recommended for purposes of establishing permit limitations and emissions levels to provide additional margin.
8. Ammonia use is calculated with 19% aqueous ammonia and factors in ammonia slip.
9. Information presented is not reflective of emissions control equipment guaranteed performance levels as this information is not presently available. Engineer reserves the ability to adjust information to reflect guaranteed and OEM specific information when available.
10. Information presented is intended to reflect a conservative approach to estimated stack emissions; however, no additional margin has been applied to the emissions rates.
11. Steam turbine and combined-cycle performance information presented is preliminary and for information purposes. Information is subject to change based on equipment supplier feedback and equipment selection.
12. No margin has been included in the information provided. It is recommended that additional margin be added for the purposes of establishing permit limitations.

Alamitos Energy Center
Table 5.1B.7R
Simple-Cycle: GE LMS-100PB Performance Data
December 2015

Alamitos Energy Center LMS-100PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
GE Case Number	100	101	102	103	104	105	106	122	123	124	125	130	131	132
CTG Model	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB	LMS100PB
CTG Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
CTG Load Level (percent of Base Load)	100	75	50	100	100	75	50	100	100	75	50	100	75	50
CTG Inlet Air Cooling	Off	Off	Off	On	Off	Off	Off	On	Off	Off	Off	Off	Off	Off
Ambient Conditions	Low	Low	Low	Average	Average	Average	Average	High	High	High	High	ISO	ISO	ISO
Ambient Temperature, F	28.0	28.0	28.0	65.3	65.3	65.3	65.3	107	107	107	107	59	59	59
Ambient Relative Humidity, %	76.3	76.3	76.3	86.8	86.8	86.8	86.8	10.7	10.7	10.7	10.7	60.0	60.0	60.0
Atmospheric Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Combustion Turbine Performance														
Inlet Loss, in. H_2O	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Exhaust Loss, in. H_2O	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Gross CTG Output, kW (ONE CTG)	100,317	75,011	49,671	99,215	98,788	73,878	48,916	82,840	70,821	52,867	34,887	100,438	75,030	49,740
Gross CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	7,893	8,592	10,032	7,950	7,960	8,618	10,073	8,312	8,747	9,715	11,594	7,915	8,590	10,020
Gross CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	8,761	9,538	11,135	8,825	8,836	9,566	11,181	9,226	9,710	10,783	12,869	8,785	9,535	11,122
Net CTG Output, kW (ONE CTG)	98,966	73,661	48,321	97,864	97,437	72,527	47,565	81,489	69,470	51,516	33,536	99,087	73,679	48,389
Net CTG Heat Rate, Btu/kWh (LHV) (ONE CTG)	8,001	8,750	10,312	8,060	8,070	8,778	10,359	8,449	8,917	9,969	12,061	8,023	8,748	10,299
Net CTG Heat Rate, Btu/kWh (HHV) (ONE CTG)	8,881	9,712	11,446	8,946	8,958	9,744	11,498	9,379	9,898	11,066	13,388	8,905	9,710	11,432
CTG Heat Input, MMBtu/h (LHV) (ONE CTG)	792	645	498	789	786	637	493	689	619	514	404	795	645	498
CTG Heat Input, MMBtu/h (HHV) (ONE CTG)	879	715	553	876	873	707	547	764	688	570	449	882	715	553
CTG Exhaust Flow, 10^3 lb/h (ONE CTG)	1,755	1,479	1,161	1,726	1,721	1,463	1,152	1,525	1,385	1,176	938	1,745	1,478	1,162
CTG Exhaust Temperature, F (ONE CTG)	789	816	888	797	798	814	883	837	868	908	981	794	815	885
4 LMS-100PB Gross, KW	401,268	300,045	198,686	396,860	395,152	295,511	195,663	331,360	283,284	211,467	139,549	401,751	300,120	198,958
4 LMS-100PB Gross Heat Rate, Btu/kWh (LHV)	7,893	8,592	10,032	7,950	7,960	8,618	10,073	8,312	8,747	9,715	11,594	7,915	8,590	10,020
Gross Heat Rate, Btu/kWh (LHV) (ONE CTG)	7,893	8,592	10,032	7,950	7,960	8,618	10,073	8,312	8,747	9,715	11,594	7,915	8,590	10,020
Aux Load and Transformer Losses	15,007	13,122	11,245	14,957	14,926	13,025	11,178	13,691	12,804	11,453	10,071	15,039	13,122	11,247
Net KW's for 4 LMS-100PB	386,261	286,924	187,440	381,903	380,226	282,485	184,485	317,669	270,480	200,014	129,478	386,712	286,998	187,711
Net Plant Heat Rate (all 4 LMS-100PB), Btu/kWh (LHV)	8,200	8,985	10,633	8,261	8,272	9,015	10,683	8,670	9,161	10,271	12,496	8,223	8,983	10,620
Net Plant Heat Rate (all 4 LMS-100PB), Btu/kWh (HHV)	9,102	9,974	11,803	9,170	9,182	10,007	11,858	9,623	10,169	11,401	13,870	9,127	9,971	11,788
CTG Exhaust Composition % Weight - Wet (ONE CTG)														
O_2	14.3	14.6	14.7	14.0	14.0	14.4	14.5	14.0	14.3	14.5	14.6	14.1	14.5	14.6
CO_2	5.84	5.64	5.55	5.91	5.91	5.63	5.53	5.84	5.78	5.65	5.58	5.89	5.64	5.55
H_2O	4.89	4.73	4.66	5.70	5.71	5.60	5.53	5.95	5.14	5.03	4.97	5.32	5.12	5.04
N_2	73.7	73.8	73.8	73.1	73.1	73.1	73.1	72.9	73.5	73.6	73.6	73.4	73.5	73.5
Ar	1.26	1.26	1.26	1.25	1.25	1.25	1.25	1.24	1.25	1.25	1.25	1.25	1.25	1.25
Catalyst Inlet Exhaust Analysis - % Mole Basis - Wet (ONE CTG / HRSG TRAIN)														
Ar	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89	0.89	0.90	0.90
CO_2	3.77	3.65	3.59	3.80	3.80	3.62	3.56	3.77	3.75	3.66	3.61	3.78	3.65	3.59
H_2O	7.73	7.48	7.37	8.97	8.97	8.80	8.70	9.07	7.98	7.80	7.70	7.87	7.61	7.50
N_2	74.9	75.0	75.0	73.9	73.9	73.9	74.0	73.8	74.7	74.7	74.8	74.8	74.9	74.9
O_2	12.7	13.0	13.1	12.4	12.4	12.7	12.9	12.4	12.7	12.9	13.0	12.6	12.9	13.1
Ave Mol Wt (based on % mol)	28.4	28.5	28.5	28.3	28.3	28.3	28.3	28.3	28.4	28.4	28.4	28.4	28.4	28.4
Stack Exit Temperature, F	789	816	888	797	798	814	883	837	868	908	981	794	815	885
Stack Diameter, ft (estimated)	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Stack Flow, 10^3 lb/h	1,755	1,479	1,161	1,726	1,721	1,463	1,152	1,525	1,385	1,176	938	1,745	1,478	1,162
Stack Flow, 10^3 acfm	938	807	670	933	931	802	665	852	789	689	579	939	808	670
Stack Exit Velocity, ft/s	109	94.0	78.0	109	108	93.3	77.4	99.2	91.8	80.3	67.4	109.3	94.1	78.0
NO_X (Catalyst Inlet), ppmvd (dry, 15% O_2)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
CO (Catalyst Inlet), ppmvd (dry, 15% O_2)	100	100	125	100	100	100	125	100	100	100	125	100	100	125
VOC (Catalyst Inlet), ppmvd (dry, 15% O_2)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Estimated Maximum Emissions (at CTG Exhaust) x (GE Data, One CTG)														

Alamitos Energy Center
Table 5.1B.7R
Simple-Cycle: GE LMS-100PB Performance Data
December 2015

Alamitos Energy Center LMS-100PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NO_X, ppmvd (15% O_2)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
NO_X as NO_2, lb/hr	82.3	67.0	51.8	82.0	81.7	66.2	51.2	71.5	64.4	53.4	42.0	82.6	67.0	51.8
CO, ppmvd (15% O_2)	100	100	125	100	100	100	125	100	100	100	125	100	100	125
CO, lb/hr	200	163	158	200	199	161	156	174	157	130	128	201	163	158
VOC, ppmvd (15% O_2)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
VOC, lb/hr	4.59	3.74	2.89	4.57	4.56	3.69	2.86	3.99	3.59	2.98	2.34	4.61	3.74	2.89
Fuel Sulfur Content, gr/100 scf	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
PM_{10}, lb/hr	4.33	0.00	0.00	4.33	4.33	0.00	0.00	4.33	4.33	0.00	0.00	4.33	0.00	0.00
SO_2, lb/hr	1.62	1.32	1.02	1.62	1.61	1.31	1.01	1.41	1.27	1.05	0.83	1.63	1.32	1.02
SO_3, lb/hr	0.11	0.09	0.07	0.11	0.11	0.09	0.07	0.09	0.08	0.07	0.05	0.11	0.09	0.07
Estimated Maximum Emissions (at Stack) x (GE Data, One CTG)														
NO_X, ppmvd (15% O_2)	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
NO_X as NO_2, lb/hr	8.23	6.70	5.18	8.20	8.17	6.62	5.12	7.15	6.44	5.34	4.20	8.26	6.70	5.18
CO, ppmvd (15% O_2)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
CO, lb/hr	8.01	6.52	5.04	7.98	7.96	6.44	4.99	6.97	6.27	5.20	4.09	8.05	6.52	5.04
VOC, ppmvd (15% O_2)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
VOC, lb/hr	2.30	1.87	1.44	2.29	2.28	1.85	1.43	2.00	1.80	1.49	1.17	2.30	1.87	1.44
NH_3, ppmvd (15% O_2)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
NH_3, lb/hr	6.09	4.96	3.83	6.07	6.05	4.90	3.79	5.30	4.77	3.95	3.11	6.12	4.96	3.83
PM_{10}, lb/hr	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	0.00	0.00
Sulfur, Stack Ammonium Sulfate and PM Calculations with 0.75 grain/100 scf Sulfur - PEC Calculation (One CTG)														
Fuel Sulfur Content, gr/100 scf	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Fuel Molecular Weight, lbm/lbmol	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7	16.7
Fuel Flow, lb/hr	38,300	31,176	24,101	38,151	38,035	30,795	23,833	33,304	29,965	24,842	19,565	38,451	31,176	24,106
SCFM Fuel (LHV)	14,480	11,787	9,112	14,424	14,380	11,643	9,011	12,591	11,329	9,392	7,397	14,537	11,787	9,114
Elemental Sulfur Molar Weight	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
SO_2 Molar Weight	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1
SO_3 Molar Weight	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1
Ammonium Sulfate Molar Weight	132	132	132	132	132	132	132	132	132	132	132	132	132	132
H_2SO_4 Molar Weight	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1
Elemental Sulfur in Fuel, lb/hr	0.62	0.51	0.39	0.62	0.62	0.50	0.39	0.54	0.49	0.40	0.32	0.62	0.51	0.39
Moles of Sulfur in Fuel, lbmol/hr	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.01
% Sulfur Oxidized to SO_2, assumed	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
% Sulfur Oxidized to SO_3, assumed	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Conservative SO_2 Calculation at CTG Exhaust, 90% oxidation assumption, lb/hr	1.12	0.91	0.70	1.11	1.11	0.90	0.69	0.97	0.87	0.72	0.57	1.12	0.91	0.70
Conservative SO_3 Calculation at CTG Exhaust, 10% oxidation assumption, lb/hr	0.15	0.13	0.10	0.15	0.15	0.12	0.10	0.13	0.12	0.10	0.08	0.16	0.13	0.10
SO_2 Moles at Catalyst Inlet	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01
Assumed SO_2 oxidation rate in CO Catalyst for SO_3 calculation, vol%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%
Assumed SO_2 oxidation rate in SCR for SO_3 calculation, vol%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SO_3, lb/hr created in CO Catalyst	0.60	0.49	0.38	0.60	0.60	0.48	0.37	0.52	0.47	0.39	0.31	0.60	0.49	0.38
SO_3, lb/hr created in SCR Catalyst	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00
SO_3, lb/hr from Catalysts	0.61	0.50	0.38	0.61	0.61	0.49	0.38	0.53	0.48	0.40	0.31	0.61	0.50	0.38
Total SO_3, lb/hr (Catalysts plus initial fuel SO_3)	0.77	0.62	0.48	0.76	0.76	0.62	0.48	0.67	0.60	0.50	0.39	0.77	0.62	0.48
Maximum Stack Ammonium Sulfate [$(NH_4)_2$-(SO_4)] (assuming 100% conversion from SO_3), lb/h	1.26	1.03	0.79	1.26	1.25	1.02	0.79	1.10	0.99	0.82	0.65	1.27	1.03	0.80
Maximum Stack H_2SO_4 (assuming 100% conversion from SO_3 to H_2SO_4), lb/h	0.94	0.76	0.59	0.93	0.93	0.75	0.58	0.82	0.73	0.61	0.48	0.94	0.76	0.59
Total PM_{10} at Stack, lb/h per 1 LMS-100PB	5.60	1.03	0.79	5.59	5.59	1.02	0.79	5.43	5.32	0.82	0.65	5.60	1.03	0.80
Catalyst Ammonia Usage - PEC Calculation (One CTG)														
Total Catalyst NO_X Removal, lb/hr	74.0	60.3	46.6	73.8	73.5	59.5	46.1	64.4	57.9	48.0	37.8	74.3	60.3	46.6
NO_X Removal Efficiency, %	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
NO_X Molar Weight	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
NH_3 Molar Weight	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0

Alamitos Energy Center
Table 5.1B.7R
Simple-Cycle: GE LMS-100PB Performance Data
December 2015

Alamitos Energy Center LMS-100PB Emissions Data

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NH_3 required for NO_X Removal, lb/hr	27.4	22.3	17.2	27.3	27.2	22.0	17.0	23.8	21.4	17.7	14.0	27.5	22.3	17.2
NH_3 Slip (assumed to be NH_3 in Stack), lb/hr	6.09	4.96	3.83	6.07	6.05	4.90	3.79	5.30	4.77	3.95	3.11	6.12	4.96	3.83
Total Ammonia Usage	33.5	27.2	21.1	33.3	33.2	26.9	20.8	29.1	26.2	21.7	17.1	33.6	27.2	21.1
19% Aqueous Ammonia Solution, lb NH_3/ft^3	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Aqueous Ammonia Usage, gph per 1 LMS-100PB	22.8	18.5	14.3	22.7	22.6	18.3	14.2	19.8	17.8	14.8	11.6	22.8	18.5	14.3
19% Aqueous Ammonia Usage, lb/hr per CTG	176	144	111	176	175	142	110	153	138	114	90	177	144	111
THE BELOW IS FROM GE PERFORMANCE AND EMISSIONS 2.10.15														
Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)														
AR	1.26	1.26	1.26	1.25	1.25	1.25	1.25	1.24	1.25	1.25	1.25	1.25	1.25	1.25
N_2	73.7	73.8	73.8	73.1	73.1	73.1	73.1	72.9	73.5	73.6	73.6	73.4	73.5	73.5
O_2	14.3	14.6	14.7	14.0	14.0	14.4	14.5	14.0	14.3	14.5	14.6	14.1	14.5	14.6
CO_2	5.84	5.64	5.55	5.91	5.91	5.63	5.53	5.84	5.78	5.65	5.58	5.89	5.64	5.55
H_2O	4.89	4.73	4.66	5.70	5.71	5.60	5.53	5.95	5.14	5.03	4.97	5.32	5.12	5.04
SO_2														
CO	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
HC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)														
AR	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
N_2	81.2	81.0	81.0	81.2	81.2	81.1	81.0	81.2	81.1	81.1	81.0	81.2	81.1	81.0
O_2	13.7	14.0	14.1	13.6	13.6	14.0	14.1	13.7	13.8	14.0	14.1	13.6	14.0	14.1
CO_2	4.09	3.94	3.88	4.18	4.18	3.97	3.90	4.14	4.06	3.96	3.91	4.15	3.96	3.89
H_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO_2	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CO	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
HC	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	----------	----------	----------	----------	----------	----------	----------
Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)														
AR	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89
N_2	74.9	75.0	75.0	73.9	73.9	73.9	74.0	73.6	74.6	74.6	74.7	74.4	74.5	74.6
O_2	12.7	13.0	13.1	12.4	12.4	12.7	12.9	12.4	12.7	12.9	13.0	12.5	12.8	13.0
CO_2	3.77	3.65	3.59	3.80	3.80	3.62	3.56	3.75	3.73	3.65	3.61	3.80	3.64	3.58
H_2O	7.73	7.48	7.37	8.97	8.97	8.80	8.70	9.34	8.10	7.94	7.85	8.38	8.07	7.96
SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
HC	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NO_X	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Attachment DR136-1
PM_{10} and VOC Emission Reduction Credits

CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Emission Reduction Credit

Facility	115394
Certificate No.	AQ014169
Application No.	578697

To: AES ALAMITOS, LLC

In the Amount of 1 Pounds/Day of Particulate Matter Less than 10 Microns

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/9/2015 Start Year: 0 End Year: 0

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 17

Previous Certificate No: AQ014160

Previous Owner, ID: CE2 CARBON CAPITAL, LLC, ID 178346

Reduction Created At: 1001 N TUSTIN
SANTA ANA, CA 92705

Description of Reduction: Beginning Amount

Date Reduction Created: 7/4/1991

Original Certificate No.: AQ000491

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
Any use or transfer of ownership must be approved by the SCAQMD

CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Emission Reduction Credit

Facility	115394
Certificate No.	AQ014168
Application No.	578696

To: AES ALAMITOS, LLC

In the Amount of 4 Pounds/Day of Particulate Matter Less than 10 Microns

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/9/2015 Start Year: 0 End Year: 0

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014162

Previous Owner, ID: CE2 CARBON CAPITAL, LLC, ID 178346

Reduction Created At: 750 ELDRIDGE ST
TERMINAL ISLAND, CA 90731

Description of Reduction: Beginning Amount

Date Reduction Created: 6/28/1990

Original Certificate No.: AQ006307

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
Any use or transfer of ownership must be approved by the SCAQMD

CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Short Term Emission Reduction Credit

Facility	115394
Certificate No.	AQ014175
Application No.	578453

To: AES ALAMITOS, LLC

In the Amount of 5 Pounds/Day of Reactive Organic Gases

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/13/2015 Start Year: 2015 End Year: 2015

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014124

Previous Owner, ID: ELEMENT MARKETS LLC, ID 155272

Reduction Created At: 500 CRENSHAW BLVD
TORRANCE, CA 90503

Description of Reduction: Derived From Shut Down

Date Reduction Created: 11/17/2010

Original Certificate No.: AQ013346

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
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CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Short Term Emission Reduction Credit

Facility	115394
Certificate No.	AQ014176
Application No.	578454

To: AES ALAMITOS, LLC

In the Amount of 5 Pounds/Day of Reactive Organic Gases

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/13/2015 Start Year: 2016 End Year: 2016

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014125

Previous Owner, ID: ELEMENT MARKETS LLC, ID 155272

Reduction Created At: 500 CRENSHAW BLVD
TORRANCE, CA 90503

Description of Reduction: Derived From Shut Down

Date Reduction Created: 11/17/2010

Original Certificate No.: AQ013347

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
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CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Short Term Emission Reduction Credit

Facility	115394
Certificate No.	AQ014177
Application No.	578455

To: AES ALAMITOS, LLC

In the Amount of 5 Pounds/Day of Reactive Organic Gases

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/13/2015 Start Year: 2017 End Year: 2017

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014126

Previous Owner, ID: ELEMENT MARKETS LLC, ID 155272

Reduction Created At: 500 CRENSHAW BLVD
TORRANCE, CA 90503

Description of Reduction: Derived From Shut Down

Date Reduction Created: 11/17/2010

Original Certificate No.: AQ013348

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
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CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Short Term Emission Reduction Credit

Facility	115394
Certificate No.	AQ014178
Application No.	578457

To: AES ALAMITOS, LLC

In the Amount of 5 Pounds/Day of Reactive Organic Gases

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/13/2015 Start Year: 2018 End Year: 2018

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014127

Previous Owner, ID: ELEMENT MARKETS LLC, ID 155272

Reduction Created At: 500 CRENSHAW BLVD
TORRANCE, CA 90503

Description of Reduction: Derived From Shut Down

Date Reduction Created: 11/17/2010

Original Certificate No.: AQ013349

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
Any use or transfer of ownership must be approved by the SCAQMD

CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Short Term Emission Reduction Credit

Facility	115394
Certificate No.	AQ014179
Application No.	578458

To: AES ALAMITOS, LLC

In the Amount of 5 Pounds/Day of Reactive Organic Gases

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/13/2015 Start Year: 2019 End Year: 2019

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014128

Previous Owner, ID: ELEMENT MARKETS LLC, ID 155272

Reduction Created At: 500 CRENSHAW BLVD
TORRANCE, CA 90503

Description of Reduction: Derived From Shut Down

Date Reduction Created: 11/17/2010

Original Certificate No.: AQ013350

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
Any use or transfer of ownership must be approved by the SCAQMD

AQMD

CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

The South Coast Air Quality Management District hereby registers this Short Term Emission Reduction Credit

Facility	115394
Certificate No.	AQ014180
Application No.	578459

To: AES ALAMITOS, LLC

In the Amount of 5 Pounds/Day of Reactive Organic Gases

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/13/2015 Start Year: 2020 End Year: 2020

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014129

Previous Owner, ID: ELEMENT MARKETS LLC, ID 155272

Reduction Created At: 500 CRENSHAW BLVD
TORRANCE, CA 90503

Description of Reduction: Derived From Shut Down

Date Reduction Created: 11/17/2010

Original Certificate No.: AQ013351

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
Any use or transfer of ownership must be approved by the SCAQMD

CERTIFICATE OF PROOF
FOR REGISTERED EMISSION REDUCTION CREDIT

AQMD

The South Coast Air Quality Management District hereby registers this Emission Reduction Credit

Facility	115394
Certificate No.	AQ014181
Application No.	578460

To: AES ALAMITOS, LLC

In the Amount of 5 Pounds/Day of Reactive Organic Gases

Type of Certificate: CHANGE OF TITLE

Date of Issue: 10/13/2015 Start Year: 2021 End Year: 9999

Sensitive Zone of Origin: 01 - COASTAL NSR Zone of Origin: 03

Previous Certificate No: AQ014130

Previous Owner, ID: ELEMENT MARKETS LLC, ID 155272

Reduction Created At: 500 CRENSHAW BLVD
TORRANCE, CA 90503

Description of Reduction: Derived From Shut Down

Date Reduction Created: 11/17/2010

Original Certificate No.: AQ013352

Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering and Compliance

ORIGINAL
NOT NEGOTIABLE
Any use or transfer of ownership must be approved by the SCAQMD

Cultural Resources (137-145)

BACKGROUND

Staff has reviewed the Cultural Resources Section of the Supplemental Application for Certification (SAFC). Staff identified a number of points where clarification would aid staff in identifying sources of information for its analysis, and in accurately understanding the proposed project and potential resulting impacts.

DATA REQUESTS

137. Provide a legend item for Figure 5.3-1 that identifies the limits of archaeological survey.

Response: Figure 5.3-1R presents the limits of the archaeological survey.

138. The Cultural Resources Section of the SAFC says that "most" proposed AEC improvements would be built at or near existing grade "with little excavation" (AES 2015:5.3-2). Please clarify which improvements would require excavation to some extent.

Response: All of the equipment that will require excavations is noted as such on the general arrangement figure, SAFC Figure 2.1-2.

139. The citation California State Military Museum (n.d., cited in AES 2015:5.3-12) lacks a bibliographic entry in the Cultural Resources Section's References Cited and the cultural resources report (Cardenas et al. 2013). Please provide the bibliographic data.

Response: There is a citation for the following in the technical report (Cardenas et al. 2013):

California State Military Museum. 2012. Historic California Posts, Naval Station, Long Beach. Available online at: http://www.militarymuseum.org/NOBLongBeach.html. Accessed January 12, 2012.

This is the correct reference for the California State Military Museum. The above citation should have noted "2012", rather than "n.d.".

140. The URLs for the following sources are no longer valid. Please provide an alternate means for checking these sources.

a. Johnson (2008, cited in AES 2015:5.3-6, 5.3-36)
b. NRHP (2012, cited in AES 2015:5.3-9, 5.3-37)
c. NPS (2004, cited in AES 2015:5.3-13)
d. Cambridge University Engineering Department (2000, cited in AES 2015:5.3-13)
e. Encyclopedia Britannica (1995, cited in AES 2015:5.3-13)
f. Lundsten and Flick (2012, cited in AES 2015:5.3-15)

Response: The tech report was written in 2013 and researched in 2012 to 2013. The following URLs are currently active as of December 2015 and have links to the above citations. Please note that Johnson (2008) is the same as listed in the technical report (Cardenas et al. 2013). The link was checked in December 2015 and found to be active.

a. Johnson (2008, cited in AES 2015:5.3-6, 5.3-36) http://www.nps.gov/chis/learn/historyculture/arlington.htm

b. NRHP (2012, cited in AES 2015:5.3-9, 5.3-37) http://focus.nps.gov/nrhp

   From this link, the State field (California) and the County field (Los Angeles) need to be entered to obtain search results.

c. NPS (2004, cited in AES 2015:5.3-13)
http://www.nps.gov/parkhistory/online_books/5views/5views4a.htm

d. Cambridge University Engineering Department (2000, cited in AES 2015:5.3-13)

The link for this reference is broken and the specific article could not be located in 2015; however, the reference is not cited in either the technical report or the SAFC.

e. Encyclopaedia Britannica (1995, cited in AES 2015:5.3-13)

This source was updated in 2014 and the original source document is no longer available. The information in the article at the link below contains the same information used in the report. The update was completed by Fred Landis and edited by Charles R. Russell. Landis, Fred. 2014. Energy Conversion. In, Encyclopaedia Britannica. Charles R. Russell, editor. Available online at: http://www.britannica.com/technology/energy-conversion. Accessed December 11, 2015.

f. Lundsten and Flick (2012, cited in AES 2015:5.3-15)

The link for this article is broken. The article does not appear to be available in any other location online. A request for a hard copy of this article was submitted directly to the University of Southern California on December 11, 2015.

141. The SAFC states that Section 2.4.2 contains a detailed description of the Gabrielino village, Puvunga (AES 2015:5.3-23). Section 2.4.2 of which document?

Response: Information on Puvunga is included in Section 2.4.4 of the technical report (Cardenas et al. 2013) and in Section 5.3.2.3.1 of the SAFC (AES 2015).

142. Why was the former tank farm area subjected to archaeological survey twice in 2015 (see AES 2015:5.3-24)?

Response: The former tank farm area was surveyed in two phases. One half of the tank farm was surveyed in April 2015. At that time, only the eastern half of the tank farm was part of the project. In August 2015, a road was proposed through the second half of the tank farm to connect Studebaker Road with the project. As the road will involve ground disturbance, the western half of the former tank farm was surveyed in September 2015.

143. Section 5.3.3.6 of the SAFC gives the acreage surveyed as 125 acres, whereas elsewhere the SAFC says that 158 acres were surveyed (AES 2015:5.3-2, 5.3- 24). Which acreage figure is correct?

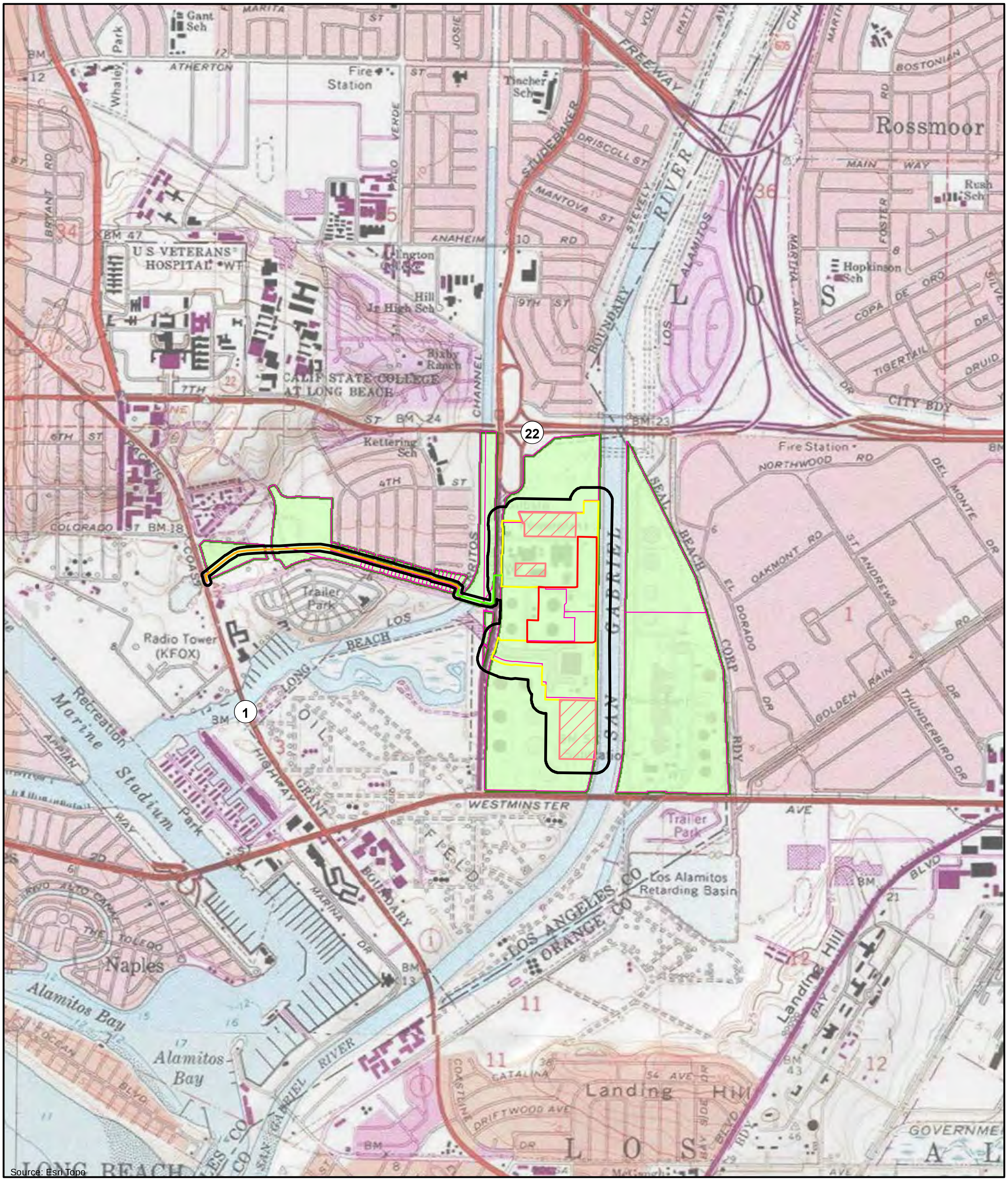
Response: The correct acres surveyed is 148.8.

144. Work plans dated July 2012 and January 2013 proposed more than 130 borings along fuel oil pipelines and monitoring wells combined (EMS 2015:21). The accompanying data logs would probably have information useful for staff's estimate of the depth of fill and Holocene-age sediments underneath the project site. Have these borings and monitoring wells been made? If so, please provide staff with copies of the ensuing reports and data logs.

Response: The Applicant has reviewed its files and it does not have a copy of the January 2013 Southern California Edison report being requested. Attachment DR144-1 presents a copy of the July 2012 Soil Investigation Work Plan. The Applicant has requested a copy of this report from SCE, and if received it will be promptly docketed.

145. In November 2014, a soil characterization report was completed based on the results of 119 hand augers around the Alamitos Generating Station (AGS) retention basins, 18 background borings, and 122 borings along pipelines (EMS 2015:21). Please provide a copy of this report to staff for characterization of project site stratigraphy.

Response: Attachment DR145-1 presents the November 2014 soil characterization report requested.



Source: Esri Topo

Legend

- AEC Site
- AGS Boundary
- Parking/Laydown Construction Area
- Parcel Boundary
- Archaeological Survey Area
- Architectural Survey Area
- Proposed New Process/Sanitary Wastewater Pipeline to First Point of Interconnection
- Potential Sewer Upgrade

0 1,000 2,000 Feet

N

FIGURE 5.3-1R
Archaeological and Historic Architectural Survey Area
Alamitos Energy Center
Long Beach, California
December 2015

Attachment DR144-1
July 2012 Soil Investigation Work Plan

SOIL INVESTIGATION WORK PLAN
PIPELINES and RETENTION BASINS
Alamitos Generating Station

Southern California Edison Company

July 2012

Prepared By:

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Figure 5a: Bore-Hole locations -- Units 5-6 Fireside Wash Pipelines

Appendix 1: Soil Sampling and Analysis Plan

Appendix 2: Soil Vapor Sampling and Analysis Plan

1. Introduction

In 1996, Southern California Edison Company (Edison) implemented a Water Quality Monitoring Program in response to a Final Judgment pursuant to a Stipulation, handed down by the Superior Court of California, Los Angeles County, Number BC 121219 on February 1, 1995. The Stipulation alleged that Edison had stored hazardous wastes in non-permitted wastewater retention basins at their generating stations in southern California. Edison agreed to clean close these basins according to Chapter 15 of Title 22, California Code of Regulations.

Investigations pursuant to 22 CCR 66265.98 began at the Alamitos Generating Station in 1996. The purpose of the investigations was to demonstrate if any environmental contamination had resulted from the operation of the retention basins at the facility. The investigations included the implementation of an evaluation groundwater monitoring program and soil sampling beneath the retention basin liners and adjacent to the footprint of the basins. The geographic location of the facility is shown on Figures 1 and 2.

As part of the closure process, the DTSC is requiring Edison to investigate any station feature that conveyed wastewater to and from the retention basins. Edison began this task by a determination of which station features were directly related to the basins, each feature's use, and whether the feature was part of a process that could create hazardous materials. Several station personnel were interviewed during this process. To the extent possible, design drawings were obtained and examined. Each of the features determined to be associated with the retention basins was inspected at the station.

The results of the investigation revealed that several pipelines convey wastewater to the retention basins. These pipelines convey wastewater from various station drains originating at the steam generation units. These drains include floor drains, steam trap drains, boiler acid wash drains, fireside wash drains, and boiler blowdown drains. It has previously been determined that the floor, steam trap, and boiler blowdown drains are not related to a process that could create hazardous materials. However, the drains associated with the boiler acid washes historically conveyed wastewater with low pH values and metals. Wastewater from the fireside washes typically contained hydrocarbons and metals. The station later discontinued the use of the boiler acid and fireside washes.

The purpose of the boiler acid wash was to clean the boiler steam tubes. During the production of steam, the boiler tubes would become coated with material deposited from the water. The coating would cause the heating cycle to become less efficient. When this occurred, an acid wash would be performed on the boiler. This was performed by injecting an acid solution into the boiler tubes. The resultant waste solution was conveyed through pipelines to a pump sump and then the retention basin. This practice was discontinued in 1996.

The purpose of the fireside wash was to clean the outside of the boiler tubes. During the early decades of operation, when the station burned fuel oil, deposits occurred on the boiler walls and on the boiler tubes. The deposits caused a reduction in the efficiency of the heat transfer to the tubes. The fireside wash was used to clean the deposits from the tubes and boiler when it was determined necessary. This was performed by externally washing the boiler walls and tubes with water. The wash water was diverted into pipelines via collector drains. These pipelines conveyed the wastewater to sediment traps adjacent to each unit. Fuel oil use was discontinued in the 1970s, when air quality regulations required a switch to clean-burning natural gas. Since then, these residual deposits have not been an issue, and fireside washes were discontinued.

An additional pipeline conveying wastewater to the basins originates at a sump near Unit 6 which was initially used to collect regeneration wastewater from a demineralizer. This is a surface pipeline located on a pipe rack on the eastern boundary (Figure 5). Prior to 1991, the station operated a demineralizer to produce ultra-clean water for the steam system. This process utilized both acid and caustic materials. The regeneration wastewater was collected in a small sump associated with the treatment facility. The dimension of the sump is nine feet by nine feet with a depth of nine feet. During the process, this sump would often contain water with a low pH value. The station discontinued this process in 1991 and presently uses a portable reverse osmosis system. The sump is presently used to collect regeneration water from this reverse osmosis unit. This wastewater contains concentrations of general anions and cations similar to those generated in home reverse osmosis units.

The sump was investigated in 1996 as part of a sump integrity study for all generating stations. The results of this investigation were presented to the DTSC in a report titled "Sump Integrity Report" dated December 19, 1996. It was determined that the sump had not leaked low pH water to the soil.

The following sections describe the results of the investigation determining the origin of wastewater entering the retention basins. It relates the physical description of the features. The last section is the proposed investigation. Appendix 1 is the Sampling and Analysis Plan that will be used to perform the soil investigation. The Sampling and Analysis Plan for the soil vapor investigation is contained in Appendix 2.

2. Drain Systems

Alamitos Generating Station is composed of three pairs of generators, Units 1-2, Units 3-4, and Units 5-6 shown on Figure 3. Each pair was constructed at different times over the years and is serviced by separate boiler acid wash and fireside wash systems. Each pair has a designated retention basin established for the wastewater generated by the pair of units. Later, after all three pairs of units were operating; a pipeline was constructed connecting the three retention basins to maximize the operation of the wastewater systems.

The boiler acid wash and fireside wash systems for Units 1-2 are conveyed through a common pipeline to the oil/water separator at the southeast corner of the units. The separator allowed any heavy particles to settle from the wastewater as it passed through the structure. In the separator, the wastewater would also commingle with water from other drains. The wastewater from the separator would gravity flow a short distance to a transfer sump. This sump also received boiler blowdown water. The combined water was pumped from the transfer sump to the North Basin and eventually the outfall.

Units 3-4 and Units 5-6 have a common design. The fireside wash wastewater drains to a sediment trap associated with each of the four units. The wastewater then gravity flows to a pump sump attached to an oil/water separator located between each of the unit pairs. Through a separate pipeline, the pump sump also receives the acid wash waste solutions. There was no commingling of the waste solutions since the acid wash and fireside wash processes were not performed concurrently. The waste water solution for Units 3-4 was pumped to the Central Basin while the South Basin received the solution from Units 5-6. The wastewater was eventually pumped into the cooling water system at the outfall structure after treatment and testing to ensure compliance with permit effluent limits.

After the completion of Units 5-6, the three existing retention basins were connected with a pipeline located along the eastern side of the basins. This line allowed station Operators more flexibility in storing wastewater. This pipeline is above grade to the south and buried north of the Central Basin (Figure 3).

The Boiler Chemical Cleaning Basin (BCCB) was constructed specifically for the purpose of processing the waste solutions generated by the acid wash system. The two small basins shown on Figure 4 are hydraulically connected by a pipe through the dike. The waste solution was processed as follows. First, it was treated with lime to raise the pH and precipitate out any metals. The clear liquids were then pumped off to the adjacent basin, neutralized and tested for metals to verify they were non-hazardous, before being pumped to the Central Basin. The solids were then processed through a filter press, located on the dike, until they were removed. The remaining solution was pumped to the Central Basin where it was commingled with other wastewater and then discharged into the cooling water system under the station's NPDES permit. Waste solution to the BCCB from Units 1-2 and Units 3-4 entered through the pipeline shown in green (Figure 4) while the solution from Units 5-6 was conveyed through the above-grade pipeline on the east.

A third system that conveyed wastewater to the retention basins is the pipeline associated with the water treatment facility. In the past, this pipeline conveyed low pH wastewater from the regeneration of a demineralizer system. This is an above grade pipeline shown on Figure 5.

3. Constituents of Concern

The project list of Constituents of Concern (COCs) has historically been pH, metals, and Volatile Organic Compounds (VOCs). Based on work plan development discussions with DTSC project staff from the Geological Services Branch and Human and Ecological Risk Office, the list of potential COCs was expanded to include Total Petroleum Hydrocarbons (TPH). Further, Edison agreed to analyze samples from within the sediment traps/sumps closest to the units, to determine whether additional COCs requiring investigation were present.

In November 2011, the sediment traps from Unit 3and Unit 4 were sampled for metals, TPH, carcinogenic Polynuclear Aromatic Hydrocarbons (c-PAHs), and dioxins/furans. Significant concentrations of metals, and TPH were detected. The c-PAHs were not detected, but at significantly elevated detection limits. These elevated detection limits were related to dilution factors caused by the high TPH concentrations. Based on these findings, c-PAHs have been added to the COC list. Although dioxins/furans were detected in the samples, the Toxicity Equivalency Quotient (TEQ) concentrations were all below the 2009 California suggested remedial goal value of 50 nanograms per gram, for residential exposures. Even though these concentrations are below the Residential remedial goal, the DTSC Geological Services Branch has requested dioxin/furan sampling and analysis.

In April 2012, the sediment traps from Unit 5 and Unit 6 were sampled for metals, TPH, carcinogenic Polynuclear Aromatic Hydrocarbons (c-PAHs), and dioxins/furans. Significant concentrations of metals, and TPH were detected. The c-PAHs were not detected, but at significantly elevated detection limits. These elevated detection limits were related to dilution factors caused by the high TPH concentrations. Based on these findings, c-PAHs have been added to the COC list. Although dioxins/furans TEQ were all below the 2009 California suggested remedial goal for residential exposures, the DTSC Geological Services Branch similarly requested sampling and analysis at these Units.

4. Conclusions

It was determined that three drain systems conveyed wastewater which could have potentially contained hazardous materials: boiler acid wash, fireside wash, and water treatment facility. These processes could create wastewater with low pH, metals, dioxins/furans, and hydrocarbon constituents. As directed by the DTSC, a soil investigation will be performed along the pipelines and related sumps and traps for the boiler acid and fireside wash drain system. The water treatment facility demineralizer pipeline is located above grade and will not require a soil investigation. The investigation will include borings adjacent to the sumps and sediment traps. The scope of the investigation is outlined below.

5. Investigation

The pipelines, which could have potentially conveyed hazardous materials, will be investigated by retrieving soil samples from 93 boring locations shown on Figures 4, 4a, 5, and 5a. The proposed boring locations to collect soil samples investigating the pipelines, sumps, and traps are shown in red. The borings have been positioned at pipeline elbows where leakage is most likely to occur and on a minimum of 50-foot intervals. The figures also show the location of existing bore-holes where soil samples were collected for the basin investigation. These are shown in blue. The analytical data derived from these samples will be used to determine if leakage from the adjacent pipeline has occurred.

Soil sampling beneath the power block area is extremely difficult because of the thick reinforced concrete foundations and low overhead clearance. As agreed at other stations, the pipeline investigation will begin at the concrete/asphalt interface along the pipelines.

Table 1 lists the number of soil samples to be collected at each boring, the sample depth, and the feature that the samples will be investigating, i.e. pipeline, sump or trap. A sample will be collected at the invert of the pipeline and two feet beneath the invert. The borings adjacent to the sumps and traps will be sampled at the invert of the intake and outlet pipes, and at a depth of one foot beneath the bottom of the feature. All soil samples will be collected using the protocol described in the Soil SAP (Appendix 1).

The bore-hole locations for the pipelines, sumps and traps associated with Units 1-2 and Units 3-4 are shown on Figure 4. The pipeline conveying the wastewater from Units 1-2 (black) passes over the wastewater pipeline from Units 3-4 (green). A detailed view of the bore-hole locations for the acid wash and fireside wash pipelines near the pump sump at Units 3-4 is shown on Figure 4a. Figure 5 shows the bore-hole locations for the pipelines, sump and traps associated with Units 5-6. A detailed view of the bore-hole locations for the fireside wash pipelines, sump, and traps is shown on Figure 5a.

Deeper samples will be collected in any boring if the pH screening records values less than 6 or greater than 9 for the second sample. Additional samples will also be collected if the soil at the deepest sample shows evidence of leakage such as discoloration or odor. Step-out borings will be installed if the analytical findings from the samples proposed in this work plan require further investigation. The DTSC will be notified if additional work is necessary.

The pipelines being investigated with this Work Plan could have conveyed low pH wastewater which could have contained metal parameters from the chemical processes. Analytical testing of sediments contained in the sediment traps at Alamitos has detected the presence of dioxins and TPH from the oil residue. Semi-volatile organic compounds (PAHs) have been detected in the sediment trap materials at other stations. The Constituents of Concern (COCs) for the pipeline investigation will be as follows: pH, CAM metal parameters, and volatile organic compounds (VOCs). Analysis for dioxins, TPH, and PAHs will be included for nineteen samples collected adjacent to the traps and sumps which would most likely be the source for these parameters. These samples are shown in red on Table 1. If a suspected pipeline leak is detected in a sample by analytical or physical data that sample will then be re-analyzed for dioxins, TPH, and PAHs.

This investigation will include a soil vapor survey around each of the four retention basins. Existing soil matrix VOC data collected beneath and adjacent to the North, BCCB, and South basins has recorded only a few detections. The probe spacing around these basins will be set at screening dimensions, as detailed in Appendix 2. However, a known soil vapor plume exists north and east of the Central Basin. This plume was investigated in January 2000 using outdated protocol. A new detailed soil vapor survey will be performed to verify the nature and extent of the plume. Appendix 2 contains the Soil Vapor SAP that will be used for these surveys.

All work performed for this investigation will conform to the Soil Sampling and Analysis Plan (SAP) included as Appendix 1 to this Work Plan. Soil sampling activities will be conducted in accordance with the DTSC-approved, January 1996 Project Health and Safety Plan (HASP) with Addendums 1 and 2 dated March 2004 and May 2004, respectively. To summarize the SAP, soil borings will be advanced using either a hand auger or a Geoprobe type drill. The bore-hole will be logged and the samples screened for pH values. A duplicate sample will be collected for every ten samples. A field blank will be processed to show the adequacy of the decontamination methods. A final report will be prepared which will include a description of the field operation, the resulting data, and the laboratory reports.

Following the completion of the exploration and the laboratory analysis program, a detailed report will be prepared by a Certified Engineering Geologist for submittal to the DTSC. At a minimum, the report will contain the following information.

1. A comprehensive discussion of all data derived during the exploration including any supportive graphics generated comparing the data derived from each sample. A table will be prepared showing the results of all parameter concentrations.
2. Any field problems that occurred during the exploration will be discussed.
3. Any deviations from the Work Plan or SAP will be discussed with the causes for the deviations.
4. All boring logs generated from the exploration.
5. The report will contain all field forms generated during the exploration to document all activities which occurred.
6. The Weck Laboratories Reports will be included with the report.

Soil Investigation -- Fireside/ Acid Wash Pipelines
Alamitos Generating Station

Boring ID	Sample Depth	Number of Samples	Feature
P1	5, 7	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P2	5, 7	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P3	5, 7, 11	3	Oil/Water Separator -- Units 1 and 2
P4	6, 8, 11	3	Oil/Water Separator -- Units 1 and 2
P5	6, 8	2	Oil/Water Separator -- Units 1 and 2
P6	6, 8	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P7	7, 9, 16	3	Transfer Sump -- Units 1 and 2
P8	5, 7, 16	3	Transfer Sump -- Units 1 and 2
P9	6, 8	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P10	6, 8	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P11	6, 8	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P12	6, 8	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P13	6, 8	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P14	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P15	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P16	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P17	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P18	4, 7.5	2	Sediment Trap -- Unit 3
P19	3.5, 5.5, 7.5	3	Sediment Trap -- Unit 3
P20	4.5, 6.5, 7.5	3	Sediment Trap -- Unit 3
P21	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 3
P22	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 3
P23	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 3
P24	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 3
P25	4, 7.5	2	Sediment Trap -- Unit 4
P26	3.5, 5.5, 7.5	3	Sediment Trap -- Unit 4
P27	4.5, 6.5, 7.5	3	Sediment Trap -- Unit 4
P28	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 4
P29	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 4
P30	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 4
P31	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 3 and 4
P32	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 3 and 4
P33	6, 8, 15	3	Fireside Wash Drain Pipeline -- Unit 3 and 4
P34	6, 8, 15	3	Acid Wash Wastewater Pipeline -- Units 3 and 4
P35	6, 8, 15	3	Acid Wash Wastewater Pipeline -- Units 3 and 4
P36	6, 8	2	Acid Wash Wastewater Pipeline -- Units 3 and 4
P37	6, 8	2	Acid Wash Wastewater Pipeline -- Units 3 and 4
P38	6, 8	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4

Sample depth shown in Red will also be analyzed for TPH, c-PAHs, and dioxins/furans

Soil Investigation -- Fireside/ Acid Wash Pipelines
Alamitos Generating Station

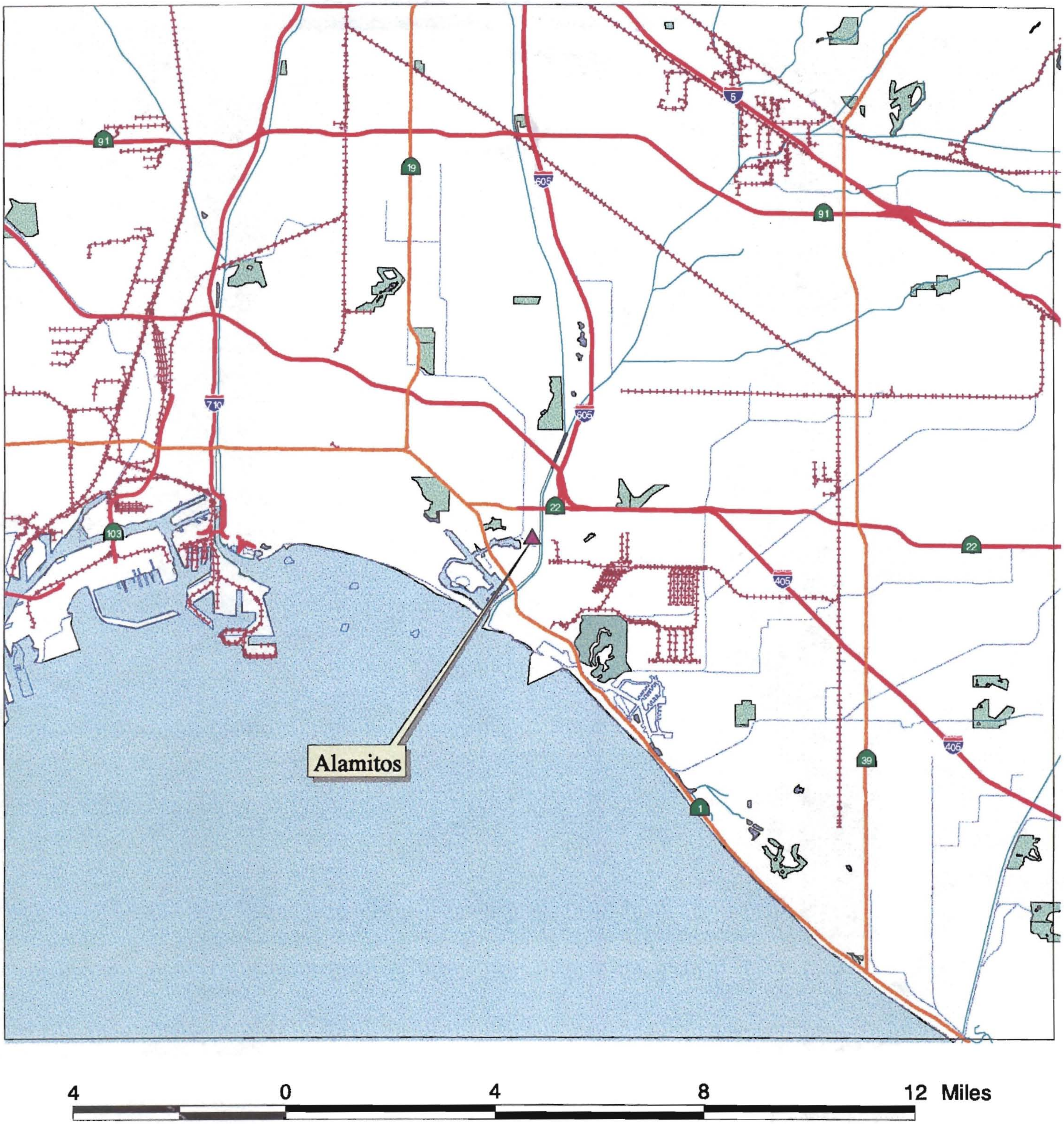
Boring ID	Sample Depth	Number of Samples	Feature
P39	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P40	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P41	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P42	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P43	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P44	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P45	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P46	6.5, 8.5	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P47	6, 8	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P48	6, 8	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P49	7, 9	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P50	7, 9	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P51	7, 9	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P52	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P53	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P54	5, 7	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P55	5, 7	2	Acid Wash Wastewater Pipeline -- Units 1 and 2
P56	5, 7	2	North Basin Discharge Pipeline
P57	5, 7	2	North Basin Discharge Pipeline
P58	5, 7	2	Central Basin Discharge Pipeline
P59	5, 7	2	Basin Transfer Pipeline
P60	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P61	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 3 and 4
P62	4.5, 8	2	Sediment Trap -- Unit 5
P63	4.5, 6.5, 8	3	Sediment Trap -- Unit 5
P64	4.5, 6.5, 8	3	Sediment Trap -- Unit 5
P65	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 5 and 6
P66	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 5 and 6
P67	6, 8, 19	3	Fireside Wash Drain Pipeline -- Unit 5 and 6
P68	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 5 and 6
P69	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 5 and 6
P70	4.5, 6.5	2	Fireside Wash Drain Pipeline -- Unit 5 and 6
P71	4.5, 6.5, 8	3	Sediment Trap -- Unit 6
P72	4.5, 6.5, 8	3	Sediment Trap -- Unit 6
P73	4.5, 8	2	Sediment Trap -- Unit 6
P74	5, 7, 19	3	Acid Wash Wastewater Pipeline -- Units 5 and 6
P75	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P76	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6

Sample depth shown in Red will also be analyzed for TPH, c-PAHs, and dioxins/furans

Soil Investigation -- Fireside/ Acid Wash Pipelines
Alamitos Generating Station

Boring ID	Sample Depth	Number of Samples	Feature
P77	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P78	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P79	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P80	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P81	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P82	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P83	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P84	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P85	5, 7	2	Acid Wash/Fireside Wash Drain Pipeline -- Units 5 and 6
P86	2, 3	2	South Basin Discharge Pipeline
P87	2, 3	2	South Basin Discharge Pipeline
P88	2, 3	2	South Basin Discharge Pipeline
P89	2, 3	2	South Basin Discharge Pipeline
P90	2, 3	2	South Basin Discharge Pipeline
P91	2, 3	2	South Basin Discharge Pipeline
P92	2, 3	2	South Basin Discharge Pipeline
P93	2, 3	2	South Basin Discharge Pipeline
Total Number of Borings: 93		**Total Number of Samples: 203**	

Sample depth shown in Red will also be analyzed for TPH, c-PAHs, and dioxins/furans



Map Number:	gs010823404
Issued For:	D. Chupa
Projection:	Nad83/UTM/Zone 11
Approved By:	D. Chupa
Checked By:	D. Chupa/Jim Schaefle
Project Lead:	Pat Turner
Supervisor:	Greta Bellis
Created By:	Jim Schaefle
Date:	11/07/01

▲ Target Property

Target Property: Alamitos Generation Facility

Source: Thomas Bros. Street Data

Thomas Bros. Maps®

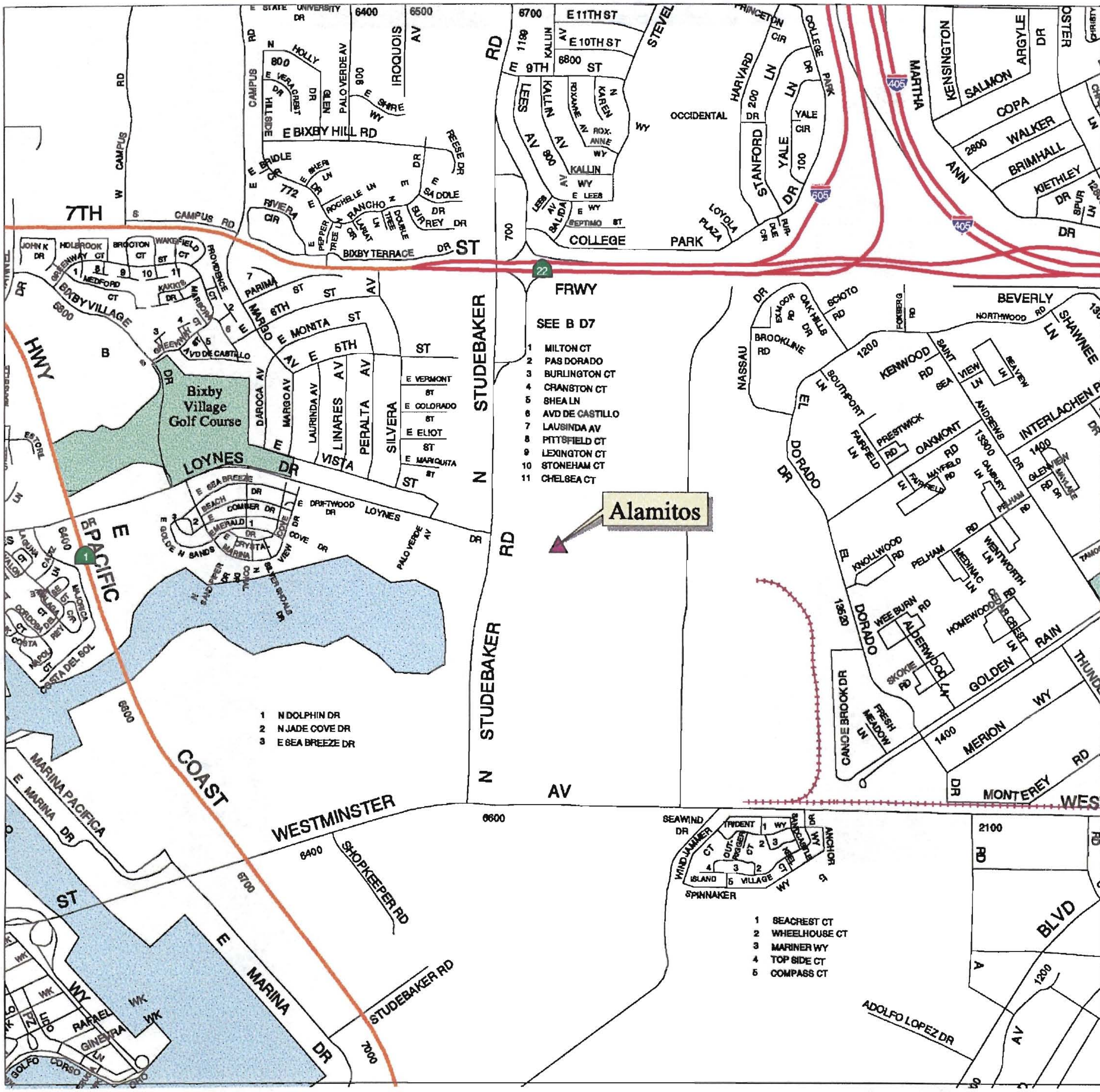
N

C&GS

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL Company

FIGURE 1



0.4 0 0.4 0.8 1.2 Miles

▲ Target Property

Target Property: Alamitos Generation Facility

Source: Thomas Bros. Street Data

Map Number:	gs010823404
Issued For:	D. Chupa
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Checked By:	D. Chupa/Jim Schaefle
Project Lead:	Pat Turner
Supervisor:	Greta Bellis
Created By:	Jim Schaefle
Date:	11/07/01

N

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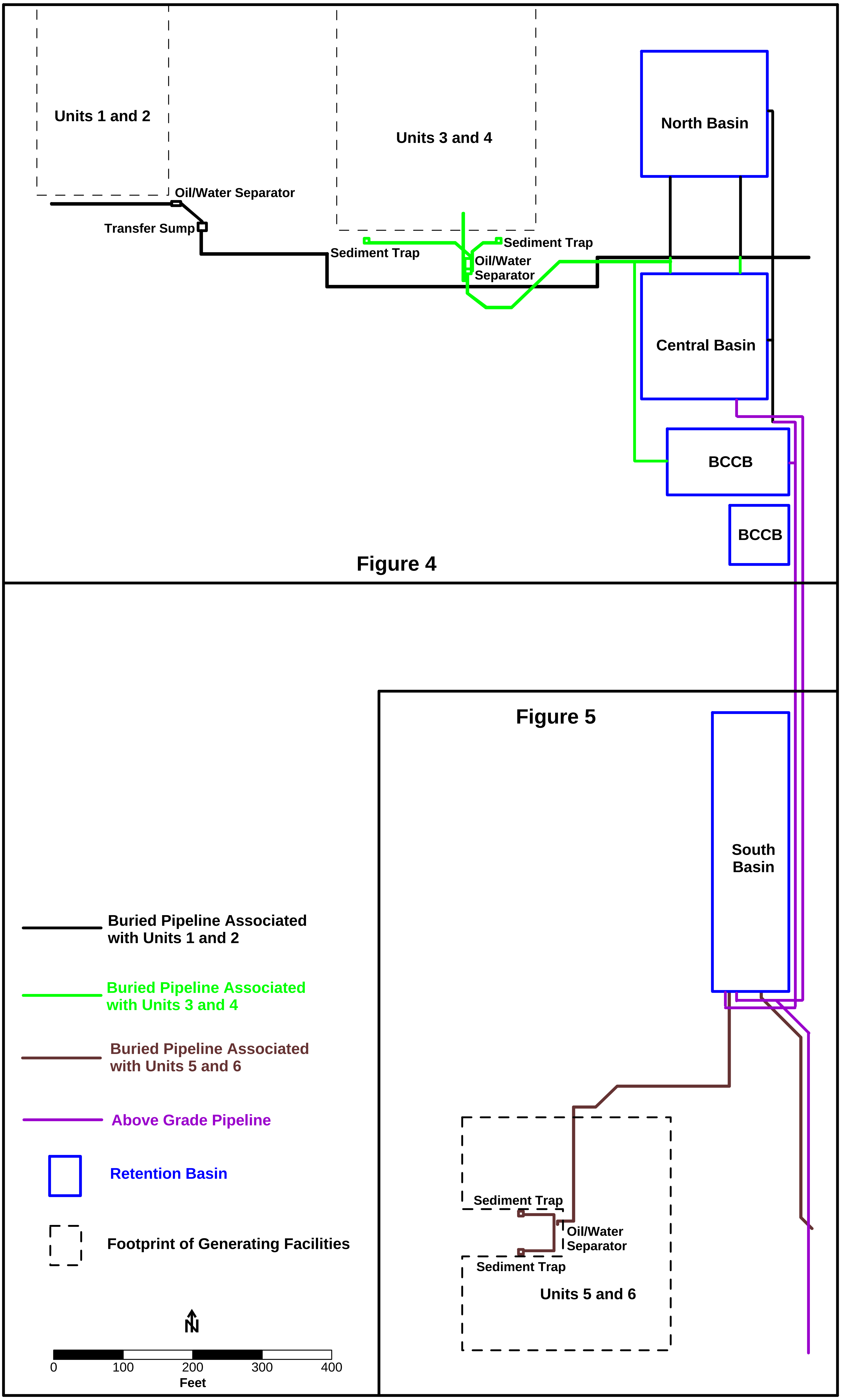
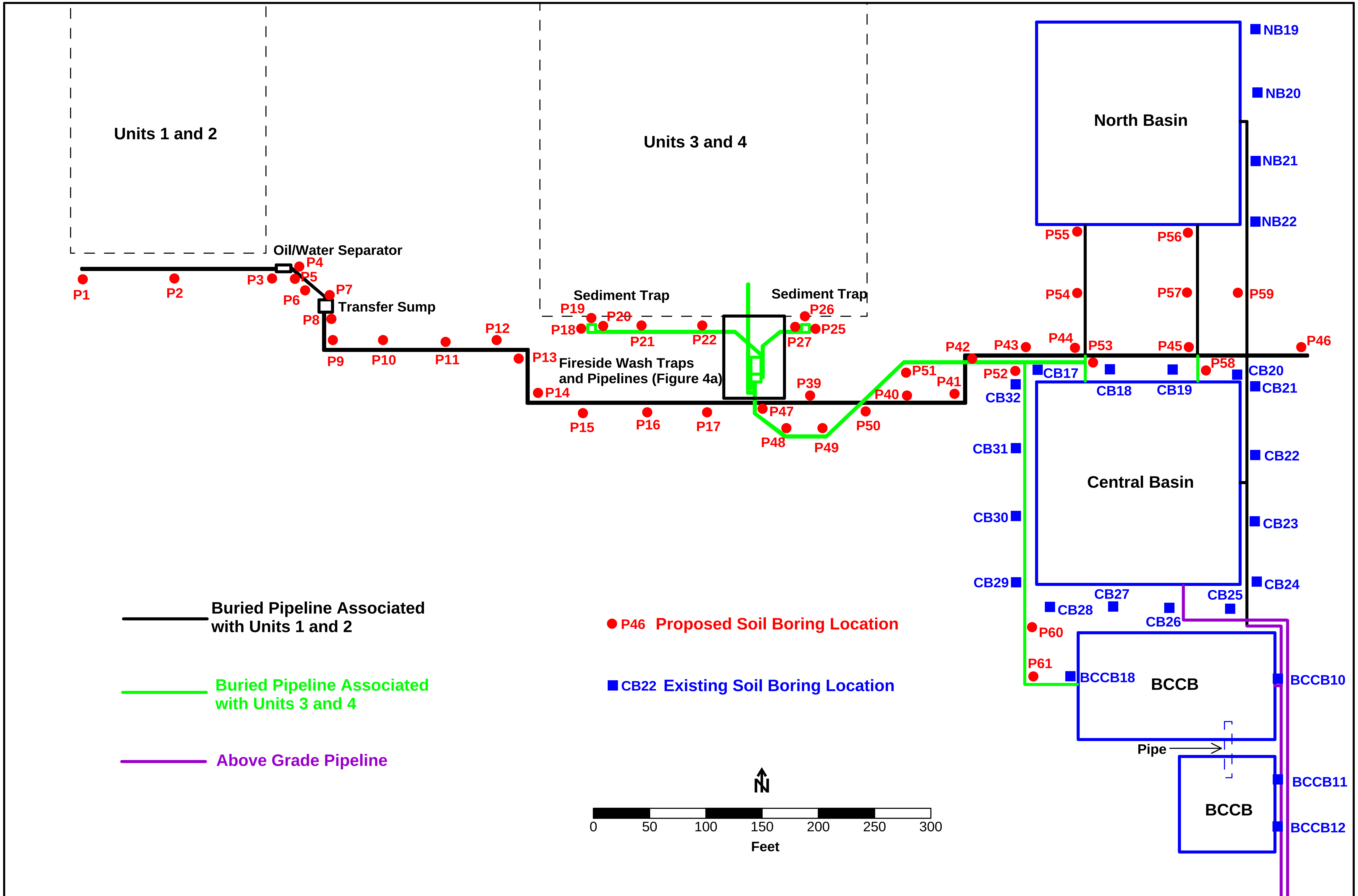
FIGURE 2



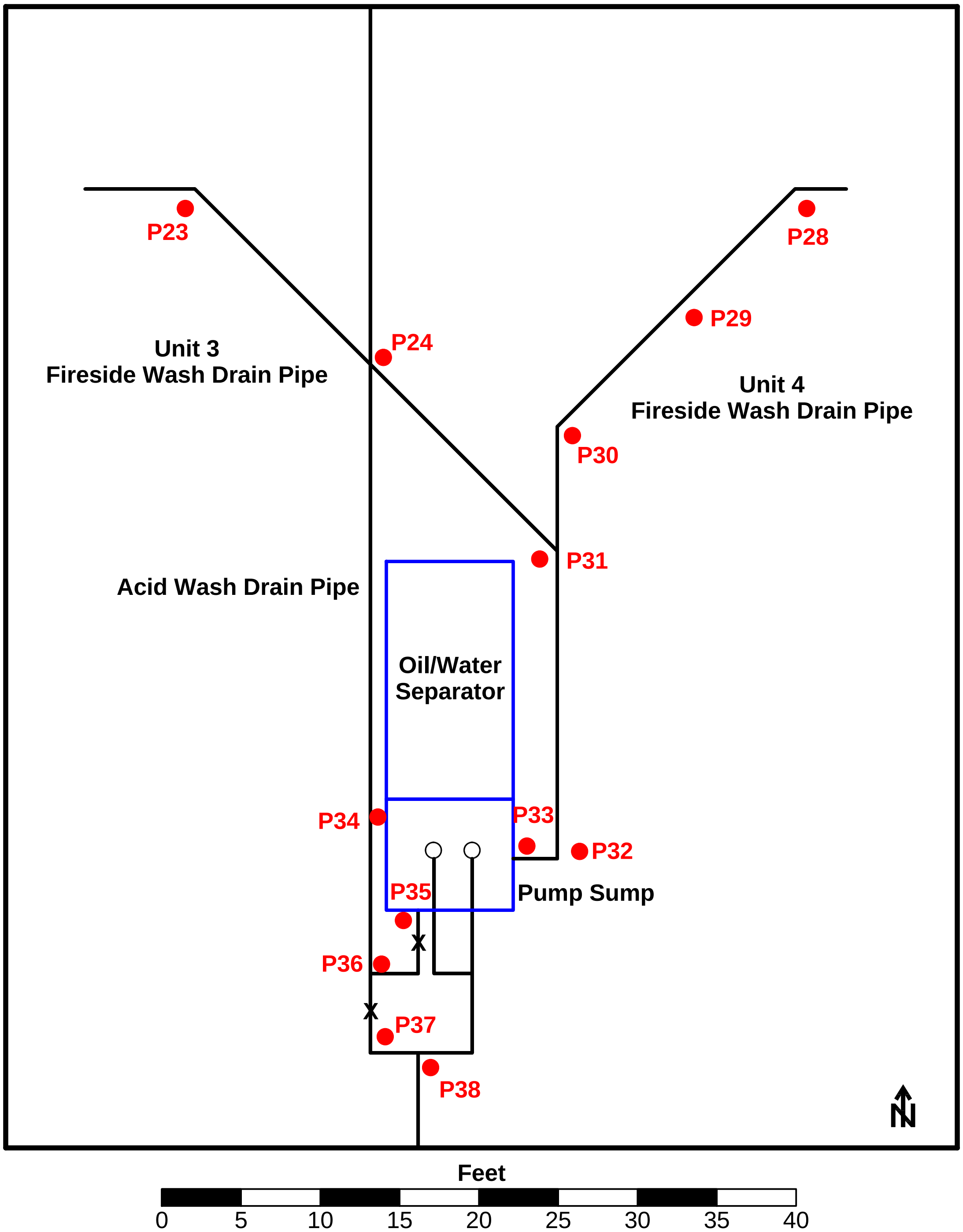
Units 1 and 2
Units 3 and 4
North Basin
Oil/Water Separator
Transfer Sump
Sediment Trap
Sediment Trap
Oil/Water Separator
Central Basin
BCCB
BCCB
Figure 4
Figure 5
South Basin
Buried Pipeline Associated with Units 1 and 2
Buried Pipeline Associated with Units 3 and 4
Buried Pipeline Associated with Units 5 and 6
Above Grade Pipeline
Retention Basin
Footprint of Generating Facilities
N
0
100
200
300
400
Feet
Sediment Trap
Oil/Water Separator
Sediment Trap
Units 5 and 6

Figure 3



Units 1 and 2
Units 3 and 4
North Basin
Central Basin
BCCB
BCCB
Oil/Water Separator
Transfer Sump
Sediment Trap
Sediment Trap
Fireside Wash Traps and Pipelines (Figure 4a)
Pipe
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
P13
P14
P15
P16
P17
P18
P19
P20
P21
P22
P25
P26
P27
P39
P40
P41
P42
P43
P44
P45
P46
P47
P48
P49
P50
P51
P52
P53
P54
P55
P56
P57
P58
P59
P60
P61
NB19
NB20
NB21
NB22
CB17
CB18
CB19
CB20
CB21
CB22
CB23
CB24
CB25
CB26
CB27
CB28
CB29
CB30
CB31
CB32
BCCB10
BCCB11
BCCB12
BCCB18
Buried Pipeline Associated with Units 1 and 2
Buried Pipeline Associated with Units 3 and 4
Above Grade Pipeline
P46 Proposed Soil Boring Location
CB22 Existing Soil Boring Location
N
0
50
100
150
200
250
300
Feet

Figure 4



P28 Proposed Soil Boring Location

Valve

Figure 4a

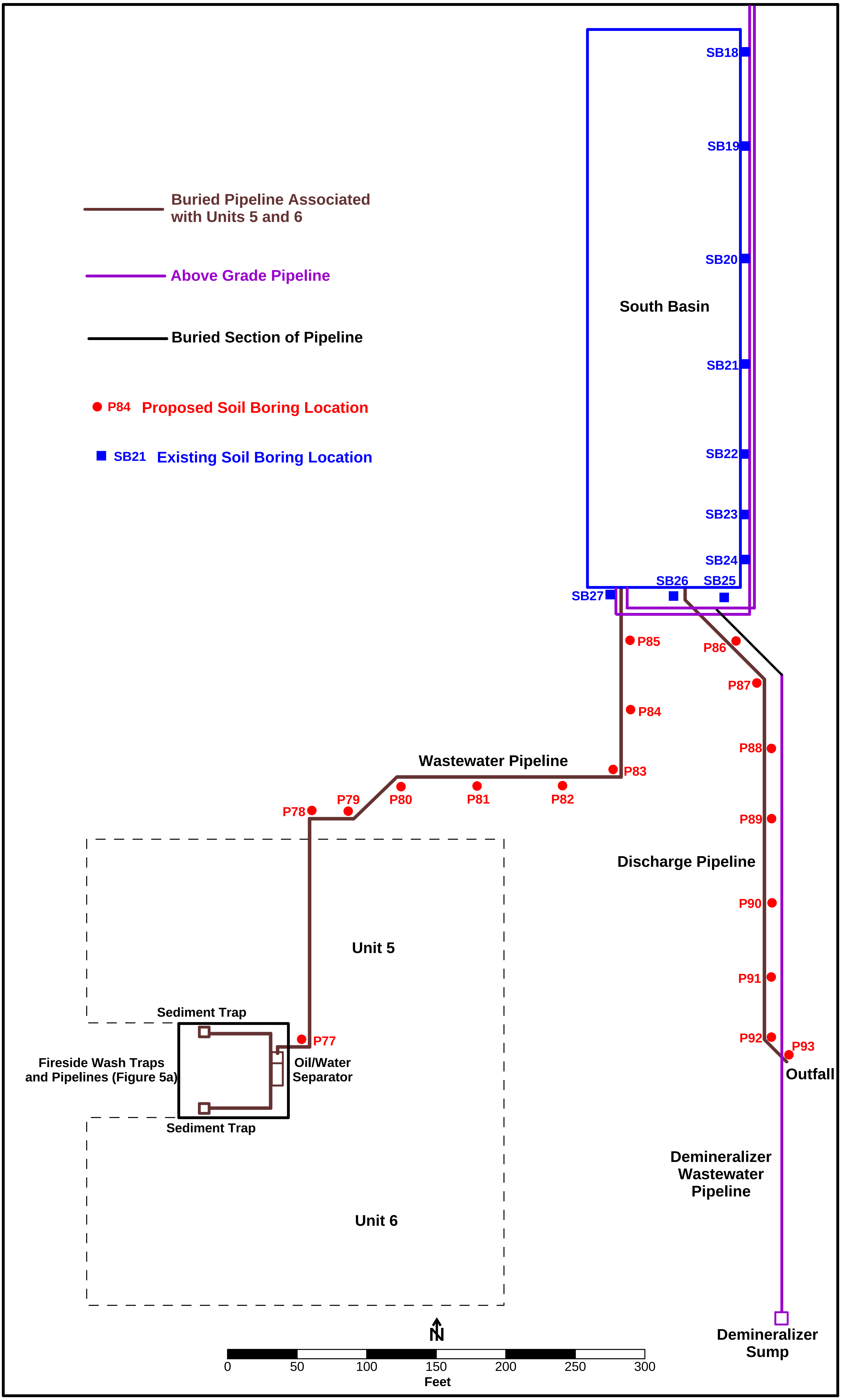

Buried Pipeline Associated with Units 5 and 6
Above Grade Pipeline
Buried Section of Pipeline
P84 Proposed Soil Boring Location
SB21 Existing Soil Boring Location
South Basin
SB18
SB19
SB20
SB21
SB22
SB23
SB24
SB25
SB26
SB27
P85
P86
P87
P84
P88
P83
Wastewater Pipeline
P78
P79
P80
P81
P82
P89
Discharge Pipeline
P90
Unit 5
P91
Sediment Trap
P77
P92
P93
Outfall
Fireside Wash Traps and Pipelines (Figure 5a)
Oil/Water Separator
Sediment Trap
Demineralizer Wastewater Pipeline
Unit 6
N
Demineralizer Sump
0 50 100 150 200 250 300
Feet

Figure 5

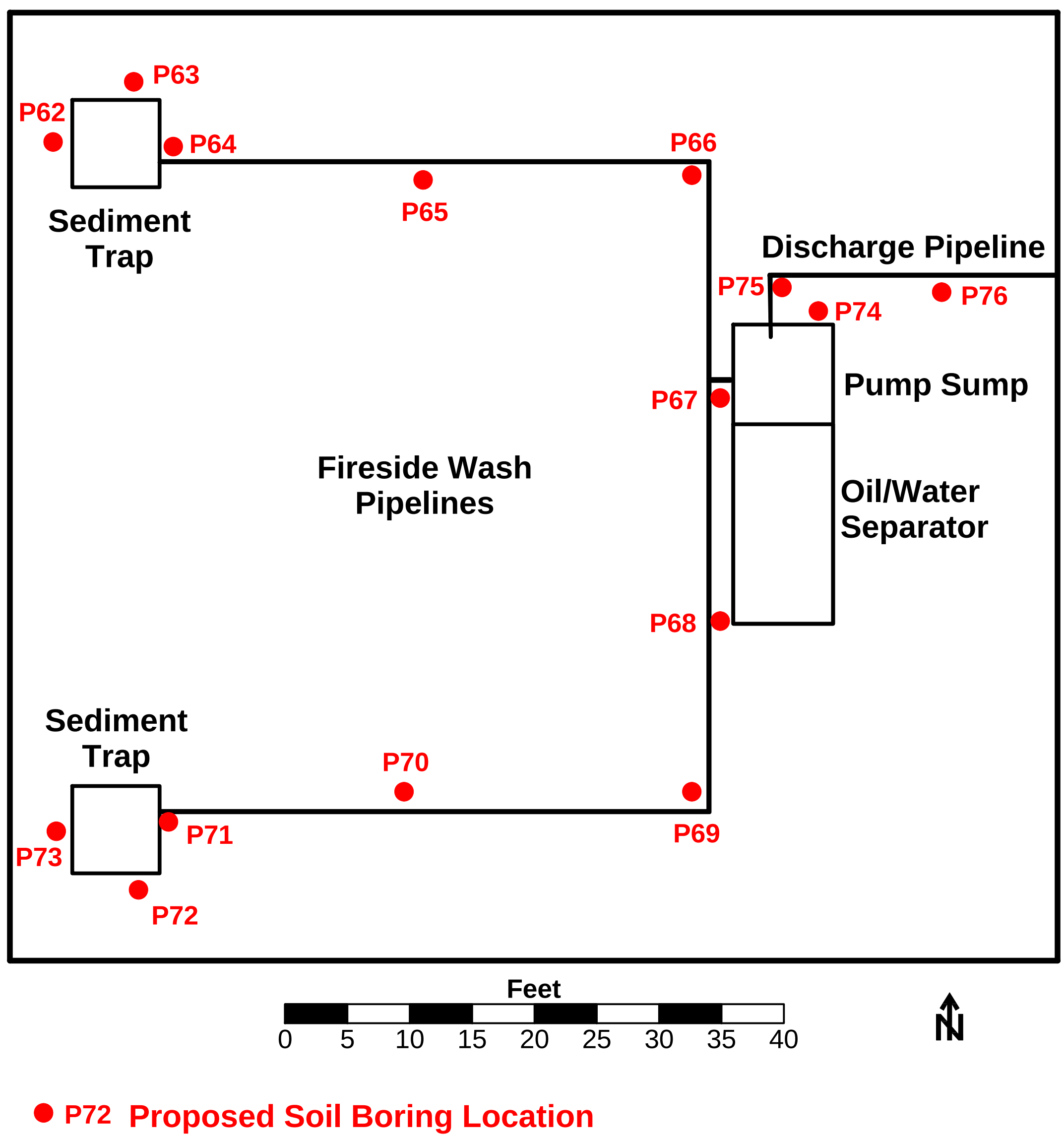

P63
P62
P64
P66
Sediment
Trap
P65
Discharge Pipeline
P75
P76
P74
Pump Sump
P67
Fireside Wash
Pipelines
Oil/Water
Separator
P68
Sediment
Trap
P70
P71
P69
P73
P72
Feet
0 5 10 15 20 25 30 35 40
N
P72 Proposed Soil Boring Location

Figure 5a

Appendix 1

SOIL SAMPLING AND ANALYSIS PLAN
Pipelines
Alamitos Generating Station

Southern California Edison Company

July 2012

Prepared By:

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2715 Altamira Circle
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Table 1-1: Constituents of Concern

Table 1-2: Soil Sample Containers, Preservatives, and Holding Time Requirements

1. Data Quality Objectives

The Data Quality Objectives (DQOs) for this investigation are as follows: Definition of the investigation goals and information inputs, the analytical approach, and performance criteria.

1.1. Investigation Goals

The goals of this investigation are to assess whether acidic boiler wash fluids and/or fireside wash solids were released from the sumps/traps and pipelines located between the operating units and the wastewater retention basins at the site. If releases occurred, this investigation will be expanded to determine the nature and extent of the release. The ultimate goal is to provide data of sufficient quality to support the Human and Ecological Risk Assessment (HERA) outlined in the Closure Performance Standards sections of the site Closure Plan (Jamison, 2011). The results of the HERA will determine the suitability for various future uses, or whether site cleanup is required.

The goals of this Sampling and Analysis Plan (SAP) are to: 1) Describe the data needs, proper field methods, sample collection and handling procedures, and field QA/QC to ensure samples of sufficient integrity to meet the project information needs; 2) determine the appropriate analytical methods which meet the information needs of the risk assessment, and 3) ensure the environmental laboratory chosen for this investigation has the capabilities to conduct the requested analyses, meet the required minimum detection limits, and has an internal QA/QC program that ensures data of sufficient quality to meet the project objectives.

1.2. Information Needs

The human and ecological risk assessment is the primary driver of the information needs for this site. The Conceptual Site Model and Closure

Performance Standards outlined in the Closure Plan indicate the most conservative exposure scenarios are for potential future residents and ecological receptors. Therefore, the goal for analytical data is sufficiently low detection limits, wherever possible, to meet screening values for both human residents and ecological receptors, documented in California and USEPA guidance.
Based on environmental data collected to date, and an evaluation of other potential Chemicals of Concern (COCs), the COCs are as follows:

- pH
- Metals
- VOCs
- TPH
- c-PAHs
- Dioxins/Furans

Table 1-1 summarizes the COCs, proposed test methods, and target reporting limits.

2. Field Procedures

The following sections describe the procedures that will be used to perform the sample collection, bore-hole logging, field screening, sample handling, and documentation.

2.1. Sample Collection

2.1.1. Bore-Hole Drilling

Bore-hole drilling will be performed with either a Geoprobe drill or a three- inch diameter hand auger. The hand auger is stainless steel and is attached to 2, 4, or 5 foot long rods which screw together as the bore-hole is advanced.

2.1.2. Sampling

The hand augered soil samples will be collected with an AMS Core Sampler. This sampler is two inches in diameter and houses a six inch long plastic liner. The sampler is driven with the AMS hammer which is attached to the auger rods. The soil samples collected by the Geoprobe will be contained in a one-inch diameter plastic tube.

All sampling equipment will be decontaminated between samples by washing in Alconox and double rinsing in de-ionized water as described in Section 2.1.5 Decontamination.

2.1.3. Logging

All bore-holes will be continuously logged by a California Certified Engineering Geologist (Geologist). Though the samples will be taken at discreet locations, the material from the bore-holes will be continuously logged. The materials viewed from the auger cuttings or sampling operation will be logged using the Unified Soil Classification System. All data will be recorded on a bore-hole log. The data will include field pH, soil classification, moisture content, color, grain size, staining, and any other pertinent observations.

2.1.4. Bore-Hole Cuttings

All material derived from the bore-hole drilling will be placed in sealable, DOT-approved, 55-gallon drums. A composite sample from each barrel generated from the drilling will be sent to a certified laboratory for analyses for waste disposal profiling. Based on the results of the profiling, the drum contents will be transported by a properly licensed waste hauler to an appropriately licensed disposal facility.

2.1.5. Decontamination

All drilling and sampling equipment will be decontaminated between bore-holes or samples to prevent cross-contamination. The cleaning procedure will be to wash the equipment in an Alconox solution. The equipment will then be double rinsed in deionized water.

2.2. Sample pH Screening

Following the sample preparation described in Section 2.3 below, all soil samples will be screened with a portable soil pH meter using the manufacturer's procedures. A Cole-Parmer pH meter model 59002-00 equipped with a soil electrode will be used to screen the samples. The soil electrode is specifically designed to measure the soil pH without effects of suspended material. Proper maintenance, calibration, and operation of the instrument and electrode are the responsibility of the Geologist assigned to the project. The meter and electrode will be maintained, calibrated, and operated according to the manufacturer's guidelines and recommendations. The pH electrode will be calibrated daily and recorded on the Calibration Log described in Section 2.5.2 Documentation. The log will be contained in the project notebook.

To measure automatically temperature-compensated pH, both the pH electrode and the temperature electrode must be connected to the meter and both sensors must be immersed in the sample being assessed. The pH value of the sample solution is a temperature-dependent quantity. When not in use, the electrode will be stored in the storage bottle provided with the electrode. The bottle will contain pH storage solution or pH 4 buffer solution.

The pH meter and electrode will be calibrated using a three point slope with the following ready-to-use commercial buffer solutions: 4, 7, and 10. These values will bracket the anticipated pH value of the samples. The calibration procedures are described below. The calibration will be performed at the beginning of each sampling day and recorded on the Calibration Log (Appendix 1). The buffer expiration date and lot number will be recorded on the Calibration Log.

The following calibration procedures are directed by the manufacturer:

1. Switch on the meter. It is automatically in the pH mode.
2. Rinse the electrode thoroughly with deionized water. Do not wipe the electrode as this will cause a build-up of electrostatic charges on the glass surface.
3. Place the electrode and temperature probe into the standard pH 7 buffer in a beaker and press CAL/MEAS. The display will show CAL. The primary display will show the measured reading while the smaller secondary display will indicate the pH 7 standard buffer solution. The automatic temperature compensation (ATC) indicator will show on the LCD.
4. Wait for the measured pH value to stabilize. The READY indicator will display when the reading stabilizes.

5. Press CON to confirm calibration. The CON indicator flashes for one second and disappears. The meter is now calibrated at the buffer indicated in the primary display. The secondary display automatically scrolls to the next buffer calibration option.
6. By pressing MI and MR keys, select the pH 4 buffer solution, and repeat steps 2 through 5. Note: do not press CAL/MEAS until all calibration is complete.
7. Repeat step 6 for the buffer solution of pH 10.
8. Press CAL/MEAS to return to measurement mode.

2.3. Sample Protocol

The following is a general step-by-step procedure for sampling at the site.

1. Upon arrival to the site, the Geologist will begin the sampling process by performing a Health and Safety meeting with the drilling contractor and any visitors to the site. The proper form will be signed by all in attendance of the meeting. The work perimeter will be established with yellow caution tape. The fugitive dust monitor will be placed within the perimeter and downwind of the work area.

2. All excavation equipment will be decontaminated before beginning work and between borings as described in Section 2.1.5 Decontamination. All sampling equipment will be decontaminated between samples by washing in Alconox and double rinsing in deionized water.

3. The procedure for collection of soil samples for VOC analysis is as follows: Immediately upon retrieval of the Geoprobe, or hand augered soil samples, three 40 ml vials will be filled with five grams of sample in accordance with EPA Method 5035 for VOC analysis of the soil sample. One vial is preserved with methanol while the other two are preserved with sodium

bisulfate. The three vials will be secured in a protective bubble bag, labeled, and placed on wet ice to chill the sample to a temperature of 4°C

4. All samples will be screened with a portable pH meter and soil electrode. For the soil pH measurements, 10 grams of soil and 10 milliliters of de-ionized water will be thoroughly mixed in a small beaker and allowed to set for a minimum of 10 minutes. The soil electrode will then be set into the sample beaker and the pH value determined with a Cole-Parmer meter. The pH value will be recorded on the Daily Field Form. The pH electrode will be washed in deionized water between samples.

5. The procedure for collection of soil samples for all other analyses is as follows: The soil sample will be placed in a labeled, glass jar and positioned on wet ice.

6. A duplicate soil sample will be collected for each ten samples collected. This sample will be processed as any other sample and it will not be designated as a duplicate.

7. A specific sample number will be assigned to each soil sample. This number will be recorded on the Daily Field Form and Chain of Custody Form with all appropriate labeling attached to the sample containers.

8. At the completion of the sampling, all bore-holes will be backfilled with hydrated bentonite chips. The chips will be carefully poured into the boring in one-foot lifts. Five gallons of fresh water will be placed over the bentonite to cause hydration. A cement plug will be placed in the upper 6-inches of the hole. The sampling and drilling equipment will be properly decontaminated before moving to the next bore-hole location.

9. Samples will be transported to Weck Laboratories, Inc., a California Certified laboratory, for analysis with the completed Chain of Custody Form on each sampling day. The soil sample will be analyzed for the project Constituents of Concern listed in Section 2.3.1.

2.3.1. Constituents of Concern

The soil samples collected will be analyzed for the COCs for the pipeline systems contained on Table 1-1.

2.3.2. Sample Containers

The required soil sample containers for specific analysis are listed on Table 1-2. The table also presents the required preservation and maximum holding time period. Once opened, a sample container must be promptly used for storage of a particular sample. Unused but open containers are to be considered contaminated and will be discarded. Because of the potential for introduction of contamination, they cannot be re-closed and saved for later use. Likewise, any unused containers that appear contaminated upon receipt will be discarded. The analyses to be performed on the samples will be specified on the Chain of Custody Form to Weck Laboratories.

2.3.3. Health and Safety

Soil sampling activities will be conducted in accordance with the DTSC-approved, January 1996 Project Health and Safety Plan (HASP) with Addendums 1 and 2 dated March 2004 and May 2004, respectively. To summarize, the Geologist will begin the daily work by performing a Health and Safety meeting with the drilling contractor and any visitors to the site. The topics of the meeting will include the maximum concentration values measured at the site from previous investigations. The drilling contractor will be informed that area to be investigated has been cleared by Underground Service Alert (USA) and an underground utility locating contractor. The personnel protection level will be addressed. At the Mandalay site, the personnel protection will be minimal with hard hats, safety glasses, and gloves. The work perimeter will be established with yellow caution tape. The proper form will be signed by all in attendance of the meeting.

The potential for fugitive dust during the soil sampling activity is deemed to be very low. This is because of the low energy activity of hand augering and/or Geoprobe push methods, as well as the moist soil conditions at the Alamitos site. However, to protect workers from a dust hazard, a fugitive dust monitor will be placed within the work perimeter and downwind of the work area. The monitor alarm will be set at 2.5 mg/m^3 since all calculated values for the metals parameters, most likely to be encountered, are much higher. If the alarm is triggered, Tyvex suits and respirators will be available for the workers.

2.3.4. Labeling and Handling

Table 1-2 lists the container types and container preparation for the Constituents of Concern. Sample container preparation and sample transport are the responsibility of the Geologist performing the sampling. The Geologist is also responsible for correct sample collection and sample handling, i.e., labeling, packaging, storage prior to the transport to the laboratory, and custody procedures.

The following procedure will be used for all soil sample handling, packaging, and shipping activities:

1. The Geologist will read and fully understand the sampling requirements to insure that the correct analyses are identified for the Weck Laboratories and that sufficient sample containers, properly prepared and in sufficient numbers, are available.

2. An ice chest containing wet ice will be on site before sampling begins. Ice will be added to the ice chests containing samples as needed. Water from melted ice must be drained from the ice chest frequently.

3. Collect soil samples in appropriate containers: see Table 1-2.

4. Print clearly in waterproof ink on the sample labels the sample identification data and the preservative, if any, that has been added to each container. Information entered on each label will include the following:
   - Sample identification number
   - Date
   - Time (military format)
   - Preservatives added, if any
   - Any special instructions or remarks/pertinent observations
   - Initials of sampler

2.4. Quality Control Samples

2.4.1. Duplicate Samples

Duplicate samples will be collected in the same manner as the routine soil samples in the same type of containers. This procedure will involve the collection of a second, distinct, sample set immediately after the routine soil sample is collected. Duplicate samples will be collected in areas where known or suspected contamination is present. Duplicate samples will be prepared, preserved, handled, stored, and transported to the laboratory according to procedures used for soil sampling. Duplicate samples will not be labeled as such. They will be assigned an identification number on the Daily Report form that will not identify the sample as a field duplicate sample. The laboratory shall not be informed which sample is a duplicate.

One duplicate sample will be processed for each ten soil samples collected during the investigation. If less than ten soil samples are collected, at least one duplicate sample per sampling day will be collected. The sample will be analyzed for the complete Constituents of Concern list as the other soil samples.

2.4.2. Field Blank

Since the soil samples are collected with non-dedicated field equipment, a field blank will be collected each sampling day. The field blank will be collected by pouring deionized water supplied by the certified laboratory (Weck) over the double-rinsed drilling equipment. The rinse water will be collected in a glass jar. The blank will be prepared, preserved, handled, stored, and transported to the laboratory according to procedures used for soil sampling. Blank samples will not be labeled as such. It will be assigned an identification number on the Daily Field Log that will not identify the sample as a field blank sample. The laboratory shall not be informed which sample is a blank.

2.5. Sample Custody, Shipment, and Documentation

2.5.1. Chain of Custody

Sample identification documents must be carefully prepared so that Chain of Custody can be maintained and sample disposition can be controlled. Samples collected during a sampling event must be traceable from the time the samples are collected until the derived data are used in the final report. The identification document is the Chain of Custody form.

The Geologist is personally responsible for the care and custody of the samples collected until they are properly transferred to the laboratory. The sampler must complete the adhesive sample labels, described in the Section 2.3.5, and secure them to the sample containers. Labels are completed in waterproof ink. The information on these labels will correspond to the Chain of

Custody form that shows the number of containers per sample set and the contents of the sample containers. The original record will accompany the sample shipping container, ice chests, during transport.

The soil samples will be transported to Weck Laboratories by the Geologist within twelve hours of collecting the samples. When transferring samples, the individuals relinquishing and receiving will sign, date, and record the time on the Chain of Custody form. This record documents sample custody transfer from the Geologist to the laboratory custodian.

A designated sample custodian at the laboratory accepts custody of the transported samples and verifies that the information on the Sample Identification Number matches that on the Chain of Custody records. The laboratory custodian uses the Sample Identification Number and assigns a unique laboratory number to each sample and insures that all containers of that sample are transferred to the proper analyst or stored in the appropriate secure area. Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted, no longer suitable for analysis, or otherwise directed by Edison.

When sample analyses have been completed, the unused portion of the sample must be disposed of properly by the laboratory. The laboratory retains all identifying tags, data sheets, and laboratory records as part of the permanent documentation and appropriately disposes of sample containers and remaining sample material.

2.5.2. Documentation

The Geologist will assign and maintain identification numbers for all sampling. He will maintain and complete all appropriate field data sheets and forms which include: a sample location plan, Boring Log, Chain of Custody, Calibration Log, and Daily Field Log. These sheets and forms will provide a daily log of significant events, observations, and measurements taken during the sampling day. The sampler will be familiar with the required documentation before any field work is initiated.

The Daily Field Log contains information and data. The information includes the project location, date, start and finishing times, weather conditions, equipment used, personnel and protection level, visitors, field observations and problems encountered, the total number of samples recorded on the Chain of Custody form, and is signed by the investigator. The data includes the boring ID, sample depth, sample type, field screening, sample ID, and verification of the backfill material. The pH instrument calibration is recorded on the Calibration Log. The Chain of Custody shows the sample time, sample ID, number of containers, and required analytical test for the sample. These field forms will be signed and dated by the sampler. A copy of all forms generated during a sampling event will be included in the completion reports submitted to DTSC.

3. Analytical Laboratory

3.1. Project Laboratory

All analyses of the soil samples will be performed by Weck Laboratories, Inc. located in the City of Industry. Weck Laboratories has been performing all analytical testing for the Closure Project since inception. They are certified by the State of California to perform all of the chemistry tests required for the project.

3.2. Analyses Performed

The following analyses could be performed on the collected soil samples:

EPA 6020 – total metals by ICP/MS

EPA 9045C – pH

EPA 7471 – Mercury

EPA 8260B – VOCs

EPA 8270 SIMS – c-PAHs

EPA 8280A – Dioxins/Furans

EPA 8015 – TPH

The PQL values reported by the laboratory will be, wherever possible, equal to or less than those established to meet the Project Data Quality Objectives.

3.3. Laboratory QA/QC

The Weck Laboratories Quality Assurance Program is on file with the DTSC and is available on their web site (www.wecklabs.com). The program is designed to continually monitor the reliability of test results, ensure that analytical results are within acceptable limits, and provide guidelines for the implementation of corrective action when necessary. The manual is based on the standards developed by the National Environmental Laboratory Accreditation Conference and any applicable state or EPA regulations or requirements.

The program describes several QC testing controls that are used in the laboratory. Matrix Spikes (MS) will be performed at a frequency of one in 20 samples per matrix type per sample extracted or preparation method. An exception is for analytes for which spiking solutions are not available such as total dissolved solids and pH. Matrix Spike Duplicates (MSDs) will be analyzed at a minimum of 1 in 20 samples per matrix type per sample extracted or preparation method. Surrogate compounds are added to all samples, standards, and blanks, for all organic chromatography methods except when the matrix precludes its use or when a surrogate is not available. Method Blanks will be performed at a frequency of one per batch of samples per matrix type per samples extraction of preparation method.

3.4. Laboratory Narratives

When the soil samples are received by the laboratory custodian, he will describe the conditions of the samples and ice chests by completing the section of the Chain of Custody form titled "Sample Conditions". The temperature of each sample set will be entered in this section.

Constituents of Concern
Alamitos Generating Station

Monitoring Parameter	EPA Method	Reporting Limit
General Mineral		
pH	9045C	10 mg/kg
Metals		
Antimony	6020	0.5 mg/kg
Arsenic	6020	0.5 mg/kg
Barium	6020	1.0 mg/kg
Beryllium	6020	0.1 mg/kg
Cadmium	6020	0.1 mg/kg
Total Chromium	6020	1.0 mg/kg
Cobalt	6020	0.2 mg/kg
Copper	6020	0.5 mg/kg
Lead	6020	0.5 mg/kg
Mercury	7471	10 ug/kg
Molybdenum	6020	0.5 mg/kg
Nickel	6020	0.5 mg/kg
Selenium	6020	0.5 mg/kg
Silver	6020	0.1 mg/kg
Thallium	6020	0.5 mg/kg
Vanadium	6020	5.0 mg/kg
Zinc	6020	5.0 mg/kg
Volatile Organic Compounds		
	8260B	5 ug/kg
Total Petroleum Hydrocarbons		
Gasoline Range (C4 - C12)	8015B	0.5 mg/kg
Diesel Range (C12 - C22)		5.0 mg/kg
Oil Range (C22 - C32)		50 mg/kg
c-PAHs		
	8270-SIMS	5 ug/kg
Dioxins/Furans		
	8280A	See Below

Constituents of Concern
Alamitos Generating Station

EPA Method 8280A		
Analyte	**ML**	**MDL**
2,3,7,8-TCDD	5.00	0.0907
1,2,3,7,8-PeCDD	5.00	0.146
1,2,3,4,7,8-HxCDD	12.5	0.227
1,2,3,6,7,8-HxCDD	12.5	0.252
1,2,3,7,8,9-HxCDD	12.5	0.226
1,2,3,4,6,7,8-HpCDD	12.5	0.428
OCDD	25.0	1.41
2,3,7,8-TCDF	5.00	0.0815
1,2,3,7,8-PeCDF	5.00	0.107
2,3,4,7,8-PeCDF	5.00	0.111
1,2,3,4,7,8-HxCDF	12.5	0.112
1,2,3,6,7,8-HxCDF	12.5	0.118
2,3,4,6,7,8-HxCDF	12.5	0.132
1,2,3,7,8,9-HxCDF	12.5	0.201
1,2,3,4,6,7,8-HpCDF	12.5	0.173
1,2,3,4,7,8,9-HpCDF	12.5	0.230
OCDF	25.0	0.518
Total TCDD	5.00	0.0907
Total PeCDD	5.00	0.146
Total HxCDD	12.5	0.252
Total HpCDD	12.5	0.428
Total TCDF	5.00	0.0815
Total PeCDF	5.00	0.111
Total HxCDF	12.5	0.201
Total HpCDF	12.5	0.230

Table 1-2

Soil Sample Containers, Preservatives, and Holding Time Requirements Alamitos Generating Station

Analysis	Holding Time	Sample Volume	Container Type	Preservative
9045C (pH)	28 days	9 oz	Glass	Cool, <6 degrees C
EPA 6020	180 days			
EPA 7471	180 days			
EPA 8280	180 days			
EPA 8015	14 days			
EPA 8270-SIMS	14 days			
EPA 8260	14 days	3 - 40 ml vials		1 with methanol, 2 with sodium bisulfate, Cool, <6 degrees C

Appendix 2

SOIL VAPOR SAMPLING AND ANALYSIS PLAN
Retention Basins
Alamitos Generating Station

Southern California Edison Company

July 2012

Prepared By:

Tetra Tech, Inc.
Jamison and Associates, Inc.

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1. Data Quality Objectives

1.1. Investigation Goal

The goal of this investigation is to assess the potential presence and extent of volatile organic compounds (VOCs) in soil vapor around the four retention basins (three wastewater retention basins and the Boiler Chemical Cleaning Basin, or BCCB). If VOC contaminated soil vapor is identified, step-out sampling will be conducted to assess the extent. The ultimate goal is to provide data of sufficient quantity and quality to support the Human and Ecological Risk Assessment (HERA) outlined in the Closure Performance Standards sections of the site Closure Plan (Jamison and Associates, 2011). The results of the HERA will determine the suitability for various future uses, or whether site cleanup is required.

The goals of this Sampling and Analysis Plan (SAP) are to: 1) Describe the data needs, proper field methods, sample collection and handling procedures, and QA/QC measures required to ensure samples of sufficient integrity to meet the project information needs; 2) specify the appropriate analytical methods that meet the information needs of the risk assessment, and 3) demonstrate that the environmental laboratory chosen for this investigation has the capabilities to conduct the requested analyses, meet the required minimum detection limits, and has an internal QA/QC program that ensures data of sufficient quality to meet the project objectives.

1.2. Information Needs

The HERA is the primary driver of the information needs for this site. The Conceptual Site Model and Closure Performance Standards outlined in the Closure Plan indicate the most conservative exposure scenarios for soil vapor are for potential future residents exposed via the vapor intrusion pathway. Due to the highly developed nature of the site, the only potential ecological receptors identified are aquatic organisms in the San Gabriel River, which are not expected to be impacted by soil vapor. Therefore, the goal for analytical data is sufficiently low detection limits, wherever possible, to meet screening values for human resident receptors exposed to VOCs in indoor air via vapor intrusion.

The Chemicals of Potential Concern (COPCs) are VOCs. Table 2-1 summarizes the VOCs that will be analyzed, the test methods, reporting levels, and project action levels.

2. Project Action Levels and Rationale

The objective of this investigation is to assess the potential presence and extent of VOC contaminated soil vapor. A prior soil vapor survey was conducted in 1999 (Hamilton, 2000) and identified a vapor plume to the north and east of the Central Basin. The overall approach for the investigation described here will be to sample soil vapor around the three retention basins and the BCCB, and if VOCs are identified, collect step-out samples to assess the extent. The project action levels (PALs) are the concentrations of VOCs in soil vapor that will warrant collection of step-out samples.

As noted above, the most conservative exposure scenario for soil vapor at this site is potential future residents exposed via the vapor intrusion pathway; therefore, it is appropriate to delineate VOCs to concentrations protective of this pathway. The PALs for each compound were selected as follows (Table 2-1):

1) If a shallow soil vapor California Human Health Screening Level (CHHSL) for residential land use is available, then it will be used as the PAL for the compound.
2) If no CHHSL is available, then the U.S. EPA Regional Screening Level (RSL) (EPA 2012) for Residential Indoor Air will be divided by an attenuation factor (α) of 0.001 and the result will be the PAL. The attenuation factor is based on Table 2 in the current DTSC Vapor Intrusion Guidance (DTSC 2011).

Table 2-1 compares the proposed PALs with current (standard) laboratory reporting limits (RLs) and also the maximum soil vapor concentrations detected in the 1999 vapor survey. Of the eight VOCs detected in 1999, only vinyl chloride has a PAL lower than the standard RL for the on-site mobile laboratory. The PAL and RL values are 0.0133 micrograms per liter (ug/L) and 0.05 ug/L, respectively.

Concentrations of vinyl chloride greater than 100 ug/L were detected in 1999 (Hamilton, 2000). These would compromise the proposed analyses if a very low RL were used. Thus the standard RL is proposed here for all VOCs, including vinyl chloride. In order to detect low concentrations of vinyl chloride associated with the Central Basin plume (e.g., at probes where vinyl chloride is not detected using the standard RL), it is proposed that a second sample from the probe be obtained and analyzed using an RL that is lower than the PAL. Thus an RL of 0.01 ug/L would be used for the re-analysis of these probes.

3. Investigation Plan

3.1. Primary Sampling Locations

The proposed investigation will assess soil vapor around all four of the basins with emphasis on the Central Basin plume area (Figure 3), to characterize the previously identified plume.

The assessment around the North, South, and BCCB basins and the south and west sides of the Central Basin is considered a screening investigation and vapor probes will be placed around the perimeters of these basins with spacing of approximately 50 feet. The 50-foot spacing was chosen based on a review of the previous soil vapor survey results. If a soil vapor plume of similar size to the plume identified at the Central Basin exists at any of the other retention basins, it would most likely be detected using 50-foot spacing.

Because a vapor plume was previously identified on the north and east sides of the Central Basin, two tiers of temporary vapor probes will be installed for characterization in this area at approximately 25-foot intervals. Figure 2-1 shows the proposed primary sampling locations around the four basins.

At each sampling location, vapor probes will be installed at 5 and 10 feet below ground surface (bgs). The retention and BCCB basin floors are at the present ground surface elevation. Dikes were constructed to form basins that range in depth from 7 to 8 feet. Shallow site groundwater is typically encountered at approximately 13 feet bgs. Therefore, the 10-foot bgs samples should be above the capillary zone. The 5-foot bgs samples are intended to detect VOCs that may migrate laterally or otherwise miss the 10-foot probes.

3.2. Step-Out Sampling Locations and Rationale

Step-out samples will be collected within the screening areas and on the perimeter of the characterization areas if VOCs are detected by the on-site mobile laboratory at concentrations that exceed the PALs (Table 2-1). Step-out sampling vapor probes will be installed at locations half the distance of the spacing (e.g., 25 feet at screening areas and 12.5 feet at characterization areas) surrounding the primary probe in which a detection occurred, in all four directions from that probe. Additional step-out vapor probes will be installed extending in the same directions until the vapor plume has been delineated to the PALs, with the following exceptions:

1. Field conditions prevent further extension of a line of step-out borings (e.g., step-out samples will not be installed within the retention basins or their dikes).
2. If VOCs above the PAL are detected in each of two adjacent (primary) characterization probes, step-out samples will not be installed between the two probes to avoid redundancy.

3. The minimum distance between probes will be ~12.5 feet (i.e., probes will not be installed with ~6-foot spacing).

The following are illustrative examples (schematic diagrams of each example are presented in Figure 2-2):

Example 1 If a VOC is detected above the PAL in a single primary vapor probe with spacing of 50 feet (e.g., a screening probe at the North Basin), then step out vapor probes will be installed 25 feet to the north, south, east, and west of the primary probe (unless a physical feature prevents it).

Example 2 If VOCs are detected above the PALs in a primary vapor probe on the east side of the Central Basin (25-foot spacing), then step out samples will be installed 12.5 feet to the north, south, east, and west of the primary probe (total of four step-out sampling probes), unless physical features prevent installation of one or more probes, or there is an adjacent primary probe in the same direction as a potential step-out probe that also has VOCs detected above the PALs.

Example 3 If VOCs are detected above the PALs in three adjacent primary vapor probes on the south side of the North Basin (50-foot spacing), then step out samples will be installed 25 feet to the east of the eastern most primary probe, 25 feet to the west of the western most primary probe, and 25 feet to the north and south of each of the primary probes (total of eight step-out sampling probes), unless a physical feature prevents it.

Example 4 If VOCs are detected above the PALs only in the step-out probe from Example 3 that is located south of the center primary probe, then second tier step-out probes will be installed 12.5 feet to the east, west, and south of the step-out probe with VOCs above the PALs (Figure 2-2).

4. Field Procedures

The following sections describe the procedures that will be used to perform the soil vapor probe installation, purge testing, sample collection, field quality control, and documentation. The soil vapor survey will be conducted in accordance with *Advisory – Active Soil Gas Investigations* (Cal/EPA 2012).

4.1. Soil Vapor Probe Installation

Soil vapor probes will be installed in bore-holes advanced using a hand auger or direct-push drilling rig (e.g., GeoProbe or StrataProbe). The 10-foot and 5-foot vapor probes will be nested in the same bore-hole. The bore-holes will be advanced to approximately 10.5 feet bgs (6 inches below the target probe depth). A clean sand filter pack will then be poured into the bottom of the bore-hole, and a length of 1/4- or 1/8-inch diameter Nylaflow tubing with a gas permeable probe tip will be inserted down the bore-hole to the bottom. Additional clean sand filter pack material will be poured into the bore-hole to cover the probe tip with several inches of filter sand. A minimum of 6 inches of dry granular bentonite will be poured on top of the filter pack, and then hydrated bentonite will be placed in the bore-hole to approximately 5.5 feet bgs. The procedures will then be repeated to install the 5-foot bgs vapor probe. The vapor probes will be terminated at the surface with a gas-tight 2-way Luer valve. A schematic diagram of nested vapor probes is provided in Figure 2-3.

All probes installed using the direct-push method will be allowed to equilibrate for a minimum of 2 hours prior to sampling, and when practical, will be allowed to equilibrate for 24 hours. It is anticipated that the field investigation program will be started on day 1 with probe installation activities only. Vapor probe sampling will not commence until at least day 2. This will provide for ample equilibration time.

All probes installed in hand-augered borings will be allowed to equilibrate for a minimum of 48 hours, as recommended in the guidance (Cal/EPA 2012).

4.1.1. Vapor Probe Identification

Vapor probes will be identified by two letters indicating the retention basin, followed by the letters "SV" to indicate soil vapor, followed by a dash and a sequential number that will start at the northeast corner of each basin and go counter clockwise around the basin, followed by a dash and the depth in feet bgs. For example, the third probe from the northeast corner of the North Basin installed at 10 feet bgs will be identified as: NBSV-3-10. Step-out probes will be identified by a lower-case letter following the number of the primary probe (e.g., NBSV-3a-10).

4.1.2. Decontamination

All down-hole equipment will be decontaminated between bore-holes to prevent cross-contamination. The cleaning procedure will be to wash the equipment in an Alconox solution. The equipment will then be double rinsed in potable water.

4.1.3. Logging

A minimum of four bore-holes per basin, distributed around the basin, will be continuously logged by a California Certified Engineering Geologist or Professional Geologist (Geologist). The soils will be logged as described in Section 2.1.3 of Appendix A (Soil Sampling and Analysis Plan) of this Pipeline Work Plan. The logged soil vapor bore-holes will include those specified for collection of physical property data (refer to Section 4.2.4 below). Existing boreholes from the basin investigation, discussed in Section 5 of this Work Plan, were logged. Their locations are shown on Figures 4and 5. Logs proposed here for the soil vapor probe bore-holes will serve to augment this existing dataset.

4.1.4. Bore-Hole Cuttings

All material derived from the bore-hole drilling will be placed in sealable, DOT-approved, 55-gallon drums. A composite sample from each barrel generated from the drilling will be sent to a certified laboratory for analyses for waste disposal profiling. Based on the results of the profiling, the drum contents will be transported by a properly licensed waste hauler to an appropriately licensed disposal facility. Bore-hole cuttings from direct-push borings for vapor probe installation are expected to be minimal and will be combined with the cuttings derived from the soil investigation (Appendix 1).

4.1.5. Abandonment Procedures

Destruction of the completed soil vapor monitoring probes will be performed in general accordance with the procedures described in *Advisory – Active Soil Gas Investigation* (Cal/EPA 2012).

When soil vapor sampling is completed, the sample tubing will be filled with a sealant such as silicone caulk or hydrated bentonite, the tubing will be cut below grade, the remaining void will be filled with saturated granulated bentonite slurry until slightly below grade. The remaining depression will be completed to grade with soil, asphalt, or concrete to match adjacent surface conditions.

4.2. Soil Vapor Sampling

4.2.1. Shut-In Testing

Prior to purging or sampling, a shut-in test will be conducted on the sampling train to check for leaks in the above-ground fittings. The shut-in test will be conducted by attaching the complete sample train assembly to the termination Luer valve on the soil vapor probe. With the Luer valve on the probe in the “off” position, a purge syringe or vacuum pump will be used to evacuate the sample train of air to a minimum measured vacuum of approximately 100 inches of water. The vacuum will be observed on an in-line vacuum gauge which is positioned upstream of the syringe or vacuum pump. The vacuum gauge will be observed for one minute and all above ground connections will be considered "air-tight" if the pressure on the gauge does not noticeably dissipate. If there is an observable loss in vacuum, the fittings in the sample assembly will be checked and tightened, and the test repeated. Sampling will not start until the shut-in test shows the system to be air-tight.

4.2.2. Purge Volume Testing

In accordance with the guidance (Cal/EPA 2012), a purge volume test will be performed at the first probe that is sampled at the site. A system volume will be considered the void space of the filter pack and the dry granular bentonite (assuming 30 percent porosity) plus the tubing volume. The probe will be purged and a sample collected after 1, 3, and 10 system volumes have been purged. The samples will be analyzed and the purge volume that corresponds to the sample with the highest concentrations of COPCs will be used for purging subsequent probes. If the results of the purge test are inconclusive, the default will be to purge three system volumes.

Additional purge volume tests will be conducted, if warranted, in accordance with the guidance (Cal/EPA 2012).

4.2.3. Soil Vapor Sampling

Vapor probe sampling will be conducted after completion of a successful shut-in test and purge volume test. All purging (including for purge tests) will be at a flow rate of 200 milliliters per minute (ml/min) or less, and the purging vacuum will be maintained at less than 100 inches of water.

Purging will be accomplished using a syringe equipped with a 3-way Luer valve, which will be attached to the 2-way valve at the probe termination. When purging with a syringe, it is very easy to "feel" the vacuum as the plunger is drawn out; therefore, it will be readily apparent if a probe is encountered with high vacuum. If this occurs, a vacuum gauge will be used to monitor the vacuum during purging and ensure it does not exceed 100 inches of water. A leak test will be performed for each sample collected using a rag or paper towel soaked with a liquid tracer compound such as isopropanol or diflouroethane.

Samples will be collected in gas-tight glass syringes and immediately handed over to the on-site mobile laboratory operated by H&P Mobile Geochemistry, Inc. (H&P) for analysis within 30 minutes using EPA method SW8260 modified for gas. Sample IDs will correspond to the vapor probe IDs as described in Section 4.1.1.

4.2.4. Soil Sampling

Soil physical properties for purposes of vapor risk assessment modeling will be obtained from approximately three soil vapor probe locations near each basin (Figure 2-1). Note that soil in these areas was sampled and analyzed previously (Figures 4 and 5 show the locations of bore-holes where soil samples were collected for the basin investigation; they are described in Section 5 of this Pipeline Work Plan).

The purpose of the soil sampling proposed here is to evaluate soil physical properties required for potential modeling of soil vapor migration. Soil will be sampled and analyzed to represent each major lithologic type observed within each physical-property bore-hole (Figure 2-1). The soil samples would consist of intact (continuous) core samples at least 12 inches long. Thin lenses within the soil column are assumed to be laterally discontinuous and therefore do not warrant individual testing for physical parameters. In these cases, the cores will provide overall “average results” within the soil column. Bore-hole logs will be recorded as described in Section 4.1.3 above. The soil samples obtained for the soil vapor investigation will be analyzed for the following physical parameters:

- Soil density (ASTM D2937);

- Soil moisture (ASTM D2216);
- Total porosity (ASTM D854);
- Effective permeability (API RP 40);
- Total organic carbon by Walkley-Black Method;
- Grain size (ASTM D422); and
- Unified Soil Classification System (USCS).

4.2.5. Health and Safety

Soil sampling activities will be conducted in accordance with the DTSC-approved, January 1996 Project Health and Safety Plan (HASP) with Addendums 1 and 2 dated March 2004 and May 2004, respectively. To summarize, the Geologist will begin the daily work by performing a Health and Safety meeting with the drilling and mobile laboratory contractors and any visitors to the site. The topics of the meeting will include the maximum concentration values measured at the site from previous investigations. The drilling contractor will be informed that the area to be investigated has been cleared by USA or an underground utility locating contractor. The personnel protection level will be addressed. The work perimeter will be established with yellow caution tape. The proper form will be signed by all in attendance of the meeting.

The potential for fugitive dust during vapor probe installation is very low. Therefore, fugitive dust monitoring will not be conducted for the vapor probe installations; however, fugitive dust monitoring may occur simultaneously for the soil investigation.

4.3. Field Quality Control Procedures

4.3.1. Replicate Samples

Field replicate samples will be collected at a rate of 5 percent of regular samples by sequentially collecting two samples from a single probe after completing the purge (the probe will not be re-purged prior to collection of the duplicate).

4.3.2. Probe Blanks

A vapor probe blank will be collected for each roll of tubing used to install vapor probes. The blank will be collected by assembling a 10-foot length of tubing, a probe tip, and a 2-way Luer valve and drawing ambient air through the assembly into a sample syringe. The blank sample will be analyzed for site COPCs by the on-site mobile laboratory.

4.3.3. Documentation

The Geologist will assign and maintain identification numbers for all vapor probes and samples. The daily field logs will include project location, date, start and finishing times, weather conditions, equipment used, personnel and protection level, visitors, field observations and problems encountered, the time and ID of all samples collected, results of the purge test, and any other pertinent information. The field logs will be signed and dated by the sampler.

5. Analytical Laboratory

5.1. Project Laboratory

All soil vapor samples will be analyzed by H&P Mobile Geochemistry, Inc. (H&P) using an on-site mobile laboratory running EPA method SW8260 modified for the analysis of gas. H&P, based in Carlsbad, CA, is a California Environmental Laboratory Accreditation Program (ELAP) certified analytical laboratory specializing in soil gas and ambient air sample analysis.

The reporting levels for H&P mobile laboratories and the corresponding project action levels are presented in Table 2-1.

5.2. Laboratory QA/QC

The H&P Quality Assurance Program Standard Operating Procedure (SOP) is on file and a summary of their QA/QC requirements is provided as Attachment A to this SAP. The program is designed to continually monitor the reliability of test results, ensure that analytical results are within acceptable limits, and provide guidelines for the implementation of corrective action when necessary. The program is based on the standards developed by the National Environmental Laboratory Accreditation Conference and applicable state and EPA requirements.

The program consists of the Quality Assurance/Quality Control (QA/QC) elements specified by the Cal/EPA Soil Gas Guidance (Cal/EPA 2012) and the EPA SW846 method. Components include analysis of method blanks and laboratory control samples (LCS) at least once for every analytical batch.

5.3. Laboratory Reporting

The laboratory will provide formal reports for all of the samples analyzed from the site. The laboratory reports will include analytical results for all compounds detected in the samples, including leak check compound, and results for QA/QC samples including method blanks, LCSs, and field replicates.

6. Reporting

Following the completion of the soil vapor survey, a comprehensive report will be prepared by a California Professional Geologist for submittal to the DTSC. At a minimum, the report will contain the following information.

1. A comprehensive discussion of all data derived during the soil vapor survey, including supporting graphics such as maps and charts.
2. A summary table of analytical results.
3. A discussion of any field problems that occur during the survey.

4. A discussion of any variances from this SAP.
5. All boring logs prepared during the survey.
6. Copies of daily field forms.
7. The H&P laboratory reports.

Table 2-1
Soil Vapor Reporting Limits and Project Action Levels for Site COPCs (µg/L)
Alamitos Generating Station
Retention Basin Site
Los Angeles County, California

Analyte	Standard RL[1]	PAL	rCHHSL	rRSL ÷ 0.001	Soil Vapor Max Conc. in 1999
1,1-Difluoroethane (LCC)	10		-	-	
1,1,1,2-Tetrachloroethane	0.5	0.33	-	0.33	
1,1,1-Trichloroethane	0.5	991	991	5200	44
1,1,2,2-Tetrachloroethane	0.5	0.042	-	0.042	
1,1,2-Trichloroethane	0.5	0.15	-	0.15	
1,1-Dichloroethane	0.5	1.5	-	1.5	13
1,1-Dichloroethene	0.5	210	-	210	20
1,2,3-Trichloropropane	0.5	0.31	-	0.31	
1,2,4-Trichlorobenzene	0.5	2.1	-	2.1	
1,2,4-Trimethylbenzene	0.5	7.3	-	7.3	
1.2-Dichlorobenzene	0.5	210	-	210	
1,2-Dichloroethane	0.1	0.0496	0.0496	0.094	
1,2-Dichloropropane	0.5	0.24	-	0.24	
1,4-Dichlorobenzene	0.5	0.22	-	0.22	
Benzene	0.1	0.0362	0.0362	0.31	
Carbon tetrachloride	0.1	0.0251	0.0251	0.41	
Chlorobenzene	0.1	52	-	52	
cis-1,2-Dichloroethene	0.5	15.9	15.9	-	183
Ethylbenzene	0.5	0.97	-	0.97	
Isopropylbenzene	0.5	420	-	420	
m,p-Xylenes	0.5	315	315 [2]	100	1.8
Methylene chloride	0.5	96	-	96	
Methyl tert-butyl ether	0.5	4	4	9.4	
Naphthalene	0.1	0.0319	0.0319	0.072	
o-Xylene	0.5	315	315 [2]	100	
Tetrachloroethene	0.1	0.18	0.18	9.4	3.3
Toluene	1	135	135	5200	ND
trans-1,2-Dichloroethene	0.5	31.9	31.9	63	
Trichloroethene	0.1	0.528	0.528	0.43	18
Trichlorofluoromethane	0.5	730	-	730	
Vinyl chloride	0.05	0.0133	0.0133	0.16	274

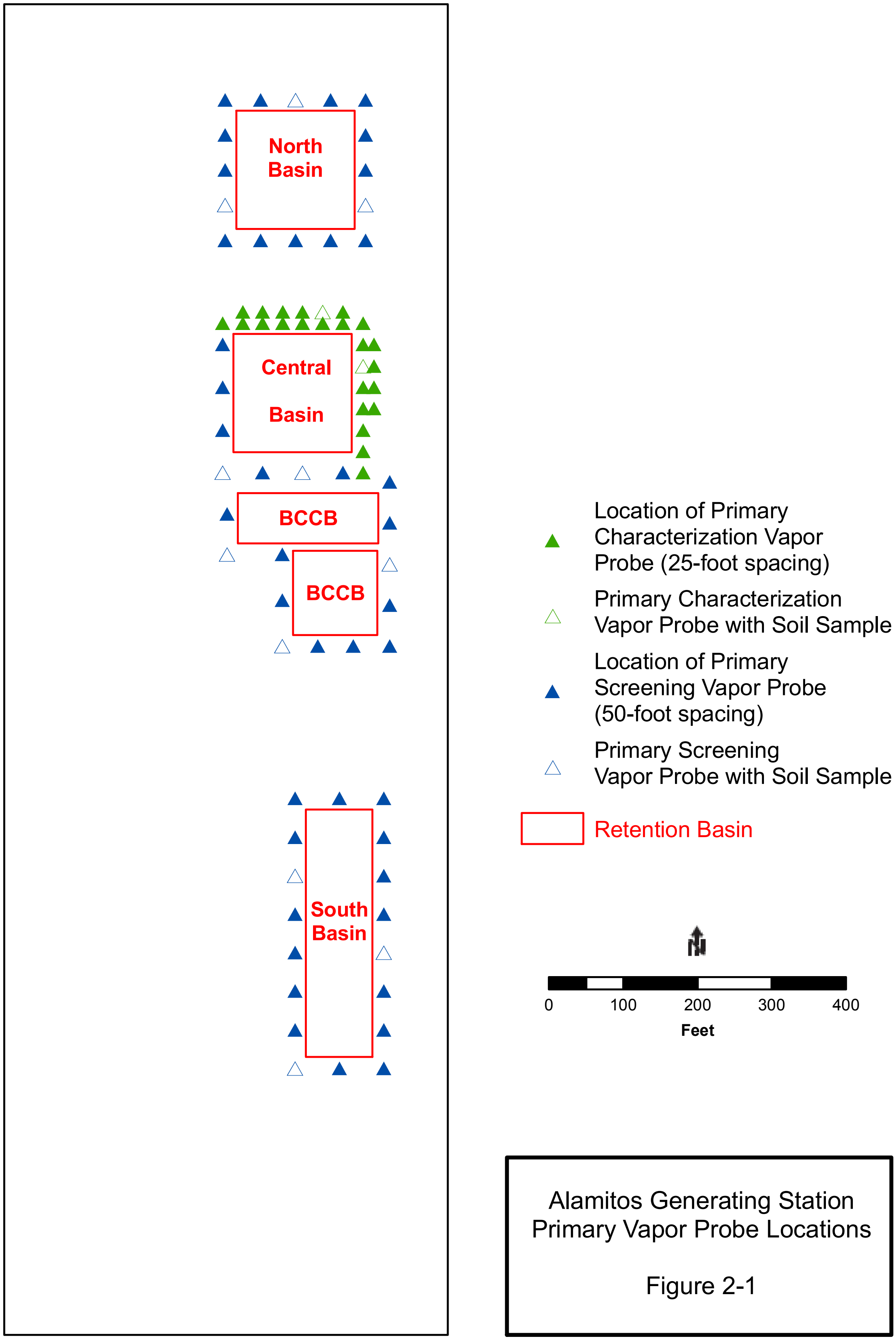
Legend:
VOCs detected in basin investigation soil samples
VOCs detected in basin soil vapor samples in 1999
Elevated concentration(s) previously detected could affect proposed quantitative analyses

Definitions:

cCHHSL - California Human Health Screen Level for Shallow Soil Gas – Commercial/Industrial Land Use
rCHHSL - California Human Health Screen Level for Shallow Soil Gas – Residential Land Use
COPC - chemical of potential concern
EPA - Environmental Protection Agency
LCC - leak check compound
µg/L - micrograms per Liter
PAL - project action level
RL - reporting limit
iRSL - Regional Screening Level for Commercial
rRSL - Regional Screening Level for Residential Indoor Air (EPA 2012)
Indoor Air (EPA 2012)

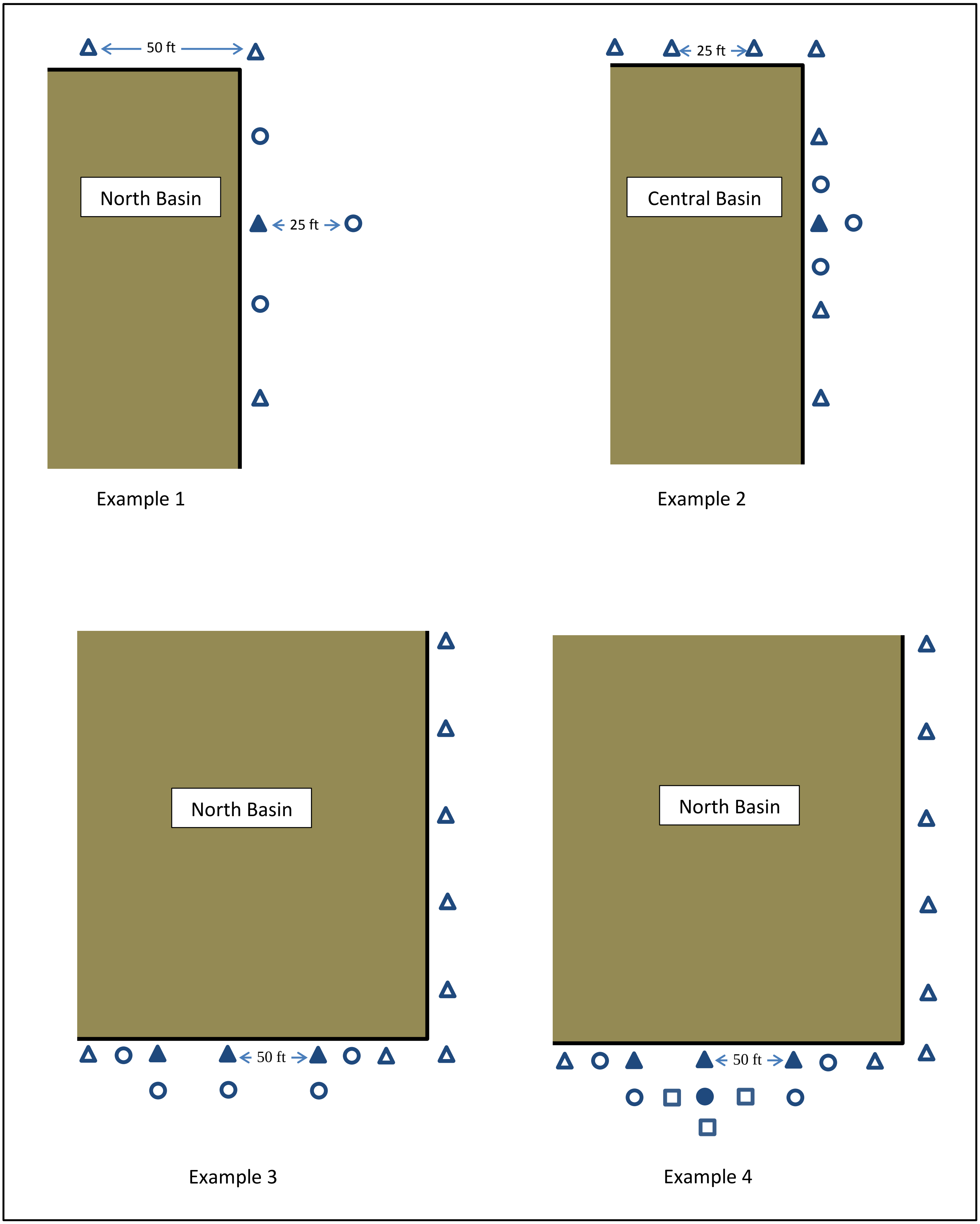
Notes:

1 - Values provided by H&P Mobile Geochemistry, Inc.
2 - Representative screening value for mixed xylenes.



Alamitos Generating Station
Primary Vapor Probe Locations

Figure 2-1



Primary vapor probe location

Primary vapor probe location with VOC above PAL

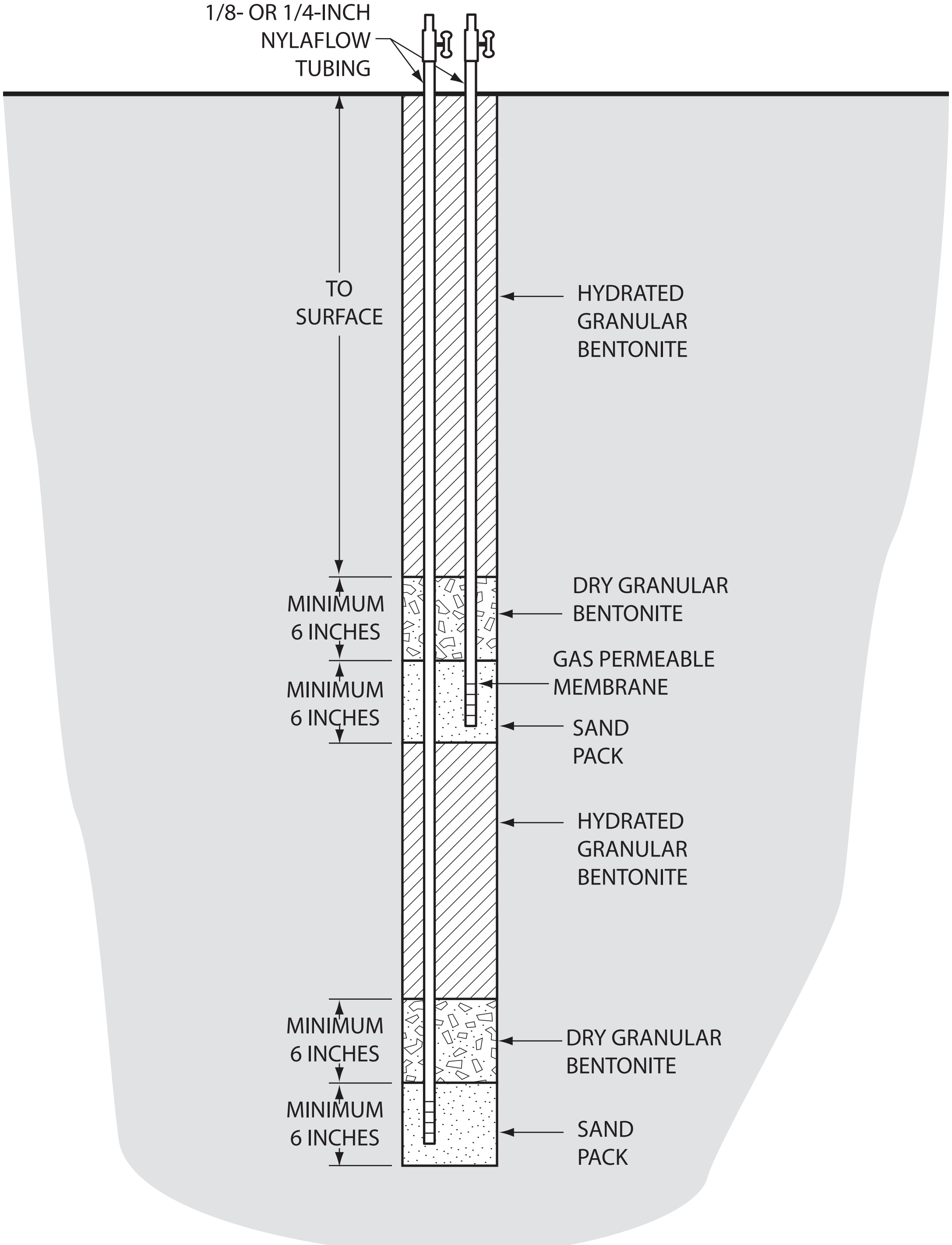
First tier step-out vapor probe location

First tier step-out vapor probe location with VOC above PAL

Second tier step-out vapor probe location

Step-Out Vapor Probe Example Schematics

Figure 2-2



NOT TO SCALE

TYPICAL NESTED
SOIL VAPOR PROBE
CONSTRUCTION SCHEMATIC

FIGURE 2-3

QA/QC REQUIREMENTS SUMMARY
Vapor/Air for VOCs
Analytical Method / SOP Reference: H&P-SOP-8260SV

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank	Once every analytical batch of 20 or fewer samples	No analyte detected equal to or above the MRL (DoD: No analytes > ½ MRL; common lab contaminants none detected > MRL)	1) Reanalyze blank 2) Identify and correct problem 3) Reanalyze blank and affected samples 4) Qualify data	H&P PM	Accuracy/Bias - Contamination	No analytes detected less than half the RL
LCS	Once every analytical batch of 20 or fewer samples	Percent recovery (%R) within 70-130%	1) Reanalyze 2) Identify and correct problem 3) Qualify data *DoD projects require corrective action for all exceedances	H&P PM	Accuracy/Bias	Recoveries within 70-130% recovery
Surrogate	Every analytical sample	A minimum of three surrogates must pass QAQC limits	Reprep and reanalyze all samples processed with the non-conforming surrogate. Dilute sample if necessary.	H&P PM	Accuracy/Bias	Dibromofluoromethane, 4-Bromofluorobenzene, Toluene-d8, and 1,2-Dichloroethane-d4: 75-125%
Sample Duplicate	One field Sample duplicate each day	Main analytes of concern must meet precision requirements	Re-collect and analyze sample	H&P PM	Precision	RSD must be equal or less than 50%
MS/MSD	Not applicable					

Initial Calibration
5 points minimum
RSD <30%
Linear Regression acceptable in correlation >0.99
2nd Source Verification

Daily Calibration (CCV)
BFB Tune Valid for 12 Hr
%D <20% (Flag analytes >20% as appropriate)

DEFINITIONS:

% D	percent Deviation (from initial calibration)
BFB	Bromofluorobenzene
CCV	Continuing Calibration Verification (daily calibration)
DoD	Department of Defense
LCS	Laboratory Control Spike
MRL	Method Reporting Limit
MS/MSD	Matrix Spike and Matrix Spike Duplicate
RSD	Relative Standard Deviation

Attachment DR145-1
November 2014 Soil Characterization Report

SOIL CHARACTERIZATION
Alamitos Generating Station

Southern California Edison Company

November 2014

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1. Introduction

In 1996, Southern California Edison Company (Edison) implemented a Water Quality Monitoring Program in response to a Final Judgment pursuant to a Stipulation, handed down by the Superior Court of California, Los Angeles County, Number BC 121219 on February 1, 1995. The Stipulation alleged that Edison had stored hazardous wastes in non-permitted wastewater retention basins at their electrical generating stations in southern California. Edison agreed to clean close these basins according to Chapter 15 of Title 22, California Code of Regulations. The Alamitos Generating Station is one of the eleven sites referenced above.

There are four wastewater retention basins at the Alamitos Generating Station. The position of the basins is shown on the station Facility Map, Figure 1. Characterization investigations pursuant to 22 CCR 66265.98 began at the facility in 1996. The purpose of the investigations was to determine if the basins or associated conveyance system (pipelines) had released wastewater to the underlying soil. If a release was detected, the nature and extent of the contamination was to be investigated.

Edison has performed several soil investigations to characterize the soil beneath and adjacent to the basins and associated pipelines at the Alamitos facility. A complete listing of these soil investigations is shown on Table 1. A total of 698 soil samples have been collected from 273 borings beneath and adjacent to the basins and pipelines. The initial investigation began with the collection of soil samples from beneath each basin in 1997. The investigation area was expanded in 2007 to the perimeter of the basins. A study of the background soil constituents and concentrations was also performed in 2007 to create a dataset for the comparison of the characterization data. The investigation for the pipelines began in 2012 and was completed in 2013 with a series of step-out/step-down borings.

This report presents the characterization of the soil beneath and adjacent to the basins and pipelines at the Alamitos facility. It begins with a description of the retention basins and pipelines which are the focus of the soil investigation. Section 3 presents the protocol used to collect the soil samples and a brief description of the field investigations. Though the sampling events occurred over several years, the sampling protocol remained consistent. The data analysis begins with a description of the physical properties of the soils encountered during the investigation. This is followed by a discussion of the analytical data derived from the collected soil samples.

2. Site Facilities

2.1. Retention Basins

The site contains four basins: North, Central, Boiler Chemical Cleaning (BCCB), and South (Figure 1). The North and Central retention basins were installed in the 1960's. The South Basin was constructed in the mid-1960s, probably 1965. The retention basins were originally constructed with a single asphaltic concrete liner. In the 1980's, a single layer of a synthetic liner (HDPE) was installed at each of the retention basins using the existing asphalt liner as a base. The BCCB was originally constructed in 1977 of asphaltic lining. The basin was retrofitted in late 1989 with a double liner of HDPE and a leachate collection system.

The retention basins are used to collect and store non-hazardous wastewater from the facility. The wastewater, containing minor amounts of oil, grease, and suspended solids, is systematically discharged to the ocean under the provisions of an NPDES permit. The BCCB was used to temporarily hold (for less than 30 days) non-hazardous acidic cleaning solutions from the removal of corrosion and mineral deposits from the boiler tubes. This cleaning process is no longer used at the facility. The BCCB is out of service and no longer used as a retention basin.

2.2. Pipelines

2.2.1. Introduction

As part of the closure process, Edison investigated any station feature that conveyed wastewater to and from the retention basins. Edison began this task by a determination of which station features were directly related to the basins, each feature's use, and whether the feature was part of a process that could create hazardous materials. Several station personnel were interviewed during this process. To the extent possible, design drawings were obtained and examined. Each of the features determined to be associated with the retention basins was inspected at the station.

The results of the investigation revealed that several pipelines convey wastewater to the retention basins originating from various station drains. These drains include floor drains, steam trap drains, boiler acid wash drains, fireside wash drains, and boiler blowdown drains. It has previously been determined that the floor, steam trap, and boiler blowdown drains are not related to a process that could create hazardous materials. However, the drains associated with the boiler acid washes historically conveyed wastewater with low pH values and metals. Wastewater from the fireside washes typically contained hydrocarbons and metals. The station later discontinued the use of the boiler acid and fireside washes.

The purpose of the boiler acid wash was to clean the boiler steam tubes. During the production of steam, the boiler tubes would become coated with material deposited from the water. The coating would cause the heating cycle to become less efficient. When this occurred, an acid wash would be performed on the boiler. This was performed by injecting an acid solution into the boiler tubes. The resultant waste solution was conveyed through pipelines to the retention basins. This practice was discontinued in 1996.

The purpose of the fireside wash was to clean the outside of the boiler tubes. During the early decades of operation, when the station burned fuel oil, deposits occurred on the boiler walls and on the boiler tubes. The deposits caused a reduction in the efficiency of the heat transfer to the tubes. The fireside wash was used to clean the deposits from the tubes and boiler when it was determined necessary. This was performed by externally washing the boiler walls and tubes with water. The wash water was diverted into pipelines via collector drains. These pipelines conveyed the wastewater to sediment traps adjacent to each unit. Fuel oil use was discontinued in the 1970s, when air quality regulations required a switch to clean-burning natural gas. Since then, these residual deposits have not been an issue, and fireside washes were discontinued.

An additional pipeline conveying wastewater to the basins originates at a sump near Unit 6 which was initially used to collect regeneration wastewater from a demineralizer. Prior to 1991, the station operated a demineralizer to produce ultra-clean water for the steam system. This process utilized both acid and caustic materials. The regeneration wastewater was collected in a small sump associated with the treatment facility. During the process, this sump would often contain water with a low pH value. The station discontinued this process in 1991 and presently uses a portable reverse osmosis system. The sump is presently used to collect regeneration water from this reverse osmosis unit. This wastewater contains concentrations of general anions and cations similar to those generated in home reverse osmosis units.

The sump was investigated in 1996 as part of a sump integrity study for all generating stations. The results of this investigation were presented to the DTSC in a report titled “Sump Integrity Report” dated December 19, 1996. It was determined that the sump had not leaked low pH water to the soil.

2.2.2. Pipeline Systems

Alamitos Generating Station is composed of three pairs of generators, Units 1-2, Units 3-4, and Units 5-6 shown on Figure 1. Each pair was constructed at different times over the years and is serviced by separate boiler acid wash and fireside wash systems. Each pair has a designated retention basin established for the wastewater generated by the pair of units. Later, after all three pairs of units were operating; a pipeline was constructed connecting all retention basins to maximize the operation of the wastewater systems.

The boiler acid wash and fireside wash systems for Units 1-2 are conveyed through a common pipeline to the oil/water separator at the southeast corner of the units. The separator allowed any heavy particles to settle from the wastewater as it passed through the structure. In the separator, the wastewater would also commingle with water from other drains. The wastewater from the separator would gravity flow a short distance to a transfer sump (Figure 4a). This sump also received boiler blowdown water. The combined water was pumped from the transfer sump to the North Basin and eventually the outfall (Figure 1).

Units 3-4 and Units 5-6 have a common design. The fireside wash wastewater drains to a sediment trap associated with each of the four units. The wastewater then gravity flows to a pump sump attached to an oil/water separator located between each of the unit pairs. Through a separate pipeline, the pump sump also receives the acid wash waste solutions (Figures 4b and 5a, respectively). There was no commingling of the waste solutions since the acid wash and fireside wash processes were not performed concurrently. The waste water solution for Units 3-4 was pumped to the Central Basin while the South Basin received the solution from Units 5-6 (Figure 1). The wastewater was eventually pumped into the cooling water system at the outfall structure after treatment and testing to ensure compliance with permit effluent limits.

After the completion of Units 5-6, the three existing retention basins were connected with a pipeline located along the eastern side of the basins. This line allowed station Operators more flexibility in storing wastewater. This pipeline is above grade to the south and buried north of the Central Basin (Figure 1).

The Boiler Chemical Cleaning Basin (BCCB) was constructed specifically for the purpose of processing the waste solutions generated by the acid wash system. The two small basins shown on Figure 1 are hydraulically connected by a pipe through the dike. The waste solution was processed as follows. First, it was treated with lime to raise the pH and precipitate out any metals. The clear liquids were then pumped off to the adjacent basin, neutralized and tested for metals to verify they were non-hazardous, before being pumped to the Central

Basin. The solids were then processed through a filter press, located on the dike, until they were removed. The remaining solution was pumped to the Central Basin where it was commingled with other wastewater and then discharged into the cooling water system under the station's NPDES permit. Waste solution to the BCCB from Units 1-2 and Units 3-4 entered through the pipeline shown in green (Figure 1) while the solution from Units 5-6 was conveyed through the above-grade pipeline on the east.

A third system that conveyed wastewater to the retention basins is the pipeline associated with the water treatment facility. In the past, this pipeline conveyed low pH wastewater from the regeneration of a demineralizer system. This is an above-grade pipeline shown on Figure 1.

3. Soil Sampling Procedures

Each of the soil investigations were conducted in compliance with DTSC-approved work plans, prepared in accordance with the Project Sampling and Analysis Plan (SAP). The depth of each sample is shown on the appropriate data table presented in Section 5. The procedures utilized in the investigations were similar as summarized below. The Geologist began each work day by performing a Health and Safety meeting with all workers. Beginning with the November 2007 investigations, a fugitive dust monitor was activated and positioned at the sampling area. All excavation equipment was decontaminated before work began. The soil samples were collected by either hand auger equipment or with a Geoprobe drill. All sampling equipment was decontaminated between samples by washing in Alconox and double rinsing in de-ionized water.

The Constituents of Concern (COC) list for each soil sampling event is included on Table 1. The analysis for volatile organic compounds (VOCs) was performed at all soil sampling events. The field protocol for VOC analysis was as follows. Immediately upon retrieval of the soil sample, three 40 ml vials were filled with five grams of sample in accordance with EPA Method 5035 for VOC analysis of soil samples. One vial was preserved with methanol while the other two were preserved with sodium bisulfate. The three vials were secured in a protective bubble bag, labeled, and placed on wet ice to chill the sample to a temperature of 4°C.

All samples were screened for soil pH utilizing a portable pH meter and soil electrode. The meter and electrode were calibrated and recorded on a Calibration Log on each sampling day. Ten milliliters of de-ionized water was thoroughly mixed with ten grams of soil in a small beaker and allowed to set for ten minutes. The soil electrode was then set into the sample beaker and the pH value determined with a Cole-Parmer meter. The pH value for the sample was recorded on a Daily Field Form. The pH electrode was rinsed in de-ionized water between pH determinations.

After the pH values were determined and recorded, the remaining sample was placed in a labeled, glass jar and placed on wet ice. This sample was utilized for the analysis of the remaining constituents on the COC list. A duplicate sample was collected for each ten samples collected beginning with the 2007 sampling event. This sample was processed as any other sample and was not labeled as a duplicate.

A specific sample number was assigned to each soil sample. This number was recorded on the Daily Field Form and Chain of Custody Form with all appropriate labeling attached to the sample containers. Samples were transported to Weck Laboratories, a California certified laboratory, for analysis with the completed Chain of Custody Form. The soil samples were analyzed for the COCs listed for each investigation listed on Table 1. The Daily Field Forms and Calibration Logs for each of the soil investigations are contained in Appendix 1.

All drilling and sampling equipment was decontaminated between borings or samples to prevent cross-contamination. The cleaning procedure was to wash the equipment in an Alconox solution. The equipment was then double rinsed in de-ionized water. A daily field blank was processed to show the adequacy of the decontamination methods.

At the completion of the sampling, all borings were backfilled with hydrated bentonite chips. The chips were carefully poured into the boring in one foot lifts. Fresh water was placed over the bentonite to cause hydration.

4. Physical Results

4.1. Boring Locations

The location of the soil borings beneath and adjacent to the Retention Basins are shown on Figure 2. Three hundred and fifty-five samples were collected from the one hundred and nineteen borings using hand auger equipment. The fifty-two background soil samples were collected from eighteen borings at four locations over the site as shown on Figure 3. The specific arrangement of boring at each of the four locations is shown on Figures 3a-3d.

The boring locations for the soil investigation for the pipelines are shown on Figures 4, 4a, 4b, 5, and 5a; northern and southern portions, respectively. Most of the one hundred and twenty-two borings depicted on the two figures were drilled using hand auger equipment. However, four of the deeper borings adjacent to sumps required the assistance of a Geoprobe drill.

The log for each boring is contained in Appendix 2. The boring logs have been separated by basin, pipeline, and background areas.

4.2. Lithology Information

4.2.1. General

The site is directly underlain by the Holocene Bellflower Aquitard composed of continental flood plain and marsh deposits. These deposits consist of discontinuous beds of sand, silt, clay, and gravel which are commonly unconsolidated. The aquitard layer has a reported thickness of about fifty feet.

The materials encountered by the forty-three groundwater monitoring wells installed on the site show the non-continuous nature of the sediment layers. Figure 6 is a section originally presented in the "Well Completion Report, Alamitos Generating Station," dated April 18, 1997. This north-south section was derived from the well bore-hole logs from the North to the South basins (Figure 1). It illustrates the non-continuous nature of the lithologic formations below the retention basins. To simplify the sections, some of the silty sand-sandy silt mixtures were combined into one unit and units of less than two feet in thickness were ignored.

The section indicates the lithology below the basins is a complex of interfingered deposits of sand, silty sand, silty clay, and clay. The lower 15 feet of the lithology is dominated by layers of the following deposits: gray sand; plastic, gray clay; and plastic, dark gray silty clay. The sand and silty clay are distinguished by the presents of organic material in the form of roots. The silty clay layer appears to trend through the entire section.

The upper 15 feet of the section is a very complex layering of deposits of sand, silty sand, sandy silt, clay, and fill material. The colors vary from tan, brown, and gray. Some layers contain gravel while others have a high content of organic material.

Complications to the lithology are areas along the east property line of hydraulic fill from dredging of the adjacent San Gabriel river channel. There is direct and indirect evidence that over the eighty year history of the site, the owner allowed the Public Works Department to deposit the dredged fill on the property. The exact location of these areas was never recorded. An area was discovered on the southern portion of the site where Edison had proposed to construct an office building. The analytical results of a soil investigation showed the soil was high in nickel, arsenic, and chromium. The project was cancelled.

4.2.2. North Basin

The liner openings removed for the exploration indicated the basin was constructed with a 3-inch layer of asphaltic concrete. A two inch sand layer was placed on the asphalt before the single layer of hypalon was installed. Dry, brown gravel was observed immediately below the liner and was apparently placed as a base for the asphalt. The work areas showed the liner was in good condition and no holes were observed.

Fourteen borings were positioned within the basin while sixteen additional borings were positioned around the perimeter (Figure 2). A boring was not placed in the northeast corner of the basin because of a concrete ramp constructed for entrance to the basin. A pump well is located in the southeast corner. A concrete slab has been placed over the liner to prevent damage due to equipment operation. A boring was not attempted below the slab.

The material below and around the basin is composed of interlayered sand, silty sand, and clayey sand. The color of the sand deposits in the upper portion of the exploratory holes varied from light to dark gray. The silty and clayey sands were a medium gray color and slightly plastic in nature. A few thin, gray silt layers were encountered which displayed plastic characteristics. All but two borings terminated in a green sand layer. The green color is normally created by accessory minerals, such as epidote, which is part of the sand fraction. Abnormal colored, wet, or odoriferous zones which could indicate leakage were not noted in the bore-hole cuttings.

4.2.3. Central Basin

The liner openings removed for the exploration indicated the basin was constructed with a 2-inch layer of asphaltic concrete. A two inch sand layer was placed on the asphalt before the single layer of hypalon was installed. Dry, orange-brown gravel was observed immediately below the sand layer and was apparently placed as a base for the asphalt. The asphalt was very in poor condition. In most locations, it had deteriorated to a gravelly material with no properties of the original asphalt.

Sixteen borings were positioned within the basin while sixteen additional borings were positioned around the perimeter (Figure 2). Five locations were previously investigated when the DTSC representative noted some evidence of liner deterioration while the basin was dry. These are designated CB-1 through CB-5.

The soil beneath the basin is composed of interlayered sand and silty sand with less frequent layers of silty clay and clayey sand. All of the soil penetrated displayed a consistent gray color. The strata containing clay demonstrated plastic characteristics. The soil cuttings removed from boring CB4 emanated a pungent odor which was later determined to be volatile organic compounds. Section 6.1 describes the physical findings from a detailed investigation of the northeast corner of the basin.

4.2.4. Boiler Chemical Cleaning Basin

The BCCB is composed of two basins. The liner openings removed for the exploration indicated these basins were constructed with a four to five inch layer of asphaltic concrete. The asphalt is covered with two layers of HDPE, a layer of geofabric, and overlain with a third layer of HDPE. The geofabric layer drains to a leachate collection system. A 1 to 2.5-foot layer of dry, brown gravel was observed immediately below the liner.

Nine borings were placed within the two basin sections with an additional nine boring around the perimeter (Figure 2). The north section is underlain by interlayered deposits of sandy silt, silty sand, and sandy clay. The finer deposits had a green color while the silty sand was predominately brown. Some brown mottling was observed in the sandy clay layers. No abnormal coloration or odors were noted. The silt and clay deposits demonstrated plastic characteristics. A six inch, dark brown peat layer was encountered in borings BCCB1, BCCB2, and BCCB3 but was absent in BCCB4.

Several soil layers were encountered in the shallow borings beneath the south section. The deposits included sandy clay, silty sand, sandy silt, sand, and clay. The peat noted below the north section was again observed. In borings BCCB5 and BCCB6, the peat was in a distinct six inch layer. Thin zones of peat were layered within other deposits in the other three exploratory borings. The color of the granular material was green to greenish brown with some brown mottling. The first silty sand deposit encountered in boring BCCB6 had a tan color with an orange mottling. A second silty sand deposit was encountered below a sandy clay and peat layer. However, this deposit lacked the orange mottling and was distinctive in its lack of moisture.

4.2.5. South Basin

The liner openings removed for the exploration indicated the basin was constructed with a two to three inch layer of asphaltic concrete. A one inch sand layer was placed on the asphalt before the single layer of hypalon was installed. Dry, coarse grained, gravelly sand was observed immediately below the liner. The asphalt was found to be in poor condition in the southern portion of the basin. In this area, it had deteriorated to a gravelly material with no remaining strength properties.

Twelve borings were positioned beneath the basin while nineteen boring were placed around the perimeter (Figure 2). The position of boring SB2 was offset by the presence of a concrete entry ramp. The gravelly base material immediately beneath the asphalt was sampled in five borings: SB1, SB4, SB7, SB12, and SB15. These samples were collected by hand and placed in plastic tubes. Because of the collection method, the samples were not tested for VOC content.

The soils beneath the basin are composed of both interlayered sediments and fill material. The borings in the northern portion of the basin showed the sediments to be composed of layers of silty sand, sandy silt, sand, and clay. The soil color ranged from gray to greenish gray. The clay and silt material demonstrated plastic characteristics. The upper sand layer in boring SB3 was a greenish brown color which was mottled with orange staining. The high biotite content in the lower silty sand layer caused the zone to be black in color.

An area in the southern portion of the basin was constructed on fill material (Figure 7). The fill is composed of a gray, silty sand material. In borings SB8 and SB9 through SB15, some type of debris was observed in the cuttings. Wood fragments, nails, and bolts were most often encountered. Boring SB10 discovered a 4-inch void with wood fragments immediately below the void. Pieces of asbestos wall board were removed from boring SB11.

4.2.6. Background Samples

The four locations for background soil samples were chosen to best represent the material on which the basins were constructed while remaining undisturbed. A complication to the site surface materials is that it was leveled using both dry and hydraulic fill. As stated previously, the hydraulic fill was derived from the dredging of the San Gabriel River channel. Four borings were located in Areas 1, 2, and 3 while six boring were sampled in Area 4(Figures 3a-3d). The borings were spaced on 20-foot centers with samples collected at 1, 3, and 5 feet. These depths matched the horizons sampled beneath the basin liners.

Similar lithology was encountered in Areas 1, 2, and 3. The surface material was composed of silty sand which was most likely fill material to level the site. These fill material overlie layers of sand and clayey sand. The layers were gray to greenish gray with a fine to medium grained texture. Area 4 was slightly different with no clayey material. All six borings terminated in a coarse grained silty sand.

4.2.7. Pipelines

The pipelines, sumps, and traps which could have potentially conveyed or contained hazardous materials, were investigated by retrieving two hundred and thirty-three soil samples from one hundred and twenty-two boring locations shown on Figures 4, 4a, 4b, 5, and 5a. The borings were positioned at pipeline elbows where leakage is most likely to occur and on a minimum of fifty foot intervals.

Soil sampling beneath the power block area is extremely difficult because of the thick reinforced concrete foundations and low overhead clearance. As agreed at other stations, the pipeline investigation began at the concrete/asphalt interface along the pipelines.

Table 2 lists the number of soil samples to be collected at each boring location, the sample depth, and any comments related to the location. The borings identified with an “S” signifies that step-out or step-down samples were collected at this location. Samples were collected at the invert of the pipeline and two feet beneath the invert. The borings adjacent to the sumps and traps were sampled at the invert of the intake and outlet pipes, and at a depth of one foot beneath the bottom of the structure. All soil samples were collected using the protocol described in the DTSC-approved SAP.

The borings that could not be sampled are highlighted on Table 2 and shown by symbol on the figures. The reason for the deletion is given in the Comments column on the table. The main reason was that the pipeline trench had been backfilled with a cement or cement slurry material.

The boring locations for the pipelines, sumps and traps associated with Units 1-2 and Units 3-4 are shown on Figure 4, 4a, and 4b. The pipeline conveying the wastewater from Units 1-2 (light blue) passes over the wastewater pipeline from Units 3-4 (green). Figure 4a shows a detailed map of the investigation in the area of the oil/water separator and transfer sump associated with Units 1-2. A detailed view of the boring locations for the acid wash and fireside wash pipelines near the pump sump at Units 3-4 is shown on Figure 4b. Figure 5 shows the boring locations for the pipelines, sump and traps associated with Units 5-6. A detailed view of the borings locations for the fireside wash pipelines, sump, and traps is shown on Figure 5a.

The bore-hole cuttings indicated that the pipe trenches were backfilled with the material excavated to install the pipeline. The exception was where cement slurry was encountered. The material was a mixture of silty sand/sandy silt, clayey sand, and sand as was encountered beneath the retention basins. Debris was encountered in many borings in the form of wood, asphalt, metal, brick, and concrete pieces. A few voids were also discovered.

5. Analytical Results

All analyses of the soil samples were performed by Weck Laboratories, Inc. located in the City of Industry. Weck is certified by the State of California (ELAP Certificate No. 1132) to perform all chemical tests required for the project. Therefore, all analyses were conducted at a laboratory certified for such analyses by the California Department of Health Services and in accordance with current United States Environmental Protection Agency (USEPA) guideline procedures or as specified in the Monitoring Program. The Weck Laboratories Analytical Reports for each of the soil investigations have been placed on a CD and has been included with this report (Appendix 4).

A summary of the soil data collected for the Alamitos site is presented on Tables 3 (metals) and 4 (VOCs). Table 3 shows the average and maximum metal concentrations for each of the four basins, pipelines, and background.

The EPA Method 8260B soil data is summarized by the number of samples detecting VOC parameters at each project feature. The VOC parameter detected in the feature's dataset is listed along with the average and maximum concentrations. The number of detections for that parameter is also listed. For example, at the North Basin, nine from the ninety samples collected detected VOC parameters from the Method 8260B analyses. Only one of the nine samples detected benzene and eight samples detected acetone.

5.1. Background Soil Samples

The four background locations have consistently been upgradient or cross gradient of the basins. A listing of the analytical dataset for the metal and select general mineral parameters is presented on Table 5. Table 6 shows only the samples that detected a VOC parameter resulting from the EPA Method 8260B analyses. The sample depths shown on the table are calculated from the ground surface.

Table 5 shows that the analytical data for the metal results is reasonably consistent when comparing the average to the maximum recorded concentrations. For the VOC data, twelve samples detected one of three parameters. It is recommended that these twelve samples be removed from the background dataset used for the statistical analysis of the project soil data.

5.2. North Basin

The average and maximum concentrations detected in the soil samples collected beneath and adjacent to the North Basin recorded parameter concentrations consistent with the background concentrations (Table 7). Nine samples detected a VOC parameter (Table 8). Acetone was the most detected parameter. The one-foot sample collected from boring NB23 located on the perimeter of the basin detected BTEX parameters.

5.3. Central Basin

Unlike the North Basin, there is evidence that the South Basin has released wastewater. Table 9 shows elevated above background concentration of nickel, cobalt, molybdenum, and vanadium in the upper soil horizons. Numerous VOC parameters were detected in the soil at all sampled depths (Table 10). The highest concentrations were for tetrachloroethene (5800 mg/kg) and cis-1,2-Dichloroethene (2600 mg/kg).

The volatile organic compound data collected beneath the basin indicates soil contamination from wastewater leakage to a depth of five feet. In 2009, the station removed the basin from service to perform a routine cleaning and liner inspection. Edison decided to use the outage to perform an investigation to determine the nature and extent of the contamination. The results of this investigation are presented in Section 6.1. To summarize, a clay layer, at a depth of about ten feet, has perched waste water containing high concentrations of several solvents. The evaluation groundwater monitoring has shown that this perched water is cascading off the clay layer, to the east.

5.4. Boiler Chemical Cleaning Basin

The average concentrations detected in the soil samples collected beneath and adjacent to the basin recorded parameter concentrations consistent with the background concentrations (Table 11). Seven samples detected a VOC parameter (Table 12). These seven samples were collected from three borings located on the perimeter of the basin. These borings are located in the area of, and may be influenced by, a BTEX plume detected in the soil vapor survey described in Section 6.3. This plume is associated with a buried gasoline storage tank which was removed in the 1980s.

5.5. South Basin

The average concentrations detected in the soil samples collected beneath and adjacent to the basin recorded parameter concentrations consistent with the background concentrations (Table 13). However, there are several metal parameters that detected much higher maximum concentrations. Most significantly are nickel, vanadium, copper, lead, and mercury. These metals were predominantly in a single sample collected immediately below the liner at boring SB12, located in the southwest corner of the basin.

There were several detections of BTEX parameters around the perimeter of the basin (Table 14). The maximum concentration recorded (56 µg/kg) was detected in the three foot sample collected in boring SB17 located outside the northeast corner of the basin.

5.6. Pipelines

The location of the exploratory borings along the pipeline systems is shown on Figures 4 and 5. A total of two hundred thirty-three soil samples were collected from the one hundred and twenty-two borings drilled along the pipeline alignments. A boring was placed at angle points in the pipelines where stresses in the pipe could occur. The boring intervals were about fifty feet along the pipeline alignments. The sample depths varied, depending on the depth of the pipe invert.

The analytical data from the initial samples delineated limited areas where a few metal concentrations were determined to be above background concentrations. There were also TPH and VOC parameters that required additional investigation. A step-out or step-down phase of soil sampling was performed to investigate these areas. The additional borings are designated with an “S”.

The metal, VOC, and TPH data derived from the soil sampling along the pipelines, traps, and sumps are listed in Table 15. The average metal concentrations detected in the soil samples collected beneath the pipelines recorded parameter concentrations consistent with the background concentrations. The TPH concentrations were encountered in areas where it would be anticipated; i.e. oil/water separators and oil handing facilities. Acetone was the most frequently detected VOC. This may be related to the pipeline construction since acetone is used as a cleaning solvent at weld points. The BTEX parameters, benzene and toluene, were detected in 39 and 28 samples, respectively. These were investigated with step-down borings.

Table 16 shows the results of the EPA Method 8270-SIM analyses for PAH parameters. The data detected low concentration of a few parameters at each of the traps associated with Units 5 and 6.

The results of the EPA Method 8280A analyses are shown on Table 17. A few parameters detected low concentrations with most listed as “J” values. These samples were collected adjacent to the traps were dioxin/furans were detected in the sludge contained in the trap.

5.7. Quality Control Samples

Quality Control samples were not required in the DTSC-approved SAP for soil sampling at the 1997 and 1998 events. Beginning in 2007, the approved Work Plans and SAP required that Quality Assurance (QA) samples be collected. The requirement was that one duplicate sample was to be processed for each ten soil samples collected during the investigation. The duplicate samples were analyzed for the same COC list as the other soil samples. The duplicate sample was obtained by collecting a sample from the same tube as the scheduled sample. Duplicate samples were prepared, preserved, handled, stored, and transported to the laboratory according to procedures used for soil sampling. Duplicate samples were not labeled as such. They were assigned an identification number on the Chain of Custody form that did not identify the sample as a duplicate sample.

Two types of aqueous samples were collected: equipment blanks and trip blanks. Since the soil samples were collected with non-dedicated field equipment, a blank was collected each sampling day. The equipment blank was collected by pouring de-ionized water supplied by the certified laboratory (Weck) over the double-rinsed sampling equipment. The rinse water was collected in a wide-mouth, glass jar. The equipment blank was prepared, preserved, handled, stored, and transported to the laboratory according to procedures used for soil sampling. The blank sample was not labeled as such. It was assigned an identification number on the Chain of Custody that did not identify the sample as an equipment blank sample.

The second aqueous sample was a trip blank. On each sampling day when VOCs were included on the COC list, the laboratory supplied a 40-milliter vial filled with de-ionized water. This vial remained in the ice chest with the soil samples processed in accordance with EPA Method 5035 for VOC analysis of the soil sample.

The analytical results of the quality control samples are shown on tables contained in Appendix 3. There are two sets of tables in the Appendix: Basins and Pipelines. The RPD values indicated the duplicate samples were consistent for routine soil samples. No VOCs were detected in any of the trip blanks. The field blanks indicated the decontamination protocol was successful.

6. Additional Investigations

6.1. Northeast Corner of Central Basin

The volatile organic compound data collected beneath the Central Basin presented in Section 5.3 indicates soil contamination from wastewater leakage to a depth of five feet. In 2009, the station removed the basin from service to perform a routine cleaning and liner inspection. Edison decided to use the outage to perform an investigation to determine the nature and extent of the contamination.

Fourteen borings were hand augered in the northeast corner of the basin as shown on Figure 8. These borings were positioned on a 25-foot grid and reoccupy four old locations. Four samples were collected from each boring at 1, 3, 7, and 10 feet of depth for a total of 56 samples.

All work performed for this investigation conformed to the DTSC-approved Sampling and Analysis Plan (SAP) included as Appendix 1 of the "Work Plan for Phase 2 Soil Characterization, Alamitos Generating Station" dated October 2007. The sampling protocol was presented in Section 3. Soil sampling activities was conducted in accordance with the DTSC-approved, January 1996 Project Health and Safety Plan (HASP) with Addendums 1 and 2 dated March 2004 and May 2004, respectively.

The Constituents of Concern (COCs) for this investigation are as follows: pH, VOCs (EPA Method 8260B), and metal parameters for all samples. The upper sample from each bore-hole was analyzed by the EPA Method 8270-SIMS for PAH parameters. The extraction process for EPA Method 8270-SIMS was completed on the lower samples in each bore-hole and held. In the event of a detection is recorded in the upper sample, the next lower sample would be analyzed until a non-detection was encountered.

The Weck Laboratories Analytical Reports for the soil samples collected for this investigation have been placed on the CD with the rest of the soil investigation reports. Summary tables are included in this report for the EPA Method 6020 analysis (Table 18), EPA Method 8260B (Table 19), and EPA Method 8270C-SIM (Table 20).

The metals data showed elevated concentrations of cobalt, copper, nickel, and vanadium for the one foot samples. The concentrations for these metals reduced to background values at the subsequent sample depth (three feet). Low concentrations of a few PAH compounds was detected in the one and three foot samples collected from boring C7.

The most significant finding was the verification of VOC contamination in the soil. Table 19 shows the detection of high levels of c-1,2-DCE, TCE, and PCE plus the detection of other solvents and BTEX compounds.

The logs for the fourteen borings are located in Appendix 2. The logs show that the material beneath the basin is composed of layers of silty sand, sandy silt, and clayey sand. A clay/sandy clay layer was encountered at 9 to 9.5 feet in the initial three boring, C1, C2, and C3 (Figure 8). This clay layer was also encountered at the same depth in borings C4 through C9 but not observed at borings C10 through C14. Boring logs for monitoring wells AW-20, AW-21, and AW-30 show that the clay layer is not present outside the footprint of the basin.

The known aerial extent of the clay layer is shown with a dashed line on Figure 8. A generalized section is shown on Figure 9 with the position of the section illustrated on Figure 8. Since the monitoring wells showed the groundwater surface to be over 13 feet below the ground surface, the water discovered in the three bore-holes was perched on the clay layer. With the clay layer protected from the environment by the basin liner, it was assumed that the source was most likely leakage from the basin. Before backfilling these borings, one to three feet of perched water was measured in borings C5, C6, and C8. A turbid sample was dipped from boring C6 and delivered to Weck Laboratories to be analyzed for CAM metals. The analytical results showed that the perched water contained high concentrations of metals (Table 21, C-PW). The sample was not analyzed for VOCs because of the sampling method and turbidity.

A decision was made that an attempt to remove the perched water should be performed since it was a potential source of groundwater contamination. The station approved the work since the basin was not yet required. A two-inch diameter piezometer was placed within one foot of the original borings C5, C6, and C8. The piezometers were drilled to ten feet with pre-pack screen inserted in each bore-hole. Peristaltic pumps were installed in the piezometers with the discharge conveyed to a five hundred gallon tank. It was soon discovered that the fine sediments containing the perched water had a very low yield. This required cycling the pumping to fifteen minutes on with an hour and forty-five minute recovery period. Approximately 360 gallons of water was removed from the three piezometers over a six month period at which time the station required the basin. When completed, piezometers C6 and C8 were dry and about a foot of water remained in C5.

Over the pumping period, samples of perched water were collected for analysis. The samples were sent to Weck Laboratories to be analyzed for metals, VOCs and 1,4-dioxane. The resultant data is shown on Table 21. The table shows high concentrations of c-1,2-DCE, TCE, and VC.

The groundwater quality downgradient of the basin was affected by the removal of the perched water. The VOC concentrations detected in the quarterly samples collected from well AW-20 was decreasing, and in the case of vinyl chloride, was no longer detected. However, these concentrations increased and the detection of VC reappeared shortly after the perch water pumping was terminated. This indicates that the perched water remains and is flowing over the clay to the east.

6.2. Sediment Traps

As described in Section 2.2.2, the fireside wash drain systems conveys wastewater from Units 3, 4, 5, and 6 through a pipeline to a sediment trap adjacent to each unit. The traps allow the sediments entrained in the wastewater from the wash process to settle before flowing by gravity through a pipeline to a common sump attached to the oil/water separator.

An inspection of the four sediment traps revealed that the four chambers composing each trap contained sludge. Wastewater was also observed in the traps for Units 3 and 4. A sample of wastewater and sludge was collected from two chamber of the traps associated with Units 3 and 4. A single grab sample of sludge was collected from each trap associated with Units 5 and 6 since no wastewater was present. The samples were analyzed to determine the composition of the wastewater and sludge for disposal purposes. The analytical results from the samples showed high concentrations of metals and the presence of semi-volatile (SVOC), total petroleum hydrocarbons (TPH), and dioxin compounds. The analytical data is presented on Tables 10 (Metals, TPH, and SVOC), and Table 11(EPA Method 8280: dioxins).

On December 19, 2012, the wastewater and sludge were removed from the traps associated with Units 3 and 4. The traps associated with Units 5 and 6 were cleaned on the following day. The four sediment traps were cleaned using the following procedure. A vacuum truck was used to remove all liquid and solid materials. Abiding by approved confined space protocol, the walls and floor were pressure washed with deionized water supplied by the station. This wash water and all loose sediments were then removed by the vacuum truck. A second pressure wash was performed on the walls. A sample of the second wash water from each trap was collected for analytical analysis. The results are shown on Tables 22 and 23. The data indicates that the concentrations of metal constituents detected in the second wash water are similar to those detected in the deionized water. No dioxin compounds were detected.

A sample of the station supplied deionized water was collected for analysis. The laboratory results are shown on Tables 22 and 23. The sample detected concentrations of copper, lead, nickel, and zinc. The final analytical data shows that the four sediment traps are clean of metals, SVOC, and dioxin compounds.

6.3. Soil Vapor Survey

A Soil Vapor Survey was performed as part of the soil investigation in December 2012. Soil vapor probes were installed and sampled at a total of 120 locations (including all primary and step-out sample locations) for this investigation. The goal of the investigation was to assess the potential presence and extent of VOCs in soil vapor adjacent the four retention basins. All sampling and analyses were conducted in accordance with the "Soil Vapor Sampling and Analysis Plan" (Tetra Tech and Jamison & Associates, 2012) and the DTSC-approved "Soil Investigation Work Plan, Pipelines and Retention Basins at Alamitos Generating Station, California" (Hamilton 2012). The ultimate objective was to provide data of sufficient quantity and quality to support the Human and Ecological Risk Assessment (HERA) outlined in the Closure Performance Standards sections of the site Closure Plan (Jamison and

Associates, Inc. 2011). The results of the HERA will determine the suitability for various future uses, or whether Site cleanup is required.

The results of the investigation is presented in a report titled “Soil Vapor Survey Report, Retention Basins, Alamitos Generating Station” dated May 2014 (Tetra Tech and Jamison & Associates). The following is a summary of the conclusions. Several relatively small soil vapor plumes were detected adjacent to the retention basins, particularly along the north side of the Central Basin. These plumes are considered delineated because the detected Constituents of Concern were either detected at low concentrations or not detected at the step-out sampling locations.

The conclusions continue by stating that the goal of the investigation was achieved. No further investigation of soil vapor associated with the basins is warranted. The findings show that the VOC plumes are degrading through natural attenuation, indicating that the primary source is potentially inactive or attenuating.

7. Conclusions

The soil beneath and adjacent to the wastewater retention basins and associated pipeline systems has been extensively investigated. Six hundred and ninety-eight soil samples have been collected from two hundred and seventy-three borings. The COC list varied over the phases of the soil investigation. The soil samples have been analyzed for metals using EPA Method 6020 and VOCs using EPA Method 8260B. The early phases incorporated general mineral parameters on the COC list which included leachable chloride, leachable fluoride, leachable nitrate, manganese, aluminum, and pH. The analyses since 2007 have included EPA Method 8270-SIM. The pipeline investigation included TPH and dioxins/furans for samples collected adjacent to the traps and sumps.

A soil vapor survey was performed adjacent to the basins in 2013. The on-site laboratory detected several relatively small soil vapor plumes adjacent to the retention basins, particularly along the north side of the Central Basin. The findings show that the VOC plumes are degrading through natural attenuation.

The extensive sampling and resultant analytical data illustrates a complete characterization of the soil beneath the retention basins and associated pipeline systems. It has been demonstrated that soil below the Central Basin has been impacted by a release of wastewater and the impacted soil is confined to the basin footprint. No further soil characterization is required for the site. The completed dataset has been transmitted for statistical and health risk analysis.

The results of the health risk analysis will determine the necessity for any remedial activities associated with the detected soil matrix and soil vapor contamination detected by soil characterization. Recommendations for potential soil remediation, if necessary, will be provided within a Work Implementation Plan.

TABLES

Table 1

Investigations for Soil Characterization -- Alamitos Generating Station

Date	Number of Borings	Number of Soil Samples	Boring ID	COC's	Sample Depths	Comments
December 1995 Central Basin	5	10	CB-1 through CB-5	CAM metals, pH, EPA 418.1, EPA 8260B	0.5 and 3 feet	During well installation, DTSC geologist noted two small holes in the liner and requested soil samples in these areas.
September 1997 South Basin	15	50	SB1 through SB15	CAM metals, pH, Cr^{+6}, Cl, Fl, Al, Fe, EPA 8260B	Varied from 0 to 5 feet	Soil samples collected beneath the South Basin
November 1997 BCCB	9	25	BCCB1 through BCCB9	CAM metals, pH, Cr^{+6}, Cl, Fl, Al, Fe, EPA 8260B	Varied from 0 to 5 feet	Soil samples collected beneath the BCCB
December 1997 North Basin	14	42	NB1 through NB14	CAM metals, pH, Cr^{+6}, Cl, Fl, Al, Fe, EPA 8260B	0.5, 3, and 5 feet	Soil samples collected beneath the North Basin
March 1998 Central Basin	16	48	CB1 through CB16	CAM metals, pH, Cr^{+6}, Cl, Fl, Al, Fe, EPA 8260B	0.5, 3, and 5 feet	Soil samples collected beneath the Central Basin
November 2007	16	48	NB15 through NB30	CAM metals, pH, Cr^{+6}, Cl, Fl, NO^3, Mg, Al, Fe, EPA 8260B	1, 3, and 5 feet	Soil samples collected around the perimeter of the basins
	16	48	CB17 through CB32			
	9	27	BCCB10 through BCCB18			
	19	57	SB16 through SB34			
November 2007	4	12	B1-1 through B1-4	CAM metals, pH, Cr^{+6}, Cl, Fl, NO^3, Mg, Al, Fe, EPA 8260B	1, 3, and 5 feet	Background soil samples collected from four representative areas around the site
	4	12	B2-1 through B2-4			
	4	12	B3-1 through B3-4			
	6	18	B4-1 through B4-6			

Table 1

Investigations for Soil Characterization -- Alamitos Generating Station

Date	Number of Borings	Number of Soil Samples	Boring ID	COC's	Sample Depths	Comments
2009-2010 Central Basin	14	56	C1 through C14	CAM metals, pH, EPA 8260B, EPA 8270-SIM	1, 3, 7, and 10 feet	Soil Samples to investigate the nature and extent of contamination beneath Central Basin
2012						Soil Vapor Survey
2012-2013	122	233	P1 through P93 plus 25 step-out and step-down borings	CAM metals, pH, EPA 8260B. The following were added to 20 samples: EPA 8270-SIM, TPH, and dioxins/furans	Varied from 2 to 16 feet	Investigation of Fireside and Acid Wash Pipelines
Total	**273**	**698**				

Soil Investigation -- Fireside/ Acid Wash Pipelines
Alamitos Generating Station

Boring ID	Sample Depth	Number of Samples	Comments
P1	5, 7	2	
P1-S1	7,9	2	Step-out
P1-S2	7,9	2	Step-out
P1-S3	7,9	2	Step-down
P2	5, 7	2	
P3	5, 7, 11	3	
P4	6, 8, 11	3	
P4-S1	8,9	2	Step-out
P4-S2	8,9	2	Step-out
P5	5,6,8	3	
P5-S1	6,8	2	Step-out
P5-S2	6,8,10	3	Step-out
P6	6, 8	2	
P7	7, 9, 16	3	
P7-S1	9,10	2	
P7-S2	9,10	2	
P7-S3	9,10	2	
P8	5, 7, 16	3	
P9	6, 8	2	
P9-S1	8,10	2	Step-down
P10	6, 8	2	
P11	6, 8	2	
P12	6, 8		Pipeline section backfilled with cement slurry
P13	6, 8		
P14	6.5, 8.5	2	
P15	6.5, 8.5		Borehole location blocked by permanent equipment
P16	6.5, 8.5		
P17	6.5, 8.5	2	
P18	4, 7.5	2	
P19	3.5, 5.5, 7.5	3	
P19A	4.5, 6.5	2	Borehole location directed by DTSC
P19A-S1	7,9	2	Step-down
P20	4.5, 6.5, 7.5	3	
P21	4.5, 6.5	2	
P22	4.5, 6.5	2	
P22-S1	7,9	2	
P23	4.5, 6.5		Borehole location covered by reinforced concrete containment
P24	4.5, 6.5	2	
P24-S1	7,9	2	Step-out
P24-S2	7,9	2	Step-out
P25	4, 7.5	2	

Sample depth shown in Red were also analyzed for TPH, PAHs, and dioxins/furans

Soil Investigation -- Fireside/ Acid Wash Pipelines
Alamitos Generating Station

Boring ID	Sample Depth	Number of Samples	Comments
P26	3.5, 5.5, 7.5	3	
P26A	4.5, 6.5	2	
P27	4.5, 6.5, 7.5	3	
P28	4.5, 6.5	2	
P29	4.5, 6.5	2	
P30	4.5, 6.5	2	
P31	4.5, 6.5	2	
P32	4.5, 6.5	2	
P33	6, 8, 15	3	
P33-S1	8,10	2	Step-out
P33-S2	8,10	2	Step-out
P34	6, 8, 15	3	
P35	6, 8, 15	3	
P36	6, 8		Pipeline section backfilled with cement slurry
P37	6, 8		
P38	6, 8		Removed due to change in piping configuration
P39	6.5, 8.5		Pipeline section backfilled with cement slurry
P40	6.5, 8.5	2	
P41	6.5, 8.5	2	
P42	6.5, 8.5	2	
P43	6.5, 8.5	2	
P43-S1	8,10	2	
P44	6.5, 8.5	2	
P44-S1	7,9	2	
P45	6.5, 8.5	2	
P46	6.5, 8.5	2	
P47	6, 8	2	
P47-S1	8,10	2	Step-out
P47-S2	8,10	2	Step-out
P47-S3	8,10	2	Step-out
P48	6, 8	2	
P49	7, 9	2	
P50	7, 9	2	
P51	7, 9	2	
P52	5, 7	2	
P53	5, 7	2	
P54	5, 7	2	
P55	5, 7	2	
P56	5, 7	2	
P57	5, 7	2	

Sample depth shown in Red were also analyzed for TPH, PAHs, and dioxins/furans

Soil Investigation -- Fireside/ Acid Wash Pipelines
Alamitos Generating Station

Boring ID	Sample Depth	Number of Samples	Comments
P58	5, 7	2	
P59	5, 7	2	
P60	5, 7	2	
P61	5, 7	2	
P62	4.5, 8	2	
P63	4.5, 6.5, 8	3	
P64	4.5, 6.5, 8	3	
P65	4.5, 6.5		Borehole location blocked by cement backfill
P66	4.5, 6.5	2	
P67	6, 8, 19	3	
P68	4.5, 6.5		Borehole location blocked by cement backfill
P69	4.5, 6.5	2	
P70	4.5, 6.5		Borehole location blocked by cement backfill
P71	4.5, 6.5, 8	3	
P72	4.5, 6.5, 8	3	
P73	4.5, 8	2	
P73-S1	8,10	2	Step-down
P74	5, 7, 19	3	
P75	5, 7		Borehole location blocked by cement backfill
P76	5, 7		Borehole location blocked by cement backfill
P77	5, 7	2	
P77A	5,7	2	
P78	5, 7	2	
P79	5, 7	2	
P79-S1	7,9	2	Step-down
P80	5, 7	2	
P81	5, 7	2	
P82	5, 7	2	
P83	5, 7	2	
P84	5, 7	2	
P85	5, 7	2	
P85-S1	7,9	2	Step-down
P86	2, 3	2	
P87	2, 3	2	
P88	2, 3	2	
P89	2, 3	2	
P90	2, 3	2	
P91	2, 3	2	
P92	2, 3	2	
P93	2, 3	2	
Total Boring 122		**Total Samples 233**	

Sample depth shown in Red were also analyzed for TPH, PAHs, and dioxins/furans

Table 3

Summary of Soil Data -- Metal Parameters
Alamitos Generating Station

Feature	Background		North Basin		Central Basin		BCCB		South Basin		Pipelines	
Number of Samples	54		90		162		52		105		229	
	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum
	mg/kg											
Parameter												
Antimony	0.85	1.8	0.83	3.30	1.02	5.14	0.92	2.71	0.80	6.36	0.64	1.5
Arsenic	7.8	26	6.9	29	6.8	15.5	6	12.8	7.3	66	6.0	24
Barium	147	250	139	210	143	290	135	214	135	823	119	240
Beryllium	0.53	0.95	0.47	0.88	0.51	0.97	0.45	1.10	0.45	0.70	0.39	0.8
Cadmium	0.24	0.44	0.25	0.71	0.27	0.65	0.24	1.15	0.21	0.70	0.15	0.36
Chromium, Total	28	45	23	35	25	52	25	89	24	163	21	130
Chromium VI	ND	ND	ND	ND	ND	ND	3.6	3.6	ND	ND	NT	NT
Cobalt	11	19	9.2	18.2	11.3	38.8	9.2	19.3	9.9	46	8.0	20
Copper	28	51	24	41	25	44	31	424	47	2,600	23	220
Lead	8.5	23	7.5	66	9.1	46	9.9	40	15.3	270	5.9	13
Mercury	0.044	0.120	0.050	0.180	0.056	0.200	0.055	0.160	0.086	0.550	0.039	0.48
Molybdenum	1.9	7.7	1.5	7.2	3.5	25.5	4.2	29.2	3.1	71	2.2	12
Nickel	22	38	27	232	83	1,500	31	359	70	1,020	33	460
Selenium	0.57	0.7	0.54	0.57	0.40	1.20	0.51	0.51	0.66	0.92	0.55	0.6
Silver	0.13	0.19	0.30	1.71	0.16	0.36	0.47	2.82	0.42	1.6	0.14	0.16
Thallium	ND	ND	0.51	0.51	ND	ND	0.17	0.82	0.18	0.86	ND	ND
Vanadium	53	79	47	87	56	130	46	151	99	3,410	53	1000
Zinc	67	110	60	180	66	104	64	360	69	500	48	180

Table 4

Summary of Detections -- Volatile Organic Compounds
Alamitos Generating Station

Background Area 1 -- 5 of 12 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Benzene	5.9	6.8	4
Toluene	5.6	5.8	3
Acetone	30	39	2

Background Area 2 -- 2 of 12 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Benzene	8.2	8.2	1
Toluene	6.6	8.1	2

Background Area 3 -- 0 of 12 samples Detected VOCs

Background Area 4 -- 5 of 18 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Acetone	29	37	5

North Basin -- 9 of 90 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Benzene	5.2	5.2	1
Ethylbenzene	5.3	5.3	1
m,p-Xylene	32	32	1
Toluene	12	12	1
Acetone	29	46	8
2-Butanone	6.7	7	2
o-Xylene	21	21	1
1,3,5-Trimethylbenzene	14	14	1
1,2,4-Trimethylbenzene	39	39	1
Naphthalene	16	16	1

Summary of Detections -- Volatile Organic Compounds
Alamitos Generating Station

Central Basin -- 25 of 162 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Trichloroethene (TCE)	96	370	11
Tetrachloroethene (PCE)	2,545	5,800	4
1,1,1-Trichloroethane (1,1,1-TCA)	1,304	2,600	2
1,1-Dichloroethene (1,1-DCE)	5.7	5.7	1
cis-1,2-Dichloroethene (C-1,2-DCE)	149	1,000	12
trans-1,2-Dichloroethene (t-1,2-DCE)	4.6	5.5	2
1,1-Dichloroethane (1,1-DCA)	70	96	2
Vinyl Chloride	13	13	1
Benzene	5.4	5.5	3
Toluene	43	130	10
m/p-Xylene	3	3	1
o-Xylene	6.6	6.6	1
Chlorobenzene	5.6	7.9	2
1,3,5-Trimethylbenzene	34	34	1
1,2,4-Trimethylbenzene	36	36	1
n-Propylbenzene	4.4	4.4	1
1,2-Dichlorobenzene (o-DCB)	49	49	1
1,4-Dichlorobenzene (p-DCB)	5.1	5.1	1
Acetone	28	38	3
2-Butanone	8.5	11	3

BCCB -- 7 of 52 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Benzene	11.1	19	5
Toluene	9.7	11	3
m,p-Xylene	5.9	5.9	1
Acetone	78.5	190	4
2-Butanone	16.9	51	5

Summary of Detections -- Volatile Organic Compounds
Alamitos Generating Station

South Basin -- 30 of 105 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Benzene	9.5	56	21
Ethylbenzene	8.7	8.7	1
Toluene	11.5	53	13
m,p-Xylene	9.2	9.2	1
Acetone	32.9	93	25
2-Butanone	7.3	19	17
cis-1,2DCE	6.5	6.8	2
TCE	5.6	6.2	2

Pipelines -- 188 of 229 samples Detected VOCs			
Parameter	**Average**	**Maximum**	**Number of Detections**
Trichloroethene (TCE)	12	12	1
Tetrachloroethene (PCE)	9.4	16	4
cis-1,2-Dichloroethene (C-1,2-DCE)	15	15	1
1,1-Dichloroethane (1,1-DCA)	10	10	1
Benzene	8.3	27	39
Toluene	8.8	25	28
Isopropylbenzene	7.9	9	2
n-Propylbenzene	19	19	1
1,2,4-Trimethybenzene	21	27	2
4-Methyl-2-pentanone	6.7	6.7	1
m/p-Xylene	5.4	5.4	2
Naphthalene	14.1	17	4
n-Propylbenzene	14	17	2
m-Dichlorobenzene (m-DCB)	12	12	1
o-Dichlorobenzene (o-DCB)	23.7	61	8
p-Dichlorobenzene (p-DCB)	16	16	1
p-Isopropyltoluene	10.6	14	2
sec-Butylbenzene	7.3	8.1	3
Acetone	35.5	310	176
2-Butanone	10.5	24	23

Table 5

Analytical Soil Data -- Metal and General Mineral Parameters
Background Samples -- Alamitos Generating Station

		Location	Area 1												Area 2											
		Sample ID	B1-1-1	B1-1-2	B1-1-3	B1-2-1	B1-2-2	B1-2-3	B1-3-1	B1-3-2	B1-3-3	B1-4-1	B1-4-2	B1-4-3	B2-1-1	B2-1-2	B2-1-3	B2-2-1	B2-2-2	B2-2-3	B2-3-1	B2-3-2	B2-3-3	B2-4-1	B2-4-2	B2-4-3
		Depth (feet)	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
Parameter	**PQL**	**Units**																								
Antimony	0.5	mg/kg	1.1	0.76	0.9	1	1.8	0.89	0.81	1.1	0.81	0.81	0.92	1.7	0.67	0.56	ND	0.71	0.69	0.78	0.78	0.88	0.69	0.7	0.55	0.56
Arsenic	0.5	mg/kg	8.7	3.2	9.2	6.8	9.5	9.4	7.6	6.5	8.7	5.8	4.8	12	5.9	8	5.1	6.1	7.9	3.8	7.6	8.3	14	8	6.2	5.9
Barium	1	mg/kg	200	84	160	160	250	160	95	170	160	120	140	200	130	110	87	110	160	170	120	120	150	120	110	100
Beryllium	0.1	mg/kg	0.64	0.34	0.56	0.61	0.95	0.59	0.39	0.53	0.52	0.38	0.39	0.79	0.42	0.36	0.27	0.39	0.46	0.67	0.42	0.38	0.41	0.43	0.35	0.36
Cadmium	0.1	mg/kg	0.25	ND	0.31	0.25	0.23	0.28	0.17	0.27	0.26	0.13	0.16	0.14	0.12	ND	ND	ND	0.12	ND	0.13	ND	ND	0.11	ND	ND
Chromium, Total	1	mg/kg	33	18	26	30	41	26	19	27	26	19	23	38	23	18	15	20	22	27	28	20	20	21	19	18
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	11	6.6	10	10	13	9.5	7.7	9.6	9.6	7.1	8.6	13	8.3	8.2	6.1	7.9	8.2	9.9	9.2	7.8	7.8	8.5	8	8.1
Copper	0.5	mg/kg	34	16	28	33	49	28	22	29	27	22	22	45	49	16	12	19	22	25	23	18	18	19	16	16
Lead	0.5	mg/kg	23	4.8	8.5	20	13	8.3	14	7.7	7.7	18	8.1	12	7.5	4.4	3.8	6.6	7.5	7.4	9.1	8.5	4.6	6.1	4.4	4.7
Mercury	0.010	mg/kg	0.050	0.052	0.034	0.061	0.075	0.082	0.026	0.100	0.038	0.029	0.038	0.071	0.018	ND	ND	ND	0.012	0.022	ND	0.017	0.013	0.022	ND	ND
Molybdenum	0.2	mg/kg	1.9	0.68	1.6	1.5	4	1.5	0.65	1.5	1.3	1.1	0.63	3.5	1.4	2	3.2	1.7	1.3	1.3	1.8	1.8	1.1	2	2.6	2.2
Nickel	0.5	mg/kg	28	13	21	24	31	21	24	21	21	18	18	29	24	14	24	15	19	18	38	22	15	21	14	16
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	64	47	55	62	79	53	43	57	54	41	49	78	50	40	41	41	43	52	70	45	43	44	39	40
Zinc	5	mg/kg	84	42	66	73	83	64	48	63	65	52	55	79	51	51	40	49	49	63	60	48	46	47	49	57
pH		units	7	7	7.2	7.3	7.4	7.2	7.3	7.2	7.4	7.2	7	7	7.2	7.3	7.3	7.2	7.2	7.2	7.3	7.3	7.4	7.3	7.2	7.2
Iron	91	mg/kg	29,000	23,000	27,000	28,000	37,000	26,000	20,000	26,000	26,000	20,000	24,000	34,000	22,000	20,000	17,000	21,000	21,000	28,000	23,000	22,000	21,000	20,000	20,000	20,000
Aluminum	100	mg/kg	21,000	11,000	20,000	21,000	31,000	19,000	11,000	18,000	19,000	12,000	15,000	27,000	14,000	12,000	9,600	13,000	15,000	20,000	14,000	13,000	13,000	13,000	12,000	12,000
Magnesium	45	mg/kg	550	260	540	480	680	530	300	450	510	380	370	550	480	330	480	400	630	350	420	400	380	330	370	340
Chloride	2	mg/l	17	7	24	35	100	58	6.2	22	28	15	25	41	6.9	6.2	3.2	ND	2.7	2.5	17	17	24	7.2	23	25
Fluoride	0.5	mg/l	1.6	0.66	1.5	1.4	1.6	1.1	0.52	1.5	1.3	1	0.55	1.4	1	0.91	0.87	0.65	0.55	0.8	0.92	1	1	0.78	0.63	0.73
Nitrate	2	mg/l	28	9.4	26	28	50	33	3.8	18	21	12	18	33	2.2	ND	ND	ND	ND	ND	5	3.8	3	ND	ND	ND

Analytical Soil Data -- Metal and General Mineral Parameters
Background Samples -- Alamitos Generating Station

	Location		Area 3												Area 4					
	Sample ID		B3-1-1	B3-1-2	B3-1-3	B3-2-1	B3-2-2	B3-2-3	B3-3-1	B3-3-2	B3-3-3	B3-4-1	B3-4-2	B3-4-3	B4-1-1	B4-1-2	B4-1-3	B4-2-1	B4-2-2	B4-2-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
Parameter	**PQL**	**Units**																		
Antimony	0.5	mg/kg	0.83	0.65	0.92	0.6	0.82	0.64	0.77	1.2	0.99	0.75	ND	ND	0.69	0.75	0.75	0.51	0.91	ND
Arsenic	0.5	mg/kg	6.5	6.3	8	5.5	6.6	5.8	8	10	7.2	9.6	4.5	4.2	26	7.1	7.5	3.9	7.3	5.1
Barium	1	mg/kg	110	140	180	110	170	140	120	210	170	210	140	120	160	160	150	110	160	130
Beryllium	0.1	mg/kg	0.4	0.55	0.79	0.47	0.6	0.65	0.45	0.92	0.48	0.79	0.59	0.61	0.5	0.8	0.5	0.38	0.5	0.6
Cadmium	0.1	mg/kg	0.2	0.35	0.37	0.19	0.41	0.27	0.24	0.44	0.19	0.17	0.32	0.22	0.14	0.27	0.29	0.15	0.24	0.38
Chromium, Total	1	mg/kg	23	29	37	24	34	33	25	45	30	35	33	29	28	36	31	22	34	29
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	10	13	16	10	13	13	12	19	12	14	13	13	11	13	11	8.8	12	11
Copper	0.5	mg/kg	22	27	39	22	30	33	26	51	30	28	29	27	24	37	32	19	34	28
Lead	0.5	mg/kg	8	7.2	9.8	6.2	7.4	8.1	7.9	13	7.6	8.1	8.8	6.9	7.9	10	7.9	5.2	7	7.7
Mercury	0.010	mg/kg	0.036	0.023	0.037	0.035	0.051	0.049	0.048	0.051	0.058	0.058	0.019	0.018	0.041	0.053	0.056	0.027	0.053	0.031
Molybdenum	0.2	mg/kg	0.87	1.5	2.3	1	1.8	1.7	1.1	2.7	0.99	7.7	1.7	1.5	5.1	1.7	1.6	1.1	1.4	2.2
Nickel	0.5	mg/kg	20	21	26	17	23	22	20	32	22	28	22	21	22	24	23	15	24	19
Selenium	0.5	mg/kg	ND	0.56	ND	ND	0.53	0.58	ND	ND	ND	ND	ND	ND	ND	0.54	0.57	ND	0.52	0.7
Silver	0.1	mg/kg	ND	ND	0.19	ND	0.12	0.1	ND	0.12	ND	ND	ND	ND	ND	0.11	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	43	52	63	41	55	52	45	64	46	52	54	49	49	65	59	47	60	56
Zinc	5	mg/kg	64	80	93	67	82	85	68	110	71	63	91	84	52	83	72	61	78	74
pH		units	7.3	7.1	7.2	7.3	7.2	7.3	7.3	7.2	7.2	7.2	7.3	7.3	7.6	7.3	7.6	7.6	7.4	7.2
Iron	91	mg/kg	23,000	27,000	32,000	24,000	30,000	29,000	24,000	36,000	26,000	29,000	29,000	27,000	26,000	33,000	29,000	25,000	33,000	29,000
Aluminum	100	mg/kg	17,000	20,000	26,000	16,000	23,000	23,000	17,000	31,000	19,000	22,000	22,000	21,000	19,000	25,000	21,000	16,000	23,000	22,000
Magnesium	45	mg/kg	410	520	700	430	520	540	460	830	550	1,600	530	470	1,100	690	600	470	630	600
Chloride	2	mg/l	73	100	160	75	150	140	24	88	65	220	130	130	70	110	150	67	120	100
Fluoride	0.5	mg/l	0.68	0.97	1.8	0.7	1.3	1.3	0.81	1.9	1.2	2.1	1.2	1.2	2.2	2.7	1.6	1	1.9	1.6
Nitrate	2	mg/l	2.9	4.5	6.5	3.5	5.6	4.8	ND	4.9	3.9	13	8	8.1	ND	3.7	8.6	4.1	9.3	9.7

Table 5

Analytical Soil Data -- Metal and General Mineral Parameters
Background Samples -- Alamitos Generating Station

	Location		Area 4											
	Sample ID		B4-3-1	B4-3-2	B4-3-3	B4-4-1	B4-4-2	B4-4-3	B4-5-1	B4-5-2	B4-5-3	B4-6-1	B4-6-2	B4-6-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5
Parameter	**PQL**	**Units**												
Antimony	0.5	mg/kg	0.59	0.93	1.4	0.93	1.2	0.85	0.77	0.94	0.94	0.7	0.68	0.73
Arsenic	0.5	mg/kg	4.6	8.6	8.5	6.8	11	10	19	8	8.4	6.2	5.6	5.9
Barium	1	mg/kg	110	180	170	160	190	150	150	160	180	140	120	160
Beryllium	0.1	mg/kg	0.37	0.57	0.54	0.55	0.73	0.46	0.55	0.62	0.64	0.54	0.45	0.65
Cadmium	0.1	mg/kg	0.16	0.26	0.28	0.33	0.33	0.19	0.19	0.31	0.29	0.24	0.2	0.27
Chromium, Total	1	mg/kg	23	36	28	31	37	26	26	34	32	27	24	27
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	8.6	14	12	13	15	11	10	13	13	11	10	11
Copper	0.5	mg/kg	21	39	31	33	46	29	26	36	35	27	25	29
Lead	0.5	mg/kg	6.4	9.8	8.9	8.1	11	7.3	7.6	9	8.3	6.3	6.7	7
Mercury	0.010	mg/kg	0.039	0.063	0.049	0.037	0.059	0.120	0.036	0.069	0.048	0.035	0.035	0.031
Molybdenum	0.2	mg/kg	1.1	2.2	1.8	2	2.1	1.2	3.8	1.8	1.9	1.4	1.2	1.5
Nickel	0.5	mg/kg	16	27	22	25	27	21	19	24	25	20	18	19
Selenium	0.5	mg/kg	0.55	0.68	ND	0.5	0.59	ND	ND	ND	0.61	ND	0.53	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	44	64	57	63	72	52	51	65	66	58	52	59
Zinc	5	mg/kg	58	81	85	76	86	64	57	77	77	67	64	71
pH		units	7.8	7.4	7.4	7.7	7.8	7.2	7.2	7.4	7.4	7.3	7.7	7.6
Iron	91	mg/kg	24,000	34,000	28,000	29,000	32,000	25,000	24,000	30,000	30,000	25,000	24,000	26,000
Aluminum	100	mg/kg	16,000	25,000	19,000	21,000	25,000	18,000	17,000	22,000	22,000	17,000	16,000	19,000
Magnesium	45	mg/kg	440	840	700	600	730	620	880	680	650	500	440	570
Chloride	2	mg/l	63	110	110	160	160	130	91	150	120	110	97	100
Fluoride	0.5	mg/l	1	2.1	1.6	1.9	2.7	1.6	2.5	1.8	2.2	1.5	1.6	1.6
Nitrate	2	mg/l	6.3	11	13	9.9	11	9.5	3.9	6.9	11	11	8.2	10

Table 6

Analytical Soil Data -- Volitale Organic Compounds
Background Samples
Alamitos Generating Station

	Sample ID		B1-1-1	B1-1-2	B1-1-3	B1-2-1	B1-2-2	B1-2-3	B1-3-1	B1-3-2	B1-3-3	B1-4-1	B1-4-2	B1-4-3	B2-2-1	B2-2-2	B2-2-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Location		Area 1												Area 2		
Parameter	PQL	Units															
Benzene	5	ug/kg	ND	ND	**5.8**	**5.3**	ND	**5.5**	ND	ND	ND	**6.8**	ND	ND	**8.2**	ND	ND
Toluene	5	ug/kg	ND	ND	**5.7**	ND	ND	**5.4**	ND	ND	ND	**5.8**	ND	ND	**8.1**	**5**	ND
Acetone	20	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	**20**	**39**	ND	ND	ND	ND	ND

	Sample ID		B4-3-1	B4-3-2	B4-3-3	B4-4-1	B4-4-2	B4-4-3	B4-5-1	B4-5-2	B4-5-3
	Depth (feet)		1	3	5	1	3	5	1	3	5
	Location		Area 4								
Parameter	PQL	Units									
Benzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	20	ug/kg	**20**	ND	ND	**34**	ND	**23**	**37**	**33**	ND

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Table 7

Analytical Soil Data -- Metal and General Mineral Parameters
North Basin -- Alamitos Generating Station

Parameter	PQL	Units	NB1-1	NB1-2	NB1-3	NB2-1	NB2-2	NB2-3	NB3-1	NB3-2	NB3-3	NB4-1	NB4-2	NB4-3	NB5-1	NB5-2	NB5-3	NB6-1	NB6-2	NB6-3	NB7-1	NB7-2	NB7-3	NB8-1	NB8-2	NB8-3
Depth (feet)			0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5
Year			1997																							
Location			Below Basin																							
Antimony	0.2	mg/kg	1.08	0.46	0.68	0.73	0.75	0.59	0.94	1.25	0.58	0.84	0.7	0.59	0.71	0.66	0.38	0.77	0.91	0.69	0.82	1.37	0.67	0.85	0.68	0.81
Arsenic	0.2	mg/kg	6.2	3.5	4.8	4	4.6	12.7	7	6.7	3	5.5	4.5	5.8	5.3	6.7	1.7	6.7	6.4	5.7	4.2	9.1	9.8	6.8	5.8	8.8
Barium	1	mg/kg	149	113	109	81.9	137	136	143	169	128	141	121	148	130	141	153	145	147	155	128	182	166	150	132	165
Beryllium	0.1	mg/kg	0.56	0.22	0.26	0.28	0.37	0.25	0.46	0.53	0.23	0.45	0.31	0.26	0.47	0.63	0.23	0.61	0.39	0.3	0.39	0.59	0.48	0.52	0.45	0.3
Cadmium	0.1	mg/kg	0.71	0.15	ND	0.15	0.25	0.11	0.45	0.56	0.15	0.34	0.16	0.13	0.36	0.48	0.12	0.37	0.33	0.12	0.3	0.29	0.18	0.36	0.31	0.11
Chromium, Total	0.5	mg/kg	28	13	17	15	20	16	25	28	13	24	17	15	22	23	12	24	22	18	21	25	21	24	20	17
Chromium VI	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.1	mg/kg	10	5.2	8.1	6.7	8.5	6.8	10	10.6	5.2	9.5	7.2	6.1	9.8	9.7	5.4	10.4	9.4	7.7	8	10.3	9.5	12.6	8.8	7.5
Copper	0.5	mg/kg	29	13	16	16	22	14	27	29	14	24	17	13	25	25	9	26	24	16	18	28	22	33	33	14
Lead	0.5	mg/kg	7.8	4.6	3.7	4.3	5.8	4.0	7.2	7.4	5.2	6.5	4.9	4.0	6.7	8.5	2.9	7.9	5.8	4.8	5.4	7.2	7.4	8.0	6.6	4.0
Mercury	0.06	mg/kg	ND	ND	0.07	ND	ND	ND	ND	0.08	ND	0.07	ND	ND	ND	ND	ND	0.06	0.07	0.07	ND	ND	ND	ND	ND	ND
Molybdenum	0.2	mg/kg	2.13	0.5	0.62	0.52	0.81	0.4	1.23	2.21	1.21	1.4	0.69	0.27	0.81	1.83	ND	1.66	0.98	0.61	0.78	1.02	1.73	1.4	1.21	0.61
Nickel	0.5	mg/kg	20	8	11	12	15	9	20	21	8	18	12	9	28	16	7	18	17	10	14	18	17	81	31	9
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	0.12	ND	ND	ND	0.19	ND	0.1	0.1	ND	ND	ND	ND	0.27	ND	ND	1.71	ND	ND	ND	ND	ND	0.1	ND	ND
Thallium	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	60	23	32	31	37	31	47	58	23	44	32	28	42	44	25	47	41	38	44	49	39	59	56	36
Zinc	1	mg/kg	73	43	37	44	53	36	64	69	44	64	46	37	62	68	32	70	57	41	58	67	58	69	58	36
pH		units	9.0	8.8	9.1	8.8	8.7	8.8	8.3	8.5	8.3	9.0	8.9	9.2	8.6	8.6	8.6	8.8	8.6	8.6	8.8	7.8	8.0	8.6	8.7	9.1
Iron	7	mg/kg	33,600	10,200	11,700	16,600	19,200	12,200	24,700	25,300	12,500	28,400	19,700	11,500	28,900	31,200	11,600	29,600	27,900	14,000	24,700	32,100	20,900	29,100	25,500	12,700
Aluminum	3	mg/kg	16,400	7,930	8,880	9,260	11,900	9,060	14,100	18,800	7,890	14,400	10,200	8,840	13,600	16,900	7,160	16,600	13,100	10,800	13,300	13,900	10,800	15,300	12,500	10,300
Magnesium			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	2	mg/l	15.8	25.3	27.3	ND	28.6	32.2	22.6	31	27.3	16.5	22.6	33.6	24.3	14.8	28.1	20.3	23.6	20.7	11.8	16.2	27.7	28.5	19.6	21.4
Fluoride	1	mg/l	2.59	4.02	2.18	ND	1.97	2.29	3.59	2.45	2.43	2.37	2.9	2.72	4.64	1.92	2.25	2.72	1.88	2.09	2.32	1.38	2.24	2.88	2.54	2.85
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Analytical Soil Data -- Metal and General Mineral Parameters
North Basin -- Alamitos Generating Station

	Sample ID		NB9-1	NB9-2	NB9-3	NB10-1	NB10-2	NB10-3	NB11-1	NB11-2	NB11-3	NB12-1	NB12-2	NB12-3	NB13-1	NB13-2	NB13-3	NB14-1	NB14-2	NB14-3
	Depth (feet)		0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5
	Year		1997																	
	Location		Below Basin																	
Parameter	**PQL**	**Units**																		
Antimony	0.2	mg/kg	0.98	0.61	0.96	0.98	0.83	0.74	0.72	0.45	0.58	0.62	0.6	0.5	0.95	0.31	0.45	0.56	0.48	0.82
Arsenic	0.2	mg/kg	5.9	3.9	6.3	5.7	5.4	4.0	7.6	5.2	5.9	7.0	11.7	3.3	7.3	4.1	2.8	4	3	4.5
Barium	1	mg/kg	157	126	173	140	145	135	146	118	121	135	180	101	143	91.1	79.1	91.4	64	145
Beryllium	0.1	mg/kg	0.55	0.45	0.45	0.53	0.55	0.41	0.69	0.61	0.32	0.64	0.88	0.29	0.49	0.41	0.23	0.35	0.26	0.44
Cadmium	0.1	mg/kg	0.39	0.36	0.15	0.27	0.31	0.16	0.32	0.32	0.15	0.29	0.47	0.13	0.28	0.15	ND	0.2	0.11	0.19
Chromium, Total	0.5	mg/kg	28	22	21	25	24	19	25	23	18	24	27	15	25	18	11	18	29	21
Chromium VI	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.1	mg/kg	9.6	8	8	9.4	9.8	7.5	18.2	9	6.8	9.7	12.2	5.4	9.4	7.4	4.3	11	6.5	8.2
Copper	0.5	mg/kg	23	16	20	23	25	20	24	21	18	27	31	15	24	13	11	38	14	22
Lead	0.5	mg/kg	7.6	5.2	5.4	6.4	6.8	6.1	8	6.4	6	7.9	10.1	4.1	7.9	4	3.7	12.2	3.4	6
Mercury	0.06	mg/kg	ND	ND	ND	ND	0.07	0.1	ND	ND	0.09	ND	ND	ND	0.1	ND	ND	0.08	ND	ND
Molybdenum	0.2	mg/kg	1.56	1.21	0.93	1.24	1.16	0.7	1.16	1.15	0.78	1.08	2.1	0.41	1.39	1.05	0.68	0.61	0.93	0.65
Nickel	0.5	mg/kg	18	14	15	17	18	13	232	15	12	17	19	10	22	12	7	130	64	26
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	0.11	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND
Thallium	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	62	52	42	50	46	36	54	46	28	49	54	26	51	41	21	72	30	42
Zinc	1	mg/kg	71	59	54	66	68	53	71	69	52	68	85	45	66	55	33	52	38	55
pH		units	8.8	9.0	8.5	8.0	7.9	7.8	8.1	8.0	8.2	8.8	8.8	9.1	9.0	9.2	9.0	8.1	8.2	8.1
Iron	7	mg/kg	27,600	27,000	19,400	27,900	29,100	19,000	37,900	24,000	15,600	21,500	33,400	15,200	26,200	19,600	12,500	18,100	15,800	19,200
Aluminum	3	mg/kg	18,100	14,400	11,300	13,200	12,700	10,200	15,300	13,000	8,510	14,300	21,300	7,500	13,300	9,740	6,100	7,820	6,800	11,300
Magnesium			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	2	mg/l	28.8	22.5	31.6	24.4	29.9	37	ND	11.5	11.5	16.6	20.6	20.2	14.9	18.6	32.4	26.5	15.5	38.8
Fluoride	1	mg/l	3.86	2.16	3.58	1.76	1.58	2.27	1.97	5.14	3.36	3.68	3.98	4.87	2.81	1.66	5.1	2.29	2.6	4.59
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

	Sample ID		NB15-1	NB15-2	NB15-3
	Depth (feet)		1	3	5
			2007		
			Basin Perimeter		
Parameter	**PQL**	**Units**			
Antimony	0.5	mg/kg	1.3	0.96	0.77
Arsenic	0.5	mg/kg	29	7.8	6
Barium	1	mg/kg	180	170	150
Beryllium	0.1	mg/kg	0.54	0.66	0.49
Cadmium	0.1	mg/kg	0.15	0.32	0.17
Chromium, Total	1	mg/kg	28	35	24
Chromium VI	2.5	mg/kg	ND	ND	ND
Cobalt	0.2	mg/kg	11	14	10
Copper	0.5	mg/kg	27	36	24
Lead	0.5	mg/kg	9.4	8.7	6.6
Mercury	0.01	mg/kg	0.02	0.017	0.024
Molybdenum	0.2	mg/kg	4.6	1.7	0.88
Nickel	0.5	mg/kg	24	27	17
Selenium	0.5	mg/kg	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND
Vanadium	1	mg/kg	60	70	49
Zinc	5	mg/kg	62	86	60
pH		units	7.0	7.4	7.2
Iron	91	mg/kg	26,000	30,000	23,000
Aluminum	100	mg/kg	19,000	22,000	16,000
Magnesium	45		420	580	460
Chloride	2	mg/l	13	10	12
Fluoride	0.5	mg/l	1.6	1.4	1.7
Nitrate	2		7.7	8.6	11

Table 7

Analytical Soil Data -- Metal and General Mineral Parameters
North Basin -- Alamitos Generating Station

Sample ID			NB16-1	NB16-2	NB16-3	NB17-1	NB17-2	NB17-3	NB18-1	NB18-2	NB18-3	NB19-1	NB19-2	NB19-3	NB20-1	NB20-2	NB20-3	NB21-1	NB21-2	NB21-3	NB22-1	NB22-2	NB22-3	NB23-1	NB23-2	NB23-3
Depth (feet)			1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
			2007																							
			Basin Perimeter																							
Parameter	PQL	Units																								
Antimony	0.5	mg/kg	ND	ND	ND	0.51	0.98	1	0.7	0.91	1.1	0.87	ND	1	0.73	0.59	0.67	0.82	ND	0.52	0.74	1.2	0.68	0.54	ND	0.78
Arsenic	0.5	mg/kg	2	3	2.6	7.2	6.1	6.8	8.2	5.3	6.8	9.4	4.3	7.4	13	5.7	6.4	7.2	4.5	5.4	7.7	10	4.2	6	3.9	4.2
Barium	1	mg/kg	94	98	97	170	160	190	210	150	200	180	130	170	200	130	150	130	120	130	120	170	100	110	79	140
Beryllium	0.1	mg/kg	0.27	0.28	0.29	0.6	0.58	0.49	0.65	0.5	0.55	0.65	0.58	0.55	0.46	0.52	0.6	0.48	0.62	0.66	0.4	0.74	0.38	0.41	0.22	0.42
Cadmium	0.1	mg/kg	0.32	0.32	ND	0.2	0.26	0.21	ND	0.15	0.55	0.17	0.35	0.25	0.17	0.25	0.36	0.15	0.25	0.25	0.17	0.24	0.16	0.42	ND	0.27
Chromium, Total	1	mg/kg	12	12	14	18	27	28	23	25	28	26	28	28	20	27	30	25	27	28	23	33	20	23	14	27
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	4.1	5.2	5.3	7.7	10	9.4	7.4	9.2	10	10	9.6	11	7.3	9.3	10	8.9	8.9	9.3	8	11	7.5	11	10	14
Copper	0.5	mg/kg	15	17	19	23	29	30	22	27	30	26	22	30	22	22	31	25	24	27	23	40	21	26	15	27
Lead	0.5	mg/kg	3.6	4.1	3.8	5.9	8	7.3	6.1	6.5	9.3	13	7.3	7.2	13	7	7.9	11	6.7	7.3	6.5	11	5.4	12	3.8	5.6
Mercury	0.01	mg/kg	0.055	0.031	ND	0.035	0.045	0.049	0.034	0.062	0.049	0.026	ND	0.025	0.013	0.02	0.039	0.031	0.022	0.031	0.034	0.1	0.045	0.027	0.054	0.039
Molybdenum	0.2	mg/kg	0.55	0.36	0.49	3.6	1.3	1.4	5.5	1.1	1.4	5.9	1.9	1.4	7.2	1.5	1.7	1.1	1.3	1.5	0.84	1.9	0.76	0.93	0.57	0.69
Nickel	0.5	mg/kg	8.7	9.2	9.1	21	21	23	19	20	23	24	20	21	17	18	22	19	18	19	16	25	15	89	110	160
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	0.5	ND	ND	ND	ND	ND	ND	ND	ND	0.52	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	0.6	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	31	31	34	42	57	51	39	53	56	52	56	54	37	50	53	45	49	51	41	54	37	54	33	54
Zinc	5	mg/kg	32	35	35	41	66	61	44	61	180	67	67	67	45	65	78	67	74	75	59	82	52	71	48	69
pH		units	7.1	6.9	7.0	7.3	7.2	7.0	7.5	7.3	7.2	7.3	7.4	7.3	7.4	7.2	7.3	7.2	7.3	7.2	7.1	7.3	7.3	7.2	7.2	7.6
Iron	91	mg/kg	15,000	17,000	16,000	21,000	28,000	25,000	23,000	27,000	27,000	26,000	27,000	28,000	19,000	25,000	29,000	25,000	27,000	29,000	23,000	31,000	21,000	22,000	16,000	26,000
Aluminum	100	mg/kg	8,300	9,000	8,200	12,000	20,000	19,000	17,000	18,000	19,000	19,000	19,000	19,000	13,000	18,000	21,000	16,000	19,000	21,000	14,000	23,000	13,000	14,000	8,000	17,000
Magnesium	45	mg/kg	240	260	260	510	420	480	670	430	530	470	500	560	1100	490	520	420	490	520	380	640	390	370	230	340
Chloride	2	mg/l	57	35	42	20	14	19	9.3	5.2	5.6	24	22	21	130	40	50	44	52	77	23	26	9.8	8.2	4.4	5.9
Fluoride	0.5	mg/l	ND	ND	ND	1.2	1.4	1.9	1.4	0.7	1.6	1.1	1.3	1.1	1.2	0.93	1.3	1.3	1.3	1.6	0.92	2	1.1	ND	1.1	1.9
Nitrate	2	mg/l	37	22	25	9.6	7	13	4.6	ND	ND	11	8.8	7.5	6.6	ND	ND	ND	ND	ND	2.6	3.1	ND	ND	ND	ND

Table 7

Analytical Soil Data -- Metal and General Mineral Parameters
North Basin -- Alamitos Generating Station

Sample ID			NB24-1	NB24-2	NB24-3	NB25-1	NB25-2	NB25-3	NB26-1	NB26-2	NB26-3	NB27-1	NB27-2	NB27-3	NB28-1	NB28-2	NB28-3	NB29-1	NB29-2	NB29-3	NB30-1	NB30-2	NB30-3
Depth (feet)			1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
Year			2007																				
Location			Basin Perimeter																				
Parameter	PQL	Units																					
Antimony	0.5	mg/kg	0.68	1	1.1	0.67	0.97	1	2.7	3.3	0.78	0.83	ND	0.9	1	0.55	0.71	0.96	0.74	0.78	0.76	0.76	0.76
Arsenic	0.5	mg/kg	4.5	10	11	8.3	8.7	8	10	5.8	4.8	9	4.2	9	22	4.7	4.9	15	9.9	9.9	9.5	9.1	11
Barium	1	mg/kg	100	190	190	150	180	170	150	150	130	130	100	160	95	120	130	130	130	110	140	130	120
Beryllium	0.1	mg/kg	0.32	0.69	0.65	0.47	0.62	0.5	0.47	0.5	0.41	0.49	0.51	0.5	0.46	0.55	0.38	0.52	0.46	0.44	0.43	0.44	0.45
Cadmium	0.1	mg/kg	0.19	0.31	0.22	0.18	0.34	0.22	0.14	0.22	0.11	0.16	0.21	0.11	ND	0.18	0.13	0.16	0.12	ND	0.14	0.17	ND
Chromium, Total	1	mg/kg	20	34	34	25	33	31	25	28	24	23	22	24	19	26	22	25	24	21	24	23	24
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	7.7	13	13	9.5	12	11	9.7	11	8.3	9	8.3	9.6	9.5	11	9.2	10	9.9	9	10	11	9.5
Copper	0.5	mg/kg	20	41	40	25	37	32	26	27	25	24	19	24	19	24	21	24	23	21	24	29	22
Lead	0.5	mg/kg	6.9	8.9	8.7	8.4	7.8	6.5	7.4	7.2	5.7	8.3	5.9	6.4	15.0	6.8	6.1	66.0	7.3	8.7	6.3	6.2	5.6
Mercury	0.01	mg/kg	0.081	0.045	0.065	0.18	0.042	0.14	0.057	0.05	0.049	0.014	ND	0.013	0.023	0.01	0.014	0.07	ND	0.015	0.019	ND	0.011
Molybdenum	0.2	mg/kg	0.69	1.7	2.1	4.5	2.1	1.2	3.8	1.2	1.2	1.5	1.4	1.8	1.7	1.1	0.85	2.7	1.4	2.9	1.6	1.4	1.4
Nickel	0.5	mg/kg	15	25	25	17	24	22	20	20	19	34	14	17	45	19	17	50	20	31	20	22	18
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.57	ND	0.55	ND	0.55	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	41	66	65	49	65	64	50	56	49	67	50	48	87	58	44	87	52	58	53	50	49
Zinc	5	mg/kg	57	78	77	57	79	67	57	70	56	57	62	56	46	70	58	58	56	45	60	77	57
pH		units	7.9	7.4	7.7	7.6	7.2	7.4	7.6	7.4	7.5	7.1	7.2	7.3	7.0	7.0	7.2	7.3	7.4	6.9	7.0	7.0	7.2
Iron	91	mg/kg	19,000	31,000	30,000	24,000	30,000	29,000	25,000	28,000	21,000	23,000	24,000	24,000	19,000	26,000	20,000	22,000	22,000	20,000	24,000	24,000	23,000
Aluminum	100	mg/kg	11,000	24,000	22,000	17,000	22,000	18,000	17,000	19,000	15,000	15,000	17,000	16,000	14,000	18,000	13,000	15,000	15,000	13,000	16,000	16,000	15,000
Magnesium	45		310	670	590	400	550	470	370	530	440	410	460	610	250	450	420	380	430	330	520	570	550
Chloride	2	mg/l	8.4	8.8	14	12	18	29	3.5	5.5	6.5	ND	11	17	32	11	8.7	38	11	8.5	14	8.2	11
Fluoride	0.5	mg/l	0.78	1.6	2	1.8	2	1.4	1.4	1.6	1.7	1.6	1.8	2.3	1	1.6	1.4	1	1.6	1.2	1.4	1.4	1.6
Nitrate	2		ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	4.3	6.5	18	9.6	8.3	36	10	7.5	15	9.2	13

Table 8

Analytical Soil Data -- Volatile Organic Compounds
North Basin -- Alamitos Generating Station Detections

	Sample ID		NB17-1	NB17-2	NB17-3	NB19-1	NB19-2	NB19-3	NB23-1	NB23-2	NB23-3	NB24-1	NB24-2	NB24-3	NB26-1	NB26-2	NB26-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Location		Basin Perimeter														
Parameter	**PQL**	**Units**															
Benzene	5	ug/kg	ND	ND	**5.2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	**5.3**	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	**32**	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	ND	ND	ND	**12**	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	20	ug/kg	**25**	ND	ND	**27**	ND	ND	**24**	**34**	ND	**20**	ND	ND	**46**	**25**	**34**
2-Butanone	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7**	ND	**6.4**
o-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	**21**	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	**14**	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	**39**	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	5	ug/kg	ND	ND	ND	ND	ND	ND	**16**	ND	ND	ND	ND	ND	ND	ND	ND

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Table 9

Analytical Soil Data -- Metal and General Mineral Parameters
Central Basin -- Alamitos Generating Station

Sample ID			CB-1-1	CB-1-2	CB-2-1	CB-2-2	CB-3-1	CB-3-2	CB-4-1	CB-4-2	CB-5-1	CB-5-2
Depth (feet)			0.5	3	0.5	3	0.5	3	0.5	3	0.5	3
Date			1995									
Location			Below Liner									
Parameter	PQL	Units										
Antimony	5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.7	mg/kg	135	171	118	173	108	211	150	105	139	64
Beryllium	0.7	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.7	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total	1.5	mg/kg	24	26	22	31	20	30	27	18	23	11
Chromium VI		mg/kg	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Cobalt	2.5	mg/kg	12	13.1	13.8	15.2	13	15.9	17.8	9.9	16.6	6.7
Copper	1.5	mg/kg	27	31	25	37	19	43	29	19	26	10
Lead	1.5	mg/kg	6.4	8.8	5.9	10.5	6.3	10.8	7.4	4.1	6.3	2.7
Mercury		mg/kg	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Molybdenum	2.5	mg/kg	23.6	21.9	19.7	25.5	15.1	24.8	20.3	19.0	23.0	10.3
Nickel	2.5	mg/kg	20	19	88	22	128	23	227	15	173	10
Selenium	0.07	mg/kg	0.08	ND	0.08	0.09	0.09	ND	0.13	ND	0.16	ND
Silver	0.7	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium		mg/kg	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Vanadium	7.5	mg/kg	55	60	55	68	52	66	108	48	65	28
Zinc	1.5	mg/kg	57	58	56	72	46	67	61	45	54	29
pH		units	8.2	8.4	8.0	8.2	8.3	8.3	7.4	8.0	7.4	8.2
Iron	7	mg/kg	21,400	22,200	21,000	25,900	17,700	25,200	22,200	17,800	20,900	13,300
Aluminum	62.5	mg/kg	18,700	20,800	17,300	22,900	13,700	21,900	20,400	14,100	16,700	8,760
Manganese	0.7	mg/kg	428	548	379	628	271	636	436	322	389	188
Chloride		mg/l	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fluoride		mg/l	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Nitrate		mg/l	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Sample ID			CB1-1	CB1-2	CB1-3	CB2-1	CB2-2	CB2-3	CB3-1	CB3-2	CB3-3	CB4-1	CB4-2	CB4-3
Depth (feet)			0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5
Date			1997											
Location			Below Liner											
Parameter	PQL	Units												
Antimony	0.2	mg/kg	0.8	0.99	0.92	0.7	0.73	0.9	1.09	1.21	1.59	1.72	0.69	1.79
Arsenic	0.5	mg/kg	4.8	4.0	6.5	4.8	3.7	4.3	4.7	9.7	11.3	13.7	4.7	15.5
Barium	1	mg/kg	114	133	156	95	108	148	131	196	197	189	129	205
Beryllium	0.1	mg/kg	0.44	0.48	0.42	0.42	0.42	0.42	0.45	0.69	0.59	0.64	0.56	0.66
Cadmium	0.1	mg/kg	0.35	0.32	0.13	0.19	0.18	0.24	0.29	0.5	0.46	0.33	0.39	0.43
Chromium, Total	1	mg/kg	21	26	23	19	21	22	24	31	29	32	25	32
Chromium VI	1.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	9.1	10.5	10.0	11.9	8.8	8.7	9.4	11.9	12.5	20.9	9.6	12.9
Copper	1	mg/kg	21	26	26	19	19	22	24	31	32	40	21	39
Lead	0.5	mg/kg	6.3	7.3	6.9	6.3	6.4	6.2	6.9	10.9	10.3	11.6	7.4	11.6
Mercury	0.06	mg/kg	ND	ND	ND	ND	ND	0.06	0.07	ND	0.07	ND	ND	0.12
Molybdenum	0.2	mg/kg	1.3	1.4	1.8	1.7	1.0	1.2	1.6	2.1	2.1	2.4	1.5	2.3
Nickel	1	mg/kg	43	20	17	134	14	15	20	20	19	214	16	22
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.27	0.12	0.17	ND	0.15
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	40	50	42	38	42	41	45	59	53	56	51	56
Zinc	5	mg/kg	55	69	56	60	64	56	64	84	77	85	79	82
pH		units	8.4	8.7	8.9	8.3	8.5	8.5	8.1	8.3	8.6	8.0	8.3	8.5
Iron	625	mg/kg	30,100	37,100	33,900	36,600	28,700	51,200	47,500	43,200	37,400	38,800	85,900	35,900
Aluminum	20	mg/kg	11,300	14,100	12,500	12,700	13,400	13,600	14,400	20,600	18,300	19,100	16,900	19,300
Manganese			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	4	mg/l	14.2	31.5	19.5	16.2	14.6	15.9	56.9	68.1	56.3	66.6	57.5	47.3
Fluoride	1	mg/l	ND	5.4	2.2	3.6	1.5	1.9	2.0	4.6	3.9	4.6	2.2	3.3
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Table 9

Analytical Soil Data -- Metal and General Mineral Parameters
Central Basin -- Alamitos Generating Station

Parameter	PQL	Units	CB5-1	CB5-2	CB5-3	CB6-1	CB6-2	CB6-3	CB7-1	CB7-2	CB7-3	CB8-1	CB8-2	CB8-3	CB9-1	CB9-2	CB9-3	CB10-1	CB10-2	CB10-3	CB11-1	CB11-2	CB11-3
Sample ID			CB5-1	CB5-2	CB5-3	CB6-1	CB6-2	CB6-3	CB7-1	CB7-2	CB7-3	CB8-1	CB8-2	CB8-3	CB9-1	CB9-2	CB9-3	CB10-1	CB10-2	CB10-3	CB11-1	CB11-2	CB11-3
Depth (feet)			0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5
Date			1997																				
Location			Below Liner																				
Antimony	0.2	mg/kg	0.65	1.72	1.01	1.07	0.8	ND	1.14	0.84	0.72	5.14	0.8	1.35	0.62	0.88	1.14	1.06	0.76	1.1	0.8	1.21	1.13
Arsenic	0.5	mg/kg	4.4	11.5	7.4	4.9	4.1	2.5	6.1	3.4	7.9	4.3	5.5	8.3	3.6	8	11.9	6.5	3.9	7.2	5.9	12.3	11.1
Barium	1	mg/kg	92	193	162	125	115	104	150	88	136	116	110	152	82	196	211	166	103	184	118	200	212
Beryllium	0.1	mg/kg	0.38	0.67	0.53	0.44	0.37	0.34	0.46	0.28	0.55	0.37	0.43	0.51	0.25	0.47	0.93	0.76	0.34	0.54	0.56	0.78	0.97
Cadmium	0.1	mg/kg	0.33	0.45	0.62	0.3	0.19	0.2	0.34	0.11	0.32	0.23	0.25	0.23	ND	0.2	0.46	0.37	0.11	0.18	0.3	0.45	0.6
Chromium, Total	1	mg/kg	19	31	27	23	22	17	27	18	27	24	22	26	12	20	29	25	16	21	20	27	29
Chromium VI	1.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	17.8	13.4	10.1	10.7	9.4	7.2	11	7.5	10.4	21.9	8.9	10.3	8.6	8.2	11.2	36.3	17.1	8.6	9	10.2	11
Copper	1	mg/kg	20	41	27	24	21	18	31	19	25	23	21	27	12	23	31	25	15	21	17	29	31
Lead	0.5	mg/kg	6.3	12.1	7.9	7.3	6.4	5.2	7.9	4.9	7.5	6.5	6.2	8.6	3.4	7.1	12.5	9	4.8	6.9	6.1	10	11.9
Mercury	0.06	mg/kg	ND	0.08	0.06	ND	0.07	ND	0.06	ND	ND	ND	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	0.2	mg/kg	1.2	2.6	1.8	1.3	1.1	0.9	1.5	0.7	2.2	1.1	2.0	2.3	0.6	2.1	2.1	8.3	1.4	2.1	1.6	2.2	2.1
Nickel	1	mg/kg	334	24	20	101	16	12	20	18	17	385	15	18	108	14	19	1500	488	18	30	19	19
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	0.15	0.16	ND	ND	ND	ND	ND	ND	ND	ND	0.18	ND	ND	0.15	0.13	ND	0.11	0.11	0.13	0.25
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	38	56	46	44	42	36	50	40	56	46	48	52	25	37	66	51	35	41	45	62	68
Zinc	5	mg/kg	54	86	71	65	65	53	73	48	74	61	62	67	41	58	95	87	56	62	70	83	96
pH		units	8.5	8.7	8.8	8.5	8.7	9.0	8.3	8.5	8.7	7.9	8.5	8.4	8.3	8.5	8.5	7.2	8.1	8.2	8.0	8.3	8.5
Iron	625	mg/kg	27,900	54,400	45,300	35,300	36,700	28,500	38,000	26,400	40,200	34,900	35,000	48,700	18,000	12,300	38,000	31,000	21,800	26,100	28,600	35,600	36,300
Aluminum	20	mg/kg	10,600	18,500	14,400	12,900	12,700	11,700	15,300	9,340	17,600	13,000	14,000	15,700	8,900	14,900	29,500	19,600	12,100	16,300	16,600	21,900	29,300
Manganese			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	4	mg/l	20.3	42.6	32.7	20.2	26.3	16.3	33	21.5	34.8	21.9	25	38.6	9.02	35.5	33.5	22.3	12.9	28.1	19.7	36.7	42.6
Fluoride	1	mg/l	ND	5.4	3.1	2.1	1.3	1.6	2.3	1.1	2.7	4.4	3.1	3.6	ND	3.5	3.8	2.6	1.9	3.8	1.7	3.2	6.0
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Table 9

Analytical Soil Data -- Metal and General Mineral Parameters
Central Basin -- Alamitos Generating Station

	Sample ID		CB12-1	CB12-2	CB12-3	CB13-1	CB13-2	CB13-3	CB14-1	CB14-2	CB14-3	CB15-1	CB15-2	C15-3	CB16-1	CB16-2	CB16-3		Sample ID		CB17-1	CB17-2	CB17-3	CB18-1	CB18-2	CB18-3
	Depth (feet)		0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5		Depth (feet)		1	3	5	1	3	5
	Date		1997																		2007					
	Location		Below Liner																		Outside Perimeter					
Parameter	PQL	Units																	PQL	Units						
Antimony	0.2	mg/kg	0.89	0.82	0.81	0.83	1.41	1.53	0.67	0.8	1.84	0.87	1.26	1.03	0.88	1.05	1.08		0.5	mg/kg	0.59	0.7	ND	0.62	0.59	0.55
Arsenic	0.5	mg/kg	7.9	4.4	8	6.1	5.4	8.1	4.5	5.5	15.3	4.9	7.4	5	6.5	6.7	9.7		0.5	mg/kg	6.1	4.3	5.7	9.4	4.8	4
Barium	1	mg/kg	170	118	207	151	136	211	147	139	290	154	182	157	147	182	184		1	mg/kg	120	130	130	130	100	110
Beryllium	0.1	mg/kg	0.8	0.38	0.56	0.61	0.47	0.68	0.63	0.88	0.85	0.55	0.6	0.48	0.54	0.54	0.7		0.1	mg/kg	0.42	0.5	0.59	0.48	0.43	0.4
Cadmium	0.1	mg/kg	0.48	0.11	0.55	0.31	0.19	0.42	0.42	0.65	0.45	0.29	0.46	0.24	0.29	0.3	0.41		0.1	mg/kg	0.13	0.24	0.25	0.11	0.14	0.14
Chromium, Total	1	mg/kg	23	18	22	23	19	29	23	29	32	22	25	23	21	24	27		1	mg/kg	24	28	28	24	22	23
Chromium VI	1.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		2.5	mg/kg	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	38.8	9	8.5	8.9	8	10.1	17.3	8.8	12.5	8.7	9.5	9.1	18.8	9.8	10.3		0.2	mg/kg	8.7	9.3	10	9.3	7.7	15
Copper	1	mg/kg	24	17	25	22	20	26	17	22	40	21	27	22	20	25	28		0.5	mg/kg	23	28	27	23	21	22
Lead	0.5	mg/kg	9.2	5.9	8.2	7.7	6.1	8.5	6.6	10.1	13	9.8	8.5	6.4	8.5	7.2	9.3		0.5	mg/kg	7.5	6.2	7	11	4.8	4.9
Mercury	0.06	mg/kg	0.07	ND	ND	ND	ND	ND	ND	ND	0.08	ND	ND	0.06	ND	ND	ND		0.01	mg/kg	0.046	0.077	0.051	0.042	0.036	0.08
Molybdenum	0.2	mg/kg	2.3	1.0	1.9	1.5	1.3	1.3	3.3	2.0	2.1	1.1	1.7	1.0	1.3	1.2	1.6		0.2	mg/kg	1.7	1.6	1.6	2.6	1.0	1.0
Nickel	1	mg/kg	995	50	15	17	17	18	394	25	23	15	17	16	359	18	18		0.5	mg/kg	36	20	20	69	16	250
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		0.5	mg/kg	0.66	0.5	ND	0.69	ND	1.2
Silver	0.1	mg/kg	ND	ND	0.36	0.11	ND	ND	ND	0.14	0.17	ND	0.11	ND	0.1	ND	0.12		0.1	mg/kg	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		0.5	mg/kg	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	49	39	49	47	38	66	60	76	66	46	50	45	43	48	55		1	mg/kg	79	60	61	130	47	49
Zinc	5	mg/kg	104	57	63	74	62	81	76	92	91	71	73	69	67	74	79		5	mg/kg	57	65	68	53	52	56
pH		units	7.1	7.8	7.9	8.0	8.1	7.8	7.9	8.2	8.4	8.0	8.2	8.7	7.8	7.8	8.2			units	7.3	7.2	7.3	7.2	7.3	7.2
Iron	625	mg/kg	31,700	24,700	27,100	26,800	31,300	33,600	27,700	34,300	37,400	26,600	29,400	26,000	26,500	29,600	34,700		91	mg/kg	23,000	26,000	29,000	23,000	23,000	24,000
Aluminum	20	mg/kg	19,800	13,400	17,700	18,100	14,200	24,400	19,400	30,400	27,900	17,000	18,300	16,400	16,400	17,800	20,900		100	mg/kg	17,000	19,000	23,000	17,000	15,000	17,000
Manganese			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		45		450	540	650	530	370	390
Chloride	4	mg/l	25.8	16.4	26	25.8	24.7	30.1	23.7	26.1	32.2	20.8	22.5	26.7	25.3	38.5	32.1		2	mg/l	ND	3.8	4	ND	2.7	5.3
Fluoride	1	mg/l	6.7	1.5	2.4	2.4	1.4	1.2	3.7	2.6	4.4	1.3	1.6	2.1	3.6	1.3	2.7		0.5	mg/l	1.3	1.6	2.7	1.5	1.3	1.7
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		2		ND	ND	ND	ND	ND	ND

Table 9

Analytical Soil Data -- Metal and General Mineral Parameters
Central Basin -- Alamitos Generating Station

Parameter	PQL	Units	CB19-1	CB19-2	CB19-3	CB20-1	CB20-2	CB20-3	CB21-1	CB21-2	CB21-3	CB22-1	CB22-2	CB22-3	CB23-1	CB23-2	CB23-3	CB24-1	CB24-2	CB24-3	CB25-1	CB25-2	CB25-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Date		2007																				
	Location		Outside Perimeter																				
Antimony	0.5	mg/kg	0.51	ND	0.64	1.2	0.94	1	0.87	0.79	0.95	1.2	0.58	1.2	1	0.98	0.99	0.93	0.95	1.2	0.87	0.71	1.1
Arsenic	0.5	mg/kg	6.9	3.4	7.6	13	6.9	7.2	6.8	5	6.1	9.9	4.7	9	9.6	6.7	7.6	9.4	6.9	6.6	7.4	7.1	8.5
Barium	1	mg/kg	110	85	160	160	150	160	140	110	130	170	110	180	150	180	160	150	160	160	130	130	150
Beryllium	0.1	mg/kg	0.38	0.41	0.8	0.5	0.54	0.47	0.45	0.35	0.39	0.54	0.43	0.5	0.47	0.57	0.47	0.46	0.55	0.52	0.45	0.43	0.52
Cadmium	0.1	mg/kg	0.11	0.12	0.38	0.15	0.27	0.13	0.15	0.14	0.13	0.24	0.16	0.15	0.16	0.4	0.14	0.17	0.33	0.22	0.2	0.25	0.19
Chromium, Total	1	mg/kg	22	21	32	25	28	25	25	24	21	31	21	26	25	29	24	30	29	29	36	24	29
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	7.6	7.5	10	12	12	10	9.8	9.4	8.8	13	8.6	10	10	11	9.4	16	11	11	10	9.6	10
Copper	0.5	mg/kg	21	18	35	28	33	28	27	23	23	32	19	28	32	29	27	28	29	33	29	24	31
Lead	0.5	mg/kg	6.1	4.3	8.5	9.3	8.2	7.6	10	6.1	7.2	29	5.5	8.2	15	7.7	7.8	46	7.3	7.5	19	7	7.6
Mercury	0.01	mg/kg	0.038	0.018	0.041	0.05	0.067	0.043	0.06	0.031	0.2	0.073	0.025	0.043	0.039	0.031	0.047	0.043	0.038	0.086	0.035	0.12	0.044
Molybdenum	0.2	mg/kg	2.1	1.0	1.5	2.3	1.7	1.5	1.5	0.9	1.0	2.7	1.6	1.6	2.1	1.9	1.3	2.5	1.8	1.5	2.6	1.4	1.5
Nickel	0.5	mg/kg	30	15	23	87	70	28	20	21	17	150	15	19	48	22	18	260	22	24	56	18	21
Selenium	0.5	mg/kg	ND	0.52	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	64	48	66	91	84	56	52	50	44	120	47	52	67	59	49	110	59	58	70	51	56
Zinc	5	mg/kg	49	58	78	74	74	60	66	59	50	78	61	60	68	73	59	72	73	72	70	63	66
pH		units	7.3	7.3	7.3	7.2	7.4	7.5	7.5	7.6	7.6	7.2	7.3	7.4	7.5	7.0	7.4	7.7	7.5	7.5	7.7	7.4	7.4
Iron	91	mg/kg	21,000	23,000	30,000	25,000	28,000	25,000	22,000	25,000	22,000	26,000	24,000	25,000	25,000	28,000	24,000	24,000	30,000	29,000	27,000	25,000	26,000
Aluminum	100	mg/kg	15,000	15,000	27,000	17,000	19,000	17,000	14,000	17,000	14,000	17,000	15,000	16,000	16,000	19,000	16,000	15,000	20,000	19,000	17,000	16,000	18,000
Manganese	45		430	410	710	540	550	490	400	460	480	520	510	540	490	560	470	480	550	540	490	500	520
Chloride	2	mg/l	2.5	7.2	12	12	5.2	4	64	25	14	44	7.5	10	31	9.2	12	68	13	9.7	99	20	17
Fluoride	0.5	mg/l	1.1	1.1	3.5	1.5	1.9	1.6	1	1.2	1.1	1.2	1.2	1.6	1.1	1.3	1.6	0.83	1.5	2	0.98	1	1.7
Nitrate	2		ND	ND	ND	ND	ND	ND	17	7.3	4.7	18	2.5	3.9	12	7.3	8.1	33	4.7	5.1	39	14	13

Table 9

Analytical Soil Data -- Metal and General Mineral Parameters
Central Basin -- Alamitos Generating Station

	Sample ID		CB26-1	CB26-2	CB26-3	CB27-1	CB27-2	CB27-3	CB28-1	CB28-2	CB28-3	CB29-1	CB29-2	CB29-3	CB30-1	CB30-2	CB30-3	CB31-1	CB31-2	CB31-3	CB32-1	CB32-2	CB32-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Date		2007																				
	Location		Outside Perimeter																				
Parameter	**PQL**	**Units**																					
Antimony	0.5	mg/kg	0.92	ND	ND	1	ND	ND	1.1	ND	1.4	0.84	0.93	ND	1.1	0.8	1.2	0.94	0.64	0.93	0.8	0.92	0.61
Arsenic	0.5	mg/kg	7	1.4	1.7	7	2.4	1.3	9.3	1.9	9.4	7.3	8.6	3.7	13	6	8	9.5	5.2	7	6.6	4.7	6.8
Barium	1	mg/kg	140	77	77	140	80	72	140	80	210	130	130	110	140	140	160	150	120	140	150	110	130
Beryllium	0.1	mg/kg	0.57	0.25	0.24	0.52	0.23	0.23	0.57	0.23	0.75	0.43	0.48	0.32	0.52	0.55	0.57	0.52	0.49	0.55	0.56	0.34	0.54
Cadmium	0.1	mg/kg	0.21	ND	ND	0.2	ND	ND	0.31	ND	0.24	0.16	0.23	0.11	0.22	0.2	0.21	0.17	0.25	0.19	0.29	0.13	0.18
Chromium, Total	1	mg/kg	30	15	15	29	15	13	52	16	36	28	38	19	26	28	30	26	24	28	31	21	28
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	11	5.7	5.8	12	5.9	5.8	16	5.6	13	9.8	12	8	10	10	11	10	9	10	11	10	9.7
Copper	0.5	mg/kg	33	11	11	28	14	11	40	11	44	24	30	18	27	28	35	31	23	31	32	21	28
Lead	0.5	mg/kg	21	4.2	4	23	11	4.2	27	4.4	12	18	22	11	10	7.5	9.4	13	6.2	8.4	7.5	5.3	8.2
Mercury	0.01	mg/kg	0.052	0.026	0.031	0.043	0.043	0.037	0.044	0.03	0.064	0.032	0.039	0.076	0.04	0.039	0.047	0.074	0.03	0.044	0.047	0.052	0.043
Molybdenum	0.2	mg/kg	2.0	0.4	0.7	2.0	0.7	0.3	5.0	0.5	2.5	2.0	3.2	1.0	1.7	1.5	1.3	2.0	1.4	1.5	1.8	1.0	2.2
Nickel	0.5	mg/kg	54	8	9	130	22	8	210	9	25	55	89	40	26	19	24	30	17	20	21	75	21
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	63	39	40	63	40	38	76	41	64	68	110	65	55	55	61	64	48	56	61	47	59
Zinc	5	mg/kg	74	39	38	67	39	47	96	39	82	58	70	52	67	70	75	68	62	70	68	58	68
pH		units	7.1	7.1	7.4	7.5	7.6	7.7	7.6	7.4	7.4	7.5	7.5	7.7	7.3	7.4	7.5	7.6	7.4	7.5	7.6	7.5	7.3
Iron	91	mg/kg	27,000	20,000	20,000	27,000	18,000	19,000	27,000	20,000	34,000	23,000	29,000	22,000	26,000	25,000	31,000	25,000	25,000	29,000	30,000	23,000	27,000
Aluminum	100	mg/kg	20,000	9,300	9,300	19,000	9,600	8,900	17,000	9,800	26,000	16,000	17,000	13,000	18,000	17,000	22,000	16,000	17,000	21,000	22,000	14,000	20,000
Manganese	45		540	250	260	540	270	250	460	250	900	400	660	330	490	450	570	480	460	590	590	350	510
Chloride	2	mg/l	3.3	9	13	40	7.8	4.4	20	3.9	11	ND	ND	36	ND	ND	ND	25	7.1	ND	17	14	9.9
Fluoride	0.5	mg/l	2	ND	ND	1.6	ND	ND	0.61	ND	1.9	0.79	1.3	0.59	0.98	1.1	1.5	1.2	1	1.7	2.1	1.3	1.4
Nitrate	2		4.2	3.3	4.6	17	4.3	2.1	10	3.3	12	ND	ND	14	ND	ND	ND	10	4.7	ND	ND	ND	ND

Table 10

Analytical Soil Data -- Volatile Organic Compounds
Central Basin -- Alamitos Generating Station

Parameter	PQL	Units	CB-1-1	CB-1-2	CB-2-1	CB-2-2	CB-3-1	CB-3-2	CB-4-1	CB-4-2	CB-5-1	CB-5-2
Sample ID			CB-1-1	CB-1-2	CB-2-1	CB-2-2	CB-3-1	CB-3-2	CB-4-1	CB-4-2	CB-5-1	CB-5-2
Depth (feet)			0.5	3	0.5	3	0.5	3	0.5	3	0.5	3
Date			1995									
Location			Below Liner									
Trichloroethene (TCE)	2.5	ug/kg	ND	**170**	ND	**51**	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	2.5	ug/kg	**16**	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane (1,1,1-TCA)	2.5	ug/kg	**2,600**	**8**	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-DCE)	2.5	ug/kg	**5.7**	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	2.5	ug/kg	ND	**57**	**3.9**	**24**	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene (t-1,2-DCE)	2.5	ug/kg	ND	**3.6**	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	2.5	ug/kg	**43**	96	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2.5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	2.5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	2.5	ug/kg	**38**	**36**	**130**	**20**	**52**	**42**	**38**	**24**	**22**	**28**
m/p-Xylene	2.5	ug/kg	**3**	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	2.5	ug/kg	**6.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	2.5	ug/kg	**3.2**	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	2.5	ug/kg	**34**	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	2.5	ug/kg	**36**	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	2.5	ug/kg	**4.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	2.5	ug/kg	**49**	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	2.5	ug/kg	**5.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	2.5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Parameter	PQL	Units	CB3-1	CB3-2	CB3-3	CB4-1	CB4-2	CB4-3	CB5-1	CB5-2	CB5-3
Sample ID			CB3-1	CB3-2	CB3-3	CB4-1	CB4-2	CB4-3	CB5-1	CB5-2	CB5-3
Depth (feet)			0.5	3	5	0.5	3	5	0.5	3	5
Date			1997								
Location			Below Liner								
Trichloroethene (TCE)	5	ug/kg	ND	**10**	**15**	**370**	**87**	**120**	ND	ND	ND
Tetrachloroethene (PCE)	5	ug/kg	ND	ND	ND	**5,800**	**4,300**	**63**	ND	ND	ND
1,1,1-Trichloroethane (1,1,1-TCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-DCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	5	ug/kg	ND	**8.5**	**5.3**	**1,000**	**400**	**160**	ND	ND	ND
trans-1,2-Dichloroethene (t-1,2-DCE)	5	ug/kg	ND	ND	ND	**5.5**	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	10	ug/kg	ND	ND	ND	**13**	ND	ND	ND	ND	ND
Benzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	**7.9**	ND	ND
1,3,5-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	20	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Table 10

Analytical Soil Data -- Volatile Organic Compounds
Central Basin -- Alamitos Generating Station

	Sample ID		CB7-1	CB7-2	CB7-3	CB8-1	CB8-2	CB8-3	CB17-1	CB17-2	CB17-3	CB19-1	CB19-2	CB19-3	CB32-1	CB32-2	CB32-3
	Depth (feet)		0.5	3	5	0.5	3	5	1	3	5	1	3	5	1	3	5
	Date		1997						2007								
	Location		Below Liner						Basin Perimeter								
Parameter	**PQL**	**Units**															
Trichloroethene (TCE)	5	ug/kg	ND	ND	**16**	**23**	**76**	**120**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane (1,1,1-TCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-DCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	5	ug/kg	ND	ND	ND	**20**	**40**	**57**	ND	ND	ND	ND	ND	**13**	ND	ND	ND
trans-1,2-Dichloroethene (t-1,2-DCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	10	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	5	ug/kg	ND	ND	ND	ND	ND	ND	**5.3**	ND	ND	**5.5**	ND	**5.4**	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	20	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	**20**	ND	ND	ND	ND	**38**	**26**
2-Butanone	5	ug/kg	ND	ND	ND	ND	ND	ND	**8.1**	ND	ND	ND	ND	ND	ND	**11**	**6.5**

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Analytical Soil Data -- Metal and General Mineral Parameters
Boiler Chemical Cleaning Basin -- Alamiros Generating Station

	Sample ID		BCCB1-1	BCCB1-2	BCCB1-3	BCCB2-1	BCCB2-2	BCCB3-1	BCCB3-2	BCCB4-1	BCCB4-2	BCCB4-3	BCCB5-1	BCCB5-2	BCCB5-3	BCCB6-1	BCCB6-2	BCCB6-3
	Depth (feet)		0.5	3	5	2.9	5	2.2	5	0.5	2	5	0.5	3	5	0.5	3	5
	Year		1997															
	Location		Below Liner															
Parameter	PQL	Units																
Antimony	0.2	mg/kg	1.18	0.28	0.81	0.95	0.93	1	1.39	0.75	0.87	0.74	0.78	2.71	0.97	1.23	0.76	0.75
Arsenic	0.2	mg/kg	6.7	3.3	2.3	3.5	6.1	10.1	4.4	5.6	3.9	3.5	4.3	4.8	4	3	3.8	4
Barium	1	mg/kg	125	111	134	147	129	182	214	81	86	99	120	179	163	136	105	117
Beryllium	0.1	mg/kg	0.51	0.1	0.34	0.32	0.36	0.53	0.7	0.31	0.31	0.3	0.47	0.68	0.39	0.68	0.25	0.32
Cadmium	0.1	mg/kg	1.15	ND	ND	ND	ND	ND	0.48	ND	ND	ND	ND	ND	0.13	ND	ND	ND
Chromium, Total	0.5	mg/kg	65	5	18	19	18	26	32	15	18	16	22	33	20	32	16	22
Chromium VI	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.1	mg/kg	19.3	1.7	6.3	6.7	6.9	8.2	10.4	5.7	7.3	6.1	7.5	18.0	7.7	14.8	7.3	7.3
Copper	0.5	mg/kg	42	7	16	16	15	19	28	15	16	14	18	27	20	27	16	19
Lead	0.5	mg/kg	24.2	2	5.1	3.8	4.3	7.3	9.5	4.3	5.1	3.8	6.6	8.8	5.4	9.7	8	6.2
Mercury	0.06	mg/kg	0.07	ND	ND	ND	ND	0.06	ND	0.16	ND	ND	0.09	0.08	0.06	0.09	ND	ND
Molybdenum	0.2	mg/kg	7	29.2	0.3	1.4	0.7	1.9	0.9	2.3	1.7	0.8	1.7	2.6	0.3	1.8	1.3	3.7
Nickel	1	mg/kg	359	3	11	12	11	16	19	11	14	10	16	20	12	22	12	14
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	0.12	ND	ND	ND	ND	ND	0.18	ND	0.13	ND	ND	2.82	0.1	ND	ND	ND
Thallium	0.1	mg/kg	0.12	0.15	0.16	0.13	0.14	0.17	0.23	ND	0.17	0.12	ND	0.12	0.13	0.11	0.11	0.11
Vanadium	5	mg/kg	151	8	32	34	37	49	57	27	33	31	35	44	34	48	31	33
Zinc	1	mg/kg	360	14	51	40	44	55	75	33	48	42	44	54	54	57	50	52
pH		units	7.0	7.7	8.6	7.9	9.2	7.8	8.3	7.8	8.3	8.5	8.0	8.7	8.5	7.7	8.0	8.5
Iron	7	mg/kg	32,000	4,140	21,000	21,600	23,400	31,300	39,800	19,500	23,300	19,600	28,600	36,900	23,400	38,500	24,900	22,800
Aluminum	3	mg/kg	21,400	4,000	15,200	14,700	14,400	21,700	27,000	10,700	12,200	12,300	16,400	20,300	16,700	21,800	11,100	12,700
Magnesium			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	2	mg/l	26.6	159	92.5	22.6	50.3	221	238	23.4	68.5	160	60.6	137	191	258	101	226
Fluoride	1	mg/l	3.45	1.62	3.41	ND	1.29	ND	3.07	ND	ND	2.11	ND	1.3	3.5	ND	ND	ND
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Analytical Soil Data -- Metal and General Mineral Parameters
Boiler Chemical Cleaning Basin -- Alamiros Generating Station

	Sample ID		BCC7-1	BCCB7-2	BCCB7-3	BCCB8-1	BCCB8-2	BCCB8-3	BCCB9-1	BCCB9-2	BCCB9-3
	Depth (feet)		0.5	3	5	0.5	3	5	0.5	3	5
	Year		1997								
	Location		Below Liner								
Parameter	PQL	Units									
Antimony	0.2	mg/kg	1.06	1.02	0.87	1.31	0.85	0.78	0.74	0.87	0.84
Arsenic	0.2	mg/kg	9.3	5.4	4.1	12.8	5.9	3.9	5.7	4.2	5.1
Barium	1	mg/kg	184	147	173	140	118	147	76	124	137
Beryllium	0.1	mg/kg	0.7	0.59	0.43	0.28	0.36	0.3	0.3	0.27	0.34
Cadmium	0.1	mg/kg	0.3	ND	0.27	ND	ND	ND	ND	ND	ND
Chromium, Total	0.5	mg/kg	29	23	21	89	18	17	16	18	19
Chromium VI	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.1	mg/kg	10.6	8.4	7.9	6.7	7.5	7	6.3	8.9	7.9
Copper	0.5	mg/kg	25	19	20	424	69	34	14	19	20
Lead	0.5	mg/kg	9.8	7.8	8.7	9.9	5.6	5.9	4	5.2	7.1
Mercury	0.06	mg/kg	ND	ND	ND	0.12	ND	0.06	ND	ND	ND
Molybdenum	0.2	mg/kg	1.4	8.4	1.2	12.5	14	0.7	2.2	1.8	4.9
Nickel	1	mg/kg	20	16	13	51	21	11	12	15	13
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	0.11	1.19	ND	ND	ND	ND	ND
Thallium	0.1	mg/kg	0.13	0.1	0.16	0.19	0.14	0.12	ND	0.21	0.12
Vanadium	5	mg/kg	46	40	35	73	32	28	29	36	32
Zinc	1	mg/kg	71	52	71	92	51	51	35	59	56
pH		units	7.9	8.0	8.7	3.3	7.3	7.6	7.7	8.5	8.2
Iron	7	mg/kg	29,800	38,000	24,200	46,400	35,200	22,800	19,600	28,100	25,000
Aluminum	3	mg/kg	18,500	17,100	14,700	16,400	11,500	12,500	10,600	12,000	13,500
Magnesium			NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	2	mg/l	277	360	257	141	142	57.1	288	108	258
Fluoride	1	mg/l	ND	1.36	2.76	1.14	4.54	2.19	ND	ND	1.82
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT

	Sample ID		BCCB10-1	BCCB10-2	BCCB10-3	BCCB11-1	BCCB11-2	BCCB11-3
	Depth (feet)		1	3	5	1	3	5
	Year		2007					
	Location		Basin Perimeter					
Parameter	PQL	Units						
Antimony	0.5	mg/kg	1.1	0.75	0.67	0.95	0.71	0.5
Arsenic	0.5	mg/kg	9.4	5	4	6.2	10	4
Barium	1	mg/kg	140	93	170	140	110	150
Beryllium	0.1	mg/kg	0.48	0.33	0.5	0.49	0.46	0.24
Cadmium	0.1	mg/kg	0.28	ND	0.17	0.13	ND	0.16
Chromium, Total	1	mg/kg	32	20	24	31	23	17
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	14	9.4	9.9	13	9.6	6.2
Copper	0.5	mg/kg	42	21	25	30	21	22
Lead	0.5	mg/kg	33	8.4	8.8	18	6.2	7.2
Mercury	0.01	mg/kg	0.052	0.038	0.023	0.053	0.032	0.027
Molybdenum	0.2	mg/kg	2.2	1	4.4	3.7	5.4	26
Nickel	0.5	mg/kg	65	17	18	43	17	16
Selenium	0.5	mg/kg	0.51	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	63	34	34	60	31	24
Zinc	5	mg/kg	120	63	67	72	54	57
pH		units	7.4	7.3	7.2	7.2	7.3	7.4
Iron	91	mg/kg	24,000	18,000	20,000	25,000	20,000	11,000
Aluminum	100	mg/kg	17,000	11,000	15,000	18,000	14,000	7,900
Magnesium	45	mg/kg	370	270	370	380	200	240
Chloride	2	mg/l	5.8	2.9	3.4	33	41	150
Fluoride	0.5	mg/l	0.56	ND	1.3	0.5	0.63	1.1
Nitrate	2	mg/l	4.1	ND	2.9	2.4	ND	8.1

Analytical Soil Data -- Metal and General Mineral Parameters
Boiler Chemical Cleaning Basin -- Alamiros Generating Station

	Sample ID		BCCB12-1	BCCB12-2	BCCB12-3	BCCB13-1	BCCB13-2	BCCB13-3	BCCB14-1	BCCB14-2	BCCB14-3	BCCB15-1	BCCB15-2	BCCB15-3	BCCB16-1	BCCB16-2	BCCB16-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Year		2007														
	Location		Basin Perimeter														
Parameter	**PQL**	**Units**															
Antimony	0.5	mg/kg	1.5	0.74	0.99	0.56	0.83	ND	0.64	0.66	1.2	0.68	0.61	0.91	0.7	0.77	0.84
Arsenic	0.5	mg/kg	8.2	4	3.6	8.2	8.6	6.4	6.3	6.4	8.2	7.0	4.6	6.6	11.0	9.3	8.5
Barium	1	mg/kg	160	110	140	97	190	140	120	120	120	140	110	120	120	180	190
Beryllium	0.1	mg/kg	0.55	0.39	0.41	0.38	0.7	0.33	0.36	0.4	0.42	0.43	0.4	0.4	0.38	0.61	0.57
Cadmium	0.1	mg/kg	0.26	0.13	0.13	0.12	0.17	0.11	0.12	0.13	0.18	0.19	ND	ND	ND	0.12	ND
Chromium, Total	1	mg/kg	31	20	21	19	31	17	23	20	36	21	19	22	21	26	25
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	15	9.1	7.9	6.7	12	6.5	7.5	7.8	8.6	8.6	7.9	8.9	9.5	11	8.7
Copper	0.5	mg/kg	83	21	22	17	31	18	22	20	35	22	21	22	22	29	35
Lead	0.5	mg/kg	40	8.2	6.8	5.5	9.2	5	8.6	15	31	7	6.1	8.5	8.7	7.7	7.6
Mercury	0.01	mg/kg	0.035	0.027	0.025	0.051	0.052	0.035	0.042	0.05	0.11	0.042	0.068	0.041	0.035	0.054	0.047
Molybdenum	0.2	mg/kg	8.5	1.4	4.7	3.3	4.2	29	3	1.9	4.7	2.2	2.0	2.6	1.5	4.6	11
Nickel	0.5	mg/kg	49	33	15	15	23	12	18	21	26	26	15	17	37	20	17
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	0.11	ND	ND	0.15	0.14	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	0.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	62	38	38	34	55	28	41	46	52	61	39	42	45	52	58
Zinc	5	mg/kg	190	54	50	38	60	34	50	57	100	51	46	52	54	55	50
pH		units	7.3	7.3	7.1	7.2	7.4	7.5	7.5	7.6	7.8	7.3	7.4	7.3	7.3	7.2	7.3
Iron	91	mg/kg	25,000	18,000	20,000	16,000	28,000	13,000	19,000	19,000	21,000	20,000	19,000	21,000	22,000	24,000	22,000
Aluminum	100	mg/kg	18,000	13,000	14,000	12,000	20,000	10,000	12,000	13,000	13,000	14,000	12,000	14,000	14,000	18,000	17,000
Magnesium	45	mg/kg	390	280	400	260	320	210	380	360	430	470	320	280	510	410	260
Chloride	2	mg/l	3.7	ND	ND	69	110	290	ND	ND	ND	ND	ND	ND	10	46	110
Fluoride	0.5	mg/l	0.79	0.9	0.86	1.1	0.79	1.3	0.79	0.99	1.1	1.1	0.56	0.57	0.76	0.66	0.78
Nitrate	2	mg/l	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analytical Soil Data -- Metal and General Mineral Parameters
Boiler Chemical Cleaning Basin -- Alamiros Generating Station

	Sample ID		BCCB17-1	BCCB17-2	BCCB17-3	BCCB18-1	BCCB18-2	BCCB18-3	CB25-1	CB25-2	CB25-3	CB26-1	CB26-2	CB26-3	CB27-1	CB27-2	CB27-3	CB28-1	CB28-2	CB28-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Year		2007																	
	Location		Basin Perimeter																	
Parameter	**PQL**	**Units**																		
Antimony	0.5	mg/kg	0.87	0.72	1.2	0.89	0.69	0.95	0.87	0.71	1.1	0.92	ND	ND	1	ND	ND	1.1	ND	1.4
Arsenic	0.5	mg/kg	6.9	4	8.2	12	5.3	4.8	7.4	7.1	8.5	7	1.4	1.7	7.0	2.4	1.3	9.3	1.9	9.4
Barium	1	mg/kg	200	130	150	190	120	200	130	130	150	140	77	77	140	80	72	140	80	210
Beryllium	0.1	mg/kg	0.68	0.52	0.7	0.64	0.49	1.1	0.45	0.43	0.52	0.57	0.25	0.24	0.52	0.23	0.23	0.57	0.23	0.75
Cadmium	0.1	mg/kg	0.25	ND	ND	0.25	ND	ND	0.2	0.25	0.19	0.21	ND	ND	0.2	ND	ND	0.31	ND	0.24
Chromium, Total	1	mg/kg	30	24	31	30	22	35	36	24	29	30	15	15	29	15	13	52	16	36
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	3.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	11	9.9	12	12	9.8	14	10	9.6	10	11	5.7	5.8	12	5.9	5.8	16	5.6	13
Copper	0.5	mg/kg	35	26	35	34	22	28	29	24	31	33	11	11	28	14	11	40	11	44
Lead	0.5	mg/kg	9.1	6.6	9.1	12	7.8	10	19	7	7.6	21	4.2	4	23	11	4.2	27	4.4	12
Mercury	0.01	mg/kg	0.048	0.062	0.065	0.048	0.055	0.048	0.035	0.12	0.044	0.052	0.026	0.031	0.043	0.043	0.037	0.044	0.03	0.064
Molybdenum	0.2	mg/kg	1.3	3.4	4.8	2.1	4.5	1.8	2.6	1.4	1.5	2.0	0.4	0.7	2.0	0.7	0.3	5.0	0.5	2.5
Nickel	0.5	mg/kg	22	18	23	35	17	27	56	18	21	54	8	9	130	22	8	210	9	25
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	57	49	59	67	46	72	70	51	56	63	39	40	63	40	38	76	41	64
Zinc	5	mg/kg	70	54	68	73	49	64	70	63	66	74	39	38	67	39	47	96	39	82
pH		units	7.4	7.4	7.4	7.3	7.3	7.3	7.7	7.4	7.4	7.1	7.1	7.4	7.5	7.6	7.7	7.6	7.4	7.4
Iron	91	mg/kg	27,000	23,000	29,000	28,000	23,000	32,000	27,000	25,000	26,000	27,000	20,000	20,000	27,000	18,000	19,000	27,000	20,000	34,000
Aluminum	100	mg/kg	21,000	16,000	22,000	21,000	14,000	26,000	17,000	16,000	18,000	20,000	9,300	9,300	19,000	9,600	8,900	17,000	9,800	26,000
Magnesium	45	mg/kg	630	310	350	620	340	230	490	500	520	540	250	260	540	270	250	460	250	900
Chloride	2	mg/l	ND	2	8	44	71	77	99	20	17	3.3	9	13	40	7.8	4.4	20	3.9	11
Fluoride	0.5	mg/l	1.5	ND	0.78	1.3	0.64	1.8	0.98	1	1.7	2	ND	ND	1.6	ND	ND	0.61	ND	1.9
Nitrate	2	mg/l	ND	ND	ND	ND	ND	ND	39	14	13	4.2	3.3	4.6	17	4.3	2.1	10	3.3	12

Table 12

Analytical Soil Data -- Volatile Organic Compounds
Boiler Chemical Cleaning Basin
Alamitos Generating Station

	Sample ID		BCCB13-1	BCCB13-2	BCCB13-3	BCCB14-1	BCCB14-2	BCCB14-3	BCCB16-1	BCCB16-2	BCCB16-3
	Depth (feet)		1	3	5	1	3	5	1	3	5
	Date		2007								
	Location		Basin Perimeter								
Parameter	**PQL**	**Units**									
Benzene	5	ug/kg	**12**	ND	**19**	**8.6**	ND	**5.8**	ND	**10**	ND
Toluene	5	ug/kg	**11**	ND	ND	**8**	ND	ND	ND	**10**	ND
m,p-Xylene	5	ug/kg	ND	ND	**5.9**	ND	ND	ND	ND	ND	ND
Acetone	20	ug/kg	**38**	ND	**190**	ND	ND	ND	ND	**20**	**66**
2-Butanone	5	ug/kg	**8.7**	**5.8**	**51**	**7.9**	ND	ND	ND	ND	**11**

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Analytical Soil Data -- Metal and General Mineral Parameters
South Basin -- Alamitos Generating Station

	Sample ID		SB1-1	SB1-2	SB1-3	SB1-4	SB2-1	SB2-2	SB2-3	SB3-1	SB3-2	SB3-3	SB4-1	SB4-2	SB4-3	SB4-4	SB5-1	SB5-2	SB5-3	SB6-1	SB6-2	SB6-3	SB7-1	SB7-2	SB7-3	SB7-4
	Depth (feet)		0	0.5	3	5	0.5	3	5	0.5	3	5	0	0.5	3	5	0.5	3	5	0.5	3	5	0	0.5	3	5
	Year		1997																							
	Location		Below Liner																							
Parameter	**PQL**	**Units**																								
Antimony	0.2	mg/kg	0.59	0.34	0.96	0.93	0.57	0.84	0.96	0.58	0.31	0.4	0.35	0.99	0.85	0.55	0.56	0.81	0.65	0.36	0.49	0.61	0.27	ND	0.69	0.79
Arsenic	0.2	mg/kg	3.6	2.7	3.9	5.9	4.5	7.1	5.2	5.3	1.9	13.6	2.5	8.1	10.5	5.1	5.7	4.3	4.2	2.7	4.8	2.5	4.1	6.6	9.1	5.7
Barium	1	mg/kg	49	27	106	132	78	184	156	75	164	65	55	136	155	204	46	99	93	38	121	83	81	65	114	150
Beryllium	0.1	mg/kg	0.22	0.15	0.31	0.38	0.27	0.63	0.44	0.31	0.41	0.32	0.33	0.54	0.51	0.68	0.28	0.48	0.33	0.23	0.57	0.25	0.29	0.32	0.48	0.49
Cadmium	0.1	mg/kg	ND	ND	ND	0.32	0.28	0.3	0.24	0.25	0.19	0.24	ND	0.12	0.22	ND	0.46	0.21	0.26	0.27	0.16	0.14	0.11	0.36	0.13	0.26
Chromium, Total	1	mg/kg	21	7	20	22	12	27	24	11	16	12	16	25	24	21	9	22	15	12	23	15	24	15	21	23
Chromium VI	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.1	mg/kg	8.1	3.2	9.9	9.6	6.4	11.7	10.6	18.4	6.6	6.1	5.8	12.0	10.4	6.1	4.7	8.9	7.0	8.9	8.9	6.7	7.5	12.8	8.2	8.5
Copper	1	mg/kg	23	10	21	25	19	36	28	22	19	16	9	25	30	12	12	20	19	15	22	16	11	16	22	22
Lead	0.5	mg/kg	8.8	4.3	6.1	14.3	5.9	12.2	11.1	6.1	4.2	4.4	6.8	7.7	8.4	6	5.2	11.5	9.3	5	10.1	6.1	11.1	5.8	6.1	7.7
Mercury	0.060	mg/kg	ND	0.067	ND	ND	0.080	0.060	ND	ND	0.060	0.070	ND	ND	0.070	ND	0.200	0.070	ND	0.090	0.080	0.110	ND	0.100	ND	ND
Molybdenum	0.2	mg/kg	1.37	0.79	1.11	1.04	1.01	0.58	1.26	1.39	1.44	70.6	0.82	3.7	0.71	3.55	1.63	1.13	0.37	0.69	0.81	0.66	2.36	0.97	2.41	1
Nickel	0.5	mg/kg	97.3	14.4	16	17.3	38	21.2	19	382	12.6	11.6	20.7	31.4	17.8	11.2	45.7	15.8	11.5	183	16.4	11.3	141	385	15.2	15.5
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	1.64	0.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND	ND	ND	0.11	ND	ND
Thallium	0.1	mg/kg	0.17	ND	0.19	0.19	0.11	0.2	0.17	ND	ND	ND	0.11	0.14	0.19	ND	0.11	0.17	0.11	ND	0.18	0.11	0.16	0.13	0.17	0.16
Vanadium	5	mg/kg	66	14	38	39	32	46	39	37	24	18	36	44	38	33	27	39	30	55	38	30	120	34	41	40
Zinc	1	mg/kg	40	29	58	83	58	80	75	203	45	45	30	60	68	41	49	64	102	60	67	46	33	79	59	62
pH		units	6.0	8.3	8.0	8.1	8.6	7.9	7.9	8.8	7.9	7.4	8.5	8.3	7.7	8.4	8.0	8.1	8.5	8.2	7.9	8.9	7.6	8.5	8.0	7.8
Iron	7	mg/kg	15,500	13,000	23,900	26,400	20,300	23,500	31,200	15,500	12,800	13,000	18,100	33,100	27,500	27,500	20,600	24,900	20,000	17,500	23,700	18,200	14,500	21,100	26,500	26,600
Aluminum	3	mg/kg	4,420	2,330	6,800	7,700	5,250	10,100	9,130	4,650	6,760	4,690	5,770	9,680	9,400	20,700	5,290	10,700	7,330	4,100	12,000	6,310	7,720	8,150	13,800	13,800
Magnesium			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	2	mg/l	14.2	10	44.3	83.5	21.6	96.3	90.4	15.7	115	195	14.4	47.4	106	63.5	25.3	64.6	40.6	30.6	74.1	30	26.7	25.5	102	73.9
Fluoride	1	mg/l	ND	ND	ND	1.05	ND	1.67	1.95	1.04	1.35	ND	ND	3.33	1.71	1.09	ND	ND	ND	ND	1.75	ND	ND	ND	3.15	1.11
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Analytical Soil Data -- Metal and General Mineral Parameters
South Basin -- Alamitos Generating Station

		Sample ID	SB8-1	SB8-2	SB8-3	SB9-1	SB9-2	SB9-3	SB10-1	SB10-2	SB10-3	SB11-1	SB11-2	SB11-3	SB12-1	SB12-2	SB12-3	SB12-4	SB13-1	SB13-2	SB13-3	SB14-1	SB14-2	SB14-3
		Depth (feet)	0.5	3	5	0.5	3	5	0.5	3	5	0.5	3	5	0	0.5	3	5	0.5	3	5	0.5	3	5
		Year	1997																					
		Location	Below Liner																					
Parameter	PQL	Units																						
Antimony	0.2	mg/kg	0.49	0.69	0.54	0.41	0.48	0.6	0.73	0.82	0.52	0.71	1.15	0.7	6.36	0.91	0.83	0.63	0.58	1.03	1.27	0.64	0.77	0.84
Arsenic	0.2	mg/kg	4.2	6.9	3.3	5.7	3.7	5.9	4.5	7.7	13.4	4.1	5.7	3.4	66.1	4.3	6.7	5.5	7.9	8.6	33.5	10.4	10.1	7.3
Barium	1	mg/kg	78	125	101	61	130	125	88	120	160	136	125	130	823	163	125	105	94	155	139	106	193	136
Beryllium	0.1	mg/kg	0.42	0.49	0.3	0.62	0.45	0.45	0.32	0.4	0.26	0.47	0.55	0.43	0.27	0.46	0.47	0.36	0.38	0.55	0.5	0.41	0.64	0.49
Cadmium	0.1	mg/kg	0.5	0.11	0.18	0.7	0.33	0.21	0.36	0.17	ND	0.18	0.32	0.14	0.57	0.27	0.18	0.2	0.15	0.22	0.26	0.23	0.3	0.18
Chromium, Total	1	mg/kg	42	20	16	33	18	19	12	18	22	18	20	18	163	19	18	16	49	22	22	16	22	18
Chromium VI	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.1	mg/kg	41.4	7.9	6.9	23.8	7.5	7.8	8.7	7.2	5.7	7.1	8.0	6.9	45.6	10.6	6.8	6.0	15.8	8.9	11.6	7.6	8.8	6.7
Copper	1	mg/kg	24	19	16	17	18	17	14	17	22	17	20	17	78	18	17	18	17	22	20	15	24	16
Lead	0.5	mg/kg	6.9	7.6	7.1	5.6	6.1	7.5	6.2	5.4	4	5.5	10.7	5.9	201	6.5	8.3	7.7	26.2	11.1	15.7	7.5	7.4	6.3
Mercury	0.060	mg/kg	0.120	0.060	ND	0.120	0.060	0.060	0.300	ND	ND	0.090	0.150	0.070	0.300	0.060	ND	0.090	ND	ND	0.160	0.130	0.070	ND
Molybdenum	0.2	mg/kg	1.22	2.97	0.73	3.35	2.03	2.62	1.05	1.77	6.56	1.44	5.01	7.27	16	1.14	1.21	2.01	7.43	2.51	4	2.83	2.55	2.58
Nickel	0.5	mg/kg	1,020	12.9	11.9	685	22.8	34	166	14	9.58	16.9	44	13.2	824	132	11.9	11.4	395	25	191	75.7	37.3	11.6
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.92	ND	0.9	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	0.77	0.12	ND	ND	ND	ND	ND	ND	0.11	ND
Thallium	0.1	mg/kg	ND	0.12	0.14	ND	0.15	0.12	0.12	0.16	0.12	0.15	0.19	ND	0.11	0.21	0.15	ND	0.14	0.15	0.12	0.1	0.15	0.11
Vanadium	5	mg/kg	313	40	32	3410	63	149	39	39	34	38	464	34	359	41	37	30	288	52	279	81	97	36
Zinc	1	mg/kg	217	49	53	161	49	51	52	47	39	51	64	45	274	52	47	56	58	62	56	55	63	46
pH		units	7.2	7.6	8.1	6.2	7.4	7.4	8.3	7.5	7.1	7.6	8.0	7.2	8.3	7.4	7.9	7.7	7.8	7.5	7.7	8.1	7.8	7.9
Iron	7	mg/kg	18,300	19,800	19,800	18,400	20,400	23,100	18,400	18,700	25,800	20,700	23,100	18,300	27,000	21,300	20,800	17,800	17,000	24,600	20,200	22,300	23,200	22,300
Aluminum	3	mg/kg	7,640	9,980	9,870	8,660	11,900	13,200	8,500	10,900	12,000	12,600	14,100	11,700	8,500	13,100	12,300	10,300	9,350	15,800	12,600	10,600	17,000	14,300
Magnesium			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chloride	2	mg/l	31.1	51	46.5	22	37.8	59.5	30.1	52.4	68.9	13.1	12	19.9	89.9	29.5	19	16.1	24.6	36.3	63.2	17.9	63.7	56
Fluoride	1	mg/l	1.78	1.19	1.14	ND	1.84	2.12	ND	1.66	1.38	1.96	2.36	1.57	ND	1.84	2.48	ND	1.13	1.76	1.01	1.38	2.52	1.66
Nitrate			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Analytical Soil Data -- Metal and General Mineral Parameters
South Basin -- Alamitos Generating Station

	Sample ID		SB15-4	SB15-1	SB15-2	SB15-3
	Depth (feet)		0	0.5	3	5
	Year		1997			
	Location		Below Liner			
Parameter	**PQL**	**Units**				
Antimony	0.2	mg/kg	0.84	0.64	0.3	0.64
Arsenic	0.2	mg/kg	5.6	4.9	3.1	5
Barium	1	mg/kg	147	126	76	168
Beryllium	0.1	mg/kg	0.59	0.48	0.32	0.46
Cadmium	0.1	mg/kg	0.28	0.2	0.13	0.15
Chromium, Total	1	mg/kg	21	18	12	18
Chromium VI	0.5	mg/kg	ND	ND	ND	ND
Cobalt	0.1	mg/kg	8.0	11.5	5.0	6.1
Copper	1	mg/kg	21	18	12	19
Lead	0.5	mg/kg	21.1	9.9	10	5.3
Mercury	0.060	mg/kg	ND	ND	ND	ND
Molybdenum	0.2	mg/kg	1.5	1.26	0.86	8.52
Nickel	0.5	mg/kg	15	155	12.9	10.6
Selenium	0.5	mg/kg	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND
Thallium	0.1	mg/kg	0.23	0.13	0.12	ND
Vanadium	5	mg/kg	42	85	30	35
Zinc	1	mg/kg	64	53	40	42
pH		units	8.2	7.5	7.6	7.1
Iron	7	mg/kg	27,700	28,100	16,400	18,800
Aluminum	3	mg/kg	16,800	13,600	8,280	12,700
Magnesium			NT	NT	NT	NT
Chloride	2	mg/l	39.6	57.5	29	111
Fluoride	1	mg/l	2.48	1.83	2.02	1.42
Nitrate			NT	NT	NT	NT

	Sample ID		SB16-1	SB16-2	SB16-3	SB17-1	SB17-2	SB17-3	SB18-1	SB18-2	SB18-3	SB19-1	SB19-2	SB19-3	SB20-1	SB20-2	SB20-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
			2007														
			Basin Perimeter														
Parameter	**PQL**	**Units**															
Antimony	0.5	mg/kg	0.94	0.97	0.5	1.2	0.71	0.9	0.9	0.55	1.8	0.8	0.88	0.79	0.83	0.64	0.81
Arsenic	0.5	mg/kg	6.3	8.3	2.9	12	5.1	6.1	7.8	4.9	11	6.8	5.2	4.3	7.1	11	5
Barium	1	mg/kg	150	190	68	180	75	130	190	140	170	120	150	120	130	150	130
Beryllium	0.1	mg/kg	0.53	0.62	0.24	0.7	0.39	0.61	0.68	0.46	0.49	0.45	0.42	0.38	0.45	0.5	0.44
Cadmium	0.1	mg/kg	ND	0.23	ND	ND	ND	ND	ND	ND	0.21	0.12	0.16	0.13	0.14	ND	0.14
Chromium, Total	1	mg/kg	27	32	13	29	15	27	29	22	26	22	22	20	23	22	23
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	11.0	13.0	6.2	13.0	6.3	12.0	10	7.1	9.3	8.4	8.7	8	8.6	7.9	8.7
Copper	0.5	mg/kg	30	38	14	35	18	31	19	19	2,600	22	24	20	24	17	36
Lead	0.5	mg/kg	5.9	10	4.3	7.7	4.4	8.8	10	5.2	15	7.7	9.1	7.2	9.4	5.9	7.6
Mercury	0.01	mg/kg	0.074	0.063	0.026	0.071	0.049	0.064	0.029	0.032	0.500	0.040	0.120	0.550	0.034	0.023	0.041
Molybdenum	0.2	mg/kg	6.5	1.4	0.64	14	3.5	2	7.1	9.3	1.3	2.4	0.85	0.64	1.6	2.4	1.4
Nickel	0.5	mg/kg	21	24	11	27	12	23	24	13	18	18	16	14	22	15	16
Selenium	0.5	mg/kg	ND	0.84	ND	0.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.68	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	54	60	29	73	38	54	57	42	48	45	45	43	46	42	46
Zinc	5	mg/kg	62	74	35	62	34	61	51	45	500	69	56	50	58	43	52
pH		units	7.2	7.4	7.6	7.3	7.4	7.5	7.2	7.3	7.2	7.3	7.3	7.2	7.2	7.2	7.3
Iron	91	mg/kg	26,000	28,000	14,000	28,000	16,000	24,000	28,000	19,000	26,000	25,000	23,000	21,000	23,000	22,000	23,000
Aluminum	100	mg/kg	17,000	21,000	8,300	20,000	9,500	17,000	21,000	15,000	17,000	17,000	15,000	13,000	16,000	16,000	16,000
Magnesium	45	mg/kg	310	740	210	330	190	310	240	290	430	420	420	420	480	540	400
Chloride	2	mg/l	8.2	29	16	6.7	11	47	6.1	8.8	11	12	9.1	6.7	ND	ND	ND
Fluoride	0.5	mg/l	1	2	0.7	1.3	ND	1.1	0.65	1.4	0.87	1.7	0.96	0.9	0.58	0.68	0.93
Nitrate	2	mg/l	ND	ND	ND	ND	ND	ND	ND	2.5	ND	3.8	ND	ND	ND	ND	ND

Table 13

Analytical Soil Data -- Metal and General Mineral Parameters
South Basin -- Alamitos Generating Station

		Sample ID	SB21-1	SB21-2	SB21-3	SB22-1	SB22-2	SB22-3	SB23-1	SB23-2	SB23-3	SB24-1	SB24-2	SB24-3	SB25-1	SB25-2	SB25-3	SB26-1	SB26-2	SB26-3	SB27-1	SB27-2	SB27-3
		Depth (feet)	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
		Year	2007																				
		Location	Basin Perimeter																				
Parameter	**PQL**	**Units**																					
Antimony	0.5	mg/kg	0.74	ND	0.71	0.82	0.82	0.81	0.93	0.92	0.85	0.9	0.52	0.86	0.56	ND	1.4	0.71	0.71	0.62	0.65	0.67	0.74
Arsenic	0.5	mg/kg	6.6	4.9	4.4	8.6	8.8	5.7	11	8.5	7.5	6.3	6.7	6.1	6.7	6	6	6.2	7	7.8	8.3	7.2	8.2
Barium	1	mg/kg	150	110	120	160	150	160	190	200	170	130	160	160	100	110	160	140	130	140	140	130	120
Beryllium	0.1	mg/kg	0.43	0.46	0.37	0.53	0.52	0.52	0.63	0.65	0.52	0.46	0.47	0.52	0.34	0.41	0.42	0.49	0.43	0.43	0.45	0.44	0.46
Cadmium	0.1	mg/kg	0.2	ND	0.14	0.31	0.14	0.24	0.39	ND	0.2	0.17	ND	0.23	0.12	0.12	0.26	0.16	0.13	0.15	0.17	0.11	ND
Chromium, Total	1	mg/kg	25	21	21	30	26	28	53	31	27	27	21	31	20	19	26	26	21	26	24	23	22
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	11	5.6	8.2	19	9.7	10	25	11	10	11	7	11	7.5	6.8	11	9.8	8.8	8.4	11	9.1	8.7
Copper	0.5	mg/kg	27	13	22	36	23	31	51	30	30	31	16	34	20	19	28	25	23	26	24	24	20
Lead	0.5	mg/kg	18	5	7.6	130	9.8	11	270	8.2	9.2	20	4.8	9.1	6.6	5.9	9.8	11	11	7.1	11	6.6	8
Mercury	0.01	mg/kg	0.036	0.019	0.031	0.200	0.043	0.062	0.088	0.048	0.046	0.054	0.046	0.072	0.037	0.057	0.058	0.037	0.072	0.034	0.04	0.17	0.047
Molybdenum	0.2	mg/kg	0.97	1.5	0.6	1.2	2	1.5	2.3	2.1	0.8	1.9	4.1	1	1.4	2.3	0.92	2	2.4	2.1	2.6	2	2
Nickel	0.5	mg/kg	37	14	15	250	31	24	530	23	20	74	15	24	32	14	20	27	16	19	23	20	15
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58	ND	0.73	ND	ND	0.54	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	0.55	ND	ND	0.5	ND	ND	0.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	56	41	45	140	68	53	450	57	54	70	40	61	52	39	50	57	41	48	59	51	48
Zinc	5	mg/kg	63	36	56	110	60	70	130	65	67	67	38	73	48	45	67	66	53	63	62	54	46
pH		units	7.3	7.3	7.2	7.3	7.2	7.3	7.2	7.3	7.2	7.4	7.4	7.4	7.3	7.2	7.3	7.3	7.4	7.9	7.8	7.6	7.8
Iron	91	mg/kg	23,000	19,000	20,000	26,000	25,000	24,000	29,000	29,000	25,000	26,000	21,000	28,000	20,000	19,000	26,000	25,000	22,000	20,000	23,000	23,000	22,000
Aluminum	100	mg/kg	16,000	15,000	13,000	17,000	18,000	18,000	19,000	22,000	18,000	19,000	18,000	22,000	14,000	14,000	18,000	18,000	15,000	15,000	17,000	15,000	15,000
Magnesium	45	mg/kg	530	340	310	530	390	370	520	320	440	420	1,100	420	400	500	440	510	510	440	630	510	510
Chloride	2	mg/l	3.3	2.3	2.1	6	4.2	7.1	2.6	2	4.6	3.6	2.5	5.2	ND	ND	5.9	8.3	14	10	4.8	9.2	5.8
Fluoride	0.5	mg/l	0.86	1.6	0.9	0.67	1.2	1.4	1.1	1.4	1.7	1.6	2.6	1.2	1	1	0.72	1.8	1.4	1.2	1.7	1.3	1.1
Nitrate	2	mg/l	2.2	2.6	3.5	5.4	4.3	ND	5.1	2.8	2	4.6	3.2	ND	3.5	ND	ND	12	10	12	ND	2.4	2.3

Analytical Soil Data -- Metal and General Mineral Parameters
South Basin -- Alamitos Generating Station

Parameter	PQL	Units	SB28-1	SB28-2	SB28-3	SB29-1	SB29-2	SB29-3	SB30-1	SB30-2	SB30-3	SB31-1	SB31-2	SB31-3	SB32-1	SB32-2	SB32-3	SB33-1	SB33-2	SB33-3	SB34-1	SB34-2	SB34-3
Depth (feet)			1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
Year			2007																				
Location			Basin Perimeter																				
Antimony	0.5	mg/kg	0.61	0.84	0.96	0.73	1.5	0.68	0.68	0.77	0.72	0.59	1.2	0.78	0.76	0.76	0.57	ND	0.82	0.76	0.63	0.81	0.74
Arsenic	0.5	mg/kg	6.8	6	6.6	7.2	12	6.3	7	7.7	9	6.5	20	6.3	8.1	6.4	3.6	3.3	5.9	4.5	6	5.7	8.4
Barium	1	mg/kg	140	130	72	150	110	140	140	140	150	140	160	160	130	150	100	44	170	190	150	210	140
Beryllium	0.1	mg/kg	0.48	0.46	0.34	0.65	0.36	0.39	0.5	0.44	0.48	0.48	0.49	0.42	0.49	0.48	0.32	0.32	0.55	0.57	0.37	0.51	0.45
Cadmium	0.1	mg/kg	0.15	0.16	0.1	0.16	0.19	0.14	0.15	0.16	0.17	0.18	0.19	0.16	0.13	0.13	ND	ND	0.23	0.2	0.14	0.2	0.11
Chromium, Total	1	mg/kg	25	24	17	26	21	34	26	31	38	22	27	26	28	30	21	11	31	32	24	31	29
Chromium VI	2.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	0.2	mg/kg	9.7	8.7	6.1	10	8.5	9.9	10	9.3	9.4	9.2	9.9	10	11	11	9	4	12	12	9.4	11	9.2
Copper	0.5	mg/kg	24	25	17	27	23	25	24	25	26	22	29	28	25	29	19	11	34	33	25	36	27
Lead	0.5	mg/kg	8.9	13	14	9.2	32	8	13	44	34	13	10	7	13	9.6	5.5	54	11	9	6.8	8.7	7.4
Mercury	0.01	mg/kg	0.032	0.075	0.063	0.110	0.290	0.045	0.030	0.070	0.043	0.036	0.049	0.035	0.076	0.052	0.043	0.043	0.058	0.041	0.038	0.067	0.057
Molybdenum	0.2	mg/kg	2.1	2.6	1.3	1.3	3.6	2.8	2	2	2.7	1.7	2	10	2	0.95	0.92	0.88	0.65	0.39	1.6	0.49	3.2
Nickel	0.5	mg/kg	20	30	11	20	26	50	35	33	29	24	26	19	30	21	17	10	23	23	19	24	20
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	0.67	ND	0.52	ND	ND	ND	ND	0.63	ND	ND	ND	0.51	0.6	0.53	0.55	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1	mg/kg	54	63	42	54	50	120	66	68	60	56	57	49	66	56	40	24	55	56	46	51	53
Zinc	5	mg/kg	59	65	40	62	150	59	57	91	69	58	61	60	72	68	53	44	73	77	55	69	58
pH		units	7.7	7.4	7.5	7.6	7.6	7.5	7.5	7.5	7.5	7.9	8.0	7.9	7.8	7.9	7.3	7.8	7.8	7.4	7.7	7.5	7.6
Iron	91	mg/kg	24,000	22,000	17,000	25,000	20,000	22,000	23,000	24,000	24,000	22,000	24,000	24,000	25,000	28,000	22,000	14,000	28,000	29,000	22,000	28,000	25,000
Aluminum	100	mg/kg	18,000	15,000	12,000	18,000	12,000	15,000	17,000	16,000	17,000	16,000	18,000	18,000	19,000	21,000	14,000	9,700	21,000	22,000	16,000	21,000	18,000
Magnesium	45	mg/kg	450	420	240	610	380	470	460	450	510	470	550	390	420	520	310	170	580	610	520	850	250
Chloride	2	mg/l	4.7	8.1	7.4	2.4	3.8	4.1	ND	ND	ND	8.8	12	26	5.5	18	36	3.6	22	25	11	53	46
Fluoride	0.5	mg/l	1.9	1.3	0.99	1.7	1.1	1.4	1.9	1.4	1.7	1.9	1.6	1.2	1.8	1.1	0.91	1	1.6	2.6	1.5	2.6	0.9
Nitrate	2	mg/l	ND	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 14

Analytical Soil Data -- Volatile Organic Compounds
South Basin -- Alamitos Generating Station

	Sample ID		SB16-1	SB16-2	SB16-3	SB17-1	SB17-2	SB17-3	SB24-1	SB24-2	SB24-3	SB25-1	SB25-2	SB25-3	SB26-1	SB26-2	SB26-3	SB27-1	SB27-2	SB27-3	SB28-1	SB28-2	SB28-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Date		2007																				
	Location		Outside Perimeter																				
Parameter	PQL	Units																					
Benzene	5	ug/kg	ND	5.2	ND	ND	56	ND	5.4	9.5	ND	5.2	6.3	ND	13	5.9	5.1	13	ND	ND	ND	7.4	ND
Ethylbenzene	5	ug/kg	ND	ND	ND	ND	8.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	ND	53	ND	ND	8	ND	ND	5.4	ND	13	6.1	ND	14	ND	ND	ND	6.2	ND
m,p-Xylene	5	ug/kg	ND	ND	ND	ND	9.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	20	ug/kg	ND	46	ND	ND	29	ND	23	23	27	25	31	23	25	25	21	27	ND	34	ND	31	34
2-Butanone	5	ug/kg	ND	8.2	ND	ND	ND	ND	5.2	5	ND	5	ND	ND	6.1	5.3	ND	6.8	ND	ND	ND	6.1	7
cis-1,2-Dichloroethene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.8	6.2	ND	ND	ND	ND	ND	ND
TCE	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.2	5	ND	ND	ND	ND	ND	ND

	Sample ID		SB29-1	SB29-2	SB29-3	SB30-1	SB30-2	SB30-3	SB31-1	SB31-2	SB31-3	SB32-1	SB32-2	SB32-3	SB33-1	SB33-2	SB33-3	SB34-1	SB34-2	SB34-3
	Depth (feet)		1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
	Date		2007																	
	Location		Outside Perimeter																	
Parameter	PQL	Units																		
Benzene	5	ug/kg	5.2	ND	ND	9.2	5.8	10	6.5	5.8	ND	7.4	ND	ND	ND	5.6	ND	6.3	5.8	ND
Ethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	9.7	5.5	9.6	6	ND	ND	7.5	ND	ND	ND	ND	ND	5.5	ND	ND
m,p-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	20	ug/kg	31	31	38	ND	27	ND	ND	20	35	ND	21	ND	ND	27	76	24	93	ND
2-Butanone	5	ug/kg	6	5.2	7.3	ND	5.7	ND	ND	ND	5.9	ND	ND	ND	ND	6.8	14	ND	19	ND
cis-1,2-Dichloroethene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCE	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

Table 15

	Sample ID			P1-1	P1-2	P1-S1-1	P1-S1-2	P1-S2-1	P1-S2-2	P1-S3-1	P1-S3-2	P2-1	P2-2	P3-1	P3-2	P3-3	P4-1	P4-2	P4-3	P4-S1-1	P4-S1-2	P4-S2-1	P4-S2-2
	Depth (feet)			5	7	7	9	7	9	7	9	5	7	5	7	11	6	8	11	8	9	8	9
	Date			10/25/2012		10/18/2013						10/25/2012		10/30/2012						10/18/2013			
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																				
Antimony	0.5		mg/kg	**0.51**	ND	ND	**0.55**	**0.52**	**0.6**	ND	**0.55**	**0.62**	ND	ND	ND	**0.59**	ND	ND	ND	ND	ND	ND	**0.52**
Arsenic	0.5		mg/kg	**3.9**	**3.1**	**4.3**	**3.6**	**8.1**	**4.3**	**2.5**	**1.4**	**7.3**	**16**	**4.3**	**17**	**6.1**	**3.4**	**3**	**3.4**	**2.8**	**2.2**	**3.2**	**5.3**
Barium	1		mg/kg	**48**	**48**	**78**	**190**	**180**	**160**	**56**	**190**	**140**	**190**	**80**	**190**	**170**	**30**	**30**	**66**	**35**	**35**	**36**	**130**
Beryllium	0.1		mg/kg	**0.17**	**0.23**	**0.38**	**0.39**	**0.41**	**0.39**	**0.34**	**0.39**	**0.44**	**0.21**	**0.23**	**0.28**	**0.36**	**0.25**	**0.16**	**0.2**	**0.18**	**0.2**	**0.17**	**0.4**
Cadmium	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	ND	**0.17**	ND	ND	**0.11**	ND	ND	ND	ND	ND	**0.3**
Chromium, Total	0.5		mg/kg	**91**	**16**	**28**	**24**	**22**	**24**	**15**	**24**	**42**	**22**	**22**	**21**	**25**	**25**	**9.9**	**12**	**9.2**	**9.5**	**10**	**19**
Cobalt	0.2		mg/kg	**8.1**	**6**	**9.1**	**7.5**	**7.7**	**7.7**	**11**	**8.3**	**8.6**	**5.1**	**8.2**	**6.3**	**7.3**	**16**	**4.3**	**5.2**	**4.6**	**4.1**	**4.3**	**10**
Copper	0.5		mg/kg	**18**	**13**	**23**	**17**	**22**	**18**	**11**	**18**	**44**	**16**	**76**	**22**	**21**	**21**	**55**	**45**	**8.7**	**8.5**	**53**	**110**
Lead	0.5		mg/kg	**4.3**	**3.1**	**4.8**	**8.4**	**4.5**	**5.9**	**2.7**	**5.3**	**5.5**	**4**	**11**	**4.4**	**5.7**	**2.5**	**6.5**	**6.2**	**4.6**	**3.9**	**3.7**	**4.8**
Mercury	0.01		mg/kg	**0.049**	**0.021**	**0.03**	**0.072**	**0.044**	**0.035**	**0.039**	**0.021**	**0.099**	**0.028**	**0.072**	**0.037**	**0.021**	**0.026**	**0.058**	**0.031**	**0.021**	**0.046**	**0.02**	**0.052**
Molybdenum	0.2		mg/kg	**2.1**	**2.1**	**3.6**	**5**	**9.1**	**4.1**	**1.3**	**2.5**	**2.9**	**4.4**	**1.8**	**7.4**	**12**	**0.6**	**0.34**	**0.86**	**0.36**	**0.29**	**0.3**	**2**
Nickel	0.5		mg/kg	**100**	**46**	**69**	**29**	**62**	**18**	**100**	**35**	**31**	**12**	**140**	**19**	**15**	**360**	**80**	**64**	**69**	**43**	**61**	**130**
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	**1000**	**260**	**320**	**49**	**66**	**49**	**190**	**48**	**65**	**42**	**79**	**36**	**48**	**190**	**28**	**24**	**22**	**20**	**20**	**36**
Zinc	5		mg/kg	**40**	**28**	**46**	**41**	**43**	**46**	**34**	**46**	**180**	**36**	**150**	**43**	**48**	**35**	**52**	**52**	**31**	**22**	**54**	**72**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																				
Trichloroethene (TCE)	1	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
Benzene	1.4	5	ug/kg	ND	ND							**5.2**	ND	ND	ND	ND	ND	ND	ND				
Toluene	1.1	5	ug/kg	ND	ND							**4.5 J**	ND	ND	ND	ND	ND	ND	ND				
Ethylbenzene	0.36	5	ug/kg	ND	ND							**0.69 J**	ND	ND	ND	ND	ND	ND	ND				
Isopropylbenzene	0.57	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
n-Propylbenzene	0.51	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
Methylene chloride	0.68	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	**2.8 J**				
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
m/p-Xylene	1.4	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
Naphthalene	1.3	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
n-Propylbenzene	0.51	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
o-Xylene	0.52	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
n-Butylbenzene	0.64	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
sec-Butylbenzene	0.46	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
2-Hexanone	1.2	5	ug/kg	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND				
Acetone	2.5	5	ug/kg	**130**	**52**							**58**	**36**	ND	**18**	**12**	ND	ND	ND				
2-Butanone	1.5	5	ug/kg	**5.2**	ND							ND	ND	ND	ND	ND	ND	ND	ND				
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																				
Gasoline Range		2	mg/kg																				
Diesel Range		100	mg/kg																				
Oil Range		1000	mg/kg																				

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

Table 15

			Sample ID	P5-1	P5-2	P5-3	P5-S1-1	P5-S1-2	P5-S2-1	P5-S2-2	P5-S2-3	P6-1	P6-2	P7-1	P7-2	P7-3	P7-S1-1	P7-S1-2	P7-S2-1	P7-S2-2	P7-S3-1	P7-S3-2	P8-1	P8-2	P8-3
			Depth (feet)	5	6	7	6	8	6	8	10	6	8	7	9	16	9	10	9	10	9	10	5	7	16
			Date	10/31/2012			10/25/2014					10/31/2012		12/13/2012			10/29/2013						11/1/12	12/13/2012	
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																						
Antimony	0.5		mg/kg		ND	**0.75**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.88**	**0.61**	**0.61**
Arsenic	0.5		mg/kg		**2.8**	**4.8**	**11**	**4.8**	**7.2**	**5.2**	**12**	**2.9**	**5**	**1.7**	**2.7**	**2.7**	**1.8**	**2.1**	**24**	**2.7**	**3**	**1.5**	**9.6**	**6.7**	**3.6**
Barium	1		mg/kg		**73**	**160**	**170**	**160**	**170**	**170**	**160**	**79**	**160**	**22**	**22**	**21**	**20**	**30**	**230**	**180**	**44**	**17**	**200**	**140**	**80**
Beryllium	0.1		mg/kg		**0.28**	**0.53**	**0.65**	**0.52**	**0.55**	**0.53**	**0.52**	**0.29**	**0.3**	**0.12**	**0.16**	**0.15**	ND	**0.11**	**0.22**	**0.23**	**0.17**	ND	**0.5**	**0.54**	**0.36**
Cadmium	0.1		mg/kg		**0.14**	**0.18**	**0.2**	**0.18**	**0.16**	**0.13**	**0.16**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.14**	**0.16**	ND
Chromium, Total	0.5		mg/kg		**17**	**24**	**30**	**24**	**22**	**22**	**21**	**16**	**21**	**16**	**14**	**12**	**6.9**	**8.5**	**27**	**22**	**9**	**4.4**	**24**	**23**	**15**
Cobalt	0.2		mg/kg		**12**	**9.7**	**20**	**12**	**9.4**	**9.5**	**9.6**	**6.1**	**5.8**	**4.2**	**6**	**5**	**2**	**2.8**	**6.2**	**5.9**	**4.2**	**1.4**	**9.7**	**9**	**6.6**
Copper	0.5		mg/kg		**26**	**26**	**46**	**35**	**26**	**25**	**26**	**15**	**9.7**	**66**	**17**	**19**	**5**	**13**	**67**	**47**	**13**	**3.2**	**27**	**27**	**17**
Lead	0.5		mg/kg		**6.4**	**7.7**	**10**	**7.8**	**7.3**	**7.7**	**7.6**	**3.7**	**7.8**	**8.1**	**3.2**	**2.8**	**2.4**	**2.9**	**13**	**10**	**3.1**	**1.4**	**8**	**7.2**	**3.7**
Mercury	0.01		mg/kg		**0.027**	**0.033**	**0.08**	**0.032**	**0.061**	**0.045**	**0.055**	**0.029**	**0.012**	**0.081**	**0.018**	**0.016**	**0.01**	**0.014**	**0.052**	**0.019**	**0.036**	ND	**0.036**	**0.084**	**0.023**
Molybdenum	0.2		mg/kg		**0.56**	**1.8**	**1.9**	**1.3**	**2.3**	**1.7**	**2**	**1.1**	**5.6**	**0.5**	**0.3**	**0.28**	ND	**0.22**	**12**	**7**	**0.2**	ND	**2.2**	**1.8**	**0.62**
Nickel	0.5		mg/kg		**220**	**23**	**430**	**180**	**18**	**19**	**18**	**10**	**9.9**	**110**	**170**	**130**	**46**	**47**	**24**	**18**	**15**	**9.9**	**19**	**20**	**14**
Selenium	0.5		mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1**	ND	ND	ND	ND
Thallium	0.5		mg/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg		**120**	**49**	**120**	**80**	**42**	**42**	**41**	**32**	**35**	**69**	**79**	**69**	**9.9**	**16**	**54**	**44**	**21**	**8.9**	**46**	**45**	**35**
Zinc	5		mg/kg		**50**	**53**	**84**	**60**	**54**	**49**	**61**	**33**	**31**	**49**	**30**	**28**	**14**	**17**	**44**	**34**	**23**	**13**	**36**	**54**	**36**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																						
Trichloroethene (TCE)	1	5	ug/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							ND	**1.4 J**	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							**1.9 J**	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							ND	**1.0 J**	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							ND	ND	ND
Benzene	1.4	5	ug/kg		ND	**12**	ND	ND	**9.1**	**8.4**	**7.7**	ND	ND	ND	ND	ND							**14**	**7.4**	ND
Toluene	1.1	5	ug/kg		ND	**11**	ND	ND	**10**	**8.8**	ND	ND	ND	ND	ND	ND							**14**	**7.5**	ND
Ethylbenzene	0.36	5	ug/kg		**0.48 J**	**1.9 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							**1.9 J**	**1.0 J**	ND
Isopropylbenzene	0.57	5	ug/kg		**6.3 J**	**0.89 J**	ND	ND	**6.8**	**9**	ND	ND	ND	ND	ND	ND							ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg		ND	**2.0 J**	ND	ND	ND	**19**	ND	ND	ND	ND	ND	ND							ND	ND	ND
Methylene chloride	0.68	5	ug/kg		**2.7 J**	ND	ND	ND	ND	ND	ND	ND	**0.89 J**	ND	ND	ND							ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg		**4.5 J**	**3.0 J**	ND	ND	**15**	**27**	ND	ND	ND	ND	ND	ND							ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg		ND	**0.67 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg		**3.2 J**	ND	ND	ND	ND	**6.7**	ND	ND	ND	ND	ND	ND							ND	ND	ND
m/p-Xylene	1.4	5	ug/kg		ND	**2.2 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							**2.8 J**	ND	ND
Naphthalene	1.3	5	ug/kg		**17**	**3.3 J**	ND	ND	**17**	**9.5**	ND	**2.5 J**	ND	ND	ND	ND							ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg		**11**	ND	ND	ND	**17**	ND	ND	ND	ND	ND	ND	ND							ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg		ND	ND	ND	ND	ND	**12**	ND	ND	ND	ND	ND	ND							ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg		**29**	**0.95 J**	ND	ND	**16**	**61**	ND	ND	ND	ND	ND	ND							ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg		**3.0 J**	ND	ND	ND	ND	**16**	ND	ND	ND	ND	ND	ND							ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg		**4.2 J**	**2.1 J**	ND	ND	**7.1**	**14**	ND	ND	ND	ND	ND	ND							ND	ND	ND
o-Xylene	0.52	5	ug/kg		**0.68 J**	**1.5 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							**1.2 J**	ND	ND
n-Butylbenzene	0.64	5	ug/kg		ND	**1.0 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg		**2.4 J**	ND	ND	ND	ND	**7**	ND	ND	ND	ND	ND	ND							ND	ND	ND
2-Hexanone	1.2	5	ug/kg		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.9 J**	ND							ND	ND	ND
Acetone	2.5	5	ug/kg		**68**	**100**	**33**	**29**	**97**	**70**	**46**	ND	**4.6 J**	ND	**38**	ND							**27**	**100**	**7.0**
2-Butanone	1.5	5	ug/kg		**12**	**21**	**5.4**	**5.8**	**24**	**15**	**9.3**	ND	ND	ND	**2.0 J**	**3.0 J**							**4.6 J**	**22**	ND
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																						
Gasoline Range		2	mg/kg	**12**	**76**	**2.3**	ND	ND	**2.5**	**4.4**	ND	ND				ND									ND
Diesel Range		100	mg/kg	**1500**	**4900**	**270**	**250**	**63**	**1000**	**2100**	**31**	ND				**46**									ND
Oil Range		1000	mg/kg	**5600**	**9900**	**770**	**870**	**190**	**2900**	**5800**	**320**	ND				**390**									ND

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

Table 15

	Sample ID			P9-1	P9-2	P9-S1-1	P9-S1-2	P10-1	P10-2	P11-1	P11-2	P14-1	P14-2	P17-1	P17-2	P18-1	P18-2	P19-1	P19-2	P19-3	P19A-1	P19A-2	P19A-S1-1	P19A-S1-2
	Depth (feet)			6	8	8	10	6	8	6	8	6.5	8.5	6.5	8.5	4.5	7.5	3.5	5.5	7.5	4.5	6.5	7	9
	Date			11/1/2012		10/25/2013				11/1/2012		11/2/2012		12/6/2012		4/19/2013							11/1/2013	
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																					
Antimony	0.5		mg/kg	**0.6**	**0.56**			**0.61**	**0.59**	**0.68**	**0.75**	**0.61**	**0.61**	**0.58**	**0.57**	**0.78**	**0.77**	**0.66**	**0.58**	**0.62**	**0.65**	**0.62**	ND	ND
Arsenic	0.5		mg/kg	**5.7**	**6.4**			**5**	**4.5**	**7.4**	**7**	**4.5**	**9.9**	**6.2**	**9.7**	**7.9**	**8.1**	**7**	**7.8**	**10**	**5.5**	**5.4**	**1.6**	**6.8**
Barium	1		mg/kg	**130**	**210**			**120**	**130**	**160**	**150**	**55**	**150**	**150**	**120**	**140**	**170**	**160**	**170**	**170**	**130**	**210**	**170**	**160**
Beryllium	0.1		mg/kg	**0.42**	**0.36**			**0.37**	**0.39**	**0.46**	**0.45**	**0.21**	**0.25**	**0.57**	**0.37**	**0.56**	**0.55**	**0.51**	**0.65**	**0.5**	**0.48**	**0.51**	**0.31**	**0.21**
Cadmium	0.1		mg/kg	**0.12**	**0.15**			**0.11**	**0.1**	**0.13**	**0.12**	ND	**0.25**	ND	ND	**0.16**	**0.15**	**0.11**	**0.18**	**0.12**	**0.2**	**0.11**	ND	ND
Chromium, Total	0.5		mg/kg	**20**	**18**			**19**	**21**	**21**	**22**	**13**	**14**	**23**	**18**	**24**	**25**	**23**	**26**	**23**	**22**	**19**	**23**	**16**
Cobalt	0.2		mg/kg	**7.7**	**7.6**			**7.3**	**8**	**8.5**	**8.4**	**5.1**	**5.9**	**8**	**7.2**	**10**	**9.5**	**9.1**	**10**	**8.9**	**10**	**11**	**9.9**	**5**
Copper	0.5		mg/kg	**17**	**17**			**19**	**19**	**22**	**22**	**14**	**17**	**16**	**17**	**26**	**27**	**21**	**26**	**21**	**25**	**24**	**24**	**14**
Lead	0.5		mg/kg	**4.8**	**4.3**			**5.1**	**5.1**	**5.9**	**5.8**	**7**	**4.1**	**6.1**	**4.3**	**7.7**	**8.2**	**6.2**	**7**	**5.5**	**6**	**5.3**	**5.5**	**3.9**
Mercury	0.01		mg/kg	**0.036**	**0.028**			**0.031**	**0.03**	**0.045**	**0.037**	**0.041**	**0.034**	**0.031**	**0.026**	**0.036**	**0.04**	**0.044**	**0.038**	**0.055**	**0.077**	**0.045**	**0.041**	**0.025**
Molybdenum	0.2		mg/kg	**2.5**	**2.7**			**1.9**	**1.5**	**2.9**	**4.5**	**0.21**	**1.4**	**2.2**	**0.55**	**1.6**	**3**	**4.3**	**3**	**4.3**	**1**	**1.5**	**0.4**	**8.5**
Nickel	0.5		mg/kg	**15**	**14**			**14**	**15**	**16**	**16**	**11**	**14**	**14**	**13**	**27**	**25**	**22**	**19**	**17**	**78**	**72**	**16**	**8**
Selenium	0.5		mg/kg	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	**41**	**36**			**37**	**40**	**43**	**42**	**28**	**53**	**44**	**36**	**45**	**46**	**42**	**50**	**42**	**50**	**42**	**44**	**28**
Zinc	5		mg/kg	**42**	**40**			**43**	**47**	**46**	**47**	**34**	**34**	**52**	**40**	**59**	**55**	**48**	**63**	**48**	**54**	**42**	**53**	**36**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																					
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Tetrachloroethene (PCE)	1.5	5	ug/kg	**7.7**	**6.3**	**7.4**	**16**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.4 J**	ND	ND		
Benzene	1.4	5	ug/kg	**2.8 J**	**2.6 J**	ND	**6**	**3.0 J**	**2.8 J**	**3.8 J**	**3.4 J**	ND	**2.7 J**	**3.0 J**	ND	**5.2**	**1.7 J**	**1.9 J**	**4.2 J**	**1.7 J**	**2.2 J**	ND		
Toluene	1.1	5	ug/kg	**2.2 J**	**1.9 J**	ND	ND	**2.2 J**	**2.4 J**	**3.0 J**	**3.0 J**	ND	**2.9 J**	**2.3 J**	ND	**4.6 J**	**1.1 J**	**1.3 J**	**3.1 J**	**1.2 J**	**1.6 J**	ND		
Ethylbenzene	0.36	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.47 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
o-Xylene	0.52	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Acetone	2.5	5	ug/kg	**48**	**25**	**24**	**24**	**42**	**75**	**44**	**25**	**13**	ND	**40**	**34**	**30**	**18**	**25**	**14**	**10**	**17**	**16**		
2-Butanone	1.5	5	ug/kg	**3.3 J**	**3.5 J**	ND	ND	**5.0**	**11**	**3.2 J**	**2.6 J**	ND	ND	ND	ND	**2.6 J**	ND	ND	ND	ND	ND	ND		
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																					
Gasoline Range		2	mg/kg														ND			ND				
Diesel Range		100	mg/kg														ND			ND				
Oil Range		1000	mg/kg														ND			ND				

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
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	Sample ID			P20-1	P20-2	P20-3	P21-1	P21-2	P22-1	P22-2	P22-S1-1	P22-S1-2	P24-1	P24-2	P24-S1-1	P24-S1-2	P24-S2-1	P24-S2-2	P25-1	P25-2	P26-1	P26-2	P26-3	P26A-1	P26A-2
	Depth (feet)			4.5	6.5	7.5	4.5	6.5	4.5	6.5	7	9	4.5	6.5	7	9	7	9	4	7.5	3.5	5.5	7.5	4.5	6.5
	Date			4/19/2013			4/19/2013				11/1/2013		4/17/2013		10/30/2013				4/17/2013						
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																						
Antimony	0.5		mg/kg	**0.74**	**0.72**	**0.8**	**0.6**	**0.76**	**0.51**	ND	ND	ND	**0.54**	ND					**0.52**	**0.65**	**0.63**	**0.69**	**0.73**	**0.52**	**0.52**
Arsenic	0.5		mg/kg	**7.5**	**5.8**	**7.3**	**5.6**	**5**	**5**	**2.2**	**12**	**5.5**	**4.1**	**1.8**					**5.5**	**6.5**	**5.1**	**6.5**	**7.1**	**6.4**	**5**
Barium	1		mg/kg	**150**	**170**	**190**	**100**	**110**	**76**	**46**	**190**	**130**	**51**	**37**					**110**	**140**	**110**	**130**	**140**	**92**	**140**
Beryllium	0.1		mg/kg	**0.49**	**0.53**	**0.62**	**0.44**	**0.37**	**0.31**	**0.27**	**0.58**	**0.48**	**0.23**	**0.17**					**0.31**	**0.35**	**0.33**	**0.35**	**0.39**	**0.26**	**0.29**
Cadmium	0.1		mg/kg	**0.11**	**0.12**	**0.17**	**0.19**	**0.14**	**0.2**	**0.17**	**0.11**	ND	ND	ND					**0.14**	**0.12**	**0.11**	ND	ND	ND	ND
Chromium, Total	0.5		mg/kg	**24**	**24**	**26**	**18**	**18**	**15**	**15**	**25**	**18**	**16**	**17**					**18**	**22**	**20**	**22**	**22**	**16**	**18**
Cobalt	0.2		mg/kg	**9.5**	**9.1**	**10**	**7.1**	**6.7**	**5.6**	**4.9**	**11**	**7.8**	**6.6**	**4.9**					**7.6**	**8.7**	**6.9**	**8.5**	**8.3**	**6.4**	**9.3**
Copper	0.5		mg/kg	**22**	**23**	**26**	**19**	**22**	**28**	**39**	**26**	**18**	**11**	**9.2**					**17**	**21**	**16**	**20**	**22**	**15**	**16**
Lead	0.5		mg/kg	**5.6**	**5.5**	**6.2**	**6.2**	**4.8**	**5.1**	**6.9**	**7.1**	**4.9**	**4**	**3.3**					**6.1**	**5.8**	**5.6**	**5.5**	**5.6**	**4.4**	**3.8**
Mercury	0.01		mg/kg	**0.051**	**0.067**	**0.044**	**0.074**	**0.05**	**0.028**	**0.032**	**0.057**	**0.18**	**0.025**	**0.027**					**0.038**	**0.039**	**0.027**	**0.035**	**0.04**	**0.025**	**0.027**
Molybdenum	0.2		mg/kg	**2.8**	**2.6**	**4.4**	**2.2**	**2.2**	**1.9**	**0.52**	**6.4**	**3.9**	**2.4**	**0.72**					**1.8**	**2.3**	**1.7**	**3.2**	**2.6**	**1.1**	**1.9**
Nickel	0.5		mg/kg	**25**	**20**	**41**	**20**	**15**	**16**	**46**	**20**	**12**	**10**	**15**					**22**	**17**	**21**	**18**	**16**	**14**	**16**
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	**46**	**45**	**49**	**37**	**40**	**29**	**26**	**43**	**36**	**29**	**21**					**38**	**40**	**39**	**38**	**40**	**34**	**38**
Zinc	5		mg/kg	**51**	**51**	**56**	**42**	**38**	**52**	**78**	**55**	**42**	**30**	**28**					**49**	**39**	**40**	**45**	**48**	**25**	**38**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																						
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	**2.8 J**	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
Benzene	1.4	5	ug/kg	**4.6 J**	**4.7 J**	ND	**5.2**	ND	ND	ND			ND	ND					**6.2**	**3.5 J**	**3.1 J**	**2.6 J**	**4.2 J**	**2.5 J**	ND
Toluene	1.1	5	ug/kg	**3.8 J**	**3.7 J**	ND	**5.1**	ND	**1.1 J**	ND			ND	ND					**6.0**	**2.8 J**	**3.1 J**	**1.9 J**	**3.1 J**	**2.0 J**	ND
Ethylbenzene	0.36	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					**1.1 J**	ND	**0.64 J**	ND	ND	ND	ND
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	**13**					ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	**7.4**					ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.52	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	**8.1**					ND	ND	ND	ND	ND	ND	ND
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	5	ug/kg	**27**	**69**	**21**	**30**	**20**	**13**	**19**			**19**	**28**					**26**	**19**	**14**	**30**	**28**	**17**	**19**
2-Butanone	1.5	5	ug/kg	ND	**9.4**	ND	ND	ND	ND	ND			ND	ND					ND	ND	ND	ND	ND	ND	ND
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																						
Gasoline Range		2	mg/kg	ND	ND								ND	**75**	ND	ND	ND	ND					ND		
Diesel Range		100	mg/kg	ND	ND								**45**	**1300**	ND	ND	**16**	ND					ND		
Oil Range		1000	mg/kg	ND	ND								**190**	**3200**	ND	ND	ND	ND					ND		

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

	Sample ID			P27-1	P27-2	P27-3	P28-1	P28-2	P29-1	P29-2	P30-1	P30-2	P31-1	P31-2	P32-1	P32-2	P33-1	P33-2	P33-3	P33-S1-1	P33-S1-2	P33-S2-1	P33-S2-2
	Depth (feet)			4.5	6.5	7.5	4.5	6.5	4.5	6.5	4.5	6.5	4.5	6.5	4.5	6.5	6	8	15	8	10	8	10
	Date			4/17/2013			4/12/2013				4/17/2013		4/19/2013				12/12/2012	12/13/2012		10/29/2013			
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																				
Antimony	0.5		mg/kg	**0.58**	**0.68**	**0.66**	**0.94**	**0.69**	**0.74**	**0.77**	**0.64**	**0.67**	**0.58**	**0.67**	**0.64**	**0.65**	**0.69**	**0.58**	**0.63**	ND	ND	ND	ND
Arsenic	0.5		mg/kg	**5.7**	**7.8**	**7.1**	**9.2**	**7**	**8.7**	**8.6**	**4**	**8.8**	**7.4**	**7.3**	**4.8**	**5.5**	**7.9**	**4**	**14**	**4.5**	**5.4**	**3**	**5.6**
Barium	1		mg/kg	**120**	**120**	**130**	**160**	**150**	**170**	**180**	**120**	**120**	**110**	**130**	**150**	**130**	**150**	**110**	**180**	**120**	**120**	**130**	**110**
Beryllium	0.1		mg/kg	**0.32**	**0.34**	**0.38**	**0.58**	**0.49**	**0.5**	**0.56**	**0.31**	**0.37**	**0.4**	**0.49**	**0.42**	**0.41**	**0.46**	**0.38**	**0.47**	**0.34**	**0.36**	**0.36**	**0.29**
Cadmium	0.1		mg/kg	**0.12**	**0.2**	**0.11**	**0.21**	**0.13**	**0.13**	**0.14**	**0.12**	**0.18**	**0.22**	**0.14**	**0.14**	**0.16**	**0.18**	**0.11**	ND	ND	**0.13**	**0.18**	ND
Chromium, Total	0.5		mg/kg	**19**	**20**	**21**	**24**	**24**	**23**	**26**	**20**	**21**	**19**	**41**	**20**	**29**	**130**	**24**	**27**	**20**	**17**	**18**	**18**
Cobalt	0.2		mg/kg	**7.8**	**8.1**	**8.6**	**10**	**9.3**	**9.1**	**9.7**	**8.2**	**8.9**	**7.4**	**8.8**	**8.2**	**8.3**	**17**	**7.9**	**7.6**	**7.7**	**7.4**	**8**	**6.9**
Copper	0.5		mg/kg	**18**	**20**	**21**	**29**	**22**	**22**	**24**	**20**	**22**	**21**	**23**	**20**	**21**	**220**	**24**	**31**	**18**	**20**	**21**	**17**
Lead	0.5		mg/kg	**5.3**	**4.8**	**5.6**	**9.4**	**6.9**	**6**	**6.5**	**6.1**	**5.8**	**5.6**	**7**	**6.1**	**9.8**	**13**	**6.4**	**7.7**	**4.8**	**4.9**	**6.1**	**3.8**
Mercury	0.01		mg/kg	**0.04**	**0.051**	**0.042**	**0.05**	**0.037**	**0.043**	**0.048**	**0.034**	**0.033**	**0.052**	**0.042**	**0.062**	**0.077**	**0.066**	**0.034**	**0.029**	**0.041**	**0.041**	**0.026**	**0.019**
Molybdenum	0.2		mg/kg	**1.8**	**7.4**	**2.7**	**2.2**	**2.6**	**3.1**	**4.1**	**1.5**	**3.5**	**5.4**	**3.7**	**1.1**	**1.6**	**4.3**	**1.5**	**6.4**	**4**	**1.7**	**1.2**	**3.6**
Nickel	0.5		mg/kg	**15**	**15**	**16**	**32**	**18**	**18**	**20**	**16**	**19**	**24**	**24**	**32**	**28**	**460**	**29**	**32**	**13**	**14**	**18**	**14**
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.6**	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.15**	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	**37**	**37**	**39**	**54**	**43**	**43**	**48**	**39**	**42**	**46**	**47**	**54**	**48**	**360**	**49**	**50**	**33**	**31**	**38**	**43**
Zinc	5		mg/kg	**45**	**43**	**48**	**68**	**53**	**50**	**52**	**49**	**64**	**51**	**54**	**49**	**50**	**100**	**49**	**54**	**43**	**44**	**56**	**40**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																				
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Benzene	1.4	5	ug/kg	**3.5 J**	**3.9 J**	**2.3 J**	**6.0**	**4.4 J**	**3.7 J**	**5.2**	**3.7 J**	**4.9 J**	**3.5 J**	**2.9 J**	**6.0**	**6.1**	ND	ND	ND				
Toluene	1.1	5	ug/kg	**2.5 J**	**2.4 J**	**1.4 J**	**3.4 J**	**3.1 J**	**2.5 J**	**4.2 J**	**2.7 J**	**4.9 J**	**3.6 J**	**2.8 J**	**5.0**	**4.6 J**	ND	ND	ND				
Ethylbenzene	0.36	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.7 J**	ND	ND	ND	ND				
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	**29**	**13**	**29**	ND	ND	ND	**5.2**	ND				
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.6 J**	ND				
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
o-Xylene	0.52	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	**6.8**	ND	ND	ND	ND	ND	**0.84 J**	ND				
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Acetone	2.5	5	ug/kg	**29**	**26**	**17**	**21**	**31**	**30**	**23**	**32**	**22**	**43**	**58**	**77**	**25**	**29**	**54**	**16**				
2-Butanone	1.5	5	ug/kg	**2.4 J**	ND	ND	ND	**2.1 J**	ND	ND	**5.1**	ND	**7.7**	**10**	**14**	ND	ND	**4.5 J**	ND				
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																				
Gasoline Range		2	mg/kg	ND		ND							**21**	**3.3**				**0.94**	ND	ND	ND	**11**	**71**
Diesel Range		100	mg/kg	ND		ND							**180**	**340**				**1700**	ND	ND	ND	**3500**	**8400**
Oil Range		1000	mg/kg	ND		ND							**400**	**870**				**8200**	ND	ND	ND	**12000**	**23000**

Table 15

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

Sample ID				P34-1	P34-2	P34-3	P35-1	P35-2	P35-3	P40-1	P40-2	P41-1	P41-2	P42-1	P42-2	P43-1	P43-2	P43-S1-1	P43-S1-2	P44-1	P44-2	P44-S1-1	P44-S1-2	P45-1	P45-2
Depth (feet)				6	8	15	6	8	15	6.5	8.5	6.5	8.5	6.5	8.5	6.5	8.5	8	10	6.5	8.5	7	9	6.5	8.5
Date				12/12/2012	12/13/2012		12/12/2012	12/19/2012		12/7/2012				12/20/2012		11/14/2012		11/5/2013		11/14/2012		11/5/2013		11/8/2012	
Parameter: Metals (USEPA 200.8)	MRL		Units																						
Antimony	0.5		mg/kg	**0.58**	**0.77**	**0.5**	ND	ND	ND	ND	ND	**0.62**	ND	ND	ND	**0.65**	**0.62**			1.5	0.55			**0.64**	**0.6**
Arsenic	0.5		mg/kg	**6.3**	**6.7**	**15**	**5**	**6.4**	**7.5**	**2.8**	**0.94**	**6.1**	**3.7**	**6.3**	**6.8**	**7**	**9.1**			8.7	9.2			**5.3**	**6.2**
Barium	1		mg/kg	**120**	**140**	**130**	**90**	**110**	**120**	**57**	**22**	**120**	**61**	**130**	**120**	**160**	**140**			240	130			**110**	**130**
Beryllium	0.1		mg/kg	**0.31**	**0.41**	**0.49**	**0.32**	**0.37**	**0.43**	**0.25**	**0.13**	**0.35**	**0.32**	**0.42**	**0.39**	**0.51**	**0.46**			0.8	0.33			**0.36**	**0.34**
Cadmium	0.1		mg/kg	ND	ND	ND	**0.13**	**0.1**	**0.12**	ND	ND	ND	ND	**0.1**	**0.1**	**0.13**	**0.13**			0.28	ND			ND	ND
Chromium, Total	0.5		mg/kg	**20**	**20**	**24**	**17**	**20**	**26**	**9.9**	**5.2**	**19**	**15**	**20**	**18**	**21**	**21**			34	16			**18**	**16**
Cobalt	0.2		mg/kg	**7.1**	**8**	**6.5**	**6.3**	**8.1**	**9.2**	**4**	**2.2**	**7**	**5.4**	**8.3**	**7.7**	**8.5**	**8.6**			13	6.3			**7.1**	**7.1**
Copper	0.5		mg/kg	**20**	**23**	**16**	**20**	**20**	**21**	**7.8**	**3.1**	**16**	**10**	**20**	**18**	**22**	**21**			42	16			**19**	**17**
Lead	0.5		mg/kg	**6.1**	**7**	**6.3**	**7**	**5.3**	**8.3**	**2.8**	**1.7**	**4.2**	**3.7**	**5.3**	**5.2**	**5.9**	**5.5**			10	4			**5.8**	**4.9**
Mercury	0.01		mg/kg	**0.021**	**0.064**	**0.026**	**0.024**	**0.032**	**0.025**	ND	ND	**0.025**	**0.011**	**0.021**	**0.029**	**0.046**	**0.046**			0.066	0.023			**0.026**	**0.017**
Molybdenum	0.2		mg/kg	**3.7**	**2.6**	**5.1**	**1.3**	**3**	**3**	**1**	ND	**0.48**	**0.91**	**1.9**	**1.4**	**3.6**	**1.5**			1	0.44			**0.92**	**0.99**
Nickel	0.5		mg/kg	**18**	**28**	**16**	**27**	**24**	**75**	**6.9**	**3.2**	**14**	**10**	**16**	**15**	**17**	**16**			24	12			**23**	**14**
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND			ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			0.16	ND			ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND			ND	ND
Vanadium	1		mg/kg	**40**	**58**	**46**	**41**	**82**	**180**	**24**	**16**	**35**	**28**	**45**	**42**	**40**	**40**			57	32			**41**	**33**
Zinc	5		mg/kg	**44**	**45**	**46**	**43**	**47**	**48**	**23**	**15**	**38**	**32**	**50**	**44**	**47**	**48**			75	41			**39**	**35**
Parameter: VOCs (USEPA 8260B)	MDL	MRL	Units																						
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.6 J**	**3.7 J**
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1.4	5	ug/kg	**4.1 J**	**1.6 J**	ND	**4.3 J**	**1.8 J**	ND	ND	ND	ND	**5.7**	**4.0 J**	**3.1 J**	**4.2 J**	**21**	**2.7 J**	ND	**27**	**1.9 J**	**11**	**2.3 J**	**4.5 J**	**1.9 J**
Toluene	1.1	5	ug/kg	**3.0 J**	**1.4 J**	ND	ND	**1.1 J**	ND	ND	ND	ND	**6.7**	**3.0 J**	**2.4 J**	**3.8 J**	**22**	**2.2 J**	ND	**25**	**2.0 J**	**9.1**	**1.9 J**	**3.6 J**	**1.3 J**
Ethylbenzene	0.36	5	ug/kg	**0.51 J**	ND	ND	ND	ND	ND	ND	ND	ND	**1.2 J**	ND	ND	**0.61 J**	**4.4 J**	ND	ND	**3.8 J**	ND	**1.6 J**	**0.36 J**	**0.55 J**	ND
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.72 J**	ND	ND	**0.90 J**	ND	ND	ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.4**	ND	ND	**5.3**	ND	**2.1 J**	ND	ND	ND
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.8 J**	**1.8 J**	**1.4 J**	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.52	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.54 J**	ND	ND	ND	**2.1 J**	ND	ND	**2.1 J**	ND	**0.8 J**	ND	ND	ND
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	5	ug/kg	**16**	**25**	**17**	**20**	**18**	**5.3**	ND	**17**	**17**	**41**	**16**	**18**	**20**	**29**	**16**	**18**	**15**	**15**	**24**	**48**	**23**	**26**
2-Butanone	1.5	5	ug/kg	ND	**1.6 J**	ND	**2.5 J**	ND	ND	ND	ND	ND	**3.0 J**	ND	ND	ND	ND	**2.0 J**	ND	**3.4 J**	ND	ND	**7**	ND	**2.2 J**
Parameter: TPH (USEPA 8015B)		MRL	Units																						
Gasoline Range		2	mg/kg	ND			ND																		
Diesel Range		100	mg/kg	**26**			ND																		
Oil Range		1000	mg/kg	ND			ND																		

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

	Sample ID			P46-1	P46-2	P47-1	P47-2	P47-S1-1	P47-S1-2	P47-S2-1	P47-S2-2	P47-S3-1	P47-S3-2	P48-1	P48-2	P49-1	P49-2	P50-1	P50-2	P51-1	P51-2	P52-1	P52-2	P53-1	P53-2
	Depth (feet)			6.5	8.5	6	8	8	10	8	10	8	10	6	8	7	9	7	9	7	9	5	7	5	7
	Date			11/14/2012		12/6/2012		10/30/2013		11/1/2013				12/19/2012				12/20/2012				11/15/2012			
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																						
Antimony	0.5		mg/kg	**0.6**	**0.62**	ND	ND	ND	ND	ND	ND	ND	ND	**0.52**	ND	**0.51**	ND	ND	**0.52**	ND	ND	**0.61**	**0.68**	ND	**0.7**
Arsenic	0.5		mg/kg	**7.2**	**6.6**	**2.8**	**3.5**	**5.4**	**9.1**	**4.8**	**7**	**4.2**	**8**	**8.4**	**6.4**	**7**	**5.8**	**2.9**	**9**	**7.7**	**7.2**	**5.6**	**6.9**	**4.4**	**15**
Barium	1		mg/kg	**130**	**130**	**61**	**44**	**92**	**64**	**95**	**71**	**72**	**48**	**120**	**120**	**130**	**130**	**64**	**130**	**150**	**160**	**150**	**110**	**110**	**120**
Beryllium	0.1		mg/kg	**0.44**	**0.42**	**0.26**	**0.23**	**0.36**	**0.17**	**0.39**	**0.34**	**0.35**	**0.25**	**0.47**	**0.44**	**0.42**	**0.49**	**0.21**	**0.48**	**0.52**	**0.53**	**0.62**	**0.32**	**0.19**	**0.37**
Cadmium	0.1		mg/kg	**0.13**	**0.14**	**0.14**	**0.13**	ND	ND	ND	ND	ND	ND	**0.1**	**0.12**	**0.12**	**0.13**	ND	ND	**0.11**	**0.12**	**0.25**	ND	ND	ND
Chromium, Total	0.5		mg/kg	**21**	**20**	**13**	**48**	**20**	**11**	**23**	**19**	**20**	**16**	**22**	**20**	**22**	**21**	**11**	**25**	**23**	**24**	**26**	**17**	**13**	**19**
Cobalt	0.2		mg/kg	**8.4**	**7.9**	**4.8**	**8.5**	**8.4**	**5.4**	**18**	**8.4**	**10**	**6.2**	**8.7**	**8.1**	**8.9**	**8.2**	**4.9**	**11**	**9.4**	**10**	**10**	**6.9**	**5.6**	**7.8**
Copper	0.5		mg/kg	**21**	**19**	**11**	**50**	**18**	**9.3**	**23**	**20**	**17**	**15**	**25**	**20**	**22**	**21**	**10**	**26**	**24**	**25**	**28**	**15**	**15**	**22**
Lead	0.5		mg/kg	**4.9**	**5.4**	**7.1**	**12**	**4.5**	**2.5**	**4.9**	**4.6**	**4**	**3.6**	**5.8**	**5**	**6**	**5.6**	**3.2**	**5.9**	**5.9**	**6.6**	**7.7**	**3.5**	**3.5**	**9.4**
Mercury	0.01		mg/kg	**0.048**	**0.029**	**0.02**	**0.48**	**0.03**	**0.027**	**0.028**	**0.04**	**0.039**	**0.029**	**0.038**	**0.041**	**0.043**	**0.037**	**0.025**	**0.033**	**0.025**	**0.03**	**0.025**	**0.031**	**0.03**	**0.046**
Molybdenum	0.2		mg/kg	**0.74**	**0.72**	**0.79**	**1.5**	**5.4**	**1.9**	**3.1**	**2.3**	**3.1**	**1.2**	**3.7**	**2.5**	**2.2**	**1.9**	**0.62**	**2.2**	**2.5**	**2.7**	**1.5**	**0.36**	**0.25**	**0.75**
Nickel	0.5		mg/kg	**16**	**15**	**12**	**210**	**13**	**14**	**58**	**17**	**66**	**12**	**17**	**16**	**17**	**17**	**8.9**	**19**	**17**	**18**	**18**	**12**	**11**	**35**
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	**40**	**40**	**27**	**250**	**36**	**21**	**40**	**27**	**46**	**30**	**45**	**41**	**46**	**45**	**28**	**47**	**48**	**50**	**50**	**35**	**27**	**60**
Zinc	5		mg/kg	**51**	**49**	**32**	**71**	**40**	**27**	**60**	**44**	**49**	**37**	**47**	**44**	**50**	**46**	**28**	**49**	**50**	**52**	**70**	**40**	**28**	**47**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																						
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1.4	5	ug/kg	**6.2**	**4.1 J**	**2.3 J**	**2.2 J**							**9.8**	**5.0**	**3.4 J**	**3.7 J**	**3.5 J**	ND	**3.0 J**	**3.4 J**	**2.4 J**	ND	ND	ND
Toluene	1.1	5	ug/kg	**6.8**	**3.4 J**	**2.1 J**	**2.0 J**							**9.7**	**4.7 J**	**3.0 J**	**3.9 J**	**3.4 J**	ND	**3.0 J**	**2.7 J**	**1.1 J**	ND	ND	ND
Ethylbenzene	0.36	5	ug/kg	**1.1 J**	**0.45 J**	ND	ND							**1.5 J**	**0.70 J**	ND	**0.59 J**	**0.55 J**	ND	**0.49 J**	ND	ND	ND	ND	ND
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.52	5	ug/kg	**0.54 J**	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	5	ug/kg	**32**	**20**	**26**	**31**							**29**	**21**	ND	**28**	**12**	**24**	**13**	**20**	**23**	**12**	**15**	**8.7**
2-Butanone	1.5	5	ug/kg	ND	ND	ND	ND							ND	ND	**2.3 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																						
Gasoline Range		2	mg/kg																						
Diesel Range		100	mg/kg																						
Oil Range		1000	mg/kg																						

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

Sample ID				P54-1	P54-2	P55-1	P55-2	P56-1	P56-2	P57-1	P57-2	P58-1	P58-2	P59-1	P59-2	P60-1	P60-2	P61-1	P61-2	P62-1	P62-2	P63-1	P63-2	P63-3
Depth (feet)				5	7	5	7	5	7	5	7	5	7	5	7	5	7	5	7	4.5	8	5.5	6.5	8
Date				11/15/2012				11/14/2012				11/8/2012								1/31/2013				
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																					
Antimony	0.5		mg/kg	**0.69**	**0.6**	**0.62**	**0.59**	**0.6**	**0.59**	**0.58**	**0.54**	**0.53**	**0.66**	**0.82**	**0.53**	ND	ND	ND	ND	ND	**0.76**	ND	**0.5**	ND
Arsenic	0.5		mg/kg	**8.8**	**4.7**	**9.3**	**6.4**	**5.3**	**5.2**	**4.8**	**4.6**	**5.7**	**9.1**	**6.7**	**4.9**	**3.8**	**3.7**	**3**	**4**	**5.2**	**4.3**	**5.9**	**3.8**	**6.9**
Barium	1		mg/kg	**150**	**120**	**110**	**130**	**120**	**130**	**110**	**120**	**110**	**110**	**140**	**130**	**50**	**56**	**39**	**50**	**120**	**210**	**120**	**110**	**170**
Beryllium	0.1		mg/kg	**0.49**	**0.44**	**0.31**	**0.41**	**0.4**	**0.44**	**0.38**	**0.34**	**0.24**	**0.31**	**0.35**	**0.25**	**0.16**	**0.14**	**0.16**	**0.18**	**0.61**	**0.6**	**0.63**	**0.35**	**0.54**
Cadmium	0.1		mg/kg	**0.12**	**0.14**	ND	ND	**0.12**	**0.14**	**0.11**	**0.12**	ND	ND	ND	ND	ND	ND	ND	ND	**0.36**	**0.19**	**0.13**	**0.15**	**0.12**
Chromium, Total	0.5		mg/kg	**23**	**19**	**17**	**21**	**19**	**20**	**20**	**17**	**12**	**16**	**17**	**14**	**5.5**	**7**	**5.9**	**9.2**	**23**	**27**	**24**	**17**	**20**
Cobalt	0.2		mg/kg	**9.2**	**8**	**6.9**	**7.8**	**7.7**	**7.8**	**7.6**	**6.5**	**5.5**	**6.8**	**7.4**	**5.5**	**3**	**4.1**	**2.5**	**4**	**12**	**11**	**11**	**7.3**	**6.5**
Copper	0.5		mg/kg	**23**	**20**	**19**	**18**	**19**	**22**	**19**	**18**	**13**	**18**	**22**	**13**	**9.3**	**9.6**	**7.2**	**11**	**20**	**32**	**20**	**19**	**20**
Lead	0.5		mg/kg	**6.1**	**5.9**	**5.6**	**5.4**	**5.1**	**6.1**	**5.1**	**5.7**	**4.2**	**4.7**	**5.4**	**7.4**	**2.9**	**2.7**	**2.4**	**4.8**	**6.8**	**7.9**	**6.6**	**5.9**	**5**
Mercury	0.01		mg/kg	**0.049**	**0.03**	**0.044**	**0.055**	**0.048**	**0.024**	**0.034**	**0.031**	**0.034**	**0.033**	**0.016**	**0.019**	**0.037**	**ND**	**0.035**	**0.11**	**0.026**	**0.054**	**0.023**	**0.039**	**0.027**
Molybdenum	0.2		mg/kg	**1.6**	**0.87**	**0.69**	**4.9**	**1.1**	**0.77**	**0.84**	**0.57**	**0.46**	**0.61**	**0.8**	**0.45**	**ND**	**ND**	**0.27**	**0.24**	**1.3**	**0.36**	**1.6**	**0.78**	**5.1**
Nickel	0.5		mg/kg	**18**	**18**	**23**	**15**	**14**	**15**	**14**	**13**	**10**	**14**	**14**	**11**	**5.2**	**5.3**	**4.3**	**8.6**	**150**	**21**	**19**	**16**	**13**
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	**44**	**36**	**48**	**37**	**35**	**37**	**34**	**31**	**28**	**34**	**35**	**27**	**17**	**18**	**16**	**22**	**46**	**42**	**48**	**34**	**27**
Zinc	5		mg/kg	**51**	**46**	**40**	**44**	**45**	**52**	**42**	**49**	**33**	**40**	**40**	**36**	**21**	**18**	**16**	**24**	**60**	**61**	**63**	**39**	**36**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																					
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1.4	5	ug/kg	**3.8 J**	ND	**4.8 J**	**2.3 J**	**2.4 J**	**5.2**	**3.0 J**	ND	**6.0**	**2.3 J**	**2.0 J**	ND	ND	ND	ND	ND	ND	**4.4 J**	**4.7 J**	**4.6 J**	ND
Toluene	1.1	5	ug/kg	**3.1 J**	ND	**4.5 J**	**1.7 J**	**1.7 J**	**4.2 J**	**1.4 J**	ND	**4.4 J**	**1.7 J**	**1.9 J**	ND	ND	ND	ND	ND	ND	**3.6 J**	**2.4 J**	**2.4 J**	ND
Ethylbenzene	0.36	5	ug/kg	**0.47 J**	ND	**0.73 J**	ND	ND	**0.63 J**	ND	ND	**0.65 J**	ND	ND	ND	ND	ND	ND	ND	ND	**0.51 J**	ND	ND	ND
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.52	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	5	ug/kg	**14**	ND	**22**	**21**	**14**	**19**	**31**	**18**	**12**	**18**	**28**	**17**	**14**	**8.7**	**31**	**39**	**140**	**310**	**32**	**130**	**97**
2-Butanone	1.5	5	ug/kg	ND	ND	ND	ND	**2.0 J**	ND	**3.8 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**21**	ND
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																					
Gasoline Range		2	mg/kg																		ND			ND
Diesel Range		100	mg/kg																		ND			ND
Oil Range		1000	mg/kg																		ND			ND

Table 15

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

	Sample ID			P64-1	P64-2	P64-3	P66-1	P66-2	P67-1	P67-2	P67-3	P69-1	P69-2	P71-1	P71-2	P71-3	P72-1	P72-2	P72-3	P73-1	P73-2	P73-S1-1	P73-S1-2	P74-1	P74-2	P74-3
	Depth (feet)			4.5	6.5	8	4.5	6.5	6	8	19	4.5	6.5	4.5	6.5	8	4.5	6.5	8	4.5	8	8	10	5	7	19
	Date			1/31/2013			1/30/2013					1/30/2013		1/31/2013								11/5/2013		1/30/2013		
Parameter: Metals (USEPA 200.8)	MRL		Units																							
Antimony	0.5		mg/kg	ND	0.58	0.56	0.69	0.53	0.64	0.59	0.64	0.61	0.6	ND	ND	ND	0.55	0.65	0.61	0.56	ND			0.69	0.65	0.64
Arsenic	0.5		mg/kg	6.2	4.4	4.8	4.1	3.2	4.1	5.8	4.6	5.9	6.1	5.8	5.9	5.8	6.3	5.7	4.4	8.2	5.4			4.8	5.1	4.1
Barium	1		mg/kg	120	120	120	110	94	100	120	110	130	130	140	100	110	130	110	140	120	120			110	130	110
Beryllium	0.1		mg/kg	0.49	0.43	0.45	0.44	0.35	0.32	0.56	0.45	0.51	0.58	0.61	0.37	0.42	0.44	0.42	0.46	0.43	0.57			0.39	0.45	0.36
Cadmium	0.1		mg/kg	0.17	0.11	ND	0.11	ND	0.18	0.22	0.1	0.15	0.22	0.19	0.13	0.14	0.17	0.1	0.21	0.13	0.18			ND	0.11	ND
Chromium, Total	0.5		mg/kg	22	21	22	19	18	17	20	19	24	22	24	19	21	22	19	21	20	24			19	20	18
Cobalt	0.2		mg/kg	9.1	8.5	8.7	7.8	7.2	7.2	8.5	8	8.9	9	9.3	7.1	8	8.6	7.6	8.6	7.8	9.2			8	8.1	7.6
Copper	0.5		mg/kg	21	20	22	20	19	20	23	21	26	26	23	15	17	21	20	23	20	25			22	23	21
Lead	0.5		mg/kg	6.1	6.1	5.9	5	4.2	6.1	7.6	5.8	7.2	8.4	11	4.4	5.4	6.2	6	6.7	5.3	6.8			6.6	5.9	5.1
Mercury	0.01		mg/kg	0.04	0.026	0.023	0.028	0.021	0.039	0.032	0.025	0.03	0.031	0.051	0.027	0.017	0.042	0.04	0.038	0.035	0.03			0.026	0.033	0.023
Molybdenum	0.2		mg/kg	2.5	2.6	4.1	2.9	3.5	3.5	2.4	2.2	2.6	2.6	2.3	1.5	1.7	0.78	0.46	0.45	1	1.1			2.7	1.9	2
Nickel	0.5		mg/kg	17	17	16	15	14	15	23	18	17	17	18	15	16	22	14	18	15	18			16	16	15
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND
Vanadium	1		mg/kg	42	42	43	42	39	40	50	42	55	51	49	36	40	42	39	40	37	43			42	42	39
Zinc	5		mg/kg	53	56	56	46	48	45	62	52	56	54	62	47	51	54	47	54	50	60			47	48	47
Parameter: VOCs (USEPA 8260B)	MDL	MRL	Units																							
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
Benzene	1.4	5	ug/kg	ND	ND	3.7 J	ND	ND	ND	2.6 J	ND	2.9 J	5.5	ND	ND	ND	7.8	ND	ND	ND	ND	3.4 J	2.6 J	3.5 J	ND	ND
Toluene	1.1	5	ug/kg	ND	ND	3.4 J	ND	ND	ND	2.3 J	ND	2.4 J	5.4	ND	ND	ND	5.3	ND	ND	ND	ND	3.3 J	2.2 J	2.5 J	ND	ND
Ethylbenzene	0.36	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.60 J	ND	ND	ND	ND	ND	ND	ND	ND	0.55 J	ND	ND	ND	ND
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.52	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	5	ug/kg	120	61	42	ND	7.1	ND	23	ND	ND	110	79	93	79	62	51	55	ND	36	20	72	21	34	9.6
2-Butanone	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.4	ND	ND	ND
Parameter: TPH (USEPA 8015B)		MRL	Units																							
Gasoline Range		2	mg/kg	ND		ND								ND		ND			ND		ND					
Diesel Range		100	mg/kg	ND		ND								ND		610			ND		ND					
Oil Range		1000	mg/kg	ND		ND								ND		200			ND		ND					

Table 15

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

	Sample ID			P77-1	P77-2	P77A-1	P77A-2	P78-1	P78-2	P79-1	P79-2	P79-S1-1	P79-S1-2	P80-1	P80-2	P81-1	P81-2	P82-1	P82-2	P83-1	P83-2	P84-1	P84-2
	Depth (feet)			5	7	5	7	5	7	5	7	7	9	5	7	5	7	5	7	5	7	5	7
	Date			1/30/2013				12/6/2012				11/5/2013		12/6/2012				12/5/2012					
Parameter: Metals (USEPA 200.8)	MRL		Units																				
Antimony	0.5		mg/kg	0.65	0.53	0.8	0.52	ND	0.81	ND	0.59			0.61	ND	ND	0.56	0.58	0.59	0.62	0.8	ND	0.88
Arsenic	0.5		mg/kg	2.5	5.3	3.5	5	5.5	5.8	4.3	11			12	3.2	7	4.5	6.9	8	7.8	5.6	2.9	7
Barium	1		mg/kg	88	130	100	120	110	170	100	130			130	100	110	130	120	120	120	160	43	180
Beryllium	0.1		mg/kg	0.27	0.51	0.33	0.54	0.5	0.52	0.48	0.41			0.38	0.3	0.55	0.46	0.43	0.41	0.36	0.44	0.21	0.48
Cadmium	0.1		mg/kg	0.26	0.18	ND	0.17	0.15	0.12	0.15	0.11			ND	0.16	0.21	0.19	0.12	0.11	0.12	0.14	ND	0.2
Chromium, Total	0.5		mg/kg	17	42	16	20	23	30	22	21			21	16	24	23	21	23	19	24	10	27
Cobalt	0.2		mg/kg	6.5	8.7	7	8.3	9.1	12	8.8	8.4			8.7	5.7	9	8.3	8.2	8.1	7.7	9	3	10
Copper	0.5		mg/kg	17	23	19	23	23	32	20	25			20	13	22	24	21	20	19	24	4.7	29
Lead	0.5		mg/kg	4	7.2	4.4	7.4	8.1	7	5.8	5.3			4.5	3.2	6.8	6.1	7.3	6.2	5.4	6.8	1.2	6.8
Mercury	0.01		mg/kg	0.026	0.026	0.043	0.032	0.024	0.065	0.025	0.022			0.021	0.018	0.019	0.03	0.034	0.033	0.031	0.064	0.017	0.05
Molybdenum	0.2		mg/kg	4.1	1.9	4.8	2.3	2.1	1	1.8	1.1			0.93	1.2	1.6	1.3	1.4	1.2	0.84	1	0.28	0.6
Nickel	0.5		mg/kg	15	31	13	15	18	23	16	16			16	12	16	16	16	17	15	18	6.7	21
Selenium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	0.5	ND	ND
Silver	0.1		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	37	46	36	47	47	51	44	43			43	31	48	46	43	43	39	48	21	47
Zinc	5		mg/kg	45	62	43	51	57	65	56	47			48	34	66	54	51	49	45	54	19	63
Parameter: VOCs (USEPA 8260B)	MDL	MRL	Units																				
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1.4	5	ug/kg	ND	4.7 J	ND	2.7 J	2.2 J	3.8 J	ND	13	1.7 J	1.4 J	5.6	1.5 J	2.6 J	1.5 J	5.9	7.2	6.5	7.9	ND	4.3 J
Toluene	1.1	5	ug/kg	ND	3.7 J	ND	1.5 J	1.1 J	2.1 J	ND	15	ND	ND	5.0	1.4 J	2.3 J	1.3 J	5.6	7.1	6.0	7.3	ND	3.0 J
Ethylbenzene	0.36	5	ug/kg	ND	0.60 J	ND	ND	ND	ND	ND	2.5 J	ND	ND	0.92 J	ND	ND	ND	0.85 J	0.92 J	0.92 J	1.1 J	ND	ND
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	0.60 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	2.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.52	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	5	ug/kg	39	16	46	16	30	38	26	33	39	21	16	21	30	37	33	26	29	23	7.7	16
2-Butanone	1.5	5	ug/kg	ND	ND	ND	ND	3.0 J	8.2	ND	ND	4.4 J	ND	ND	ND	ND	5.3	3.1 J	3.4 J	3.9 J	4.0 J	ND	ND
Parameter: TPH (USEPA 8015B)		MRL	Units																				
Gasoline Range		2	mg/kg																				
Diesel Range		100	mg/kg																				
Oil Range		1000	mg/kg																				

Analytical Soil Data -- Metals, Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Pipelines -- Alamitos Generating Station

Table 15

	Sample ID			P85-1	P85-2	P85-S1-1	P85-S1-2	P86-1	P86-2	P87-1	P87-2	P88-1	P88-2	P89-1	P89-2	P90-1	P90-2	P91-1	P91-2	P92-1	P92-2	P93-1	P93-2
	Depth (feet)			5	7	7	9	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3
	Date			12/5/2012		11/5/2013		11/7/2012															
Parameter: Metals (USEPA 200.8)	**MRL**		**Units**																				
Antimony	0.5		mg/kg	**0.69**	**0.74**			**0.58**	**0.6**	**0.58**	ND	ND	ND	**0.6**	ND	**0.53**	**0.64**	**0.57**	**0.59**	**0.52**	ND	ND	ND
Arsenic	0.5		mg/kg	**6.8**	**7.3**			**5.1**	**5.2**	**7.8**	**4.1**	**5.5**	**6.3**	**7.2**	**5.8**	**6.1**	**8**	**6.1**	**5.6**	**5.6**	**4.7**	**5.2**	**4.8**
Barium	1		mg/kg	**140**	**130**			**140**	**130**	**120**	**94**	**120**	**120**	**120**	**120**	**120**	**140**	**130**	**140**	**120**	**110**	**100**	**110**
Beryllium	0.1		mg/kg	**0.38**	**0.37**			**0.47**	**0.42**	**0.4**	**0.33**	**0.46**	**0.51**	**0.49**	**0.5**	**0.51**	**0.54**	**0.5**	**0.53**	**0.52**	**0.47**	**0.48**	**0.45**
Cadmium	0.1		mg/kg	**0.21**	**0.12**			**0.17**	**0.12**	**0.15**	ND	**0.16**	**0.19**	**0.23**	**0.13**	**0.17**	**0.14**	**0.18**	**0.14**	**0.14**	**0.11**	**0.15**	**0.14**
Chromium, Total	0.5		mg/kg	**23**	**22**			**23**	**20**	**20**	**14**	**21**	**24**	**24**	**22**	**23**	**24**	**24**	**25**	**24**	**23**	**23**	**23**
Cobalt	0.2		mg/kg	**8.2**	**8.3**			**9.1**	**8.2**	**8.4**	**5**	**8.7**	**9.5**	**9.5**	**9.1**	**9**	**9.4**	**10**	**9.9**	**9.8**	**9.4**	**10**	**9.3**
Copper	0.5		mg/kg	**23**	**23**			**22**	**19**	**20**	**8.1**	**20**	**22**	**23**	**20**	**22**	**23**	**23**	**24**	**22**	**20**	**20**	**21**
Lead	0.5		mg/kg	**9.4**	**5.8**			**9.1**	**6**	**7.1**	**3.3**	**7.8**	**8.4**	**9.5**	**7**	**8.3**	**7.3**	**7.7**	**7.1**	**7.5**	**6.7**	**6.5**	**5.9**
Mercury	0.01		mg/kg	**0.039**	**0.045**			ND	**0.027**	ND	ND	**0.026**	**ND**	**0.048**	**0.028**	**0.03**	**0.03**	**0.027**	**0.03**	**0.022**	**0.019**	**0.021**	**0.026**
Molybdenum	0.2		mg/kg	**1.1**	**0.51**			**1.5**	**1.6**	**1.7**	**0.72**	**1.9**	**2.1**	**2.4**	**2**	**2.2**	**2.4**	**1.8**	**1.9**	**1.7**	**1.5**	**3.3**	**2**
Nickel	0.5		mg/kg	**16**	**17**			**23**	**16**	**23**	**17**	**16**	**17**	**23**	**17**	**17**	**17**	**18**	**19**	**18**	**17**	**19**	**17**
Selenium	0.5		mg/kg	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1		mg/kg	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5		mg/kg	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	1		mg/kg	**42**	**40**			**51**	**40**	**55**	**78**	**44**	**49**	**50**	**46**	**47**	**51**	**48**	**48**	**49**	**47**	**45**	**45**
Zinc	5		mg/kg	**54**	**49**			**56**	**44**	**52**	**28**	**57**	**61**	**62**	**58**	**59**	**58**	**61**	**62**	**62**	**59**	**60**	**57**
Parameter: VOCs (USEPA 8260B)	**MDL**	**MRL**	**Units**																				
Trichloroethene (TCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	1.5	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	1	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	0.86	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1.4	5	ug/kg	**6.9**	**12**	**4.6 J**	**3.2 J**	**8.8**	**8.5**	**8.0**	ND	**3.4 J**	**5.9**	**4.3 J**	**4.7 J**	**7.6**	**4.5 J**	**3.5 J**	**2.1 J**	**3.1 J**	ND	**1.4 J**	ND
Toluene	1.1	5	ug/kg	**5.6**	**11**	**3.0 J**	**2.5 J**	**7.6**	**6.0**	**6.3**	ND	**2.7 J**	**4.9 J**	**3.8 J**	**3.0 J**	**7.3**	**2.8 J**	**3.4 J**	**1.8 J**	**2.5 J**	ND	ND	ND
Ethylbenzene	0.36	5	ug/kg	**0.85 J**	**1.5 J**	**0.38 J**	ND	**1.2 J**	ND	**1.2 J**	ND	**0.45 J**	**0.76 J**	**0.58 J**	ND	**1.2 J**	**0.47 J**	**0.60 J**	ND	ND	ND	ND	ND
Isopropylbenzene	0.57	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.68	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethybenzene	0.48	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,5-Trimethybenzene	0.50	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	1.4	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	1.4	5	ug/kg	ND	**1.7 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	1.3	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.51	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m-Dichlorobenzene (m-DCB)	0.7	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Dichlorobenzene (o-DCB)	0.60	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Dichlorobenzene (p-DCB)	0.70	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.55	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.52	5	ug/kg	ND	**0.66 J**	ND	ND	**0.53 J**	ND	**0.56 J**	ND	ND	ND	ND	ND	**0.52 J**	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.64	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.46	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	1.2	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	2.5	5	ug/kg	**58**	**30**	**52**	**71**	**41**	**66**	**51**	**21**	**33**	ND	ND	**24**	ND	**34**	**17**	**32**	**29**	**21**	ND	**25**
2-Butanone	1.5	5	ug/kg	**6.2**	**5.7**	**4.9 J**	ND	ND	ND	**3.8 J**	ND	**3.2 J**	ND	**3.5 J**	ND	ND	**3.3 J**	ND	ND	ND	ND	ND	ND
Parameter: TPH (USEPA 8015B)		**MRL**	**Units**																				
Gasoline Range		2	mg/kg																				
Diesel Range		100	mg/kg																				
Oil Range		1000	mg/kg																				

Table 16

Analytical Soil Data -- Semi-Volatile Organic Compounds
Pipelines -- Alamitos Generating Station

	Sample ID	P3-3		P4-3		P7-3		P8-3		P18-2		P19-3		P20-1		P20-3		P26-3		P27-1		P27-3	
	Date	10/30/2012				12/13/2012				4/19/2013								4/17/2013					
USEPA 8270C-SIM	Units: ug/kg	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Parameter																							
1-Methylnaphthalene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
2-Methylnaphthalene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Acenaphthene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Acenaphthylene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Anthracene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Benzo (a) anthracene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Benzo (a) pyrene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Benzo (b) fluoranthene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Benzo (g,h,i) perylene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Benzo (k) fluoranthene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Chrysene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Dibenzo (a,h) anthracene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Fluoranthene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Fluorene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Indeno (1,2,3-cd) pyrene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Naphthalene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Phenanthrene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0
Pyrene		ND	5.0	ND	5.0	ND	10	ND	5.0	ND	50	ND	5.0	ND	5.0	ND	5.0	ND	5.0	ND	50	ND	5.0

Analytical Soil Data -- Semi-Volatile Organic Compounds
Pipelines -- Alamitos Generating Station

	Sample ID	P62-2		P63-3		P64-1		P64-3		P71-1		P71-3		P72-3		P73-2	
	Date	1/31/2013		1/31/2013		1/31/2013		1/31/2013		1/31/2013		1/31/2013		1/31/2013		1/31/2013	
USEPA 8270C-SIM	Units: ug/kg	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Parameter																	
1-Methylnaphthalene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
2-Methylnaphthalene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Acenaphthene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Acenaphthylene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Anthracene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Benzo (a) anthracene		ND	16	ND	16	**21**	16	ND	16	ND	16	**21**	16	ND	16	ND	15
Benzo (a) pyrene		ND	16	ND	16	**18**	16	ND	16	ND	16	**17**	16	ND	16	ND	15
Benzo (b) fluoranthene		ND	16	ND	16	**20**	16	ND	16	ND	16	**19**	16	ND	16	ND	15
Benzo (g,h,i) perylene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Benzo (k) fluoranthene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Chrysene		ND	16	ND	16	**20**	16	ND	16	ND	16	**20**	16	ND	16	ND	15
Dibenzo (a,h) anthracene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Fluoranthene		ND	16	ND	16	**51**	16	ND	16	ND	16	**48**	16	ND	16	ND	15
Fluorene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Indeno (1,2,3-cd) pyrene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Naphthalene		ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	16	ND	15
Phenanthrene		ND	16	ND	16	**42**	16	ND	16	ND	16	**44**	16	ND	16	ND	15
Pyrene		ND	16	ND	16	**47**	16	ND	16	ND	16	**45**	16	ND	16	ND	15

Table 17

Analytical Soil Data -- Dioxins/Furans
Pipelines -- Alamitos Generating Station

	Sample ID		P3-3		Sample ID		P4-3		Sample ID		P7-3		Sample ID		P8-3		Sample ID		P18-2	
	Date		10/30/2012		Date		10/30/2012		Date		12/13/2012		Date		12/13/2012		Date		4/19/2013	
	TEQ		0.00		TEQ		0.0200		TEQ		0.241		TEQ		0.00		TEQ		0.0921	
USEPA 8280A	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**
Parameter	**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**	
2,3,7,8-TCDD	0.0907	0.860	ND		0.0907	0.769	ND		0.0907	0.347	ND		0.0907	0.292	ND		0.0907	0.724	ND	
1,2,3,7,8-PeCDD	0.146	0.557	ND		0.146	0.423	ND		0.146	0.409	ND		0.146	0.273	ND		0.146	0.541	ND	
1,2,3,4,7,8-HxCDD	0.227	1.06	ND		0.227	1.42	ND		0.227	0.735	ND		0.227	0.461	ND		0.227	1.22	ND	
1,2,3,6,7,8-HxCDD	0.252	1.20	ND		0.252	1.52	ND		0.252	0.817	ND		0.252	0.489	ND		0.252	1.27	ND	
1,2,3,7,8,9-HxCDD	0.226	1.06	ND		0.226	1.37	ND		0.226	0.724	ND		0.226	0.443	ND		0.226	1.17	ND	
1,2,3,4,6,7,8-HpCDD	0.428	1.29	ND		0.428		**1.77 J**	**0.0177**	0.428		**7.51 J**	**0.0751**	0.428	1.05	ND		0.428		**8.14 J**	**0.0814**
OCDD	1.41	3.47	ND		1.41		**7.79 J**	**0.00234**	1.41		**76.6**	**0.0230**	1.41	3.42	ND		1.41		**35.5**	**0.0107**
2,3,7,8-TCDF	0.0815	0.473	ND		0.0815	0.657	ND		0.0815	0.328	ND		0.0815	0.170	ND		0.0815	0.330	ND	
1,2,3,7,8-PeCDF	0.107	0.678	ND		0.107	0.661	ND		0.107	0.829	ND		0.107	0.201	ND		0.107	0.355	ND	
2,3,4,7,8-PeCDF	0.111	0.715	ND		0.111	0.677	ND		0.111	0.798	ND		0.111	0.210	ND		0.111	0.396	ND	
1,2,3,4,7,8-HxCDF	0.112	0.571	ND		0.112	0.792	ND		0.112		**0.870 J**	**0.0870**	0.112	0.234	ND		0.112	0.515	ND	
1,2,3,6,7,8-HxCDF	0.118	0.593	ND		0.118	0.833	ND		0.118		**0.414 J**	**0.0414**	0.118	0.240	ND		0.118	0.491	ND	
2,3,4,6,7,8-HxCDF	0.132	0.684	ND		0.132	0.913	ND		0.132	0.243	ND		0.132	0.289	ND		0.132	0.564	ND	
1,2,3,7,8,9-HxCDF	0.201	0.916	ND		0.201	1.20	ND		0.201	0.354	ND		0.201	0.419	ND		0.201	0.657	ND	
1,2,3,4,6,7,8-HpCDF	0.173	0.778	ND		0.173	1.33	ND		0.173		**1.27 J**	**0.0127**	0.173	0.491	ND		0.173	0.766	ND	
1,2,3,4,7,8,9-HpCDF	0.230	0.941	ND		0.230	1.64	ND		0.230	0.536	ND		0.230	0.579	ND		0.230	0.909	ND	
OCDF	0.518	1.79	ND		0.518	2.49	ND		0.518		**4.52 J**	**0.00136**	0.518	2.33	ND		0.518	2.44	ND	
Total TCDD		0.860	ND			0.769	ND			0.347	ND			0.292	ND			0.724	ND	
Total PeCDD		0.557	ND			0.423	ND			0.409	ND			0.273	ND			0.541	ND	
Total HxCDD		1.20	ND			1.52	ND			0.817	ND			0.489	ND			1.27	ND	
Total HpCDD		1.29	ND				**3.89 J**				**14.2 J**			1.05	ND				**13.1**	
Total TCDF		0.473	ND			0.657	ND				**0.743 J,M**			0.170	ND			0.330	ND	
Total PeCDF		0.715	ND			0.677	ND			0.829	ND			0.210	ND			0.396	ND	
Total HxCDF		0.916	ND			1.20	ND				**2.79 J**			0.419	ND			0.657	ND	
Total HpCDF		0.941	ND			1.64	ND				**3.08 J**			0.579	ND			0.909	ND	

Notes: J Analyte concentration is below calibration range

M Maximum possible concentration

Analytical Soil Data -- Dioxins/Furans
Pipelines -- Alamitos Generating Station

	Sample ID		P19-3		Sample ID		P20-1		Sample ID		P20-3		Sample ID		P26-3		Sample ID		P27-1	
	Date		4/19/2013		Date		4/19/2013		Date		4/19/2013		Date		4/17/2013		Date		4/17/2013	
	TEQ		0.00		TEQ		0.00		TEQ		0.00		TEQ		0.00346		TEQ		0.0474	
USEPA 8280A	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**
Parameter	Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g	
2,3,7,8-TCDD	0.0907	0.648	ND		0.0907	0.571	ND		0.0907	0.662	ND		0.0907	0.665	ND		0.0907	0.605	ND	
1,2,3,7,8-PeCDD	0.146	0.538	ND		0.146	0.395	ND		0.146	0.607	ND		0.146	0.346	ND		0.146	0.632	ND	
1,2,3,4,7,8-HxCDD	0.227	0.737	ND		0.227	0.897	ND		0.227	0.892	ND		0.227	0.547	ND		0.227	0.745	ND	
1,2,3,6,7,8-HxCDD	0.252	0.778	ND		0.252	0.904	ND		0.252	0.988	ND		0.252	0.590	ND		0.252	0.787	ND	
1,2,3,7,8,9-HxCDD	0.226	0.710	ND		0.226	0.844	ND		0.226	0.881	ND		0.226	0.530	ND		0.226	0.715	ND	
1,2,3,4,6,7,8-HpCDD	0.428	1.63	ND		0.428	1.60	ND		0.428	1.26	ND		0.428	1.22	ND		0.428		**2.51 J**	**0.0251**
OCDD	1.41	2.69	ND		1.41	3.96	ND		1.41	3.67	ND		1.41		**6.7 J**	**0.00201**	1.41		**27**	**0.0081**
2,3,7,8-TCDF	0.0815	0.507	ND		0.0815	0.477	ND		0.0815	0.385	ND		0.0815	0.576	ND		0.0815	0.356	ND	
1,2,3,7,8-PeCDF	0.107	0.326	ND		0.107	0.307	ND		0.107	0.348	ND		0.107	0.358	ND		0.107	0.652	ND	
2,3,4,7,8-PeCDF	0.111	0.351	ND		0.111	0.323	ND		0.111	0.383	ND		0.111	0.360	ND		0.111	0.659	ND	
1,2,3,4,7,8-HxCDF	0.112	0.332	ND		0.112	0.346	ND		0.112	0.359	ND		0.112	0.512	ND		0.112	0.403	ND	
1,2,3,6,7,8-HxCDF	0.118	0.331	ND		0.118	0.338	ND		0.118	0.352	ND		0.118	0.526	ND		0.118	0.424	ND	
2,3,4,6,7,8-HxCDF	0.132	0.370	ND		0.132	0.371	ND		0.132	0.390	ND		0.132	0.575	ND		0.132	0.474	ND	
1,2,3,7,8,9-HxCDF	0.201	0.453	ND		0.201	0.454	ND		0.201	0.468	ND		0.201	0.734	ND		0.201	0.589	ND	
1,2,3,4,6,7,8-HpCDF	0.173	1.67	ND		0.173	0.969	ND		0.173	0.884	ND		0.173	1.34	ND		0.173		**1.21 J**	**0.0121**
1,2,3,4,7,8,9-HpCDF	0.230	1.97	ND		0.230	1.11	ND		0.230	0.976	ND		0.230	1.53	ND		0.230	0.465	ND	
OCDF	0.518		**6.27 J**	**0.00188**	0.518	2.07	ND		0.518	3.96	ND		0.518		**4.84 J**	**0.00145**	0.518		**6.96 J**	**0.00209**
Total TCDD		0.648	ND			0.571	ND			0.662	ND			0.665	ND			0.605	ND	
Total PeCDD		0.538	ND			0.395	ND			0.607	ND			0.346	ND			0.632	ND	
Total HxCDD		0.778	ND			0.90	ND			0.988	ND			0.59	ND			0.787	ND	
Total HpCDD		1.63	ND			1.60	ND			1.26	ND			1.22	ND				**5.83**	
Total TCDF		0.507	ND			0.477	ND			0.385	ND			0.576	ND				**1.10 J,M**	
Total PeCDF		0.351	ND			0.323	ND			0.383	ND			0.36	ND				**0.986 J**	
Total HxCDF		0.453	ND			0.454	ND			0.468	ND			0.734	ND				**0.602 J**	
Total HpCDF		1.97	ND			1.11	ND			0.976	ND			1.53	ND				**2.96 J**	

Notes: J Analyte concentration is below calibration range

M Maximum possible concentration

Table 17

Analytical Soil Data -- Dioxins/Furans
Pipelines -- Alamitos Generating Station

	Sample ID		P27-3		Sample ID		P62-2		Sample ID		P63-3		Sample ID		P64-1		Sample ID		P64-3	
	Date		4/17/2013		Date		1/31/2013		Date		1/31/2013		Date		1/31/2013		Date		1/31/2013	
	TEQ		0.00239		TEQ		0.000840		TEQ		0.0804		TEQ		0.0226		TEQ		0.0380	
USEPA 8280A	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**
Parameter	**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**	
2,3,7,8-TCDD	0.0907	0.754	ND		0.0907	0.559	ND		0.0907	0.464	ND		0.0907	0.607	ND		0.0907	0.454	ND	
1,2,3,7,8-PeCDD	0.146	0.586	ND		0.146	0.416	ND		0.146	0.630	ND		0.146	0.475	ND		0.146	0.500	ND	
1,2,3,4,7,8-HxCDD	0.227	0.747	ND		0.227	0.497	ND		0.227	0.567	ND		0.227	0.733	ND		0.227	1.08	ND	
1,2,3,6,7,8-HxCDD	0.252	0.739	ND		0.252	0.512	ND		0.252	0.582	ND		0.252	0.804	ND		0.252	1.13	ND	
1,2,3,7,8,9-HxCDD	0.226	0.693	ND		0.226	0.471	ND		0.226	0.536	ND		0.226	0.717	ND		0.226	1.03	ND	
1,2,3,4,6,7,8-HpCDD	0.428	1.30	ND		0.428	1.14	ND		0.428		**6.80 J**	**0.0680**	0.428		**1.73 J**	**0.0173**	0.428		**3.11 J**	**0.0311**
OCDD	1.41		**4.47 J**	**0.00134**	1.41		**2.80 J**	**0.000840**	1.41		**41.4**	**0.0124**	1.41		**17.7**	**0.00531**	1.41		**23.1**	**0.00693**
2,3,7,8-TCDF	0.0815	0.310	ND		0.0815	0.529	ND		0.0815	0.566	ND		0.0815	0.462	ND		0.0815	0.577	ND	
1,2,3,7,8-PeCDF	0.107	0.531	ND		0.107	0.375	ND		0.107	0.327	ND		0.107	0.398	ND		0.107	0.601	ND	
2,3,4,7,8-PeCDF	0.111	0.551	ND		0.111	0.400	ND		0.111	0.361	ND		0.111	0.410	ND		0.111	0.664	ND	
1,2,3,4,7,8-HxCDF	0.112	0.396	ND		0.112	0.597	ND		0.112	0.791	ND		0.112	0.625	ND		0.112	0.798	ND	
1,2,3,6,7,8-HxCDF	0.118	0.409	ND		0.118	0.558	ND		0.118	0.732	ND		0.118	0.608	ND		0.118	0.716	ND	
2,3,4,6,7,8-HxCDF	0.132	0.460	ND		0.132	0.651	ND		0.132	0.861	ND		0.132	0.611	ND		0.132	0.82	ND	
1,2,3,7,8,9-HxCDF	0.201	0.586	ND		0.201	0.941	ND		0.201	1.20	ND		0.201	0.787	ND		0.201	1.08	ND	
1,2,3,4,6,7,8-HpCDF	0.173	0.784	ND		0.173	0.537	ND		0.173	0.695	ND		0.173	0.471	ND		0.173	0.764	ND	
1,2,3,4,7,8,9-HpCDF	0.230	0.902	ND		0.230	0.871	ND		0.230	1.15	ND		0.230	0.563	ND		0.230	1.16	ND	
OCDF	0.518		**3.50 J**	**0.00105**	0.518	0.983	ND		0.518	1.25	ND		0.518	1.47	ND		0.518	1.73	ND	
Total TCDD		0.754	ND			0.559	ND			0.464	ND			0.607	ND			0.454	ND	
Total PeCDD		0.586	ND			0.416	ND			0.36	ND			0.475	ND			0.5	ND	
Total HxCDD		0.747	ND			0.512	ND				**2.07 J**			0.804	ND			1.13	ND	
Total HpCDD		1.30	ND			1.14	ND				**15.3 J**				**3.87 J**				**7.52 J**	
Total TCDF			**0.738 J**			0.529	ND			0.566	ND			0.462	ND			0.577	ND	
Total PeCDF			**3.48 J**			0.400	ND			0.361	ND				**0.711 J**				**1.00 J**	
Total HxCDF			**0.884 J**			0.941	ND			1.20	ND			0.787	ND			1.08	ND	
Total HpCDF		0.902	ND			0.871	ND			1.15	ND			0.563	ND			1.16	ND	

Notes: J Analyte concentration is below calibration range

M Maximum possible concentration

Analytical Soil Data -- Dioxins/Furans
Pipelines -- Alamitos Generating Station

	Sample ID		P71-1		Sample ID		P71-3		Sample ID		P72-3		Sample ID		P73-2	
	Date		1/31/2013		Date		1/31/2013		Date		1/31/2013		Date		1/31/2013	
	TEQ		0.109		TEQ		0.0387		TEQ		0.0348		TEQ		0.0742	
USEPA 8280A	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**
Parameter	**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**	
2,3,7,8-TCDD	0.0907	0.667	ND		0.0907	0.64	ND		0.0907	0.542	ND		0.0907	0.754	ND	
1,2,3,7,8-PeCDD	0.146	0.509	ND		0.146	0.636	ND		0.146	0.284	ND		0.146	0.375	ND	
1,2,3,4,7,8-HxCDD	0.227	1.02	ND		0.227	0.802	ND		0.227	0.667	ND		0.227	1.01	ND	
1,2,3,6,7,8-HxCDD	0.252	1.10	ND		0.252	0.878	ND		0.252	0.757	ND		0.252	1.07	ND	
1,2,3,7,8,9-HxCDD	0.226	0.986	ND		0.226	0.783	ND		0.226	0.664	ND		0.226	0.970	ND	
1,2,3,4,6,7,8-HpCDD	0.428		**7.23**	**0.0723**	0.428		**2.50 J**	**0.0250**	0.428		**2.80 J**	**0.0280**	0.428		**5.39 J**	**0.0539**
OCDD	1.41		**82.2**	**0.0247**	1.41		**25.2**	**0.00756**	1.41		**22.7**	**0.00681**	1.41		**67.8**	**0.0203**
2,3,7,8-TCDF	0.0815	0.238	ND		0.0815	0.532	ND		0.0815	0.107	ND		0.0815	0.392	ND	
1,2,3,7,8-PeCDF	0.107	0.467	ND		0.107	0.592	ND		0.107	0.572	ND		0.107	0.387	ND	
2,3,4,7,8-PeCDF	0.111	0.477	ND		0.111	0.574	ND		0.111	0.599	ND		0.111	0.425	ND	
1,2,3,4,7,8-HxCDF	0.112	0.482	ND		0.112	0.836	ND		0.112	0.536	ND		0.112	0.657	ND	
1,2,3,6,7,8-HxCDF	0.118	0.492	ND		0.118	0.831	ND		0.118	0.512	ND		0.118	0.656	ND	
2,3,4,6,7,8-HxCDF	0.132	0.527	ND		0.132	0.948	ND		0.132	0.586	ND		0.132	0.704	ND	
1,2,3,7,8,9-HxCDF	0.201	0.603	ND		0.201	1.15	ND		0.201	0.694	ND		0.201	0.849	ND	
1,2,3,4,6,7,8-HpCDF	0.173		**1.05 J**	**0.0105**	0.173		**0.560 J**	**0.0056**	0.173	0.711	ND		0.173	0.731	ND	
1,2,3,4,7,8,9-HpCDF	0.230	0.586	ND		0.230	0.432	ND		0.230	0.844	ND		0.230	0.889	ND	
OCDF	0.518		**4.41 J**	**0.00132**	0.518		**1.91 J**	**0.000573**	0.518	1.58	ND		0.518	1.22	ND	
Total TCDD		0.667	ND			0.640	ND			0.542	ND			0.766	ND	
Total PeCDD		0.509	ND			0.636	ND			0.284	ND			0.375	ND	
Total HxCDD		1.10	ND			0.878	ND			0.757	ND			1.07	ND	
Total HpCDD			**16.7**				**6.96**				**6.01**				**12.2**	
Total TCDF			**0.622 J**			0.532	ND				**0.436 J**			0.392	ND	
Total PeCDF			**3.55 J**				**.986 J**				**0.805 J**			0.425	ND	
Total HxCDF			**2.05 J**			1.15	ND			0.694	ND			0.849	ND	
Total HpCDF			**3.36 J**				**1.47 J**			0.844	ND			0.889	ND	

Notes: J Analyte concentration is below calibration range

M Maximum possible concentration

Analytical Soil Data -- Metals -- Nature and Extent Investigation
Northeast Corner -- Central Basin -- Alamitos Generating Station

USEPA Method 6020	Sample ID		C1-1	C1-2	C1-3	C1-4	C2-1	C2-2	C2-3	C2-4	C3-1	C3-2	C3-3	C3-4	C4-1	C4-2	C4-3	C4-4	C5-1	C5-2	C5-3	C5-4
	Depth (feet)		1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10
	Date		2009																			
	PQL	Units																				
Antimony	0.2	mg/kg	0.55	0.91	0.55	ND	0.82	0.52	0.69	ND	0.61	0.75	0.62	0.64	0.59	0.51	0.65	0.52	0.77	0.77	0.56	ND
Arsenic	0.5	mg/kg	7.1	9.6	8.9	1.7	21	4.8	7.8	6.4	7.5	6	7.3	11	5.1	4.9	18	4.5	7.3	8.9	20	2.9
Barium	1	mg/kg	150	200	87	170	170	100	110	240	160	160	150	230	130	130	91	110	210	210	92	120
Beryllium	0.1	mg/kg	0.63	0.67	0.38	0.46	0.48	0.41	0.5	0.51	0.66	0.6	0.51	0.48	0.5	0.59	0.38	0.34	0.67	0.62	0.43	0.38
Cadmium	0.1	mg/kg	0.3	0.25	ND	0.36	0.62	0.15	ND	0.25	0.27	0.16	ND	ND	0.23	0.25	ND	0.11	0.32	0.18	ND	0.2
Chromium, Total	0.5	mg/kg	33	37	22	23	110	27	30	28	34	32	33	29	26	29	21	20	37	34	23	19
Cobalt	0.2	mg/kg	11	12	8.5	7.7	44	8.2	10	9.5	13	11	11	11	13	9.6	8.3	7.3	30	11	9.1	6.7
Copper	0.5	mg/kg	35	43	20	24	110	22	26	28	32	29	29	32	25	26	20	20	45	36	21	21
Lead	0.5	mg/kg	7.4	9.4	4.3	5.1	38	5.9	6.4	5.8	8.4	8	6.9	6.2	6.5	7.3	4.6	4.6	10	8.7	4.6	4.5
Mercury	0.060	mg/kg	0.047	0.100	0.032	0.030	0.220	0.059	0.048	0.034	0.047	0.053	0.046	0.100	0.052	0.028	0.033	0.025	0.074	0.060	0.033	0.030
Molybdenum	0.2	mg/kg	1.7	1.8	1.2	0.38	4.4	1.5	1.3	0.68	1.8	1.3	2.1	1.2	1.3	1.7	0.85	0.6	1.9	1.7	0.83	0.41
Nickel	0.5	mg/kg	41	32	16	16	1,200	41	45	20	72	27	24	22	160	20	19	18	520	26	18	15
Selenium	0.5	mg/kg	0.5	ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.77	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	65	66	39	38	490	53	62	42	62	58	50	48	51	55	41	37	73	57	41	33
Zinc	5	mg/kg	82	79	52	49	220	55	61	81	77	66	71	65	63	69	50	46	85	69	55	43
pH		units	8.1	7.8	8.0	7.8	7.2	8.0	8.0	7.9	8.0	8.2	8.0	7.6	8.2	8.3	8.0	7.8	7.3	8.4	7.9	7.4

Table 18

Analytical Soil Data -- Metals -- Nature and Extent Investigation
Northeast Corner -- Central Basin -- Alamitos Generating Station

	Sample ID		C6-1	C6-2	C6-3	C6-4	C7-1	C7-2	C7-3	C7-4	C8-1	C8-2	C8-3	C8-4	C9-1	C9-2	C9-3	C9-4	C10-1	C10-2	C10-3	C10-4
	Depth (feet)		1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10
USEPA Method 6020	Date		2009																2010			
	PQL	Units																				
Antimony	0.2	mg/kg	ND	0.56	0.59	ND	0.72	0.83	0.64	0.5	0.94	0.82	0.75	0.71	0.68	0.72	0.58	ND	ND	0.93	0.67	ND
Arsenic	0.5	mg/kg	4.7	5.9	6.5	4.3	5.2	4.8	20	2.3	6.1	4.5	13	2.5	5.2	6.6	11	2.9	12	9.7	10	4.2
Barium	1	mg/kg	100	140	100	140	120	160	71	110	160	160	79	130	140	160	110	110	150	180	140	220
Beryllium	0.1	mg/kg	0.66	0.58	0.36	0.42	0.35	0.44	0.31	0.31	0.59	0.49	0.33	0.38	0.44	0.63	0.36	0.31	0.83	0.77	0.36	0.34
Cadmium	0.1	mg/kg	0.32	0.24	ND	0.13	0.16	0.13	ND	0.1	0.3	0.22	ND	0.11	0.15	0.22	ND	ND	0.22	0.32	ND	0.16
Chromium, Total	0.5	mg/kg	25	31	22	22	28	27	21	18	38	29	23	22	27	32	21	19	33	41	21	19
Cobalt	0.2	mg/kg	31	31	8.8	7.6	9.6	9.9	8.4	6.7	11	10	9.3	9	12	11	8.5	7	24	13	8.1	6.7
Copper	0.5	mg/kg	20	29	19	19	25	28	18	16	34	29	21	24	27	31	18	16	34	43	16	19
Lead	0.5	mg/kg	5	6.9	4.4	4.7	4.8	6.6	3.9	3.5	7.7	6.6	4.4	4.7	5.7	8	4.2	4	11	11	4.3	4.6
Mercury	0.060	mg/kg	0.019	0.053	0.027	0.061	0.065	0.038	0.025	0.084	0.050	0.042	0.028	0.041	0.040	0.043	0.032	0.130	0.026	0.046	0.027	0.026
Molybdenum	0.2	mg/kg	1.3	1.5	1.2	0.32	1.3	0.86	0.62	0.5	2	1.3	0.85	0.47	1.1	1.8	1.1	0.63	4.2	2.3	1.1	1.2
Nickel	0.5	mg/kg	950	850	24	17	31	19	17	13	30	21	17	17	76	28	23	18	590	32	15	15
Selenium	0.5	mg/kg	0.94	0.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.63	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.21	0.19	0.13	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	710	59	43	34	49	49	39	33	59	53	41	46	51	56	41	36	74	65	42	27
Zinc	5	mg/kg	140	75	52	47	52	57	45	39	69	62	48	46	63	71	44	45	73	84	43	38
pH		units	7.4	7.2	7.6	7.7	8.5	8.6	8.0	7.7	8.3	8.5	7.8	7.8	8.2	8.2	8.4	8.0	7.1	7.9	8.8	8.1

Analytical Soil Data -- Metals -- Nature and Extent Investigation
Northeast Corner -- Central Basin -- Alamitos Generating Station

	Sample ID		C11-1	C11-2	C11-3	C11-4	C12-1	C12-2	C12-3	C12-4	C13-1	C13-2	C13-3	C13-4	C14-1	C14-2	C14-3	C14-4
	Depth (feet)		1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10
USEPA Method 6020	Date		2010															
	PQL	Units																
Antimony	0.2	mg/kg	0.83	0.53	0.64	ND	1.2	0.57	0.61	ND	1.2	0.56	0.66	0.5	0.97	0.5	0.66	0.47
Arsenic	0.5	mg/kg	9.1	4.4	9	2.6	13	4.8	5.8	1.4	14	4.9	14	6	13	6.2	9.9	1.7
Barium	1	mg/kg	190	160	69	120	240	150	130	97	230	160	96	330	210	180	130	95
Beryllium	0.1	mg/kg	0.5	0.31	0.32	0.3	0.75	0.33	0.34	0.3	0.71	0.3	0.3	0.32	0.78	0.34	0.32	0.25
Cadmium	0.1	mg/kg	0.23	0.1	ND	0.12	0.35	0.12	ND	ND	0.3	0.11	ND	ND	0.25	0.12	ND	ND
Chromium, Total	0.5	mg/kg	28	18	20	17	36	20	20	18	35	18	19	17	36	18	20	15
Cobalt	0.2	mg/kg	10	6.5	7.5	6.3	13	7.1	7.6	7	13	6.4	7.9	7.5	13	6.5	8.4	5.4
Copper	0.5	mg/kg	30	16	16	14	47	19	17	15	43	17	16	14	42	17	19	13
Lead	0.5	mg/kg	6.9	5	3.9	3.6	11	5	4.1	3.6	9.9	4.9	3.9	4.1	11	4.5	4.2	3.1
Mercury	0.060	mg/kg	0.049	0.022	0.028	0.020	0.066	0.041	0.028	0.038	0.076	0.032	0.018	0.017	0.050	0.140	0.028	0.014
Molybdenum	0.2	mg/kg	2.1	0.68	0.68	0.42	2.2	0.86	0.7	0.28	2.1	0.5	0.92	1.8	2	0.57	1.5	0.34
Nickel	0.5	mg/kg	21	13	15	12	29	16	15	13	26	14	15	13	26	14	16	10
Selenium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.1	mg/kg	ND	ND	ND	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	0.5	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	5	mg/kg	53	37	39	31	64	40	41	36	66	35	37	33	66	37	38	31
Zinc	5	mg/kg	68	44	40	39	83	46	43	41	80	44	45	47	84	45	47	36
pH		units	8.7	8.2	7.6	7.3	8.9	8.8	7.7	7.7	8.8	8.8	8.2	7.8	8.5	8.9	8.2	7.8

Table 19

Analytical Soil Data -- Volatile Organic Compounds -- Nature and Extent Investigation
Northeast Corner -- Central Basin -- Alamitos Generating Station

	Sample ID		C1-1	C1-2	C1-3	C1-4	C2-1	C2-2	C2-3	C2-4	C3-1	C3-2	C3-3	C3-4	C4-1	C4-2	C4-3	C4-4	C5-1	C5-2	C5-3	C5-4
	Depth (feet)		1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10
	Date		2009																			
Parameter	PQL	Units																				
Trichloroethene (TCE)	5	ug/kg	570	38	ND	6.8	ND	5.7	ND	5.2	ND	6.7	5.3	7.6	140	380	11	19	45,000	1,900	1,000	920
Tetrachloroethene (PCE)	5	ug/kg	1,700	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	47	280	ND	ND	65,000	970	1,300	210
1,1,1-Trichloroethane (1,1,1-TCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-DCE)	5	ug/kg	ND	ND	ND	ND	ND	5.3	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	27	ND	ND	5.6
cis-1,2-Dichloroethene (C-1,2-DCE)	5	ug/kg	2,500	1,700	550	3,900	170	2,700	1,000	3,800	17	70	200	240	1,600	1,100	550	1,700	9,700	2,400	1,300	5,300
trans-1,2-Dichloroethene (t-1,2-DCE)	5	ug/kg	16	12	17	68	34	140	39	45	ND	7.6	23	22	42	20	42	48	63	22	57	120
1,1-Dichloroethane (1,1-DCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	5	ug/kg	22	24	11	62	53	96	44	30	ND	ND	15	14	110	5.7	17	22	80	ND	19	34
Benzene	5	ug/kg	ND	9.8	ND	9	5.8	ND	ND	7.8	ND	5	ND	ND	ND	ND	ND	ND	ND	5.9	ND	7.8
Ethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.2	ND	ND	ND
Isopropylbenzene	5	ug/kg	ND	ND	ND	ND	8.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	5	ug/kg	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ug/kg	ND	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	5	ug/kg	ND	ND	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	7.8	ND	7.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	6.2	ND	7.4
p-Isopropyltoluene	5	ug/kg	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	ND	ND	ND
o-Xylene	5	ug/kg	ND	ND	ND	ND	6.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9	ND	ND	ND
Chlorobenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.5	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	5	ug/kg	48	15	18	14	110	45	9.5	17	27	25	10	34	46	32	15	30	100	36	16	49
2-Butanone	5	ug/kg	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	5.6	ND	8.3

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Table 19

Analytical Soil Data -- Volatile Organic Compounds -- Nature and Extent Investigation
Northeast Corner -- Central Basin -- Alamitos Generating Station

	Sample ID		C6-1	C6-2	C6-3	C6-4	C7-1	C7-2	C7-3	C7-4	C8-1	C8-2	C8-3	C8-4	C9-1	C9-2	C9-3	C9-4	C10-1	C10-2	C10-3	C10-4
	Depth (feet)		1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10
	Date		2009																2010			
Parameter	PQL	Units																				
Trichloroethene (TCE)	5	ug/kg	9.1	57	14	45	19	100	19	82	3,600	1,000	190	610	38	130	7.9	72	ND	ND	ND	ND
Tetrachloroethene (PCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	810	110	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane (1,1,1-TCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-DCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	5	ug/kg	27	130	190	510	65	350	270	980	1,100	760	530	1,500	56	190	58	330	ND	8.3	ND	7.8
trans-1,2-Dichloroethene (t-1,2-DCE)	5	ug/kg	ND	35	15	34	7.8	63	19	42	28	49	38	56	11	58	6.6	59	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	5	ug/kg	ND	5.1	ND	7.4	ND	5.4	5.3	8.8	12	ND	6.9	7.8	ND	ND	ND	8.6	ND	ND	ND	ND
Benzene	5	ug/kg	ND	ND	ND	ND	ND	8.5	ND	ND	12	6.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
Ethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	ND	ND	7.2	ND	ND	11	5.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.1
p-Isopropyltoluene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	5	ug/kg	40	25	12	19	44	49	8.1	22	22	58	12	25	31	37	17	30	12	9.3	13	12
2-Butanone	5	ug/kg	ND	ND	ND	ND	ND	6	ND	ND	ND	8.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Table 19

Analytical Soil Data -- Volatile Organic Compounds -- Nature and Extent Investigation
Northeast Corner -- Central Basin -- Alamitos Generating Station

	Sample ID		C11-1	C11-2	C11-3	C11-4	C12-1	C12-2	C12-3	C12-4	C13-1	C13-2	C13-3	C13-4	C14-1	C14-2	C14-3	C14-4
	Depth (feet)		1	3	7	10	1	3	7	10	1	3	7	10	1	3	7	10
	Date		2010															
Parameter	PQL	Units																
Trichloroethene (TCE)	5	ug/kg	62	45	18	37	45	36	ND	65	18	25	ND	15	ND	ND	ND	ND
Tetrachloroethene (PCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane (1,1,1-TCA)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-DCE)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene (C-1,2-DCE)	5	ug/kg	48	43	47	53	84	38	20	95	24	29	8.2	48	9	ND	ND	ND
trans-1,2-Dichloroethene (t-1,2-DCE)	5	ug/kg	5.8	5.4	ND	ND	9.8	ND	ND	ND	ND	7	ND	7.6	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	5	ug/kg	19	8.4	12	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	5	ug/kg	7.1	ND	ND	ND	8.7	ND	ND	ND	6.2	6	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ug/kg	ND	ND	ND	ND	7	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-DCB)	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	5	ug/kg	36	73	17	26	11	52	32	ND	25	85	ND	ND	20	70	25	17
2-Butanone	5	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note: 1. All samples were analyzed for the complete USEPA Method 8260B list of parameters
2. Only the samples detecting a parameter are shown

Analytical Soil Data -- Semi-Volatile Organic Compounds -- Nature and Extent Investigation
North Corner -- Central Basin -- Alamitos Generating Station

	Sample ID	C1-1			C1-2			C1-3			C1-4			C2-1			C2-2			C2-3		
	Units: mg/kg																					
USEPA 8270C-SIM	Units: mg/kg	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL
Parameter																						
Acenaphthene		ND	0.15	0.37	ND	0.073	0.18	ND	0.015	0.037	ND	0.015	0.037	ND	0.74	1.9	ND	0.72	1.8	ND	0.073	0.18
Acenaphthylene		ND	0.1	0.37	ND	0.051	0.18	ND	0.01	0.037	ND	0.01	0.037	ND	0.52	1.9	ND	0.5	1.8	ND	0.051	0.18
Anthracene		ND	0.16	0.37	ND	0.08	0.18	ND	0.016	0.037	ND	0.016	0.037	ND	0.82	1.9	ND	0.79	1.8	ND	0.08	0.18
Benzo (a) anthracene		ND	0.13	0.37	ND	0.065	0.18	ND	0.013	0.037	ND	0.013	0.037	ND	0.67	1.9	ND	0.65	1.8	ND	0.065	0.18
Benzo (a) pyrene		ND	0.19	0.37	ND	0.095	0.18	ND	0.019	0.037	ND	0.019	0.037	ND	0.97	1.9	ND	0.93	1.8	ND	0.095	0.18
Benzo (b) fluoranthene		ND	0.22	0.37	ND	0.11	0.18	ND	0.022	0.037	ND	0.022	0.037	ND	1.1	1.9	ND	1.1	1.8	ND	0.11	0.18
Benzo (g,h,i) perylene		ND	0.12	0.37	ND	0.058	0.18	ND	0.012	0.037	ND	0.012	0.037	ND	0.59	1.9	ND	0.57	1.8	ND	0.058	0.18
Benzo (k) fluoranthene		ND	0.22	0.37	ND	0.11	0.18	ND	0.022	0.037	ND	0.022	0.037	ND	1.1	1.9	ND	1.1	1.8	ND	0.11	0.18
Chrysene		ND	0.16	0.37	ND	0.08	0.18	ND	0.016	0.037	ND	0.016	0.037	ND	0.82	1.9	ND	0.79	1.8	ND	0.08	0.18
Dibenzo (a,h) anthracene		ND	0.22	0.37	ND	0.11	0.18	ND	0.022	0.037	ND	0.022	0.037	ND	1.1	1.9	ND	1.1	1.8	ND	0.11	0.18
Fluoranthene		ND	0.21	0.37	ND	0.1	0.18	ND	0.021	0.037	ND	0.021	0.037	ND	1	1.9	ND	1.0	1.8	ND	0.1	0.18
Fluorene		ND	0.06	0.37	ND	0.029	0.18	ND	0.0059	0.037	ND	0.0059	0.037	ND	0.3	1.9	ND	0.29	1.8	ND	0.029	0.18
Indeno (1,2,3-cd) pyrene		ND	0.33	0.37	ND	0.16	0.18	ND	0.032	0.037	ND	0.032	0.037	ND	1.6	1.9	ND	1.6	1.8	ND	0.16	0.18
Naphthalene		ND	0.15	0.37	ND	0.073	0.18	ND	0.015	0.037	ND	0.015	0.037	ND	0.74	1.9	ND	0.72	1.8	ND	0.073	0.18
Phenanthrene		ND	0.24	0.37	ND	0.12	0.18	ND	0.024	0.037	ND	0.024	0.037	ND	1.2	1.9	ND	1.1	1.8	ND	0.12	0.18
Pyrene		ND	0.15	0.37	ND	0.073	0.18	ND	0.015	0.037	ND	0.015	0.037	ND	0.74	1.9	ND	0.72	1.8	ND	0.073	0.18

Analytical Soil Data -- Semi-Volatile Organic Compounds -- Nature and Extent Investigation
North Corner -- Central Basin -- Alamitos Generating Station

Sample ID	C2-4			C3-1			C3-2			C3-3			C3-4			C4-1			C5-1		
Units: mg/kg																					
USEPA 8270C-SIM Units: mg/kg	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL
Parameter																					
Acenaphthene	ND	0.015	0.037	ND	0.015	0.037	ND	0.015	0.036	ND	0.015	0.037	ND	0.015	0.036	ND	0.74	1.9	ND	0.74	1.9
Acenaphthylene	ND	0.01	0.037	ND	0.01	0.037	ND	0.01	0.036	ND	0.01	0.037	ND	0.01	0.036	ND	0.52	1.9	ND	0.52	1.9
Anthracene	ND	0.016	0.037	ND	0.016	0.037	ND	0.016	0.036	ND	0.016	0.037	ND	0.016	0.036	ND	0.82	1.9	ND	0.82	1.9
Benzo (a) anthracene	ND	0.013	0.037	ND	0.013	0.037	ND	0.013	0.036	ND	0.013	0.037	ND	0.013	0.036	ND	0.67	1.9	ND	0.67	1.9
Benzo (a) pyrene	ND	0.019	0.037	ND	0.019	0.037	ND	0.019	0.036	ND	0.019	0.037	ND	0.019	0.036	ND	0.97	1.9	ND	0.97	1.9
Benzo (b) fluoranthene	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.022	0.037	ND	0.022	0.036	ND	1.1	1.9	ND	1.1	1.9
Benzo (g,h,i) perylene	ND	0.012	0.037	ND	0.012	0.037	ND	0.012	0.036	ND	0.012	0.037	ND	0.012	0.036	ND	0.59	1.9	ND	0.59	1.9
Benzo (k) fluoranthene	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.022	0.037	ND	0.022	0.036	ND	1.1	1.9	ND	1.1	1.9
Chrysene	ND	0.016	0.037	ND	0.016	0.037	ND	0.016	0.036	ND	0.016	0.037	ND	0.016	0.036	ND	0.82	1.9	ND	0.82	1.9
Dibenzo (a,h) anthracene	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.022	0.037	ND	0.022	0.036	ND	1.1	1.9	ND	1.1	1.9
Fluoranthene	ND	0.021	0.037	ND	0.021	0.037	ND	0.02	0.036	ND	0.021	0.037	ND	0.02	0.036	ND	1	1.9	ND	1	1.9
Fluorene	ND	0.0059	0.037	ND	0.0059	0.037	ND	0.0058	0.036	ND	0.0059	0.037	ND	0.0058	0.036	ND	0.3	1.9	ND	0.3	1.9
Indeno (1,2,3-cd) pyrene	ND	0.032	0.037	ND	0.032	0.037	ND	0.032	0.036	ND	0.032	0.037	ND	0.032	0.036	ND	1.6	1.9	ND	1.6	1.9
Naphthalene	ND	0.015	0.037	ND	0.015	0.037	ND	0.015	0.036	ND	0.015	0.037	ND	0.015	0.036	ND	0.74	1.9	ND	0.74	1.9
Phenanthrene	ND	0.024	0.037	ND	0.024	0.037	ND	0.023	0.036	ND	0.024	0.037	ND	0.023	0.036	ND	1.2	1.9	ND	1.2	1.9
Pyrene	ND	0.015	0.037	ND	0.015	0.037	ND	0.015	0.036	ND	0.015	0.037	ND	0.015	0.036	ND	0.74	1.9	ND	0.74	1.9

Analytical Soil Data -- Semi-Volatile Organic Compounds -- Nature and Extent Investigation
North Corner -- Central Basin -- Alamitos Generating Station

	Sample ID	C6-1			C7-1			C7-2			C7-3			C7-4			C8-1			C9-1		
	Units: mg/kg																					
USEPA 8270C-SIM	Units: mg/kg	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL
Parameter																						
Acenaphthene		ND	0.014	0.036	ND	0.015	0.036	ND	0.015	0.037	ND	0.015	0.037	ND	0.014	0.036	ND	0.14	0.36	ND	0.014	0.036
Acenaphthylene		ND	0.01	0.036	ND	0.01	0.036	ND	0.01	0.037	ND	0.01	0.037	ND	0.01	0.036	ND	0.1	0.36	ND	0.01	0.036
Anthracene		ND	0.016	0.036	ND	0.016	0.036	ND	0.016	0.037	ND	0.016	0.037	ND	0.016	0.036	ND	0.16	0.36	ND	0.016	0.036
Benzo (a) anthracene		ND	0.013	0.036	**0.046**	0.013	0.036	**0.052**	0.013	0.037	ND	0.013	0.037	ND	0.013	0.036	ND	0.13	0.36	ND	0.013	0.036
Benzo (a) pyrene		ND	0.019	0.036	ND	0.019	0.036	ND	0.019	0.037	ND	0.019	0.037	ND	0.019	0.036	ND	0.19	0.36	ND	0.019	0.036
Benzo (b) fluoranthene		ND	0.022	0.036	**0.051**	0.022	0.036	**0.04**	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.22	0.36	ND	0.022	0.036
Benzo (g,h,i) perylene		ND	0.012	0.036	ND	0.012	0.036	ND	0.012	0.037	ND	0.012	0.037	ND	0.011	0.036	ND	0.12	0.36	ND	0.011	0.036
Benzo (k) fluoranthene		ND	0.022	0.036	ND	0.022	0.036	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.22	0.36	ND	0.022	0.036
Chrysene		ND	0.016	0.036	**0.048**	0.016	0.036	**0.038**	0.016	0.037	ND	0.016	0.037	ND	0.016	0.036	ND	0.16	0.36	ND	0.016	0.036
Dibenzo (a,h) anthracene		ND	0.022	0.036	ND	0.022	0.036	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.22	0.36	ND	0.022	0.036
Fluoranthene		ND	0.02	0.036	**0.041**	0.02	0.036	**0.044**	0.02	0.037	ND	0.021	0.037	ND	0.02	0.036	ND	0.2	0.36	ND	0.02	0.036
Fluorene		ND	0.0058	0.036	ND	0.0058	0.036	ND	0.0059	0.037	ND	0.006	0.037	ND	0.0057	0.036	ND	0.058	0.36	ND	0.0057	0.036
Indeno (1,2,3-cd) pyrene		ND	0.032	0.036	ND	0.032	0.036	ND	0.032	0.037	ND	0.033	0.037	ND	0.032	0.036	ND	0.32	0.36	ND	0.032	0.036
Naphthalene		ND	0.015	0.036	ND	0.015	0.036	ND	0.015	0.037	ND	0.015	0.037	ND	0.014	0.036	ND	0.14	0.36	ND	0.014	0.036
Phenanthrene		ND	0.023	0.036	ND	0.023	0.036	ND	0.023	0.037	ND	0.024	0.037	ND	0.023	0.036	ND	0.23	0.36	ND	0.023	0.036
Pyrene		ND	0.014	0.036	ND	0.015	0.036	**0.039**	0.015	0.037	ND	0.015	0.037	ND	0.014	0.036	ND	0.14	0.36	ND	0.014	0.036

Table 20

Analytical Soil Data -- Semi-Volatile Organic Compounds -- Nature and Extent Investigation
North Corner -- Central Basin -- Alamitos Generating Station

	Sample ID	C10-1			C10-2			C10-3			C10-4			C11-1			C12-1			C13-1			C14-1		
	Units: mg/kg																								
USEPA 8270C-SIM	Units: mg/kg	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL	Results	MDL	RL
Parameter																									
Acenaphthene		ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.037	ND	0.015	0.037	ND	0.014	0.036	ND	0.015	0.037
Acenaphthylene		ND	0.01	0.038	ND	0.01	0.038	ND	0.01	0.038	ND	0.01	0.038	ND	0.01	0.037	ND	0.01	0.037	ND	0.01	0.036	ND	0.01	0.037
Anthracene		ND	0.016	0.038	ND	0.016	0.038	ND	0.016	0.038	ND	0.016	0.038	ND	0.016	0.037	ND	0.016	0.037	ND	0.016	0.036	ND	0.016	0.037
Benzo (a) anthracene		ND	0.014	0.038	ND	0.014	0.038	ND	0.014	0.038	ND	0.014	0.038	ND	0.013	0.037	ND	0.014	0.037	ND	0.013	0.036	ND	0.013	0.037
Benzo (a) pyrene		ND	0.02	0.038	ND	0.02	0.038	ND	0.02	0.038	ND	0.02	0.038	ND	0.019	0.037	ND	0.02	0.037	ND	0.019	0.036	ND	0.019	0.037
Benzo (b) fluoranthene		ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.022	0.037
Benzo (g,h,i) perylene		ND	0.012	0.038	ND	0.012	0.038	ND	0.012	0.038	ND	0.012	0.038	ND	0.012	0.037	ND	0.012	0.037	ND	0.012	0.036	ND	0.012	0.037
Benzo (k) fluoranthene		ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.022	0.037
Chrysene		ND	0.016	0.038	ND	0.016	0.038	ND	0.016	0.038	ND	0.016	0.038	ND	0.016	0.037	ND	0.016	0.037	ND	0.016	0.036	ND	0.016	0.037
Dibenzo (a,h) anthracene		ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.038	ND	0.022	0.037	ND	0.022	0.037	ND	0.022	0.036	ND	0.022	0.037
Fluoranthene		ND	0.021	0.038	ND	0.021	0.038	ND	0.021	0.038	ND	0.021	0.038	ND	0.021	0.037	ND	0.021	0.037	ND	0.02	0.036	ND	0.021	0.037
Fluorene		ND	0.006	0.038	ND	0.006	0.038	ND	0.006	0.038	ND	0.006	0.038	ND	0.0059	0.037	ND	0.006	0.037	ND	0.0058	0.036	ND	0.0059	0.037
Indeno (1,2,3-cd) pyrene		ND	0.033	0.038	ND	0.033	0.038	ND	0.033	0.038	ND	0.033	0.038	ND	0.032	0.037	ND	0.033	0.037	ND	0.032	0.036	ND	0.033	0.037
Naphthalene		ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.037	ND	0.015	0.037	ND	0.014	0.036	ND	0.015	0.037
Phenanthrene		ND	0.024	0.038	ND	0.024	0.038	ND	0.024	0.038	ND	0.024	0.038	ND	0.023	0.037	ND	0.024	0.037	ND	0.023	0.036	ND	0.024	0.037
Pyrene		ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.038	ND	0.015	0.037	ND	0.015	0.037	ND	0.014	0.036	ND	0.015	0.037

Analytical Data -- Perched Water
Central Basin -- Alamitos Generating Station

	Sample ID		C-PW (6)	PW-5A		
	Date		11/13/09	1/7/10	2/25/10	4/29/10
Parameter: Metals	**PQL**	**Units**				
Antimony	0.2	ug/l	ND	ND	ND	ND
Arsenic	0.5	ug/l	560	ND	7	ND
Barium	1	ug/l	31,000	76	69	30
Beryllium	0.1	ug/l	27	ND	ND	ND
Cadmium	0.1	ug/l	13	1.6	ND	ND
Chromium, Total	1	ug/l	4,400	ND	1.3	ND
Cobalt	0.2	ug/l	670	1.5	6	3.5
Copper	1	ug/l	4,900	6.5	4.6	26
Lead	0.5	ug/l	520	ND	1.7	ND
Mercury	0.1	ug/l	ND	ND	ND	NT
Molybdenum	0.2	ug/l	100	9.1	5.4	4.4
Nickel	1	ug/l	12,000	11	21	18
Selenium	0.5	ug/l	21	ND	ND	ND
Silver	0.1	ug/l	ND	ND	ND	ND
Thallium	0.5	ug/l	13	ND	ND	ND
Vanadium	5	ug/l	8,600	9.9	3.9	2.8
Zinc	5	ug/l	10,000	42	ND	29
Parameter: General Mineral						
pH		units	6.9	NT	NT	7.1
TDS		mg/l	5,300	NT	NT	7,000
Parameter: VOCs						
Benzene	1	ug/l	1.8	ND	1.3	1.4
Toluene	1	ug/l	ND	ND	2.3	2.3
2-Butanone	5	ug/l	ND	ND	ND	ND
2-Hexanone	5	ug/l	ND	ND	ND	ND
Acetone	10	ug/l	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	1	ug/l	4.7	1.5	4.2	5.9
1,1-Dichloroethene (1,1-DCE)	1	ug/l	27	11	29	26
cis-1,2-Dichloroethene (C-1,2-DCE)	50	ug/l	4,700	5,700	24,000	24,000
trans-1,2-Dichloroethene (t-1,2-DCE)	20	ug/l	450	ND	960	790
Trichloroethene (TCE)	20	ug/l	390	830	2,800	2,700
Bromodichloromethane	1	ug/l	ND	7.6	ND	ND
Dibromochloromethane	1	ug/l	ND	4.8	ND	ND
Chloroform	1	ug/l	ND	13	2.6	ND
Tetrachloroethene (PCE)	1	ug/l	ND	8.6	11	ND
Vinyl Chloride	1	ug/l	200	130	450	280
Parameter: sVOCs						
1,4-dioxane	0.5	ug/l	NT	NT	3.5	7.9

Table 21

Analytical Data -- Perched Water
Central Basin -- Alamitos Generating Station

	Sample ID		PW-6A			PW-8A
	Date		1/7/10	2/25/10	4/29/10	2/25/10
Parameter: Metals	**PQL**	**Units**				
Antimony	0.2	ug/l	ND	ND	ND	ND
Arsenic	0.5	ug/l	3.5	36	4.4	6.2
Barium	1	ug/l	64	99	68	84
Beryllium	0.1	ug/l	ND	ND	ND	ND
Cadmium	0.1	ug/l	1.1	ND	ND	ND
Chromium, Total	1	ug/l	1.5	2.9	ND	1.1
Cobalt	0.2	ug/l	3.1	6.6	8.6	7.1
Copper	1	ug/l	9.6	5.6	ND	4.5
Lead	0.5	ug/l	ND	2.3	ND	1.7
Mercury	0.1	ug/l	ND	0.16	NT	ND
Molybdenum	0.2	ug/l	58	35	24	8.1
Nickel	1	ug/l	72	97	71	21
Selenium	0.5	ug/l	2.1	4.5	ND	ND
Silver	0.1	ug/l	ND	ND	ND	ND
Thallium	0.5	ug/l	ND	ND	ND	ND
Vanadium	5	ug/l	100	24	9.1	ND
Zinc	5	ug/l	38	ND	ND	ND
Parameter: General Mineral						
pH		units	NT	NT	6.7	NT
TDS		mg/l	NT	NT	6,700	NT
Parameter: VOCs						
Benzene	1	ug/l	NT	1.3	1.2	ND
Toluene	1	ug/l	NT	ND	ND	1.7
2-Butanone	5	ug/l	NT	8.9	570	ND
2-Hexanone	5	ug/l	NT	ND	37	ND
Acetone	10	ug/l	NT	58	4,700	ND
1,1-Dichloroethane (1,1-DCA)	1	ug/l	NT	ND	13	14
1,1-Dichloroethene (1,1-DCE)	1	ug/l	NT	ND	26	29
cis-1,2-Dichloroethene (C-1,2-DCE)	50	ug/l	NT	4,500	8,900	11,000
trans-1,2-Dichloroethene (t-1,2-DCE)	20	ug/l	NT	500	720	810
Trichloroethene (TCE)	20	ug/l	NT	330	1,400	2,400
Bromodichloromethane	1	ug/l	NT	ND	ND	ND
Dibromochloromethane	1	ug/l	NT	ND	ND	ND
Chloroform	1	ug/l	NT	ND	ND	1.9
Tetrachloroethene (PCE)	1	ug/l	NT	ND	ND	ND
Vinyl Chloride	1	ug/l	NT	190	230	210
Parameter: sVOCs						
1,4-dioxane	0.5	ug/l	NT	11	NT	0.72

Table 22

Analytical Data -- Metals, Semi-Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Sediment Traps Decontamination -- Alamitos Generating Station

	Unit 3 Characterization																Unit 3 Confirmation			Wash Water Source	
Sample ID	**Water C-1**				**Water C-2**				**Sludge C-1**				**Sludge C-2**				**Second Wash Water**			**Deionized Water**	
Metals EPA Method 6020)	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MRL**	**Result**	**Units**	**Result**
Antimony	ug/l	4.9	10	ND	ug/l	4.9	10	ND	mg/kg	0.24	1	ND	mg/kg	0.24	1	ND	ug/l	0.5	ND	ug/l	ND
Arsenic	ug/l	4	10	ND	ug/l	4	10	ND	mg/kg	0.33	1	15	mg/kg	0.33	1	60	ug/l	0.4	ND	ug/l	ND
Barium	ug/l	0.13	10	33	ug/l	0.13	10	22	mg/kg	0.04	2	79	mg/kg	0.04	2	150	ug/l	0.5	ND	ug/l	ND
Beryllium	ug/l	0.73	10	ND	ug/l	0.73	10	ND	mg/kg	0.066	0.5	0.71	mg/kg	0.066	0.5	1.6	ug/l	0.1	ND	ug/l	ND
Cadmium	ug/l	0.49	10	ND	ug/l	0.49	10	ND	mg/kg	0.04	0.5	ND	mg/kg	0.04	0.5	ND	ug/l	0.1	ND	ug/l	ND
Chromium, Total	ug/l	0.75	10	ND	ug/l	0.75	10	ND	mg/kg	0.39	1	860	mg/kg	0.39	1	1700	ug/l	0.2	ND	ug/l	ND
Cobalt	ug/l	0.29	10	55	ug/l	0.29	10	14	mg/kg	0.036	1.0	13	mg/kg	0.036	1.0	30	ug/l	0.1	ND	ug/l	ND
Copper	ug/l	0.73	20	ND	ug/l	0.73	20	ND	mg/kg	0.24	5	270	mg/kg	0.24	5	440	ug/l	0.5	2	ug/l	100
Lead	ug/l	2.9	10	ND	ug/l	2.9	10	ND	mg/kg	0.15	1	160	mg/kg	0.15	1	610	ug/l	0.2	8.1	ug/l	9.4
Mercury	ug/l	2.3	0.1	ND	ug/l	2.3	0.1	ND	ug/kg	0.8	10	1900	ug/kg	0.8	10	2500	ug/l	0.1	ND	ug/l	ND
Molybdenum	ug/l	2.3	10	ND	ug/l	2.3	10	10	mg/kg	0.17	5.0	16	mg/kg	0.17	5.0	44	ug/l	0.1	ND	ug/l	ND
Nickel	ug/l	0.44	10	1300	ug/l	0.44	10	410	mg/kg	0.056	2	270	mg/kg	0.056	2	760	ug/l	0.8	ND	ug/l	1.7
Selenium	ug/l	7.3	30	ND	ug/l	7.3	30	ND	mg/kg	0.29	1	ND	mg/kg	0.29	1	ND	ug/l	0.4	ND	ug/l	ND
Silver	ug/l	0.86	5	ND	ug/l	0.86	5	ND	mg/kg	0.087	0.5	ND	mg/kg	0.087	0.5	ND	ug/l	0.2	ND	ug/l	ND
Thallium	ug/l	3.9	50	ND	ug/l	3.9	50	ND	mg/kg	0.25	3	ND	mg/kg	0.25	3	ND	ug/l	0.2	ND	ug/l	ND
Vanadium	ug/l	0.5	10	23	ug/l	0.5	10	47	mg/kg	0.036	1	290	mg/kg	0.036	1	1100	ug/l	0.5	ND	ug/l	ND
Zinc	ug/l	1.4	50	4400	ug/l	1.4	50	1000	mg/kg	0.26	5	600	mg/kg	0.26	5	1700	ug/l	5	30	ug/l	17
TPH (USEPA Methos 8015)																					
Diesel Range	mg/l	0.024	0.1	ND	mg/l	0.024	0.1	ND	mg/kg	92	240	3100	mg/kg	92	240	4100	ug/l	0.1	ND		
Gasoline Range																	ug/l	0.1	ND		
Oil Range	mg/l	0.33	0.5	ND	mg/l	0.33	0.5	0.55	mg/kg	440	2400	15000	mg/kg	440	2400	19000	ug/l	0.5	ND		
sVOC (USEPA Method 8270-SIM)																					
1-Methylnaphthalene																	ug/l	0.1	ND		
2-Methylnaphthalene																	ug/l	0.1	ND		
Acenaphthene	ug/l	0.12	0.5	ND	ug/l	0.12	0.5	ND	mg/kg	1.4	3.6	ND	mg/kg	1.3	3.2	ND	ug/l	0.1	ND		
Acenaphthylene	ug/l	0.13	0.5	ND	ug/l	0.13	0.5	ND	mg/kg	1	3.6	ND	mg/kg	0.9	3.2	ND	ug/l	0.1	ND		
Anthracene	ug/l	0.12	0.5	ND	ug/l	0.12	0.5	ND	mg/kg	1.6	3.6	ND	mg/kg	1.4	3.2	ND	ug/l	0.1	ND		
Benzo (a) anthracene	ug/l	0.28	0.5	ND	ug/l	0.28	0.5	ND	mg/kg	1.3	3.6	ND	mg/kg	1.2	3.2	ND	ug/l	0.1	ND		
Benzo (a) pyrene	ug/l	0.36	0.5	ND	ug/l	0.36	0.5	ND	mg/kg	1.9	3.6	ND	mg/kg	1.7	3.2	ND	ug/l	0.1	ND		
Benzo (b) fluoranthene	ug/l	0.15	0.5	ND	ug/l	0.15	0.5	ND	mg/kg	2.2	3.6	ND	mg/kg	1.9	3.2	ND	ug/l	0.1	ND		
Benzo (g,h,i) perylene	ug/l	0.13	0.5	ND	ug/l	0.13	0.5	ND	mg/kg	1.2	3.6	ND	mg/kg	1	3.2	ND	ug/l	0.1	ND		
Benzo (k) fluoranthene	ug/l	0.12	0.5	ND	ug/l	0.12	0.5	ND	mg/kg	2.2	3.6	ND	mg/kg	1.9	3.2	ND	ug/l	0.1	ND		
Chrysene	ug/l	0.09	0.5	ND	ug/l	0.09	0.5	ND	mg/kg	1.6	3.6	ND	mg/kg	1.4	3.2	ND	ug/l	0.1	ND		
Dibenzo (a,h) anthracene	ug/l	0.13	0.5	ND	ug/l	0.13	0.5	ND	mg/kg	2.2	3.6	ND	mg/kg	1.9	3.2	ND	ug/l	0.1	ND		
Fluoranthene	ug/l	0.2	0.5	ND	ug/l	0.2	0.5	ND	mg/kg	2	3.6	ND	mg/kg	1.8	3.2	ND	ug/l	0.1	ND		
Fluorene	ug/l	0.15	0.5	ND	ug/l	0.15	0.5	ND	mg/kg	0.58	3.6	ND	mg/kg	0.51	3.2	ND	ug/l	0.1	ND		
Indeno (1,2,3-cd) pyrene	ug/l	0.1	0.5	ND	ug/l	0.1	0.5	ND	mg/kg	3.2	3.6	ND	mg/kg	2.8	3.2	ND	ug/l	0.1	ND		
Naphthalene	ug/l	0.11	0.5	ND	ug/l	0.11	0.5	ND	mg/kg	1.4	3.6	ND	mg/kg	1.3	3.2	ND	ug/l	0.1	ND		
Phenanthrene	ug/l	0.11	0.5	ND	ug/l	0.11	0.5	ND	mg/kg	2.3	3.6	ND	mg/kg	2.1	3.2	ND	ug/l	0.1	ND		
Pyrene	ug/l	0.21	0.5	ND	ug/l	0.21	0.5	ND	mg/kg	1.4	3.6	ND	mg/kg	1.3	3.2	ND	ug/l	0.1	ND		

Table 22

Analytical Data -- Metals, Semi-Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Sediment Traps Decontamination -- Alamitos Generating Station

	Unit 4 Characterization																Unit 4 Confirmation			Wash Water Source	
Sample ID	**Water C-1**				**Water C-2**				**Sludge C-1**				**Sludge C-2**				**Second Wash Water**			**Deionized Water**	
Metals EPA Method 6020)	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MDL**	**MRL**	**Result**	**Units**	**MRL**	**Result**	**Units**	**Result**
Antimony	ug/l	4.9	10	ND	ug/l	4.9	10	ND	mg/kg	0.24	1	ND	mg/kg	0.24	1	ND	ug/l	0.5	ND	ug/l	ND
Arsenic	ug/l	4	10	ND	ug/l	4	10	ND	mg/kg	0.33	1	9.4	mg/kg	0.33	1	5.9	ug/l	0.4	ND	ug/l	ND
Barium	ug/l	0.13	10	31	ug/l	0.13	10	47	mg/kg	0.04	2	140	mg/kg	0.04	2	70	ug/l	0.5	ND	ug/l	ND
Beryllium	ug/l	0.73	10	ND	ug/l	0.73	10	ND	mg/kg	0.066	0.5	ND	mg/kg	0.066	0.5	ND	ug/l	0.1	ND	ug/l	ND
Cadmium	ug/l	0.49	10	ND	ug/l	0.49	10	ND	mg/kg	0.04	0.5	ND	mg/kg	0.04	0.5	ND	ug/l	0.1	ND	ug/l	ND
Chromium, Total	ug/l	0.75	10	ND	ug/l	0.75	10	ND	mg/kg	0.39	1	260	mg/kg	0.39	1	280	ug/l	0.2	ND	ug/l	ND
Cobalt	ug/l	0.29	10	ND	ug/l	0.29	10	ND	mg/kg	0.036	1.0	11	mg/kg	0.036	1.0	10	ug/l	0.1	ND	ug/l	ND
Copper	ug/l	0.73	20	29	ug/l	0.73	20	45	mg/kg	0.24	5	250	mg/kg	0.24	5	370	ug/l	0.5	2.1	ug/l	100
Lead	ug/l	2.9	10	ND	ug/l	2.9	10	ND	mg/kg	0.15	1	94	mg/kg	0.15	1	140	ug/l	0.2	8.1	ug/l	9.4
Mercury	ug/l	2.3	0.1	ND	ug/l	2.3	0.1	ND	ug/kg	0.8	10	130	ug/kg	0.8	10	110	ug/l	0.1	ND	ug/l	ND
Molybdenum	ug/l	2.3	10	ND	ug/l	2.3	10	ND	mg/kg	0.17	5.0	11	mg/kg	0.17	5.0	9.2	ug/l	0.1	ND	ug/l	ND
Nickel	ug/l	0.44	10	97	ug/l	0.44	10	290	mg/kg	0.056	2	200	mg/kg	0.056	2	200	ug/l	0.8	ND	ug/l	1.7
Selenium	ug/l	7.3	30	ND	ug/l	7.3	30	ND	mg/kg	0.29	1	ND	mg/kg	0.29	1	ND	ug/l	0.4	ND	ug/l	ND
Silver	ug/l	0.86	5	ND	ug/l	0.86	5	ND	mg/kg	0.087	0.5	ND	mg/kg	0.087	0.5	ND	ug/l	0.2	ND	ug/l	ND
Thallium	ug/l	3.9	50	ND	ug/l	3.9	50	ND	mg/kg	0.25	3	ND	mg/kg	0.25	3	ND	ug/l	0.2	ND	ug/l	ND
Vanadium	ug/l	0.5	10	110	ug/l	0.5	10	160	mg/kg	0.036	1	410	mg/kg	0.036	1	170	ug/l	0.5	ND	ug/l	ND
Zinc	ug/l	1.4	50	1600	ug/l	1.4	50	1100	mg/kg	0.26	5	980	mg/kg	0.26	5	960	ug/l	5	28	ug/l	17
TPH (USEPA Methos 8015)																					
Diesel Range	mg/l	0.024	0.1	0.1	mg/l	0.024	0.1	0.16	mg/kg	92	240	8500	mg/kg	92	240	7800	mg/l	0.1	ND		
Gasoline Range																	mg/l	0.1	ND		
Oil Range	mg/l	0.33	0.5	ND	mg/l	0.33	0.5	ND	mg/kg	1800	9600	52000	mg/kg	1800	9600	38000	mg/l	0.5	ND		
sVOC (USEPA Method 8270																					
1-Methylnaphthalene																	ug/l	0.1	ND		
2-Methylnaphthalene																	ug/l	0.1	ND		
Acenaphthene	ug/l	0.12	0.5	ND	ug/l	0.12	0.5	ND	mg/kg	1.4	3.4	ND	mg/kg	1.5	3.6	ND	ug/l	0.1	ND		
Acenaphthylene	ug/l	0.13	0.5	ND	ug/l	0.13	0.5	ND	mg/kg	0.96	3.4	ND	mg/kg	1	3.6	ND	ug/l	0.1	ND		
Anthracene	ug/l	0.12	0.5	ND	ug/l	0.12	0.5	ND	mg/kg	1.5	3.4	ND	mg/kg	1.6	3.6	ND	ug/l	0.1	ND		
Benzo (a) anthracene	ug/l	0.28	0.5	ND	ug/l	0.28	0.5	ND	mg/kg	1.2	3.4	ND	mg/kg	1.3	3.6	ND	ug/l	0.1	ND		
Benzo (a) pyrene	ug/l	0.36	0.5	ND	ug/l	0.36	0.5	ND	mg/kg	1.8	3.4	ND	mg/kg	1.9	3.6	ND	ug/l	0.1	ND		
Benzo (b) fluoranthene	ug/l	0.15	0.5	ND	ug/l	0.15	0.5	ND	mg/kg	2.1	3.4	ND	mg/kg	2.2	3.6	ND	ug/l	0.1	ND		
Benzo (g,h,i) perylene	ug/l	0.13	0.5	ND	ug/l	0.13	0.5	ND	mg/kg	1.1	3.4	ND	mg/kg	1.2	3.6	ND	ug/l	0.1	ND		
Benzo (k) fluoranthene	ug/l	0.12	0.5	ND	ug/l	0.12	0.5	ND	mg/kg	2.1	3.4	ND	mg/kg	2.2	3.6	ND	ug/l	0.1	ND		
Chrysene	ug/l	0.09	0.5	ND	ug/l	0.09	0.5	ND	mg/kg	1.5	3.4	ND	mg/kg	1.6	3.6	ND	ug/l	0.1	ND		
Dibenzo (a,h) anthracene	ug/l	0.13	0.5	ND	ug/l	0.13	0.5	ND	mg/kg	2.1	3.4	ND	mg/kg	2.2	3.6	ND	ug/l	0.1	ND		
Fluoranthene	ug/l	0.2	0.5	ND	ug/l	0.2	0.5	ND	mg/kg	1.9	3.4	ND	mg/kg	2	3.6	ND	ug/l	0.1	ND		
Fluorene	ug/l	0.15	0.5	ND	ug/l	0.15	0.5	ND	mg/kg	0.55	3.4	ND	mg/kg	0.58	3.6	ND	ug/l	0.1	ND		
Indeno (1,2,3-cd) pyrene	ug/l	0.1	0.5	ND	ug/l	0.1	0.5	ND	mg/kg	3	3.4	ND	mg/kg	3.2	3.6	ND	ug/l	0.1	ND		
Naphthalene	ug/l	0.11	0.5	ND	ug/l	0.11	0.5	ND	mg/kg	1.4	3.4	ND	mg/kg	1.5	3.6	ND	ug/l	0.1	ND		
Phenanthrene	ug/l	0.11	0.5	ND	ug/l	0.11	0.5	ND	mg/kg	2.2	3.4	ND	mg/kg	2.3	3.6	ND	ug/l	0.1	ND		
Pyrene	ug/l	0.21	0.5	ND	ug/l	0.21	0.5	ND	mg/kg	1.4	3.4	ND	mg/kg	1.5	3.6	ND	ug/l	0.1	ND		

Analytical Data -- Metals, Semi-Volatile Organic Compounds, and Total Petroleum Hydrocarbons
Sediment Traps Decontamination -- Alamitos Generating Station

	Unit 5 Characterization			Unit 5 Confirmation			Unit 6 Characterization			Unit 6 Confirmation		
Sample ID	**Sludge**			**Second Wash Water**			**Sludge**			**Second Wash Water**		
Metals EPA Method 6020)	**Units**	**MRL**	**Result**	**Units**	**MRL**	**Result**	**Units**	**MRL**	**Result**	**Units**	**MRL**	**Result**
Antimony	mg/kg	0.5	8.7	ug/l	0.5	ND	mg/kg	0.5	23	ug/l	0.5	ND
Arsenic	mg/kg	2.5	240	ug/l	0.4	ND	mg/kg	2.5	1500	ug/l	0.4	ND
Barium	mg/kg	1	510	ug/l	0.5	ND	mg/kg	5	3200	ug/l	0.5	ND
Beryllium	mg/kg	0.1	0.18	ug/l	0.1	ND	mg/kg	0.1	0.69	ug/l	0.1	ND
Cadmium	mg/kg	0.1	1.7	ug/l	0.1	ND	mg/kg	0.1	0.95	ug/l	0.1	ND
Chromium, Total	mg/kg	5	6100	ug/l	0.2	ND	mg/kg	1	740	ug/l	0.2	ND
Cobalt	mg/kg	0.2	91	ug/l	0.1	ND	mg/kg	0.2	400	ug/l	0.1	ND
Copper	mg/kg	2.5	300	ug/l	0.5	2.1	mg/kg	0.5	240	ug/l	0.5	2.1
Lead	mg/kg	0.5	400	ug/l	0.2	7.9	mg/kg	2.5	1800	ug/l	0.2	7.9
Mercury	ug/kg	10	46	ug/l	0.1	ND	ug/kg	10	38	ug/l	0.1	ND
Molybdenum	mg/kg	0.2	120	ug/l	0.1	ND	mg/kg	0.2	190	ug/l	0.1	ND
Nickel	mg/kg	2.5	1700	ug/l	0.8	ND	mg/kg	2.5	12000	ug/l	0.8	ND
Selenium	mg/kg	2.5	21	ug/l	0.4	ND	mg/kg	0.5	1.1	ug/l	0.4	ND
Silver	mg/kg	0.1	ND	ug/l	0.2	ND	mg/kg	0.1	0.44	ug/l	0.2	ND
Thallium	mg/kg	0.5	ND	ug/l	0.2	ND	mg/kg	0.5	1.2	ug/l	0.2	ND
Vanadium	mg/kg	5	1600	ug/l	0.5	ND	mg/kg	5	28000	ug/l	0.5	ND
Zinc	mg/kg	25	310	ug/l	5	28	mg/kg	5	660	ug/l	5	32
TPH (USEPA Methos 8015)												
Diesel Range	mg/kg	100	1500	mg/l	0.1	ND	mg/kg	10	120	mg/l	0.1	ND
Gasoline Range	mg/kg	0.5	ND	mg/l	0.1	ND	mg/kg	0.1	ND	mg/l	0.1	ND
Oil Range	mg/kg	1000	3000	mg/l	0.5	ND	mg/kg	100	280	mg/l	0.5	ND
sVOC (USEPA Method 8270												
1-Methylnaphthalene				ug/l	0.1	ND				ug/l	0.1	ND
2-Methylnaphthalene				ug/l	0.1	ND				ug/l	0.1	ND
Acenaphthene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Acenaphthylene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Anthracene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Benzo (a) anthracene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Benzo (a) pyrene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Benzo (b) fluoranthene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Benzo (g,h,i) perylene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Benzo (k) fluoranthene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Chrysene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Dibenzo (a,h) anthracene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Fluoranthene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Fluorene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Naphthalene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Phenanthrene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND
Pyrene	mg/kg	0.45	ND	ug/l	0.1	ND	mg/kg	0.11	ND	ug/l	0.1	ND

Wash Water Source	
Deionized Water	
Units	**Result**
ug/l	ND
ug/l	ND
ug/l	ND
ug/l	ND
ug/l	ND
ug/l	ND
ug/l	ND
ug/l	100
ug/l	9.4
ug/l	ND
ug/l	ND
ug/l	1.7
ug/l	ND
ug/l	ND
ug/l	ND
ug/l	ND
ug/l	17

Analytical Data -- Dioxins/Furans
Sediment Traps Decontamination -- Alamitos Generating Station

	Unit 3 Characterization																Unit 3 Confirmation			
	Water C-1				Water C-2				Sludge C-1				Sludge C-2				Water			
	TEQ		0.00549		TEQ		0.0913		TEQ		19.8		TEQ		37.4		TEQ		0.00	
USEPA 8280A	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**	**MDL**	**DL**	**Concentration**	**2005 WHO Tox**
Parameter	**Units: pg/l**		**Units: pg/l**		**Units: pg/l**		**Units: pg/l**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/g**		**Units: pg/l**		**Units: pg/l**	
2,3,7,8-TCDD	0.215	0.871	ND	-	0.215	0.968	ND	-	0.0259		1.52	1.52	0.0259		3.19		1.13	6.56	ND	-
1,2,3,7,8-PeCDD	0.317	0.86	ND	-	0.317	0.922	ND	-	0.0434		4.91	4.91	0.0434		6.7	2.34	2.47	7.05	ND	-
1,2,3,4,7,8-HxCDD	0.326	1.1	ND	-	0.326	1.43	ND	-	0.0467		6.1	0.61	0.0467		10.6	0.293	2.83	9.68	ND	-
1,2,3,6,7,8-HxCDD	0.424	1.12	ND	-	0.424	1.5	ND	-	0.0587		16.2	1.62	0.0587		32.1	1.12	3.04	9.95	ND	-
1,2,3,7,8,9-HxCDD	0.367	1.08	ND	-	0.367	1.42	ND	-	0.0529		11.5	1.15	0.0529		22.2	0.639	2.77	9.16	ND	-
1,2,3,4,6,7,8-HpCDD	0.497	4.15	ND	-	0.497		7.64 J	0.0764	0.0742		235	2.35	0.0742		572	0.888	3.43	11.1	ND	-
OCDD	1.41		18.3 J	0.00549	1.41		49.8 J	0.0149	0.144		1960	0.588	0.144		5170	0.087	6.38	20.9	ND	-
2,3,7,8-TCDF	0.209	0.778	ND	-	0.209	0.935	ND	-	0.02		6.64 F	0.664	0.02		12.7 F	0.319	1.04	5.84	ND	-
1,2,3,7,8-PeCDF	0.235	1.79	ND	-	0.235	1.22	ND	-	0.0304		6.55	0.196	0.0304		12.8	0.129	1.45	7.84	ND	-
2,3,4,7,8-PeCDF	0.243	1.82	ND	-	0.243	1.22	ND	-	0.0322		7.09	2.13	0.0322		13.6	1.47	1.65	7.77	ND	-
1,2,3,4,7,8-HxCDF	0.255	0.657	ND	-	0.255	1.43	ND	-	0.0365		13.2	1.32	0.0365		24.4	0.952	1.59	8.59	ND	-
1,2,3,6,7,8-HxCDF	0.248	0.656	ND	-	0.248	1.4	ND	-	0.0357		8.63	0.863	0.0357		17.8	0.688	1.55	8.65	ND	-
2,3,4,6,7,8-HxCDF	0.262	0.69	ND	-	0.262	1.43	ND	-	0.0399		8.75	0.875	0.0399		18.3	0.393	1.69	9.29	ND	-
1,2,3,7,8,9-HxCDF	0.258	0.784	ND	-	0.258	1.74	ND	-	0.0386		2.68 J	0.268	0.0386		5.04	0.217	2.21	12	ND	-
1,2,3,4,6,7,8-HpCDF	0.324	0.678	ND	-	0.324	2.13	ND	-	0.0393		60.6	0.606	0.0393		128	0.305	1.8	10.3	ND	-
1,2,3,4,7,8,9-HpCDF	0.49	0.841	ND	-	0.49	2.63	ND	-	0.0418		5.69	0.0569	0.0418		11.1	0.0878	2.69	16.4	ND	-
OCDF	0.805	1.73	ND	-	0.805	4.76	ND	-	0.105		105	0.0315	0.105		204	0.0163	3.68	26.7	ND	-
Total TCDD		1.39	ND			0.968	ND				50.2				110			6.56	ND	
Total PeCDD		0.86	ND			0.922	ND				74.0 M				152 M			7.05	ND	
Total HxCDD		1.12	ND			1.5	ND				166				352			9.95	ND	
Total HpCDD		4.15	ND				18.4 J				495				1210			11.1	ND	
Total TCDF		2	ND			1.17	ND				97.8 M				201 M			5.84	ND	
Total PeCDF		1.82	ND			1.22	ND				123				243			7.84	ND	
Total HxCDF		0.784	ND			1.74	ND				119				243			12	ND	
Total HpCDF		0.841	ND			2.63	ND				131				268			16.4	ND	

Notes: J Analyte concentration is below calibration range
M Maximum possible concentration
F Analyte confirmation on second column
D Presence of Diphenyl Ethers

Table 23

Analytical Data -- Dioxins/Furans
Sediment Traps Decontamination -- Alamitos Generating Station

	Unit 4 Characterization																Unit 4 Confirmation			
	Water C-1				Water C-2				Sludge C-1				Sludge C-2				Water			
	TEQ		0.173		TEQ		0.0646		TEQ		14.6		TEQ		10.5		TEQ		0.00	
USEPA 8280A	MDL	DL	Concentration	2005 WHO Tox	MDL	DL	Concentration	2005 WHO Tox	MDL	DL	Concentration	2005 WHO Tox	MDL	DL	Concentration	2005 WHO Tox	MDL	DL	Concentration	2005 WHO Tox
Parameter	Units: pg/l		Units: pg/l		Units: pg/l		Units: pg/l		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/g		Units: pg/l		Units: pg/l	
2,3,7,8-TCDD	0.215	0.859	ND		0.215	0.723	ND		0.0259		0.648 J	0.648	0.0259		0.625 J	0.625	1.13	6.09	ND	-
1,2,3,7,8-PeCDD	0.317	1	ND		0.317	0.832	ND		0.0434		2.68 J	2.68	0.0434		1.93 J	1.93	2.47	6.28	ND	-
1,2,3,4,7,8-HxCDD	0.326	3.25	ND		0.326	0.956	ND		0.0467		4.45 J	0.445	0.0467		3.73 J	0.373	2.83	8.48	ND	-
1,2,3,6,7,8-HxCDD	0.424	3.5	ND		0.424	1.05	ND		0.0587		17.7	1.77	0.0587		11.4	1.14	3.04	9.67	ND	-
1,2,3,7,8,9-HxCDD	0.367	3.26	ND		0.367	0.969	ND		0.0529		9.32	0.932	0.0529		7.54	0.754	2.77	8.48	ND	-
1,2,3,4,6,7,8-HpCDD	0.497	11.6	14.3 J	0.143	0.497		5.38 J	0.0538	0.0742		253	2.53	0.0742		174	1.74	3.43	10.2	ND	-
OCDD	1.41		101	0.0303	1.41		35.9 J	0.0108	0.144		1500	0.45	0.144		1080	0.324	6.38	19	ND	-
2,3,7,8-TCDF	0.209	0.809	ND		0.209	0.79	ND		0.02		3.96 F	0.396	0.02		2.75 F	0.275	1.04	5.81	ND	-
1,2,3,7,8-PeCDF	0.235	1.08	ND		0.235	0.919	ND		0.0304		3.46 J	0.104	0.0304		2.43 J	0.0729	1.45	6.9	ND	-
2,3,4,7,8-PeCDF	0.243	1.05	ND		0.243	0.98	ND		0.0322		4.1 J	1.23	0.0322		3.03 J	0.909	1.65	6.94	ND	-
1,2,3,4,7,8-HxCDF	0.255	2.72	ND		0.255	1.95	ND		0.0365		6.01	0.601	0.0365		4.78 J	0.478	1.59	8.26	ND	-
1,2,3,6,7,8-HxCDF	0.248	2.62	ND		0.248	1.99	ND		0.0357		7.53	0.753	0.0357		4.68 J	0.468	1.55	8.13	ND	-
2,3,4,6,7,8-HxCDF	0.262	2.67	ND		0.262	2.09	ND		0.0399		8.31	0.831	0.0399		5.63	0.563	1.69	8.75	ND	-
1,2,3,7,8,9-HxCDF	0.258	3.17	ND		0.258	2.38	ND		0.0386		1.55 J	0.155	0.0386	0.967	ND		2.21	12.6	ND	-
1,2,3,4,6,7,8-HpCDF	0.324	3.99	ND		0.324	1.66	ND		0.0393		101	1.01	0.0393		79.8	0.798	1.8	10.5	ND	-
1,2,3,4,7,8,9-HpCDF	0.49	4.89	ND		0.49	2.21	ND		0.0418		3.38 J	0.0338	0.0418		3.63 J	0.0363	2.69	14.8	ND	-
OCDF	0.805	4.95	ND		0.805	3.1	ND		0.105		97.1	0.0291	0.105		91.6	0.0275	3.68	24.3	ND	-
Total TCDD		0.859	ND			0.723	ND				23				11.4			6.09	ND	
Total PeCDD		1	ND			0.832	ND				43.2 M				24.2 M			6.28	ND	
Total HxCDD		3.5	ND			1.05	ND				167				104			9.67	ND	
Total HpCDD		11.5	28.9				12.2 J				550				384			10.2	ND	
Total TCDF		0.809	ND			0.79	ND				70				43.8			5.81	ND	
Total PeCDF		1.08	ND			0.98	ND				112				70.7			6.93	ND	
Total HxCDF		3.17	ND			2.38	ND				140				106			12.6	ND	
Total HpCDF		4.89	ND			2.21	ND				192				190			14.8	ND	

Notes: J Analyte concentration is below calibration range

M Maximum possible concentration

F Analyte confirmation on second column

D Presence of Diphenyl Ethers

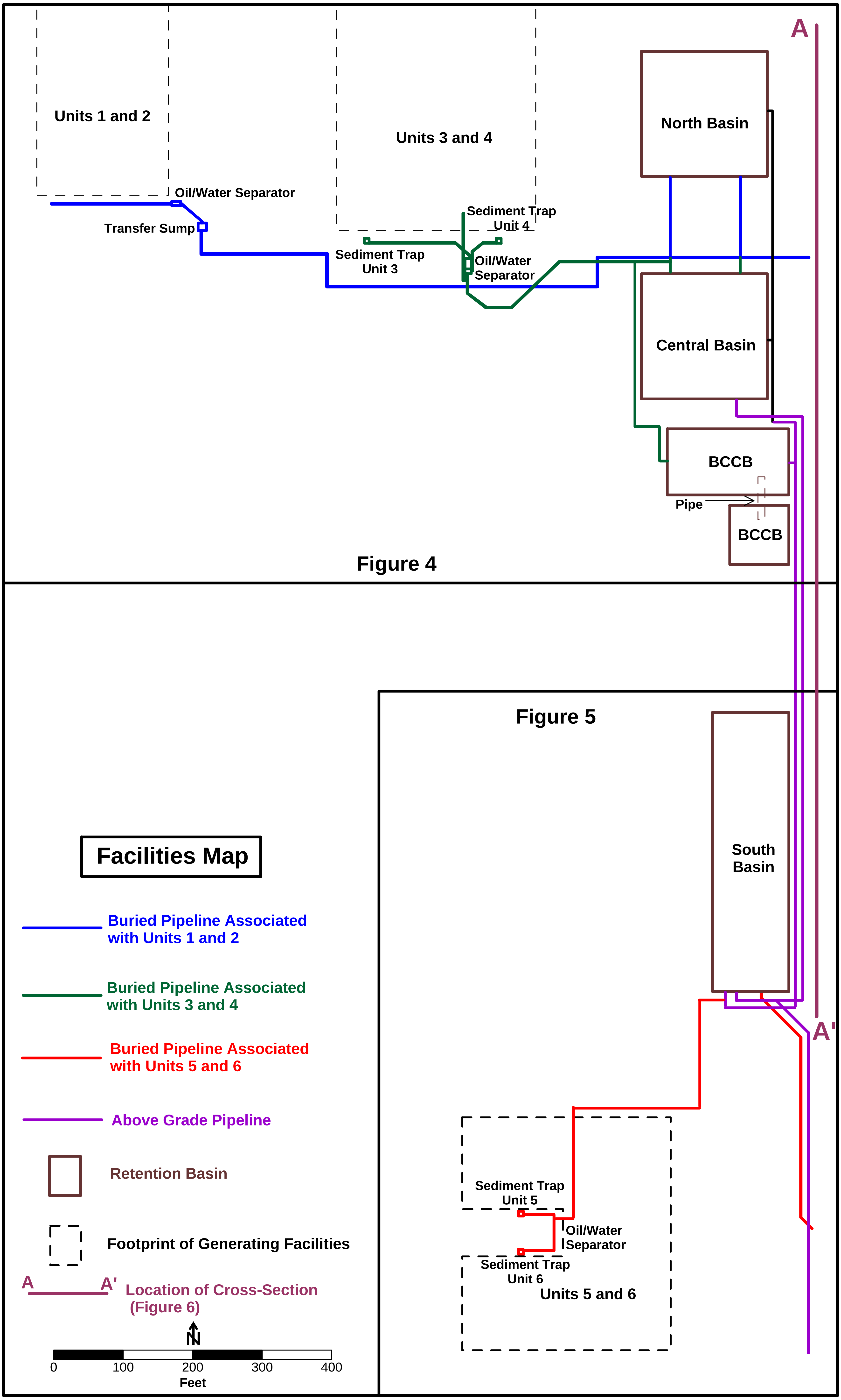
Table 23

Analytical Data -- Dioxins/Furans
Sediment Traps Decontamination -- Alamitos Generating Station

	Unit 5 Characterization				Unit 5 Confirmation				Unit 6 Characterization				Unit 6 Confirmation			
	Sludge				Water				Sludge				Water			
	TEQ		126		TEQ		0.00		TEQ		9.27		TEQ		0.00	
USEPA 8280A	MDL	DL	Concentration	2005 WHO Tox	MDL	DL	Concentration	2005 WHO Tox	MDL	DL	Concentration	2005 WHO Tox	MDL	DL	Concentration	2005 WHO Tox
Parameter	Units: pg/g		Units: pg/g		Units: pg/l		Units: pg/l		Units: pg/g		Units: pg/g		Units: pg/l		Units: pg/l	
2,3,7,8-TCDD	0.0707		3.98	3.98	1.13	6.36	ND	-	0.0707	0.841	ND		1.13	6.12	ND	-
1,2,3,7,8-PeCDD	0.156		29.6	29.6	2.47	7.73	ND	-	0.156		2.78 J	2.78	2.47	8.03	ND	-
1,2,3,4,7,8-HxCDD	0.128		61.7	6.17	2.83	9.92	ND	-	0.128		3.13 J	0.313	2.83	10.3	ND	-
1,2,3,6,7,8-HxCDD	0.131		161	16.1	3.04	10.4	ND	-	0.131		7.38 J	0.738	3.04	10.8	ND	-
1,2,3,7,8,9-HxCDD	0.124		113	11.3	2.77	9.46	ND	-	0.124		4.8 J	0.48	2.77	9.88	ND	-
1,2,3,4,6,7,8-HpCDD	0.277		1140	11.4	3.43	12.1	ND	-	0.277		49.4	0.494	3.43	12.3	ND	-
OCDD	0.495		2480	0.744	6.38	22.3	ND	-	0.495		197	0.0591	6.38	24.2	ND	-
2,3,7,8-TCDF	0.0617		19.3	1.93	1.04	5.35	ND	-	0.0617		3.22 J	0.322	1.04	5.62	ND	-
1,2,3,7,8-PeCDF	0.0726		36.5	1.1	1.45	6.68	ND	-	0.0726		5	0.15	1.45	6.43	ND	-
2,3,4,7,8-PeCDF	0.0868		35.4	10.6	1.65	7.25	ND	-	0.0868		4.39	1.32	1.65	6.74	ND	-
1,2,3,4,7,8-HxCDF	0.0643		123	12.3	1.59	8.4	ND	-	0.0643		9.15 J	0.915	1.59	7.83	ND	-
1,2,3,6,7,8-HxCDF	0.0679		78.9	7.89	1.55	8.76	ND	-	0.0679		7.35 J	0.735	1.55	8.22	ND	-
2,3,4,6,7,8-HxCDF	0.0694		63.2	6.32	1.69	8.91	ND	-	0.0694		5.23 J	0.523	1.69	8.81	ND	-
1,2,3,7,8,9-HxCDF	0.0862		23.6	2.36	2.21	12.9	ND	-	0.0862		1.92 J	0.192	2.21	12.4	ND	-
1,2,3,4,6,7,8-HpCDF	0.132		402	4.02	1.8	10.6	ND	-	0.132		21.5	0.215	1.8	10.2	ND	-
1,2,3,4,7,8,9-HpCDF	0.157		49.2	0.492	2.69	16.9	ND	-	0.157		3.05 J	0.0305	2.69	16.2	ND	-
OCDF	0.382		458	0.137	3.68	27	ND	-	0.382		21.5	0.00645	3.68	25.6	ND	-
Total TCDD			491			6.36	ND				62.3			6.12	ND	
Total PeCDD			826			7.73	ND				64			8.03	ND	
Total HxCDD			1680			10.4	ND				127			10.8	ND	
Total HpCDD			1920			12.1	ND				96.2			12.3	ND	
Total TCDF			448			5.35	ND				51.8 M			5.62	ND	
Total PeCDF			501 D,M			7.25	ND				59.9			6.74	ND	
Total HxCDF			616			12.9	ND				56.2			12.4	ND	
Total HpCDF			554			16.9	ND				32.9			16.2	ND	

Notes: J Analyte concentration is below calibration range
M Maximum possible concentration
F Analyte confirmation on second column
D Presence of Diphenyl Ethers

FIGURES



A
Units 1 and 2
Units 3 and 4
North Basin
Oil/Water Separator
Transfer Sump
Sediment Trap
Unit 4
Sediment Trap
Unit 3
Oil/Water
Separator
Central Basin
BCCB
Pipe
BCCB
Figure 4
Figure 5
South
Basin
A'
Facilities Map
Buried Pipeline Associated
with Units 1 and 2
Buried Pipeline Associated
with Units 3 and 4
Buried Pipeline Associated
with Units 5 and 6
Above Grade Pipeline
Retention Basin
Footprint of Generating Facilities
A A' Location of Cross-Section
(Figure 6)
N
0 100 200 300 400
Feet
Sediment Trap
Unit 5
Oil/Water
Separator
Sediment Trap
Unit 6
Units 5 and 6

Figure 1

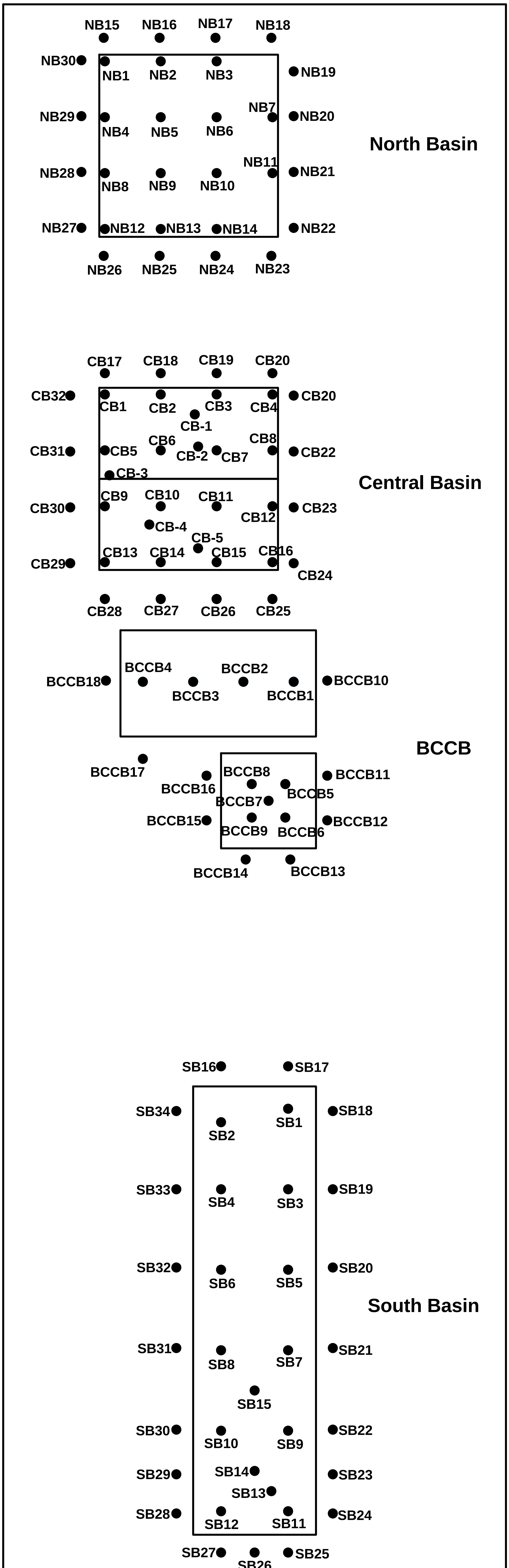


Figure 2
Soil Boring Locations
Retention Basins
Alamitos Generating Station

0 100 200 300
Feet

N

Figure 2

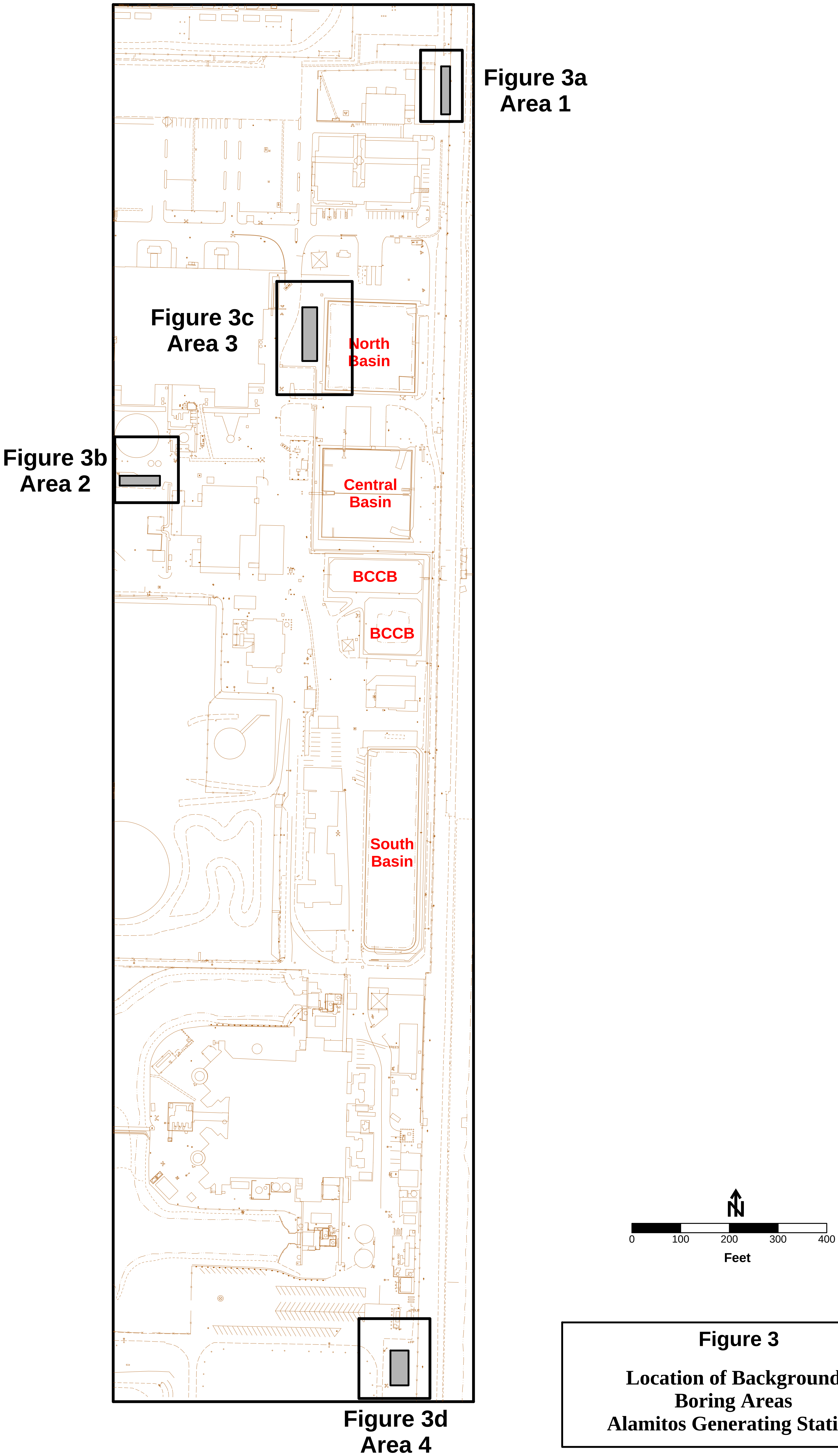


Figure 3

Location of Background Boring Areas Alamitos Generating Station

Figure 3

Background Boring Locations -- Area 1
Alamitos Generating Station

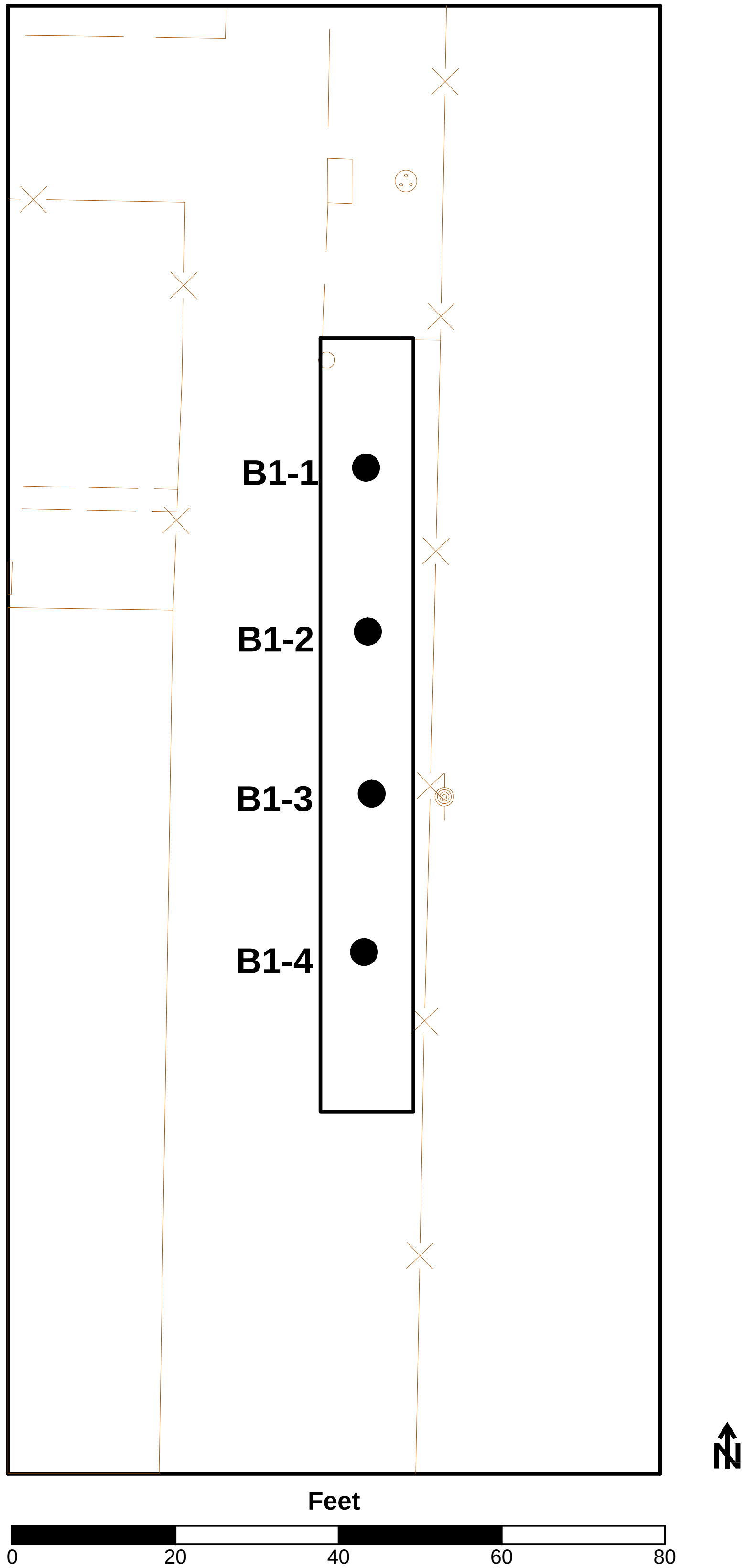


Figure 3a

Background Boring Locations -- Area 2
Alamitos Generating Station

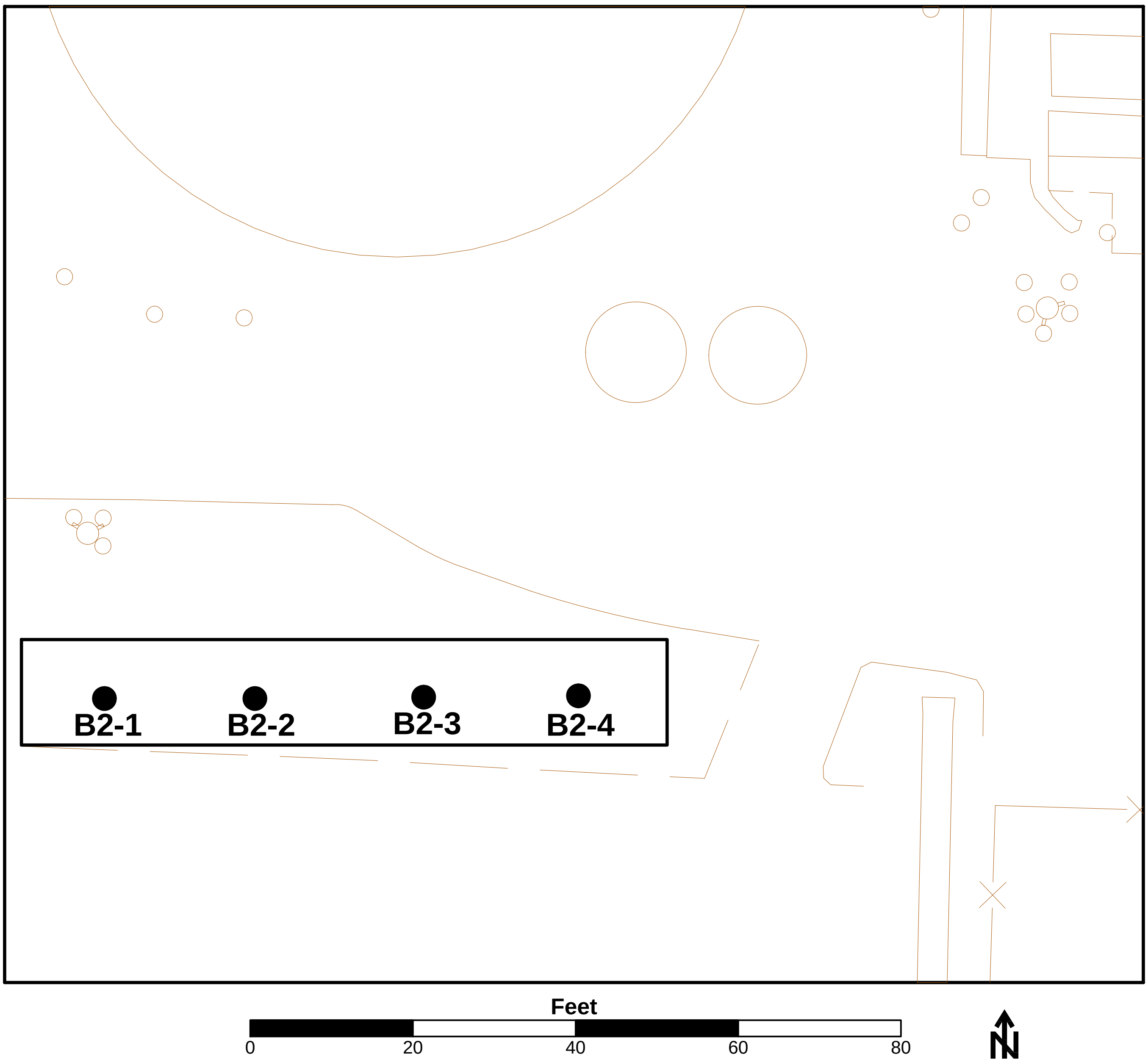


Figure 3b

Background Boring Locations -- Area 3
Alamitos Generating Station

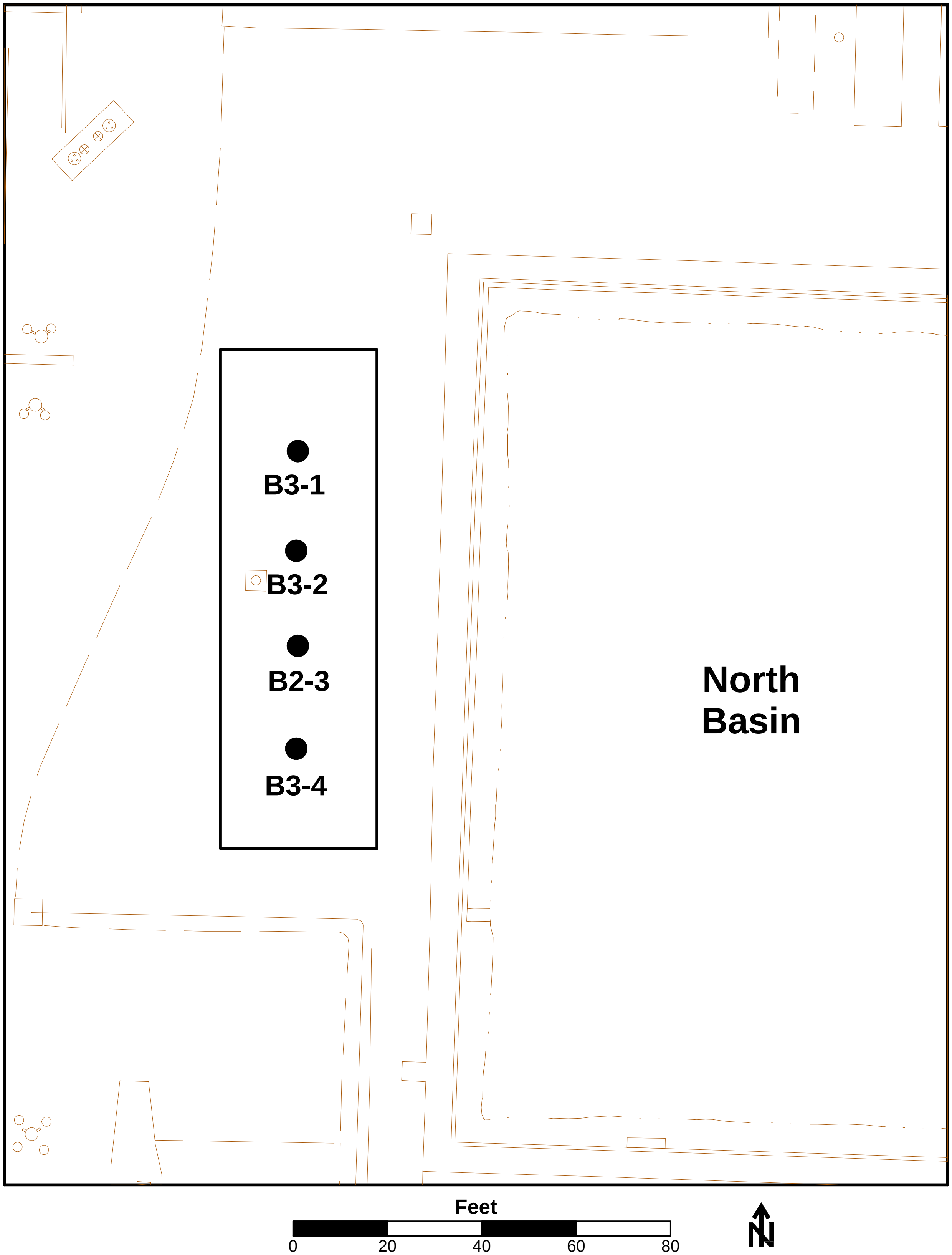


Figure 3c

Background Boring Locations -- Area 4
Alamitos Generating Station

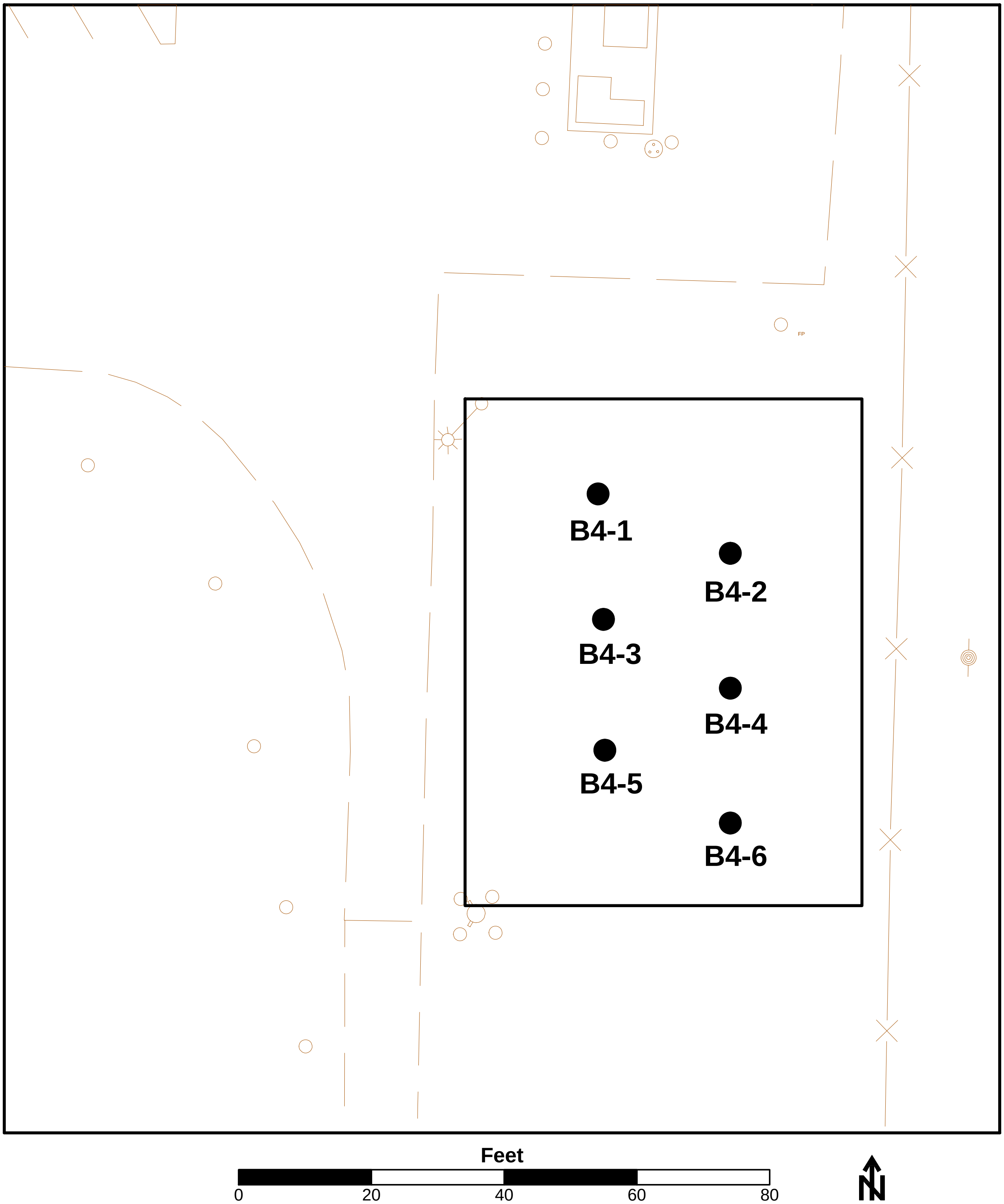


Figure 3d

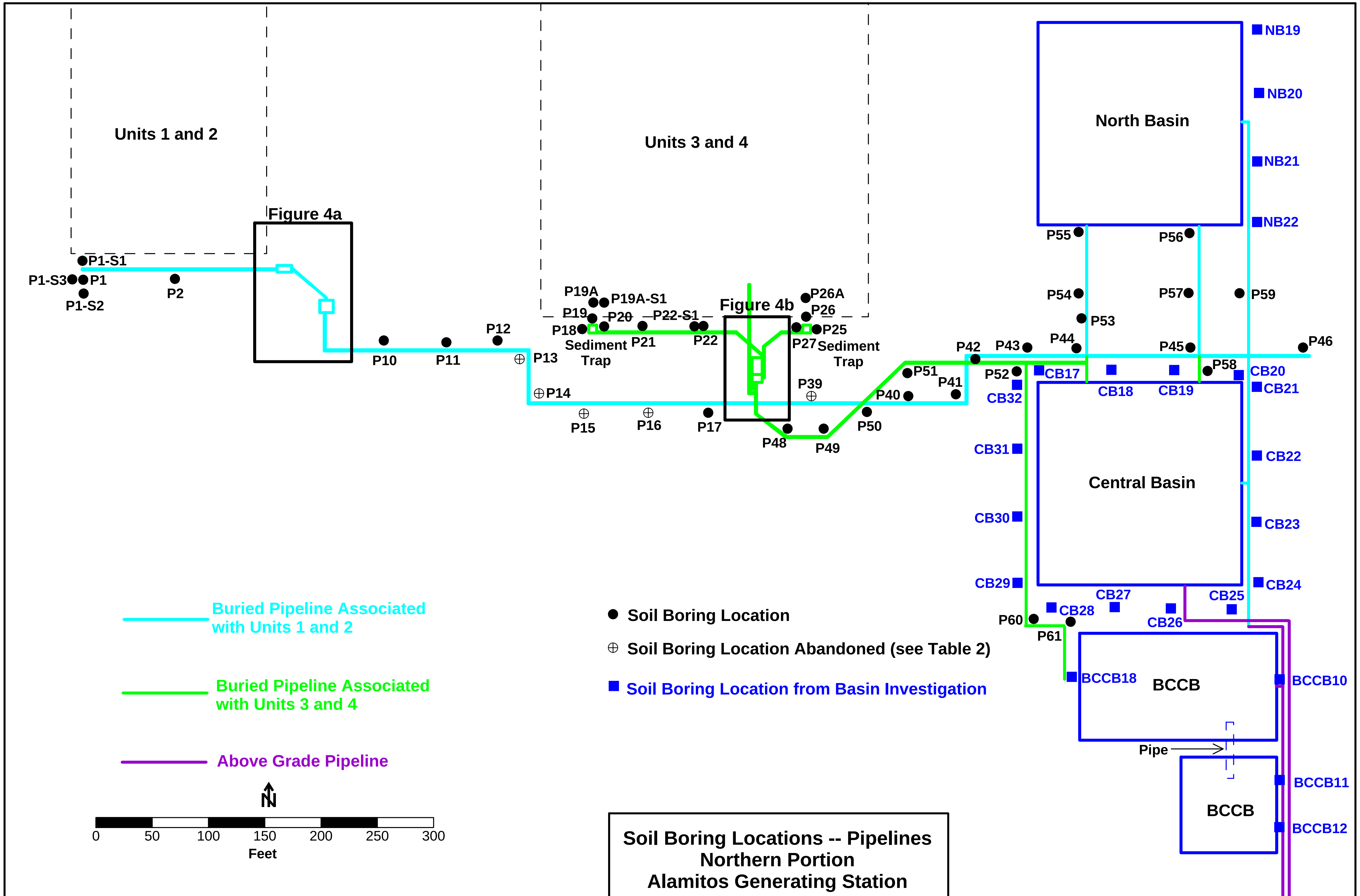
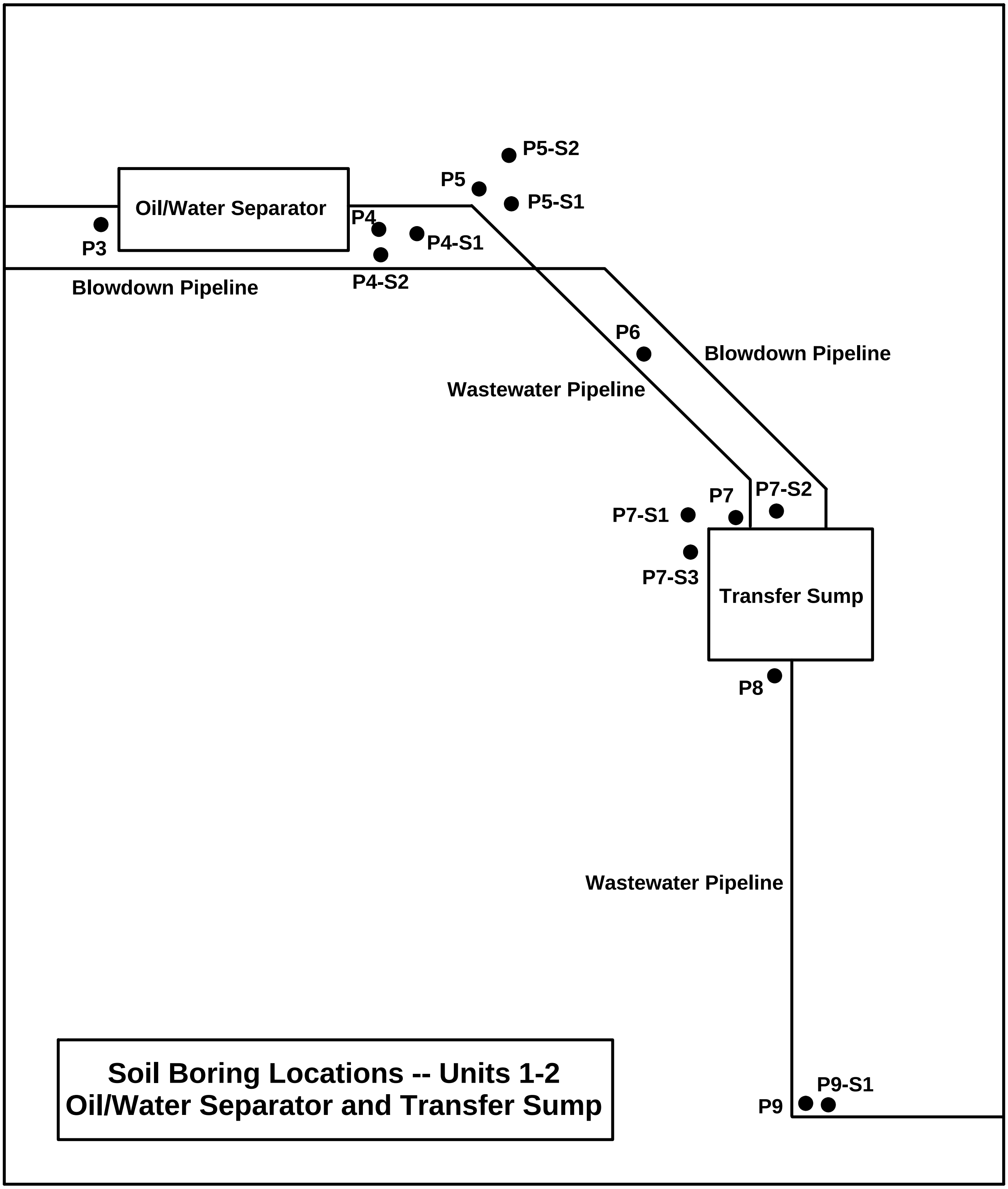

Units 1 and 2
Units 3 and 4
North Basin
Central Basin
BCCB
BCCB
Figure 4a
Figure 4b
Sediment Trap
Sediment Trap
Pipe
P1-S1
P1-S3
P1
P1-S2
P2
P10
P11
P12
P13
P14
P15
P16
P17
P18
P19
P19A
P19A-S1
P20
P21
P22
P22-S1
P25
P26
P26A
P27
P39
P40
P41
P42
P43
P44
P45
P46
P48
P49
P50
P51
P52
P53
P54
P55
P56
P57
P58
P59
P60
P61
NB19
NB20
NB21
NB22
CB17
CB18
CB19
CB20
CB21
CB22
CB23
CB24
CB25
CB26
CB27
CB28
CB29
CB30
CB31
CB32
BCCB10
BCCB11
BCCB12
BCCB18
Buried Pipeline Associated with Units 1 and 2
Buried Pipeline Associated with Units 3 and 4
Above Grade Pipeline
Soil Boring Location
Soil Boring Location Abandoned (see Table 2)
Soil Boring Location from Basin Investigation
N
0
50
100
150
200
250
300
Feet
Soil Boring Locations -- Pipelines
Northern Portion
Alamitos Generating Station

Figure 4



Feet

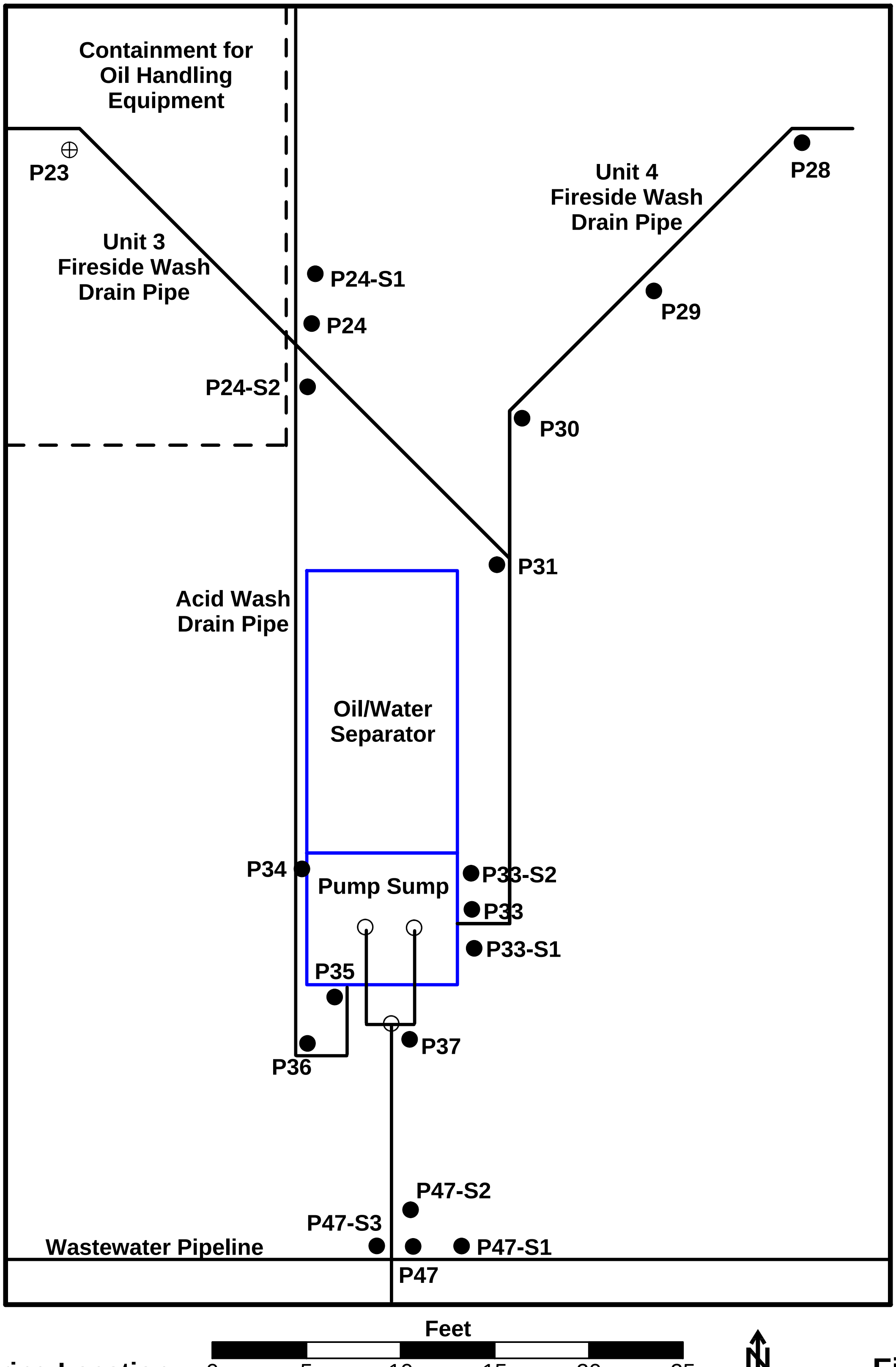
0 5 10 15 20 25 30

N

● Soil Boring Location

Figure 4a

Soil Boring Locations -- Units 3-4
Oil/Water Separator



● Soil Boring Location

Figure 4b

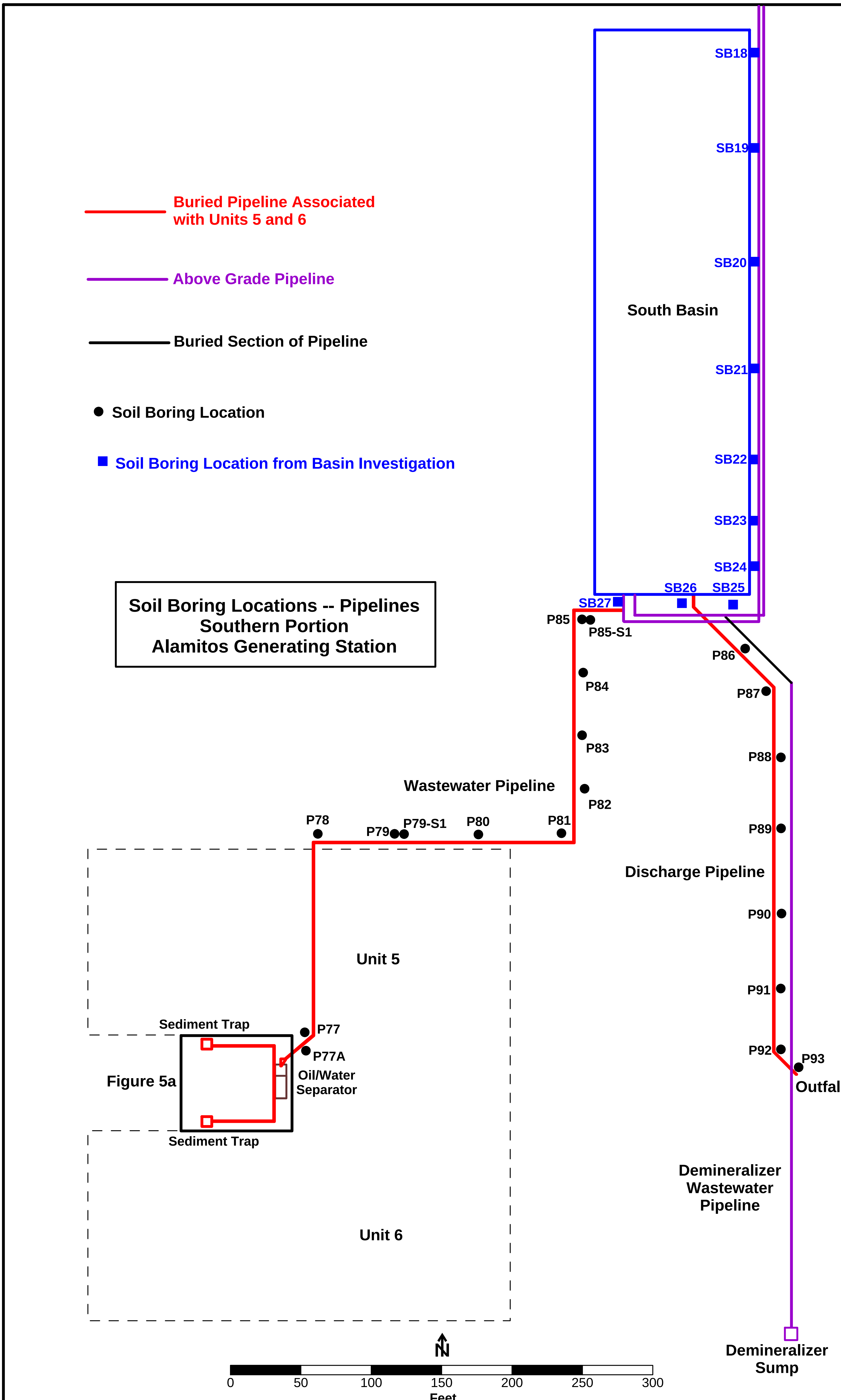
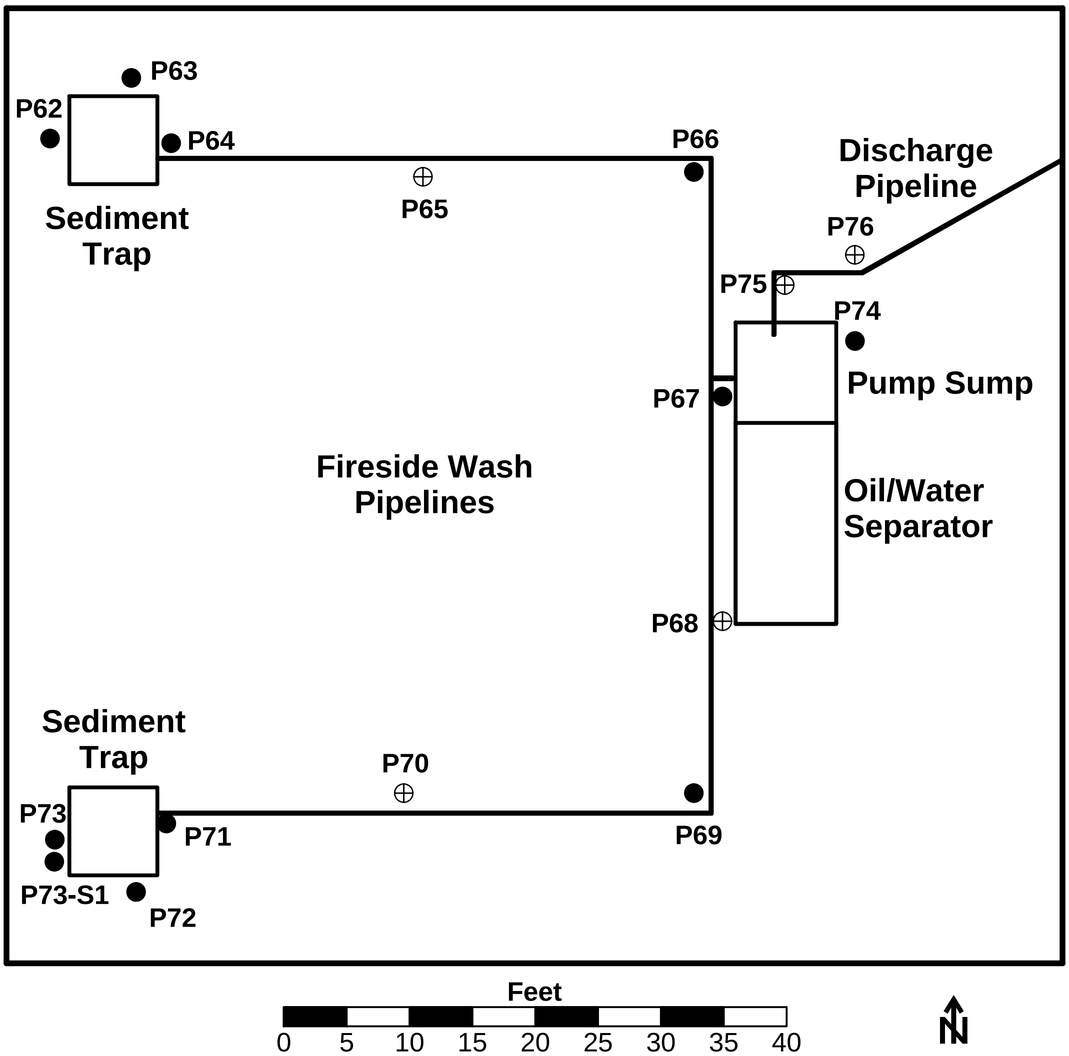

Buried Pipeline Associated with Units 5 and 6
Above Grade Pipeline
Buried Section of Pipeline
Soil Boring Location
Soil Boring Location from Basin Investigation
Soil Boring Locations -- Pipelines
Southern Portion
Alamitos Generating Station
South Basin
SB18
SB19
SB20
SB21
SB22
SB23
SB24
SB25
SB26
SB27
P85
P85-S1
P84
P83
P82
P81
P80
P79-S1
P79
P78
P77
P77A
P86
P87
P88
P89
P90
P91
P92
P93
Wastewater Pipeline
Discharge Pipeline
Outfall
Unit 5
Unit 6
Sediment Trap
Sediment Trap
Figure 5a
Oil/Water Separator
Demineralizer Wastewater Pipeline
Demineralizer Sump
N
0
50
100
150
200
250
300
Feet

Figure 5

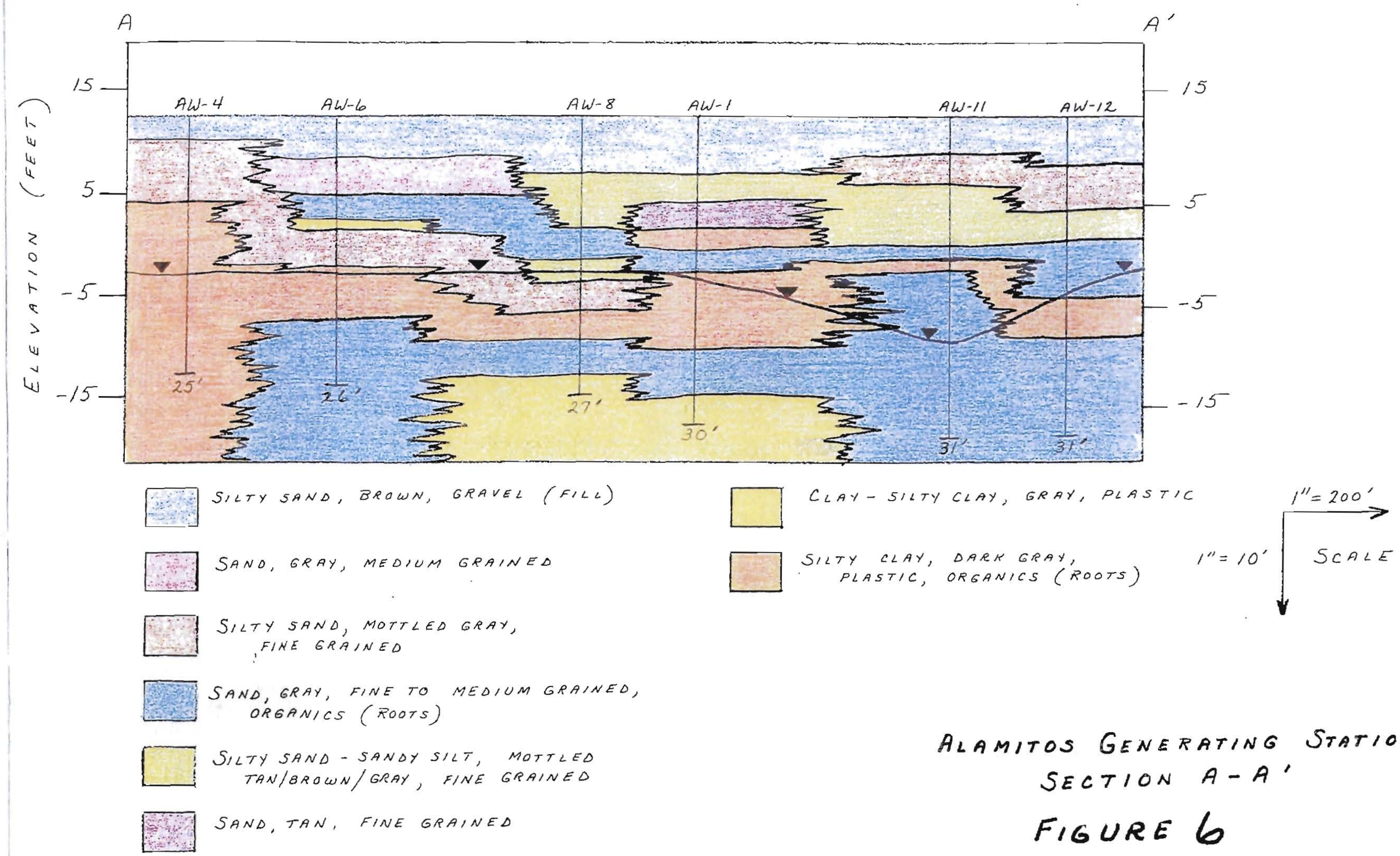
Soil Boring Locations -- Units 5-6
Sediment Traps and Oil/Water Separator



● Soil Boring Location

⊕ Soil Boring Location Abandoned (see Table 2)

Figure 5a



ALAMITOS GENERATING STATION
SECTION A - A'

FIGURE 6

Location of Buried Debris -- South Basin
Alamitos Generating Station

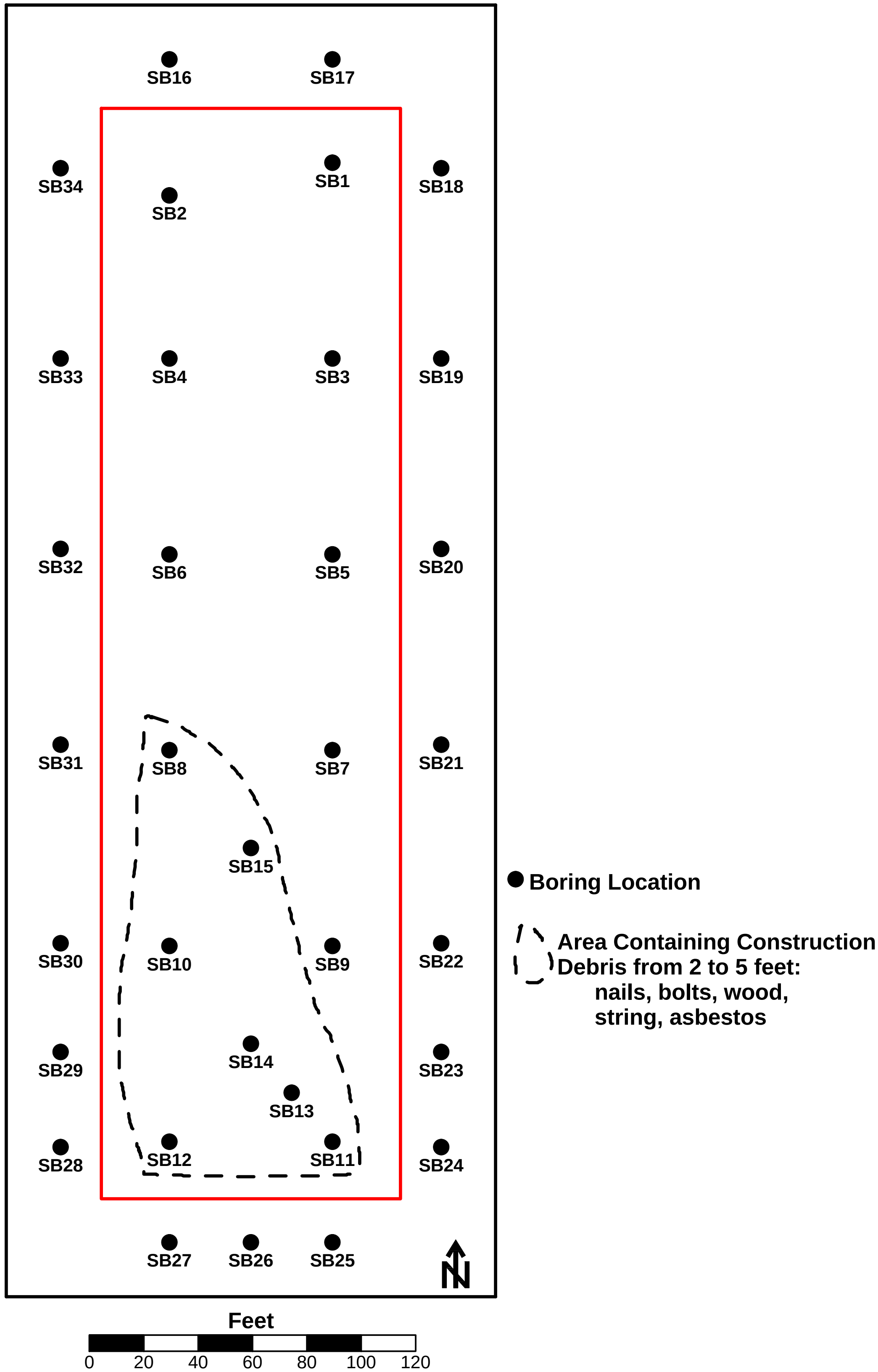


Figure 7

Boring Locations -- Northeast Corner
Central Basin -- Alamitos Generating Station

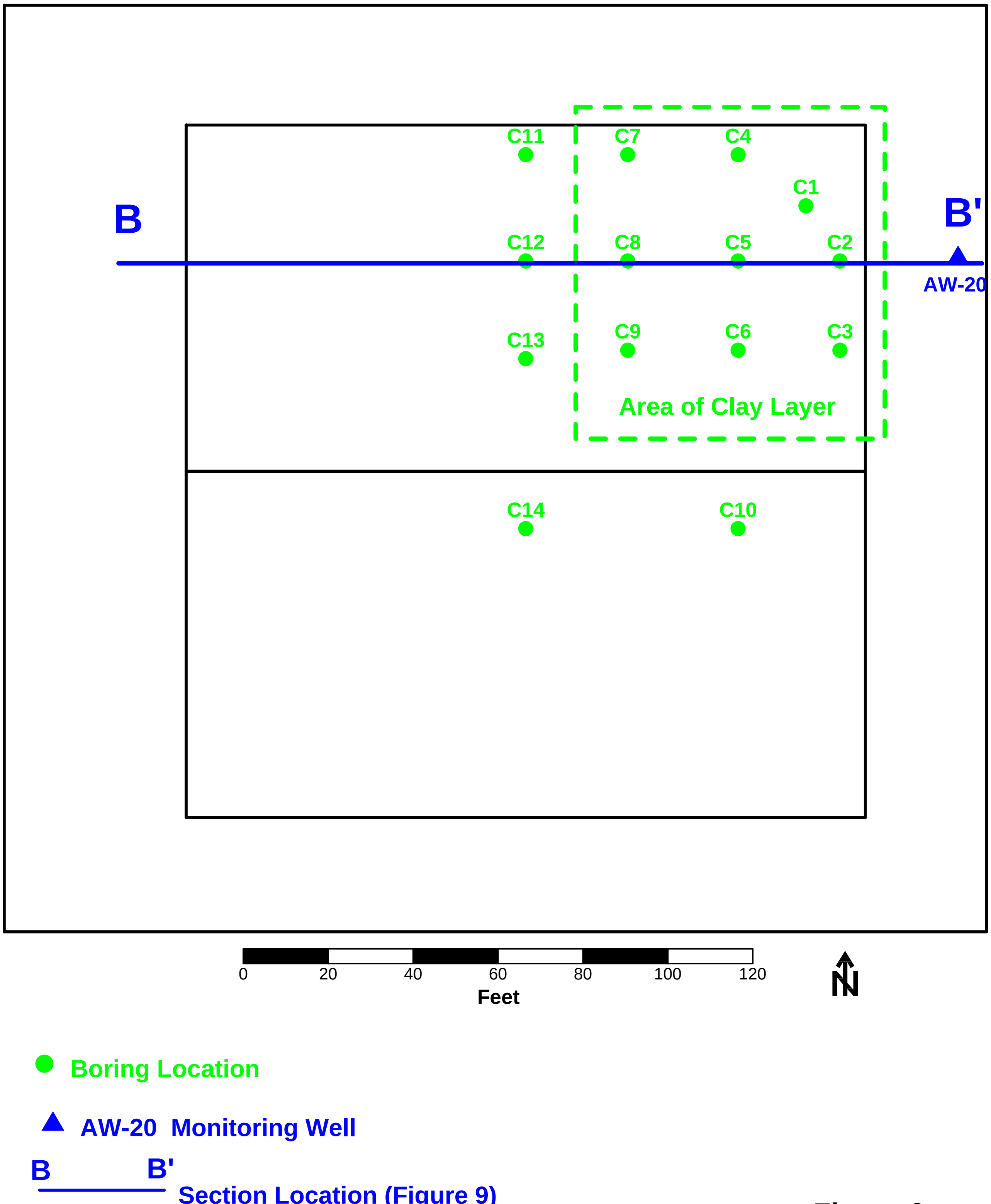


Figure 8

Central Basin Section

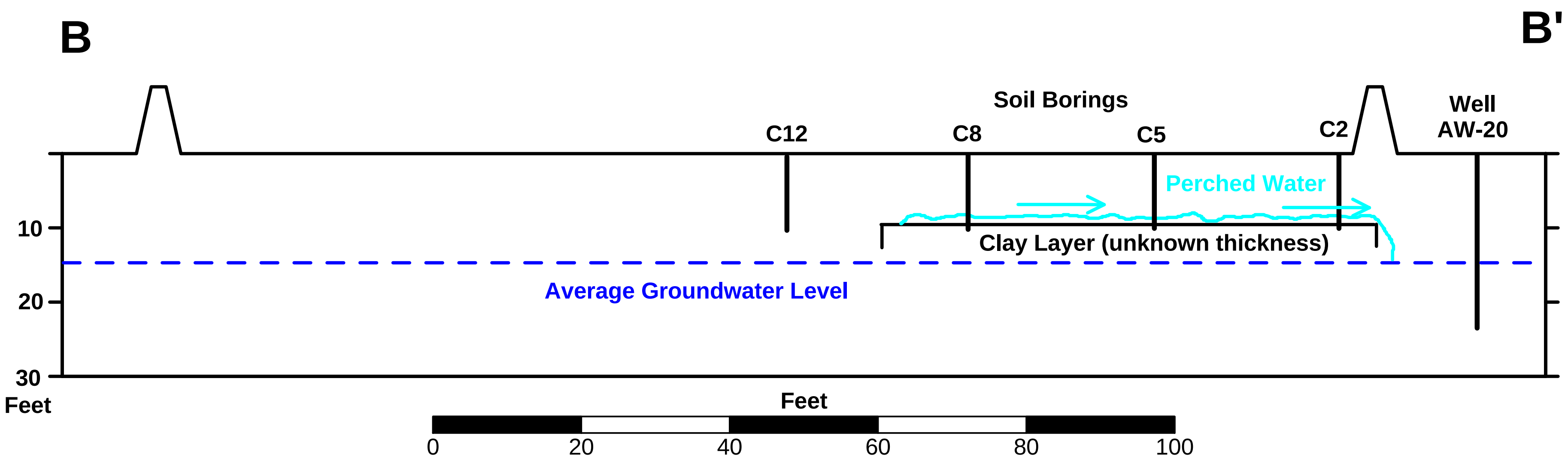


Figure 9

Appendix 1: Field Forms

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 12/15/97 Page 1 of 4

I have read and completely understand the approved procedures in the SAP. Pat Hamilton

Weather: Warm, sunny

Equipment Used: Cole Parmer pH meter and probe

Visitors: Chris Greene

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
NB3-1	6"	SOIL	8.12	15.1	Bentonite
NB3-2	3'		8.35	16.3	
NB3-3	5'		8.46	15.9	
NB2-1	6"		7.59	17.9	
NB2-2	3'		8.13	18.6	
NB2-3	5'		8.09	16.5	
NB1-1	6"		8.83	21.3	
NB1-2	3'		9.05	18.5	
NB1-3	5'		10.09	17.2	
NB4-1	6"		9.20	19.3	
NB4-2	3'		8.88	18.6	

Special Conditions/Problems/Comments:

I have completed the sampling using the approved procedures described in the SAP.

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL Company

Daily Report

Date: 12/15/97

I have read and completely understand the approved procedures in the SAP. ______

Weather: ______

Equipment Used: ______

Visitors: ______

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
NB4-3	5'	SOIL	8.73	19.3	Bentonite
NB8-1	6"		8.55	20.7	
NB8-2	3'		8.36	22.2	
NB8-3	5'		9.53	21.5	
NB9-1	6"		8.12	22.2	
NB9-2	3'		8.45	21.5	
NB9-3	5'		8.84	22.4	
NB5-1	6"		7.94	22.1	
NB5-2	3'		8.21	22.1	
NB5-3	5'		7.97	20.5	
NB6-1	6"		8.72	21.3	

Special Conditions/Problems/Comments: ______

I have completed the sampling using the approved procedures described in the SAP. ______

SOUTHERN CALIFORNIA
EDISON

An EDISON INTERNATIONAL Company

Daily Report

Date: 12/15/97 Page 3 of 4

I have read and completely understand the approved procedures in the SAP. ____________________

Weather: ____________________

Equipment Used: ____________________

Visitors: ____________________

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
NB6-2	3'	Soil	8.55	21.4	Bentonite
NB6-3	5'		7.82	21.7	
NB7-1	6"		8.04	20.7	
NB7-2	3'		8.48	22.5	
NB7-3	5'		8.30	22.3	
NB10-1	6"		8.40	24.0	
NB10-2	3'		7.74	23.0	
NB10-3	5'		7.95	22.9	
NB11-1	6"		8.57	20.6	
NB11-2	3'		8.47	21.1	
NB11-3	5'		8.50	21.6	

Special Conditions/Problems/Comments: ____________________

I have completed the sampling using the approved procedures described in the SAP. ____________________

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 12/15/97 Page 4 of 4

I have read and completely understand the approved procedures in the SAP. ____________

Weather: ____________

Equipment Used: ____________

Visitors ____________

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
NB14-1	6"	SOIL	7.68	22.5	Bentonite
NB14-2	3'		7.54	22.4	
NB14-3	5'		7.96	21.3	
NB13-1	6"		9.28	23.1	
NB13-2	3'		9.26	20.9	
NB13-3	5'		8.89	21.3	
NB12-1	6"		9.61	23.0	
NB12-2	3'		8.38	22.3	
NB12-3	5'		9.87	21.4	

Special Conditions/Problems/Comments: ____________

I have completed the sampling using the approved procedures described in the SAP. Pat Hamilton

SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL* Company

Calibration Log

Performed By: P. HAMILTON

Instrument: COLE-PARMER pH meter & probe

Date	Temp	Standard	Actual	Comments
12/15/97	15.7	7.00	7.01	
	15.3	10.01	10.36	
	15.4	4.01	4.03	

Instrument:

Date	Temp	Standard	Actual	Comments

Instrument:

Date	Temp	Standard	Actual	Comments

Comments/Problems:

Calibrations were completed using procedures described in the SAP of the WQMP. Pat Hamilton

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 3/4/98 Page 1 of 5

I have read and completely understand the approved procedures in the SAP. Pat Hamilton

Weather Warm, Sunny

Equipment Used Cole Parmer pH meter and probe

Visitors Chris Guerre

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
CB1-1	.5	Soil	7.64	19.2	Bentonite
CB1-2	3'		8.96	18.9	
CB1-3	5'		8.5	19.0	
CB5-1	.5		8.52	19.6	
CB5-2	3'		8.85	17.9	
CB5-3	5'		8.42	17.7	
CB6-1	.5		8.79	20.0	
CB6-2	3'		8.63	20.6	
CB6-3	5'		8.33	19.7	
CB7-1	.5		8.30	19.2	
CB7-2	3'		8.47	18.5	

Special Conditions/Problems/Comments:

I have completed the sampling using the approved procedures described in the SAP.

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 3/4/98 Page 2 of 5

I have read and completely understand the approved procedures in the SAP. ______

Weather ______

Equipment Used ______

Visitors ______

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
CB7-3	5'	SOIL	8.46	18.7	Bentonite
CB8-1	0.5		7.85	19.9	
CB8-2	3'		8.24	19.9	
CB8-3	5'		8.22	19.8	
CB4-1	0.5'		8.33	20.1	
CB4-2	3'		8.61	20.0	
CB4-3	5'		8.59	19.8	
CB3-1	0.5		8.13	24.3	
CB-3-2	3'		8.69	21.5	
CB-3-3	5'		8.70	21.8	
CB-2-1	0.5		8.39	25.4	

Special Conditions/Problems/Comments: ______

I have completed the sampling using the approved procedures described in the SAP. ______

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 3/4/98 Page 3 of 5

I have read and completely understand the approved procedures in the SAP. ______

Weather ______

Equipment Used ______

Visitors ______

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
CB2-2	3'	Soil	8.72	23.6	Bentonite
CB2-3	5'		8.88	23.8	
CB13-1	0.5'		7.93	24.3	
CB13-2	3'		8.35	24.7	
CB13-3	5'		7.94	24.9	
CB14-1	0.5		7.87	25.0	
CB14-2	3'		8.54	23.9	
CB14-3	5'		8.91	24.3	
CB15-1	0.5'		7.96	26.2	
CB15-2	3'		8.23	26.2	
CB15-3	5'		8.46	25.4	

Special Conditions/Problems/Comments: ______

I have completed the sampling using the approved procedures described in the SAP. ______

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 3/4/98 Page 4 of 5

I have read and completely understand the approved procedures in the SAP. ____________

Weather ____________

Equipment Used ____________

Visitors ____________

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
CB16-1	0.5'	Soil	8.00	22.3	Bentonite
CB16-2	3'		8.14	23.7	
CB16-3	5'		8.32	23.7	
CB12-1	0.5		7.01	22.8	
CB12-2	3'		7.60	23.7	
CB12-3	5'		8.16	23.6	
CB11-1	0.5		8.46	22.7	
CB11-2	3		8.54	22.5	
CB11-3	5		8.84	23.1	
CB10-1	0.5		7.72	22.6	
CB10-2	3		7.98	21.1	

Special Conditions/Problems/Comments: ____________

I have completed the sampling using the approved procedures described in the SAP. ____________

SOUTHERN CALIFORNIA
EDISON
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Daily Report

Date: 3/4/98 Page 5 of 5

I have read and completely understand the approved procedures in the SAP. ______

Weather ______

Equipment Used ______

Visitors ______

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
CB10-3	5'	SOIL	8.44	20.5	Bentonite
CB9-1	0.5'		7.52	21.1	
CB9-2	3'		8.79	21.9	
CB9-3	5'		8.82	21.8	

Special Conditions/Problems/Comments: ______

I have completed the sampling using the approved procedures described in the SAP. Pat Hamilton

SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL* Company

Calibration Log

Performed By: P/HAMILTON

Instrument: Cole Parmer pH meter and probe

Date	Temp	Standard	Actual	Comments
3/4/98	14.8	7.00	7.04	
	15.3	10.01	10.07	
	15.1	4.01	4.03	

Instrument: __________

Date	Temp	Standard	Actual	Comments

Instrument: __________

Date	Temp	Standard	Actual	Comments

Comments/Problems: __________

Calibrations were completed using procedures described in the SAP. Pat Hamilton

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 11/24/97 Page 1 of 3

I have read and completely understand the approved procedures in the SAP. Pat Hamilton

Weather: Cool, overcast

Equipment Used: Cole Parmer pH meter

Visitors: Greg Sweel, George Becker

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
BCCB6-3	5'	SOIL	8.11	22.0	Bentonite
BCCB5-1	6"		7.56	22.7	
BCCB5-2	3'		7.53	22.5	
BCCB5-3	5'		7.61	22.2	
BCCB1-1	6"		6.76	22.7	
BCCB1-2	3'		7.30	22.7	
BCCB1-3	5'		8.08	22.4	
BCCB2-1	2.9'		7.55	21.3	
BCCB2-2	5'		8.07	21.3	
BCCB2-3	2.7'	WATER	7.41	21.4	
BCCB3-1	2.2'	SOIL	7.22	20.3	

Special Conditions/Problems/Comments:

I have completed the sampling using the approved procedures described in the SAP.

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL Company

Daily Report

Date: 11/24/97 Page 3 of 3

I have read and completely understand the approved procedures in the SAP. ______

Weather: ______

Equipment Used: ______

Visitors: ______

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
BCCB3-2	5'	Soil	7.66	20.9	Bentonite
BCCB4-1	6"		7.19	19.9	
BCCB4-2	2'		7.88	19.6	
BCCB4-3	5'		7.57	20.6	

Special Conditions/Problems/Comments: ______

I have completed the sampling using the approved procedures described in the SAP. Pat Hamilton

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 9/4/97 Page 1 of 5

I have read and completely understand the approved procedures in the SAP. Pat Hamilton

Weather: Warm, Sunny

Equipment Used: Cole Parmer pH meter and probe

Visitors: Greg Sweet

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
SB1-1	0	SOIL	6.97	24.3	Bentonite
SB1-2	6"	SOIL	8.16	24.2	
SB1-3	3'	SOIL	7.46	24.3	
SB1-4	5'	SOIL	7.92	23.8	
SB2-1	6"	SOIL	7.18	25.1	
SB2-2	3'	SOIL	7.16	25.5	
SB2-3	5'	SOIL	7.89	25.9	
SB4-1	0	SOIL	8.19	25.7	
SB4-2	6"	SOIL	7.30	25.9	
SB4-3	3'	SOIL	6.83	26.4	
SB4-4	5'	SOIL	7.42	26.4	

Special Conditions/Problems/Comments:

I have completed the sampling using the approved procedures described in the SAP.

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 9/4/97 Page 2 of 5

I have read and completely understand the approved procedures in the SAP. ______

Weather: ______

Equipment Used: ______

Visitors: ______

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
SB3-1	6"	Soil	6.72	26.9	Bentonite
SB3-2	3'	Soil	7.25	26.7	
SB3-3	5'	Soil	7.88	27.5	
SB5-1	6"	Soil	7.12	27.7	
SB5-2	3'	Soil	6.85	28.0	
SB5-3	5'	Soil	7.22	28.0	
SB6-1	6"	Soil	7.23	28.8	
SB6-2	3'	Soil	7.24	28.9	
SB6-3	5'	Soil	8.42	29.2	
SB8-1	6"	Soil	7.22	28.6	
SB8-2	3'	Soil	6.87	29.2	

Special Conditions/Problems/Comments: ______

I have completed the sampling using the approved procedures described in the SAP. ______

SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL* Company

Daily Report

Date: 9/4/97 Page 3 of 5

I have read and completely understand the approved procedures in the SAP. ____________________

Weather: ____________________

Equipment Used: ____________________

Visitors: ____________________

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
SB8-3	5'	SOIL	7.71	30.2	Bentonite
SB7-1	0	SOIL	7.87	27.6	
SB7-2	6"	SOIL	7.23	27.8	
SB7-3	3'	SOIL	7.26	28.4	
SB7-4	5'	SOIL	7.36	29.2	
SB9-1	6"	SOIL	7.35	28.1	
SB9-2	3'	SOIL	7.81	31.0	
SB9-3	5'	SOIL	7.24	30.2	
SB10-1	6"	SOIL	7.42	26.8	
SB10-2	3'	SOIL	7.16	28.5	
SB10-3	5'	SOIL	~~7~~ 6.83	29.7	

Special Conditions/Problems/Comments: ____________________

I have completed the sampling using the approved procedures described in the SAP. ____________________

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Daily Report

Date: 9/4/97 Page 4 of 5

I have read and completely understand the approved procedures in the SAP. ______

Weather: ______

Equipment Used: ______

Visitors: ______

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
SB12-1	0	SOIL	8.02	28.5	Bentonite
SB12-2	6"	SOIL	7.18	28.4	
SB12-3	3'	SOIL	7.54	28.8	
SB12-4	5'	SOIL	7.08	30.2	
SB11-1	6"	SOIL	7.31	31.0	
SB11-2	3'	SOIL	7.33	28.5	
SB11-3	5'	SOIL	7.39	29.9	
SB13-1	6"	SOIL	7.76	27.7	
SB13-2	3'	SOIL	7.29	28.4	
SB13-3	5'	SOIL	7.44	29.5	
SB14-1	6"	SOIL	7.56	29.3	

Special Conditions/Problems/Comments: ______

I have completed the sampling using the approved procedures described in the SAP. ______

SOUTHERN CALIFORNIA
EDISON
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Daily Report

Date: 9/4/97 Page 5 of 5

I have read and completely understand the approved procedures in the SAP. ______________________

Weather: ______________________

Equipment Used: ______________________

____

Visitors: ______________________

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
SB 14-2	3'	SOIL	7.58	29.3	Bentonite
SB 14-3	5'	SOIL	7.36	30.3	
SB 15-1	6"	SOIL	7.05	28.8	
SB 15-2	3'	SOIL	7.24	30.3	
SB 15-3	5'	SOIL	8.41	31.4	
SB 15-4	0	SOIL	6.94	32.7	

Special Conditions/Problems/Comments: ______________________

I have completed the sampling using the approved procedures described in the SAP. Pat Hamilton

SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL* Company

Calibration Log

Performed By: P. HAMILTON

Instrument: Cole Parmer pH meter and probe

Date	Temp	Standard	Actual	Comments
9/4/97	16.8	7.00	7.03	
	16.1	10.01	10.15	
	16.5	4.01	4.31	

Instrument: ____________________

Date	Temp	Standard	Actual	Comments

Instrument: ____________________

Date	Temp	Standard	Actual	Comments

Comments/Problems: ____________________

Calibrations were completed using procedures described in the SAP. P. Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA SOIL SAMPLING – BASINS	**Page** 1 **of** 4 **Date:** 10/29/07 **Start:** 0530 **Finish:** 1200

Meteorological Conditions: Cool, overcast

Equipment Used: Cole Parmer pH meter, MINIRAE PID
HAND AUGER

Project Personnel: HAMILTON / WANHALA

Project Personnel Protection: HARD HAT, SAFETY GLASSES, GLOVES

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
B1-1	1	SOIL	0.9	6.8	16.1	B1-1-1	Backfill
	3		0.6	6.9	16.4	B1-1-2	
	5		1.1	7.3	16.5	B1-1-3	
B1-2	1		1.3	7.5	16.5	B1-2-1	
	3		0.9	7.4	16.4	B1-2-2	
	5		0.6	7.3	16.2	B1-2-3	
B1-3	1		0.5	7.4	16.4	B1-3-1	
	3		0.7	7.1	16.7	B1-3-2	
	5		2.1	7.4	16.6	B1-3-3	
B1-4	1		2.9	7.3	16.5	B1-4-1	

Field Observations/Problems:

B-101 dup for B1-4-2
NB-102 Trip Blank
NB-103 dup for NB15-2
NB-104 Equip Blank
NB-105 dup for NB28-2

Total number of samples collected and recorded on the Chain of Custody Form: 38

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	Page 2 of 3
	Date: 10/29/07
	Start: 0530 Finish: 1200

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
B1-4	3	SOIL	0.5	6.9	16.4	B1-4-2	Bentonite
"	5		0.6	7.2	16.3	B1-4-3	
NB18	1		1.3	7.3	16.6	NB18-1	
	3		1.4	7.3	16.4	NB18-2	
	5		1.0	7.4	16.4	NB18-3	
NB17	1		0.9	7.2	16.3	NB17-1	
	3		1.1	7.2	16.4	NB17-2	
	5		1.3	7.1	16.3	NB17-3	
NB16	1		1.3	7.3	16.2	NB16-1	
"	3		1.1	7.1	16.1	NB16-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:	38

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS Gen Sta	Page 3 of 4
	Date: 10/29/07
	Start: 0530 **Finish:** 1200

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
NB16	5	SOIL	0.8	7.1	16.1	NB16-3	Bentonite
NB15	1		1.0	7.2	16.4	NB15-1	
	3		1.1	7.3	16.6	NB15-2	
	5		1.4	7.3	16.5	NB15-3	
NB30	1		1.0	7.1	16.6	NB30-1	
	3		0.8	7.2	16.3	NB30-2	
	5		1.3	7.2	16.4	NB30-3	
NB29	1		0.8	7.3	16.4	NB29-1	
	3		0.9	7.3	16.3	NB29-2	
	5		1.3	7.1	16.5	NB29-3	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 38

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	Page 4 of 4
	Date: 10/29/07
	Start: 0530 Finish: 1200

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
NB28	1	Soil	0.8	6.9	16.7	NB28-1	Bentonite
	3		0.7	7.1	16.8	NB28-2	
	5		1.0	7.1	16.6	NB28-3	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 38

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA SOIL SAMPLING - BASINS	**Page** 1 **of** 3 **Date:** 10/30/07 **Start:** 0530 **Finish:** 1230

Meteorological Conditions: Cool, overcast
Equipment Used: Cole-Parmer pH meter, MINIRAE PID
HAND AUGER
Project Personnel: HAMILTON / WANHALA
Project Personnel Protection: Hard hat, safety glasses, gloves
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
NB27	1	SOIL	0.6	7.2	16.1	NB27-1	Bentonite
	3		1.1	7.1	16.3	NB27-2	
	5		1.2	7.1	16.3	NB27-3	
B2-1	1		0.8	7.3	16.6	B2-1-1	
	3		1.1	7.4	16.4	B2-1-2	
	5		0.9	7.3	16.5	B2-1-3	
B2-2	1		2.1	7.4	16.6	B2-2-1	
	3		1.9	7.3	16.6	B2-2-2	
	5		0.8	7.1	16.4	B2-2-3	
B2-3	1		0.6	7.4	16.3	B2-3-1	

Field Observations/Problems:

B-106 Trip Blank
B-107 dup for B2-3-2
B-108 dup for NB21-2
B-109 Equip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 31

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	Page 2 of 3
	Date: 10/30/07
	Start: 0530 Finish: 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
B2-3	3	Soil	0.9	7.4	16.6	B2-3-2	Bentonite
"	5		11	7.2	16.7	B2-3-3	
B2-4	1		0.7	7.3	16.6	B2-4-1	
	3		0.9	7.3	16.9	B2-4-2	
	5		0.8	7.2	16.8	B2-4-3	
NB19	1		0.7	7.2	17.1	NB19-1	
	3		0.9	7.2	16.8	NB19-2	
	5		0.7	7.2	16.8	NB19-3	
NB20	1		0.6	7.2	16.5	NB20-1	
"	3		1.4	7.1	16.8	NB20-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:	31

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	**Page** 3 **of** 3
	Date: 10/30/07
	Start: 0530 **Finish:** 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
NB20	5	SOIL	1.6	7.2	16.4	NB20-3	Bentonite
NB21	1		0.6	7.1	16.6	NB21-1	
	3		0.6	7.3	16.8	NB21-2	
	5		1.1	7.1	16.9	NB21-3	
NB22	1		0.5	6.9	17.1	NB22-1	
	3		0.6	7.1	17.3	NB22-2	
	5		0.9	7.2	17.1	NB22-3	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 31

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS Gen Sta Soil Sampling - Baseline	**Page** 1 **of** 3 **Date:** 10/31/07 **Start:** 0530 **Finish:** 1230

Meteorological Conditions: COOL, overcast

Equipment Used: Cole-Parmer pH meter, Mini RAE PID
Hand Auger

Project Personnel: HAMILTON / WANHALA

Project Personnel Protection: Hard Hat, safety glasses, gloves

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
B3-1	1	SOIL	0.8	7.4	16.6	B3-1-1	Bentonite
	3		1.1	6.9	16.8	B3-1-2	
	5		1.3	7.3	16.4	B3-1-3	
B3-2	1		1.0	7.4	16.3	B3-2-1	
	3		0.6	7.1	16.4	B3-2-2	
	5		0.5	7.3	16.5	B3-2-3	
B3-3	1		1.3	7.4	16.6	B3-3-1	
	3		11	7.3	16.7	B3-3-2	
	5		0.9	7.3	16.9	B3-3-3	
B3-4	1		0.6	7.4	16.6	B3-4-1	

Field Observations/Problems:

B-110 Trip Blank
B-111 dup for B3-4-2
B-112 dup for SB18-2
B-113 Equip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 34

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	Page 2 of 3
	Date: 10/31/07
	Start: 0530 Finish: 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
B3-4	3	Soil	0.9	7.2	16.9	B3-4-2	Bentonite
"	5		1.1	7.4	17.2	B3-4-3	
BCCB10	1		1.3	7.2	17.1	BCCB10-1	
	3		1.6	7.2	16.9	BCCB10-2	
	5		4.5	7.3	17.2	BCCB10-3	
BCCB11	1		0.7	7.1	17.4	BCCB11-1	
	3		1.9	7.3	17.1	BCCB11-2	
	5		5.3	7.2	17.3	BCCB11-3	
BCCB12	1		1.1	7.3	17.0	BCCB12-1	
"	3		2.4	7.2	17.2	BCCB12-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:	34

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	Page 3 of 3
	Date: 10/31/07
	Start: 0530 Finish: 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
BCCB12	5	Soil	1.1	7.1	17.1	BCCB12-3	Bentonite
SB18	1		0.8	7.1	17.4	SB18-1	
	3		0.5	7.2	17.3	SB18-2	
	5		1.6	7.2	17.1	SB18-3	
SB19	1		0.6	7.2	17.4	SB19-1	
	3		0.7	7.2	17.2	SB19-2	
	5		1.0	7.2	17.2	SB19-3	
SB20	1		0.7	7.1	17.1	SB20-1	
	3		1.0	7.2	17.6	SB20-2	
	5		0.9	7.2	17.4	SB20-3	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 34

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS Gen Sta Soil Sampling - Basins	**Page** 1 **of** 3 **Date:** 11/2/07 **Start:** 0530 **Finish:** 1350

Meteorological Conditions: Cool, overcast

Equipment Used: Cole - Parmer pH meter, Mini RAE PID
Hand Auger

Project Personnel: HAMILTON / WANHALA

Project Personnel Protection: Hard Hat, Safety glasses, gloves

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
SB21	1	Soil	0.6	7.4	16.8	SB21-1	Bentonite
	3		1.2	7.4	16.7	SB21-2	
	5		1.1	7.1	16.8	SB21-3	
SB22	1		0.5	7.2	16.6	SB22-1	
	3		0.7	7.2	16.8	SB22-2	
	5		0.9	7.2	16.9	SB22-3	
SB23	1		1.0	7.1	17.1	SB23-1	
	3		1.0	7.2	17.4	SB23-2	
	5		1.3	7.3	17.2	SB23-3	
BCCB18	1		1.1	7.3	17.0	BCCB18-1	

Field Observations/Problems:

B-114 Trip Blank
B-115 dup for BCCB18-2
B-116 dup for BCCB15-2
B-117 Equip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	Page 2 of 3
	Date: 11/2/07
	Start: 0530 Finish: 1350

Meteorological Conditions:
Equipment Used:
Project Personnel:
Project Personnel Protection:
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
BCCB18	3	SOIL	0.9	7.2	17.1	BCCB18-2	Bentonite
"	5		1.2	7.2	17.3	BCCB18-3	
BCCB17	1		0.7	7.3	17.4	BCCB17-1	
	3		0.8	7.3	17.3	BCCB17-2	
	5		1.0	7.3	17.4	BCCB17-3	
BCCB16	1		0.8	7.3	17.4	BCCB16-1	
	3		1.4	7.1	17.6	BCCB16-2	
	5		3.4	7.2	17.4	BCCB16-3	
BCCB15	1		1.2	7.2	17.6	BCCB15-1	
"	3		1.1	7.2	17.4	BCCB15-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:	25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS	**Page** 3 **of** 3
	Date: 11/2/07
	Start: 0530 **Finish:** 1350

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
BCCB15	5	SOIL	2.1	7.3	17.4	BCCB15-3	Bentonite

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA SOIL SAMPLING - BASINS	**Page** 1 **of** 4
	Date: 11/5/07
	Start: 0530 **Finish:** 1300

Meteorological Conditions: Cool, overcast

Equipment Used: Cole-Parmer pH meter ; Mini Rae PID
HAND AUGER

Project Personnel: HAMILTON / WANIHALA

Project Personnel Protection: Hard Hat, safety glasses, gloves

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
CB20	1	Soil	1.1	7.3	16.0	SB20-1	Bentonite
	3		1.4	7.4	16.4	SB20-2	
	5		0.9	7.4	16.1	SB20-3	
CB21	1		1.0	7.3	16.3	SB21-1	
	3		0.8	7.6	16.6	SB21-2	
	5		0.5	7.5	16.3	SB21-3	
CB22	1		0.9	7.1	16.4	SB22-1	
	3		0.7	7.3	16.5	SB22-2	
	5		1.1	7.5	16.6	SB22-3	
CB23	1		0.9	7.6	16.4	SB23-1	

Field Observations/Problems:

B-118 Trip Blank
B-119 dup for CB23-2
B-120 dup for CB 27-2
B-121 Equip Blank
B-122 dup for CB 31-2

Total number of samples collected and recorded on the Chain of Custody Form: 41

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS Gen Sta	Page 2 of 4
	Date: 11/5/07
	Start: 0530 Finish: 1300

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
CB23	3	Soil	1.3	6.9	16.9	CB23-2	Bentonite
"	5		0.9	7.5	16.8	CB23-3	
CB24	1		1.4	7.9	16.9	CB24-1	
	3		1.1	7.6	17.1	CB24-2	
	5		0.6	7.4	17.3	CB24-3	
CB25	1		0.9	7.7	17.5	CB25-1	
	3		1.3	7.4	17.2	CB25-2	
	5		1.0	7.6	17.3	CB25-3	
CB26	1		0.8	7.2	17.2	CB26-1	
"	3		0.6	7.3	17.5	CB26-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 41

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: Alamitos Gen Sta	Page 3 of 4
	Date: 11/5/07
	Start: 0530 Finish: 1300

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
CB26	5	Soil	0.6	7.3	17.6	CB26-3	Bentonite
CB27	1		0.5	7.5	17.4	CB27-1	
	3		0.9	7.7	17.1	CB27-2	
	5		0.7	7.9	17.3	CB27-3	
CB28	1		1.0	7.5	17.4	CB28-1	
	3		0.3	7.5	17.5	CB28-2	
	5		0.6	7.4	17.4	CB28-3	
CB29	1		1.1	7.6	17.3	CB29-1	
	3		0.5	7.5	17.5	CB29-2	
	5		0.8	7.6	17.6	CB29-3	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 41

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN STA	Page 4 of 4
	Date: 11/5/07
	Start: 0530 Finish: 1300

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
CB30	1	SOIL	0.7	7.2	17.4	CB30-1	Bentonite
	3		0.5	7.3	17.6	CB30-2	
	5		1.3	7.4	17.5	CB30-3	
CB31	1		0.6	7.7	17.3	CB31-1	
	3		0.9	7.5	17.3	CB31-2	
	5		0.5	7.5	17.4	CB31-3	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 41

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN. STA SOIL SAMPLING - BASINS	**Page** 1 **of** 3 **Date:** 11/14/07 **Start:** 0530 **Finish:** 1230

Meteorological Conditions: COOL, Sunny
Equipment Used: Cole-Parmer pH probe; Mini RAE PID
HAND AUGER
Project Personnel: HAMILTON / WANHALA
Project Personnel Protection: Hard Hat, Safety glasses, gloves
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
BCCB 13	1	SOIL	1.0	7.4	16.1	BCCB13-1	Bentonite
	3		1.3	7.6	16.8	BCCB13-2	
	5		6.8	7.4	16.7	BCCB13-3	
BCCB 14	1		1.2	7.5	16.5	BCCB14-1	
	3		0.7	7.7	16.9	BCCB14-2	
	5		0.9	7.7	17.1	BCCB14-3	
NB23	1		10.1	7.4	17.3	NB23-1	
	3		16.7	7.3	17.2	NB23-2	
	5		1.1	7.8	17.4	NB23-3	
NB24	1		9.6	8.2	17.4	NB24-1	

Field Observations/Problems:

B-123 Trip Blank
B-124 dup for NB24-2
B-125 dup for CB32-2
B-126 Equip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN STA	Page 2 of 3
	Date: 11/14/07
	Start: 0530 **Finish:** 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
NB24	3	SOIL	0.8	7.1	17.6	NB24-2	Bentonite
"	5		1.1	7.5	17.4	NB24-3	
NB25	1		0.5	7.6	17.3	NB25-1	
	3		7.1	7.4	17.4	NB25-2	
	5		11.3	7.4	17.5	NB25-3	
NB26	1		21.3	7.5	17.6	NB26-1	
	3		19.2	7.6	17.5	NB26-2	
	5		18.6	7.5	17.6	NB26-3	
CB32	1		1.3	7.5	17.7	CB32-1	
"	3		14.2	7.6	17.3	CB32-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN STN	Page 3 of 3
	Date: 11/14/07
	Start: 0530 Finish: 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
CB32	5	SOIL	10.6	7.5	17.5	CB32-3	Bentonite

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA SOIL SAMPLING - BASINS	**Page** 1 **of** 3
	Date: 11/15/07
	Start: 0530 **Finish:** 1230

Meteorological Conditions: COOL, SUNNY

Equipment Used: COLE-PARMER pH meter ; MINIRAE PID
HAND AUGER

Project Personnel: HAMILTON / WANIHALA

Project Personnel Protection: Hard Hat, safety glasses, gloves

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
CB17	1	SOIL	0.4	7.5	16.1	CB17-1	Bentonite
	3		0.7	7.1	16.3	CB17-2	
	5		19.7	7.4	16.1	CB17-3	
CB18	1		1.1	7.3	16.5	CB18-1	
	3		0.9	7.4	16.4	CB18-2	
	5		1.4	7.1	16.6	CB18-3	
CB19	1		1.5	7.4	16.5	CB19-1	
	3		1.1	7.3	16.8	CB19-2	
	5		0.9	7.5	16.9	CB19-3	
SB24	1		2.6	7.6	16.8	SB24-1	

Field Observations/Problems:

B-127 Trip Blank
B-128 dup for SB24-2
B-129 dup for SB27-2
B-130 Trip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN STA SOIL SAMPLING - BASINS	Page 2 of 2 **Date:** 11/15/07 **Start:** 0530 **Finish:** 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
SB24	3	SOIL	3.4	7.6	17.1	SB24-2	Bentonite
"	5		2.9	7.4	17.0	SB24-3	
SB25	1		3.8	7.4	16.9	SB25-1	
	3		2.4	7.3	17.2	SB25-2	
	5		2.1	7.4	17.3	SB25-3	
SB26	1		3.2	7.2	17.5	SB26-1	
	3		4.4	7.2	17.6	SB26-2	
	5		2.8	7.6	17.5	SB26-3	
SB27	1		2.6	7.7	17.5	SB27-1	
"	3		0.9	7.6	17.4	SB27-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:	25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN STA SOIL SAMPLING - BASINS	**Page** 3 **of** 3
	Date: 1 5 '97
	Start: 0530 **Finish:** 1230

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
SB27	5	Soil	3.7	7.7	17.6	SB27-3	Bentonite

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN. STN. SOIL SAMPLING - BORINGS	**Page** 1 **of** 3 **Date:** 11/16/07 **Start:** 0530 **Finish:** 1130

Meteorological Conditions: Cool, Sunny

Equipment Used: Cole-Parmer pH meter, MiniRAE PID
HAND AUGER

Project Personnel: HAMILTON / WANTHALA

Project Personnel Protection: Hard Hat, safety glasses, gloves

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
SB 28	1	SOIL	1.3	8.1	16.4	SB28-1	Bentonite
	3		4.8	7.6	16.6	SB28-2	
	5		2.3	7.6	16.6	SB28-3	
SB 29	1		3.3	7.7	16.3	SB 29-1	
	3		3.8	7.8	16.4	SB 29-2	
	5		2.9	7.4	16.5	SB 29-3	
SB 30	1		2.9	7.5	16.8	SB30-1	
	3		2.6	7.6	16.7	SB30-2	
	5		2.4	7.7	16.7	SB30-3	
SB 31	1		1.6	8.1	16.8	SB31-1	

Field Observations/Problems:

B-131 Trip Blank
B-132 Dup for SB31-2
B-133 Dup for SB34-2
B-134 Equip Blank

Total number of samples collected and recorded on the Chain of Custody Form:	25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS Gen Sta	Page ? of 3
	Date: ?1/6/07
	Start: 0530 Finish: 1130

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
SB31	2	Soil	2.2	8.3	17.3	SB31-2	Bentonite
"	5		3.1	8.1	17.0	SB31-3	
SB32	1		1.9	8.0	17.1	SB32-1	
	3		2.6	8.1	17.3	SB32-2	
	5		0.9	7.7	17.4	SB32-3	
SB33	1		0.8	7.9	17.6	SB33-1	
	3		2.4	8.0	17.5	SB33-2	
	5		2.9	7.6	17.4	SB33-3	
SB34	1		1.9	7.9	17.6	SB34-1	
"	3		1.6	7.6	17.5	SB34-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAmitos Gen Sta	Page 3 of 3
	Date: 11/16/07
	Start: 0530 Finish: 1130

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
SB34	5	SOIL	0.7	7.8	17.7	SB34-3	Bentonite

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 25

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA. SOIL SAMPLING - BASINS	**Page** 1 **of** 3
	Date: 11/20/07
	Start: 0530 **Finish:** 1200

Meteorological Conditions: Cool, Sunny

Equipment Used: Cole-Parmer pH meter, Mini Rae PID Hand Auger

Project Personnel: HAMILTON / WANHALA

Project Personnel Protection: Hard Hat, safety glasses, gloves

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
B4-1	1	Soil	0.9	7.8	16.6	B4-1-1	Bentonite
	3		0.6	7.4	16.8	B4-1-2	
	5		0.7	7.7	16.8	B4-1-3	
B4-2	1		1.1	7.8	16.4	B4-2-1	
	3		0.9	7.6	16.9	B4-2-2	
	5		1.3	7.4	16.7	B4-2-3	
B4-3	1		2.6	8.0	17.1	B4-3-1	
	3		1.1	7.5	17.0	B4-3-2	
	5		0.8	7.5	17.1	B4-3-3	
B4-4	1		2.7	7.9	17.4	B4-4-1	

Field Observations/Problems:

B-135 Trip Blank
B-136 dup for B4-4-2
B-137 dup for SB17-2
B-138 Equip Blank
B-139 Barrel
B-140 dup for SB16-2

Total number of samples collected and recorded on the Chain of Custody Form: 30

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN STA	Page 2 of 3
	Date: 11/20/07
	Start: 0530 Finish: 1200

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
B4-4	3	SOIL	11	8.1	17.6	B4-4-2	Bentonite
"	5		2.3	7.1	17.3	B4-4-3	
B4-5	1		2.6	7.3	17.4	B4-5-1	
	3		2.1	7.5	17.7	B4-5-2	
	5		0.9	7.4	17.5	B4-5-3	
B4-6	1		1.1	7.4	17.4	B4-6-1	
	3		0.7	7.9	17.6	B4-6-2	
	5		0.7	7.7	17.5	B4-6-3	
SB17	1		0.6	7.4	17.4	SB17-1	
"	3		4.1	7.3	17.3	SB17-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 30

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: Alamitos Gen Sta	Page 3 of 3
	Date: 11/20/07
	Start: 0530 Finish: 1200

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
SB17	5	Soil	0.6	7.4	17.7	SB17-3	Bentonite
SB18	1		0.5	7.2	17.8	SB18-1	
	3		1.9	7.5	17.8	SB18-2	
	5		0.9	7.6	17.6	SB18-3	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 30

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA. CENTRAL BASIN	**Page** 1 **of** 2
	Date: 11/12/09
	Start: 0630 **Finish:** 1200

Meteorological Conditions: SUNNY, COOL

Equipment Used: HAND AUGER, COLE-PARMER pH METER

Project Personnel: HAMILTON + WANHALA

Project Personnel Protection: HARD HAT, SAFETY GLASSES, GLOVES

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C3	1	SOIL		8.12	17.9	C3-1	Bentonite
	3			8.26	18.3	C3-2	
	7			7.98	18.4	C3-3	
	10			7.68	18.6	C3-4	
C2	1			7.51	18.9	C2-1	
	3			8.11	18.8	C2-2	
	7			8.09	19.1	C2-3	
	10			8.02	19.2	C2-4	
C1	1			8.16	19.1	C1-1	
"	3			7.88	19.2	C1-2	

Field Observations/Problems:

C-101 duplicate for C1-2

C-102 Equip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 14

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN. STA	Page 2 of 2
	Date: 11/12/09
	Start: 0630 Finish: 1200

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C1	7	Soil		7.97	19.3	C1-3	Bentonite
"	10	"		7.93	19.4	C1-4	"

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 14

All work was completed using the procedures described in the approved SAP. Patt Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA CENTRAL BASIN	**Page** 1 **of** 2 **Date:** 11/13/09 **Start:** 0630 **Finish:** 1100

Meteorological Conditions: Clear, cool

Equipment Used: Hand Auger, Cole Parmer pH meter

Project Personnel: Hamilton + [illegible]

Project Personnel Protection: Hard Hat, safety glasses, gloves

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C6	1	SOIL		7.33	16.8	C6-1	Bentonite
	3			7.29	16.8	C6-2	
	7			7.69	16.9	C6-3	
	10			7.81	16.8	C6-4	
C5	1			7.35	17.2	C5-1	
	3			8.34	17.3	C5-2	
	7			8.06	17.5	C5-3	
	10			7.33	17.4	C5-4	
C4	1			8.26	17.6	C4-1	
"	3			8.51	17.7	C4-2	

Field Observations/Problems:

C-103 Trip Blank

C-104 Duplicate for C4-2

C-105 Equip. Blank

Collected perched water sample from C6 for analysis.

Total number of samples collected and recorded on the Chain of Custody Form:	18

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN. STA	Page 1 of 2
	Date: 11/13/09
	Start: 0630 Finish: 1100

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C4	7	SOIL		8.14	17.6	C4-3	Bentonite
"	10			7.92	17.7	C4-4	
C9	1			8.31	18.3	C9-1	
	3			8.26	18.1	C9-2	
	7			8.37	18.4	C9-3	
	10			7.96	18.5	C9-4	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 18

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA CENTRAL BASIN	Page 1 of 1
	Date: 11/20/09
	Start: 0530 **Finish:** 0900

Meteorological Conditions: Sunny, cool
Equipment Used: Hand Auger, Cole-Parmer pH meter

Project Personnel: Hamilton + Wanhala
Project Personnel Protection: Hard Hat, safety glasses, gloves
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C8	1	SOIL	/	8.36	16.3	C8-1	Bentonite
	3			8.43	16.3	C8-2	
	7			7.91	16.5	C8-3	
	10			7.74	16.6	C8-4	
C7	1			8.57	16.9	C7-1	
	3			8.59	16.9	C7-2	
	7			7.97	17.4	C7-3	
	10			7.81	17.3	C7-4	

Field Observations/Problems:

C-106 TRIP BLANK
C-107 Duplicate for
C-108 Equip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 11

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA CENTRAL BASIN	**Page** 1 **of** 1
	Date: 1/5/10
	Start: 0730 **Finish:** 1100

Meteorological Conditions: Sunny, Cool
Equipment Used: Hand Auger, Col-Parmer pH meter

Project Personnel: Hamilton & Wanhala
Project Personnel Protection: Hard Hat, safety glasses, gloves
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C10	1	SOIL		7.18	17.4	C10-1	Bentonite
	3			8.06	17.3	C10-2	
	7			7.91	17.4	C10-3	
	10			8.07	17.6	C10-4	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 4

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: ALAMITOS GEN STA. CENTRAL BASIN	Page 1 of 2
	Date: 6/7/10
	Start: 0630 Finish: 1350

Meteorological Conditions: OVERCAST, DRIZZLE

Equipment Used: HAND AUGER, COLE-PARMER pH METER

Project Personnel: P HAMILTON + A [illegible]

Project Personnel Protection: HARD HAT, SAFETY GLASSES, GLOVES

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C12	1	SOIL	—	8.73	17.6	C12-1	Bentonite
	3			8.79	17.5	C12-2	
	7			7.78	17.9	C12-3	
	10			7.71	17.7	C12-4	
C13	1			8.76	17.9	C13-1	
	3			8.84	18.1	C13-2	
	7			8.17	18.3	C13-3	
	10			7.89	18.2	C13-4	
C11	1			8.66	18.3	C11-1	
	3			8.04	18.5	C11-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 16

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: ALAMITOS GEN. STA. CENTRAL BASIN	Page 2 of 2
	Date: 6/8/10
	Start: 0630 Finish: 1350

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
C11	7	SOIL	—	7.71	18.2	C11-3	Bentonite
"	10			7.24	18.6	C11-4	
C14	1			8.44	17.9	C14-1	
	3			8.81	18.3	C14-2	
	7			7.96	18.7	C14-3	
	10			7.77	18.2	C14-4	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form: 16

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	**Page** 1 **of** 1
	Date: 10/25/12
	Start: 0700 **Finish:** 1100

Meteorological Conditions: Cool, overcast

Equipment Used: Cole-Parmer pH meter

Project Personnel: P HAMILTON, M. WANIHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P1	5	SOIL	6.95	16.8	P1-1	Bentonite
"	7		7.09	16.7	P1-2	
P2	5		7.96	16.9	P2-1	
"	7		7.31	17.1	P2-2	

Field Observations/Problems:

P-101 Equipment Blank
P-102 Trip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 6

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 1 Date: 10/30/12 Start: 0600 Finish: 1300

Meteorological Conditions: Sunny, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P HAMILTON, M WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P3	5	SOIL	7.82	17.1	P3-1	Bentonite
	7		5.11	17.2	P3-2	
	11		6.16	18.0	P3-3	
P4	6		7.41	30.4	P4-1	
	8		7.54	29.4	P4-2	
	11		7.95	23.4	P4-3	

Field Observations/Problems:

P-103 Trip Blank

P-104 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 8

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	**Page** 1 **of** 1
	Date: 10/31/12
	Start: 0600 **Finish:** 1300

Meteorological Conditions: Warm, sunny

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P5	5	SOIL	7.82	17.1	P5-1	Bentonite
	6		6.95	17.1	P5-2	
	7		7.66	17.5	P5-3	
P6	6		8.03	22.5	P6-1	
"	8		7.29	22.8	P6-2	

Field Observations/Problems:

P-105 Trip Blank

P-106 Equipment Blank

P-107 Duplicate for Sample ID P6-1

Total number of samples collected and recorded on the Chain of Custody Form:	8

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamito Pipeline Investigation	Page 1 of 1 Date: 11/1/12 Start: 0600 Finish: 1300

Meteorological Conditions: Sunny, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P8	5	SOIL	7.65	15.9	P8-1	Bentonite
P9	6		7.66	16.2	P9-1	
"	8		7.19	16.9	P9-2	
P10	6		7.63	17.9	P10-1	
"	8		7.85	19.1	P10-2	
P11	6		7.86	20.7	P11-1	
"	8		8.19	21.4	P11-2	

Field Observations/Problems:

P-108 Trip Blank

P-109 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 9

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	**Page** 1 **of** 1
	Date: 11/2/12
	Start: 0600 **Finish:** 1030

Meteorological Conditions: Overcast, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P14	6.5	Soil	8.55	18.1	P14-1	Bentonite
"	8.5	"	8.26	18.6	P14-2	"

Field Observations/Problems:

P-110 Trip Blank
P-111 Duplicate for Sample ID P14-1
P-112 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 5

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 1
	Date: 11/5/12
	Start: 0600 **Finish:** 1215

Meteorological Conditions: Sunny, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. [illegible]

Project Personnel Protection: HH, SG, gloves, [illegible]

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P85	5	SOIL	8.35	18.0	P85-1	Bentonite
"	7		7.70	18.7	P85-2	
P84	5		8.62	21.4	P84-1	
"	7		7.89	22.7	P84-2	
P83	5		7.81	26.0	P83-1	
"	7		7.76	25.8	P83-2	
P82	5		7.96	25.9	P82-1	
"	7		7.99	27.6	P82-2	

Field Observations/Problems:

P-113 Trip Blank
P-114 Equipment Blank
P-115 Duplicate for Sample ID P83-1

Total number of samples collected and recorded on the Chain of Custody Form: 11

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation

Page 1 **of** 1

Date: 11/6/12

Start: 0600 **Finish:** 1130

Meteorological Conditions: Overcast, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M WAMHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P81	5	Soil	7.97	19.0	P81-1	Bentonite
	7		7.91	19.7	P81-2	
P80	5		7.90	21.2	P80-1	
"	7		8.03	21.5	P80-2	
P79	5		7.89	23.7	P79-1	
	7		7.62	24.2	P79-2	
P78	5		7.52	23.6	P78-1	
"	7		7.69	23.8	P78-2	

Field Observations/Problems:

P-116 Trip Blank
P-117 Equipment Blank
P-118 Duplicate for Sample ID P79-1

Total number of samples collected and recorded on the Chain of Custody Form: 11

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 2 Date: 11/7/12 Start: 0600 Finish: 1215

Meteorological Conditions: Sunny, warm

Equipment Used: Cole-Palmer pH meter

Project Personnel: P HAMILTON, M.WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P93	2	SOIL	7.51	19.1	P93-1	Bentonite
"	3		7.56	19.2	P93-2	
P92	2		8.19	18.5	P92-1	
"	3		8.20	18.3	P92-2	
P91	2		7.86	19.4	P91-1	
"	3		7.66	19.7	P91-2	
P90	2		8.69	18.9	P90-1	
"	3		8.81	18.9	P90-2	
P89	2		8.43	18.9	P89-1	
"	3		8.48	19.5	P89-2	

Field Observations/Problems:

P-119 Trip Blank

P-120 Duplicate for Sample ID P90-1

P-121 Equipment Blank

P-122 Duplicate for Sample ID P87-1

Total number of samples collected and recorded on the Chain of Custody Form: 20

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 2 of 2
	Date: 11/7/12
	Start: 0600 Finish: 1215

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P88	2	Soil	8.60	21.1	P88-1	Bentonite
"	3		8.70	21.2	P88-2	
P87	2		8.65	21.4	P87-1	
"	3		8.90	21.8	P87-2	
P86	2		8.44	23.3	P86-1	
"	3		8.12	22.9	P86-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: Manitou Pipeline Investigation	**Page** 1 **of** 1
	Date: 11/8/12
	Start: 0600 **Finish:** 1100

Meteorological Conditions: Overcast, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P HAMILTON, M. WANHALA

Project Personnel Protection: HH, ST, gloves, FR coveralls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P60	5	SOIL	8.11	17.7	P60-1	Bentonite
"	7		8.41	18.2	P60-2	
P61	5		8.22	18.4	P61-1	
"	7		8.37	18.7	P61-2	
P59	5		8.01	18.2	P59-1	
"	7		8.41	17.8	P59-2	
P45	6.5		8.25	19.7	P45-1	
"	8.5		8.36	20.1	P45-2	
P58	5		8.54	20.3	P58-1	
"	7		8.54	20.4	P58-2	

Field Observations/Problems:

P-123 Trip Blank

P-124 Duplicate for Sample ID P45-1

P-125 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 13

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigations	**Page** 1 **of** 1
	Date: 11/14/12
	Start: 0600 **Finish:** 1130

Meteorological Conditions: Overcast, warm
Equipment Used: Cole-Parmer pH meter

Project Personnel: P HAMILTON, M WANHALA
Project Personnel Protection: HH, SG, gloves, FR overalls
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P46	6.5	Soil	8.78	19.7	P46-1	Bentonite
"	8.5		8.80	21.2	P46-2	
P56	5		7.99	19.0	P56-1	
"	7		8.04	22.1	P56-2	
P57	5		8.34	21.8	P57-1	
"	7		8.07	21.9	P57-2	
P44	6.5		9.08	21.3	P44-1	
"	8.5		9.45	22.3	P44-2	
P43	6.5		7.92	22.1	P43-1	
"	8.5		7.94	23.9	P43-2	

Field Observations/Problems:

P-126 Trip Blank
P-127 Duplicate for Sample ID P44-1
P-128 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 13

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	**Page** 1 **of** 1
	Date: 11/15/12
	Start: 0600 **Finish:** 1045

Meteorological Conditions: Overcast, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P HAMILTON, M. WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P53	5	SOIL	8.29	16.5	P53-1	Bentonite
"	7		8.58	16.5	P53-2	
P54	5		8.44	16.7	P54-1	
"	7		8.96	16.8	P54-2	
P55	5		9.04	16.9	P55-1	
"	7		9.18	17.1	P55-2	
P52	5		8.69	17.8	P52-1	
"	7		8.46	18.2	P52-2	

Field Observations/Problems:

P-129 Trip Blank

P-130 Duplicate for Sample ID P52-1

P-131 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 11

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 1
	Date: 12/6/12
	Start: 0600 Finish: 1200

Meteorological Conditions: Sunny, Warm
Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. WANHALA
Project Personnel Protection: HH, SG, gloves, FR overalls
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P17	6.5	Soil	8.93	20.7	P17-1	Bentonite
"	8.5		8.90	20.3	P17-2	
P47	6		8.97	21.1	P47-1	
"	8		9.58	21.4	P47-2	

Field Observations/Problems:

P-132 Equipment Blank
P-133 Trip Blank

Total number of samples collected and recorded on the Chain of Custody Form: 6

All work was completed using the procedures described in the approved SAP. Patt Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 1
	Date: 12/7/12
	Start: 0600 Finish: 1230

Meteorological Conditions: Sunny, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P HAMILTON, M WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P40	6.5	SOIL	8.31	20.2	P40-1	Bentonite
"	8.5		7.85	20.3	P40-2	
P41	6.5		8.67	22.6	P41-1	
"	8.5		8.58	22.1	P41-2	

Field Observations/Problems:

P-134 Trip Blank

P-135 Duplicate for Sample ID P41-1

P-136 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 7

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 1
	Date: 12/12/12
	Start: 0600 **Finish:** 1330

Meteorological Conditions: Sunny, Warm
Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. WANHALA
Project Personnel Protection: HH, SG, gloves, FR overalls
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P34	6	Soil	6.11	17.2	P34-1	Bentonite
P35	6	Soil	814	17.8	P35-1	Bentonite
P33	6	Soil	7.28	183	P33-1	Bentonite

Field Observations/Problems:

P-137 Duplicate for Sample ID P33-1
P-138 Trip Blank
P-139 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 6

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 1
	Date: 12/13/12
	Start: 0600 Finish: 1230

Meteorological Conditions: Sunny, Warm

Equipment Used: Cole-Parmer pH meter, Geoprobe Drill

Project Personnel: P. HAMILTON, M WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P33	8	Soil	7.24	16.2	P33-2	Bentonite
"	15		8.06	17.1	P33-3	
P8	7		8.12	16.0	P8-2	
"	16		8.48	16.4	P8-3	
P7	7		9.84	16.9	P7-1	
	9		9.16	17.2	P7-2	
	16		9.19	17.4	P7-3	
P34	8		8.36	23.3	P34-2	
"	15		7.09	21.1	P34-3	

Field Observations/Problems:

P-140 Duplicate for Sample ID P7-1

P-141 Trip Blank

P-142 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 12

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	**Page** 1 **of** 1
	Date: 12/19/12
	Start: 0600 **Finish:** 1200

Meteorological Conditions: Overcast, warm

Equipment Used: Cole-Palmer pH meter

Project Personnel: P. HAMILTON, M. WAMSTADT

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P49	7	SOIL	7.32	12.6	P49-1	Bentonite
"	9		7.30	13.6	P49-2	
P48	6		7.25	12.7	P48-1	
"	8		792	14.7	P48-2	
P35	8		7.81	17.7	P35-2	
"	15		8.12	19.4	P35-3	

Field Observations/Problems:

P-143 Trip Blank
P-144 Duplicate for Sample ID P35-2
P-145 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 9

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 1 Date: 12/20/12 Start: 0600 Finish: 1100

Meteorological Conditions: Overcast, cool

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. WANHALA

Project Personnel Protection: HH, SG, gloves, FR coveralls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P50	7	Soil	7.98	9.6	P50-1	Bentonite
"	9	/	7.63	12.1	P50-2	/
P51	7	|	7.36	12.3	P51-1	|
"	9	|	7.55	12.9	P51-2	|
P42	6.5	|	7.90	16.1	P42-1	|
"	8.5	|	8.26	16.4	P42-2	|

Field Observations/Problems:

P-146 Trip Blank

P-147 Duplicate for Sample ID P51-1

P-148 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 9

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 2 Date: 1/30/13 Start: 0600 Finish: 1245

Meteorological Conditions: Overcast, cool

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. WANAGAN

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P77	5	SOIL	7.69	9.9	P77-1	Bentonite
	7		8.50	9.7	P77-2	
P77A	5		7.71	10.1	P77A-1	
	7		7.94	9.9	P77A-2	
P74	5		8.06	11.4	P74-1	
	7		8.44	12.0	P74-2	
	19		8.31	11.8	P74-3	
P67	6		8.78	13.4	P67-1	
	8		8.61	13.1	P67-2	
	19		7.98	13.2	P67-3	

Field Observations/Problems:

P-149 Trip Blank
P-150 Duplicate for Sample ID P67-1
P-151 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 17

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location:	Page 2 of 2
	Date: 1/30/13
	Start: 0600 Finish: 1245

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P66	4.5	Soil	7.58	13.8	P66-1	Bentonite
"	6.5		7.84	14.1	P66-2	
P69	4.5		8.09	14.9	P69-1	
"	6.5		8.37	16.1	P69-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:	

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: Alamitos Pipeline Investigation	**Page** 1 **of** 2
	Date: 1/31/13
	Start: 0600 **Finish:** 1300

Meteorological Conditions: Sunny, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P73	4.5	SOIL	8.02	9.7	P73-1	Bentonite
"	8		8.40	10.3	P73-2	
P72	4.5		8.55	10.7	P72-1	
	6.5		8.37	10.9	P72-2	
	8		8.41	11.1	P72-3	
P71	4.5		8.34	12.1	P71-1	
	6.5		8.50	12.2	P71-2	
	8		8.27	12.4	P71-3	
P64	4.5		8.16	16.0	P64-1	
"	6.5		8.04	16.4	P64-2	

Field Observations/Problems:

P-152 Trip Blank
P-153 Duplicate for Sample ID P62-1
P-154 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 19

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location:	Page 2 of 2
	Date: 1/31/13
	Start: 0610 Finish: 1300

Meteorological Conditions:
Equipment Used:

Project Personnel:
Project Personnel Protection:
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P64	8	Soil	7.69	16.8	P64-3	Bentonite
P63	5.5		7.67	17.3	P63-1	
	6.5		8.39	17.1	P63-2	
	8		8.44	17.5	P63-3	
P62	4.5		7.48	18.1	P62-1	
"	8		7.81	17.9	P62-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:	

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: Alamitos Pipeline Investigation

Page 1 **of** 1

Date: 4/12/13

Start: 0600 **Finish:** 1000

Meteorological Conditions: Overcast, Cool

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P29	4.5	SOIL	7.64	10.3	P29-1	Bentonite
"	6.5		7.66	9.8	P29-2	
P28	4.5		8.22	11.0	P28-1	
"	6.5		8.02	10.8	P28-2	

Field Observations/Problems:

P-155 Trip Blank

P-156 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 6

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline Investigation	Page 1 of 2 Date: 4/17/13 Start: 0630 Finish: 1300

Meteorological Conditions: Sunny, warm
Equipment Used: Cole-Parmer pH meter

Project Personnel: P. Hamilton [illegible]
Project Personnel Protection: HH, SG, gloves, FR coveralls
Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P26	3.5	Soil	7.68	14.1	P26-1	Bentonite
"	5.5	"	7.40	14.4	P26-2	"
"	7.5	"	7.55	14.6	P26-3	"
P25	4	"	7.92	14.3	P25-1	"
"	7.5		7.71	14.3	P25-2	"
P26A	4.5	"	8.13	13.9	P26A-1	"
"	6.5	"	8.18	14.5	P26A-2	"
P27	4.5	"	7.64	18.7	P27-1	"
	6.5	"	7.60	18.4	P27-2	"
"	7.5	"	8.12	18.2	P27-3	"

Field Observations/Problems:

P-157 Trip Blank
P-158 Duplicate for Sample ID P25-2
P-159 Equipment Blank
P-160 Duplicate for Sample ID P24-2

Total number of samples collected and recorded on the Chain of Custody Form: 18

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location:	Page 2 of 2
	Date: 4/17/13
	Start: 0600 Finish: 1300

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P30	4.5	SOIL	7.34	17.9	P30-1	Bentonite
"	6.5		7.98	18.6	P30-2	
P24	4.5		7.79	18.9	P24-1	
"	6.5		8.29	19.8	P24-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: Alamitos Pipeline Investigation	**Page** 1 **of** 2
	Date: 4/19/13
	Start: 0600 **Finish:** 1215

Meteorological Conditions: Sunny, warm

Equipment Used: Cole-Parmer pH meter

Project Personnel: P. HAMILTON, M. CUNNINGHAM

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P32	4.5	SOIL	8.21	10.4	P32-1	Bentonite
"	6.5		8.33	11.0	P32-2	
P31	4.5		7.86	10.8	P31-1	
"	6.5		8.65	10.7	P31-2	
P20	4.5		8.13	11.6	P20-1	
	6.5		7.68	11.8	P20-2	
	7.5		7.99	12.1	P20-3	
P18	4.5		8.19	12.6	P18-1	
"	7.5		8.04	12.5	P18-2	
P19	3.5		7.52	13.4	P19-1	

Field Observations/Problems:

P-161 Trip Blank

P-162 Duplicate for Sample ID P18-1

P-163 Equipment Blank

P-164 Duplicate for Sample ID P22-2

Total number of samples collected and recorded on the Chain of Custody Form: 22

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location:	Page 2 of 2
	Date: 4/19/13
	Start: 0600 Finish: 1215

Meteorological Conditions:

Equipment Used:

Project Personnel:

Project Personnel Protection:

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P19	5.5	SOIL	7.78	13.6	P19-2	Bentonite
"	7.5		7.50	13.5	P19-3	
P19A	4.5		7.98	14.1	P19A-1	
"	6.5		7.67	14.4	P19A-2	
P21	4.5		7.92	14.2	P21-1	
"	6.5		7.87	14.6	P21-2	
P22	4.5		8.49	16.2	P22-1	
"	6.5		8.47	16.6	P22-2	

Field Observations/Problems:

Total number of samples collected and recorded on the Chain of Custody Form:

All work was completed using the procedures described in the approved SAP.

Daily Field Log

Project Location: Alamitos Pipeline	Page 1 of 1
	Date: 10/18/13
	Start: 0630 **Finish:** 1340

Meteorological Conditions: Sunny, cool

Equipment Used: Hand Auger

Project Personnel: P HAMILTON, M WANIHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
P1-S1	7	SOIL	—	—	—	P1-S1-1	Bentonite
"	9					P1-S1-2	
P1-S2	7					P1-S2-1	
"	9					P1-S2-2	
P1-S3	7					P1-S3-1	
"	9					P1-S3-2	
P4-S2	8					P4-S2-1	
"	9					P4-S2-2	
P4-S1	8					P4-S1-1	
"	9					P4-S1-2	

Field Observations/Problems:

P-165 Equipment Blank

P-166 Duplicate to P4-S1-1

Total number of samples collected and recorded on the Chain of Custody Form: 12

All work was completed using the procedures described in the approved SAP. P HAMILTON

Daily Field Log

Project Location: ALAMITOS PIPELINES	**Page** 1 **of** 1
	Date: 10/25/13
	Start: 0600 **Finish:** 1350

Meteorological Conditions: Cool, overcast

Equipment Used: Hand Auger

Project Personnel: P HAMILTON, M. WANHALA

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
P5-S1	6	SOIL	—	—	—	P5-S1-1	Bentonite
"	8					P5-S1-2	
P5-S2	6					P5-S2-1	
	8					P5-S2-2	
	10					P5-S2-3	
P9-S1	8					P9-S1-1	
"	10					P9-S1-2	

Field Observations/Problems:

P-167 Trip Blank

P-168 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 9

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Alamitos Pipeline	Page 1 of 1
	Date: 10/29/13
	Start: 0600 **Finish:** 1350

Meteorological Conditions: Sunny, cool

Equipment Used: Hand Auger

Project Personnel: P Hamilton, M. [illegible]

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
P7-S1	9	Soil	—	—	—	P7-S1-1	Bentonite
"	10					P7-S1-2	
P7-S2	9					P7-S2-1	
"	10					P7-S2-2	
[illegible]	7					[illegible]	
	10					[illegible]	
P23-S1	5					[illegible]	
"	10					[illegible]	
P23-S2	5					[illegible]	
	10					[illegible]	

Field Observations/Problems:

P-169 D[illegible]

P-17[illegible] [illegible] + F[illegible]

Total number of samples collected and recorded on the Chain of Custody Form: 12

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: [illegible] [illegible]	Page [illegible] of 1
	Date: [illegible]
	Start: [illegible] Finish: 1230

Meteorological Conditions: [illegible]

Equipment Used: Hand Auger

Project Personnel: P Hamilton, M. Wanhala

Project Personnel Protection: HH, SG, gloves, FR overalls

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
[illegible]		[illegible]				[illegible]	Bentonite
	[illegible]					[illegible]	
[illegible]	7					[illegible]	
	9					[illegible]	
[illegible]	[illegible]					P47-S1-1	
"	10					P47-S1-2	

Field Observations/Problems:

[illegible]

P-172 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 8

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: Manito Pipeline	**Page** 1 **of** 1
	Date: 11/1/13
	Start: 0600 **Finish:** 1330

Meteorological Conditions: Cool, Sunny

Equipment Used: Hand Auger

Project Personnel: P. Hamilton, M. [illegible]

Project Personnel Protection: [illegible], [illegible], FR coverall

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	Field pH	Sample Temp	Sample ID	Backfill
P47-S2	8	SOIL	—	—	P47-S2-1	Bentonite
"	10				P47-S2-2	
P47-S3	8				P47-S3-1	
"	10				P47-S3-2	
P22-S1	7				P22-S1-1	
	9				P22-S1-2	
P19A-S1	7				P19A-S1-1	
"	9				P19A-S1-2	

Field Observations/Problems:

P-173 Duplicate for P22-S1-1

P-174 Equipment Blank

Total number of samples collected and recorded on the Chain of Custody Form: 10

All work was completed using the procedures described in the approved SAP. Pat Hamilton

Daily Field Log

Project Location: [illegible] Pipeline	Page 1 of 1
	Date: 11/5/13
	Start: 0600 **Finish:** 1230

Meteorological Conditions: Cool, Sunny

Equipment Used: Hand Auger

Project Personnel: P. Hamilton, M. Wa[illegible]

Project Personnel Protection: [illegible], SS, glove, FR [illegible]

Visitors:

Sampling

Boring ID	Sample Depth	Sample Type Soil or Water	PID	Field pH	Sample Temp	Sample ID	Backfill
P44		Soil	—	—	—	P44-S1-1	Bentonite
"						P44-S1-2	
P43						P43-S1-1	
"						P43-S1-2	
P85						P85-S1-1	
"						P85-S1-2	
P79						P79-S1-1	
"						P79-S1-2	
P73						P73-S1-1	
"						P73-S1-2	

Field Observations/Problems:

P-175 Trip Blank

P-176 Equipment Blank

P-177 Cutting Barrel

Total number of samples collected and recorded on the Chain of Custody Form: 13

All work was completed using the procedures described in the approved SAP. P. HAMILTON

Appendix 2: Boring Logs

Log of Boring B1-1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	6.8	0.9	
2				**Clayey Sand**, gray, fine grained, moist
3				
	■	6.9	0.6	
4				**Silty Sand**, greenish gray, medium grained, moist
5				**Sand**, greenish gray, fine grained, moist
	■	7.3	1.1	

Remarks:

Log of Boring B1-2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.5	1.3	
2				
3				**Clayey Sand**, gray, fine grained, moist
	■	7.4	0.9	
4				**Silty Sand**, greenish gray, medium grained, moist
5				**Sand**, greenish gray, fine grained, moist
	■	7.3	0.6	

Remarks:

Log of Boring B1-3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.4	0.5	
2				**Sand**, light gray, medium grained, moist
3				
	■	7.1	0.7	
4				**Silty Sand**, greenish gray, medium grained, moist
5				**Sand**, gray, medium grained, moist
	■	7.4	2.1	

Remarks:

Log of Boring B1-4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.3	2.9	
2				**Sand**, light gray, medium grained, moist
3				
	■	6.9	0.8	**Silty Sand**, greenish gray, medium grained, moist
4				
5				
	■	7.2	0.6	

Remarks:

Log of Boring B2-1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Silty Sand**, gray, medium grained, moist
	■	7.3	0.8	
2				
3				
	■	7.4	1.1	
4				**Sand**, gray, medium grained, moist
5				
	■	7.3	0.9	

Remarks:

Log of Boring B2-2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Silty Sand**, gray, medium grained, moist
	■	7.4	2.1	
2				
				Clay, gray, plastic, moist
3				**Silty Sand**, gray, medium grained, moist
	■	7.3	1.9	
4				**Sand**, gray, medium grained, moist
5				
	■	7.1	0.8	

Remarks:

Log of Boring B2-3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Silty Sand**, gray, medium grained, moist
	■	7.4	0.6	
2				
3				
	■	7.4	0.9	
4				**Sand**, gray, medium grained, moist
5				
	■	7.2	1.1	

Remarks:

Log of Boring B2-4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Silty Sand**, gray, medium grained, moist
	■	7.3	0.7	
2				
3				
	■	7.3	0.9	
4				
5				**Sand**, gray, medium grained, moist
	■	7.2	0.8	

Remarks:

Log of Boring B3-1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, fine grained, moist
1				
	■	7.4	0.8	
2				
3				**Clayey Sand**, gray, fine grained, stiff, moist
	■	6.9	1.1	
4				
5				**Sand**, gray, medium grained, moist
	■	7.3	1.3	

Remarks:

Log of Boring B3-2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, fine grained, moist
1				
	■	7.4	1	
2				
3				
	■	7.1	0.6	
4				**Clayey Sand**, gray, fine grained, stiff, moist
5				**Sand**, gray, medium grained, moist
	■	7.3	0.5	

Remarks:

Log of Boring B3-3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, fine grained, moist
	■	7.4	1.3	
2				
3				
	■	7.3	1.1	
4				**Clayey Sand**, gray, fine grained, stiff, moist
5				**Sand**, gray, medium grained, moist
	■	7.3	0.9	

Remarks:

Log of Boring B3-4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, fine grained, moist
	■	7.4	0.6	
2				
3				
	■	7.2	0.9	
4				
5				**Sand**, gray, medium grained, moist
	■	7.4	1.1	

Remarks:

Log of Boring B4-1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
2	■	7.8	0.9	
3				**Sand**, gray, fine grained, moist
4	■	7.4	0.6	**Silty Sand**, gray, medium grained, moist
5				
	■	7.7	0.7	**Sand**, gray, coarse grained, moist

Remarks:

Log of Boring B4-2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.8	1.1	
2				
3				**Sand**, gray, fine grained, moist
	■	7.6	0.9	
4				**Silty Sand**, gray, medium grained, moist
5				**Sand**, gray, coarse grained, moist
	■	7.4	1.3	

Remarks:

Log of Boring B4-3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	8	2.6	
2				
3				**Sand**, gray, fine grained, moist
	■	7.5	1.1	
4				**Silty Sand**, gray, medium grained, moist
5				**Sand**, gray, coarse grained, moist
	■	7.5	0.8	

Remarks:

Log of Boring B4-4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.9	2.7	
2				
3				**Sand**, gray, fine grained, moist
	■	8.1	1.1	
4				**Sand**, gray, coarse grained, moist
5				
	■	7.1	2.3	

Remarks:

Log of Boring B4-5

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.3	2.6	
2				
3				
	■	7.5	2.1	
4				**Sand**, gray, coarse grained, moist
5				
	■	7.4	0.9	

Remarks:

Log of Boring B4-6

Client: Southern California Edison	
Project: Alamitos Generating Station -- Background	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.4	1.1	
2				
3				
	■	7.9	0.7	
4				**Sand**, gray, coarse grained, moist
5				
	■	7.7	0.7	

Remarks:

Log of Boring NB1

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.88	**Sand**, layers of light and dark gray, moist, medium grained
2			
3			
	■	9.05	
4			**Silty Sand**, gray, fine grained, moist
5			**Sand**, green, fine grained, moist
	■	10.09	

Remarks:

Log of Boring NB2

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	7.59	**Sand**, layers of light and dark gray, moist, medium grained
2			
3			**Silty Sand**, gray, fine grained, moist
4	■	8.13	
5			**Sand**, green, fine grained, moist
	■	8.09	

Remarks:

Log of Boring NB3

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.12	**Clayey Sand**, gray, moist, fine grained
2			**Silty Sand**, gray, fine grained, moist, organic material
3			
4	■	8.35	
5			
	■	8.46	

Remarks:

Log of Boring NB4

Client: Southern California Edison			
Project: Alamitos Generating Station -- North Basin			
Date: 12/15/97		**Boring Depth:** 5 feet	
Logged By: P. Hamilton		**Drilling Co.:** Odyssey Exploration	
Method: Hand Auger			
Depth Feet	**Sample**	**Field pH**	**Description** 3"A/C
			Gravel, brown, dry, base
1	■	9.2	**Sand**, layers of light and dark gray, moist, medium grained
2			
3			
	■	8.88	**Clayey Sand**, gray, fine grained, moist
4			
5			**Sand**, green, fine grained, moist
	■	8.73	
Remarks:			

Log of Boring NB5

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	7.94	**Silty Sand**, gray, fine grained, moist
2			
3			**Sand**, gray, medium grained, moist
4	■	8.21	
5			**Sand**, green, fine grained, moist
	■	7.97	

Remarks:

Log of Boring NB6

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.72	**Sand**, gray, medium grained, moist
2			**Silt**, gray, moist, organic material
			Sand, light gray, fine grained, moist
3			**Silty Sand**, gray, fine grained, moist
4	■	8.55	
5			**Sand**, green, fine grained, moist
	■	7.82	

Remarks:

Log of Boring NB7

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.04	**Sand**, gray, medium grained, moist
2			**Silty Sand**, gray, fine grained, moist
3			
	■	8.48	
4			**Sand**, light gray, fine grained, moist
5			
	■	8.30	Color change to green

Remarks:

Log of Boring NB8

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.55	**Sand**, dark gray, medium grained, moist
2			
3			**Silty Sand**, gray, fine grained, moist
4	■	8.36	
5			**Sand**, green, fine grained, moist
	■	9.53	

Remarks:

Log of Boring NB9

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.12	**Silty Sand**, gray, fine grained, moist
2			
3			
	■	8.45	**Sand**, gray, medium grained, moist
4			
5			
	■	8.84	**Sand**, green, fine grained, moist

Remarks:

Log of Boring NB10

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.4	**Silty Sand**, gray, medium grained, moist
2			**Sand**, light gray, medium grained, moist
3			
	■	7.74	
4			**Silty Sand**, gray, fine grained, moist
5			**Sand**, green, medium grained, moist
	■	7.95	

Remarks:

Log of Boring NB11

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	8.57	**Silty Sand**, gray, medium grained, moist
2			**Clayey Sand**, gray, fine grained, moist
3			
	■	8.47	**Silty Sand**, gray, fine grained, moist
4			
5			**Sand**, green, medium grained, moist
	■	8.50	

Remarks:

Log of Boring NB12

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1		9.61	**Sand**, dark gray, medium grained, moist
2			
3			**Silty Sand**, gray, fine grained, moist
		8.38	
4			**Silt**, gray, moist, plastic
5			**Sandy Silt**, gray, medium grained sand, moist
		9.87	**Sand**, green, medium grained, moist

Remarks:

Log of Boring NB13

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1	■	9.28	**Sand**, dark gray, medium grained, moist
2			
3			
	■	9.26	**Silty Sand**, gray, fine grained, moist
4			
			Sand, green, medium grained, moist
5			
	■	8.89	

Remarks:

Log of Boring NB14

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 12/15/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravel, brown, dry, base
1		7.68	**Clayey Sand**, gray, fine grained, moist
2			
3			**Silty Sand**, gray, fine grained, moist
4		7.54	
5			
		7.96	**Sand**, green, medium grained, moist

Remarks:

Log of Boring NB15

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, medium grained, dry
1				**Silty Sand**, gray, fine grained, moist
	■	7.2	1	
2				
3				**Sandy Silt**, gray/green, firm, moist
	■	7.3	1.1	
4				
5				**Sand**, gray, medium grained, moist
	■	7.3	1.4	

Remarks:

Log of Boring NB16

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, medium grained, dry
1				**Sandy Silt**, gray/green, firm, moist
	■	7.3	1.3	
2				
3				
	■	7.1	1.1	
4				**Silty Sand**, light gray, fine grained, moist
5				
	■	7.1	0.8	**Sand**, gray, medium grained, moist

Remarks:

Log of Boring NB17

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, medium grained, dry
1				**Silty Sand**, gray, fine grained, moist
	■	7.2	0.9	
2				
3				
	■	7.2	1.1	
4				**Silty Sand**, light gray, fine grained, moist
5				
	■	7.1	1.3	

Remarks:

Log of Boring NB18

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, fine grained, dry
1				**Silty Sand**, gray, fine grained, moist
	■	7.3	1.3	
2				
				Clayey Sand, gray, fine grained, stiff, moist
3				
	■	7.3	1.4	
4				
5				**Silty Sand**, light gray, fine grained, moist
	■	7.4	1	

Remarks:

Log of Boring NB19

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Silty Sand**, gray, medium grained, moist
	■	7.2	0.7	
2				
3				
	■	7.2	0.9	
4				
5				**Silty Sand**, light gray, fine grained, moist
	■	7.2	0.7	

Remarks:

Log of Boring NB20

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Silty Sand**, gray, medium grained, moist
	■	7.2	0.6	
2				
3				**Clayey Sand**, gray, fine grained, moist
	■	7.1	1.4	
4				
5				**Sand**, gray/green, medium grained, moist
	■	7.2	1.6	

Remarks:

Log of Boring NB21

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Silty Sand**, gray, medium grained, moist
	■	7.1	0.6	
2				
3				
	■	7.3	0.6	
4				
5				**Sand**, gray/green, medium grained, moist
	■	7.1	1.1	

Remarks:

Log of Boring NB22

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Large rounded gravel, fill
1				**Clayey Sand**, gray, fine grained, moist
	■	6.9	0.5	
2				
3				**Silty Sand**, gray, medium grained, moist
	■	7.1	0.6	
4				
5				
	■	7.2	0.9	**Sand**, green, medium grained, moist

Remarks:

Log of Boring NB23

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 11/14/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3"A/C
				Gravel, brown, dry, base
1				**Sandy Clay**, gray, fine grained, moist
	■	7.4	10.1	
2				
3				**Silty Sand**, gray, medium grained, moist
	■	7.3	16.7	
4				
5				
	■	7.8	1.1	**Sand**, greenish gray, medium grained, moist

Remarks:

Log of Boring NB24

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 11/14/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3"A/C
				Gravel, brown, dry, base
1				**Sandy Clay**, gray, fine grained, moist
	■	8.2	9.6	
2				
3				**Silty Sand**, gray, medium grained, moist
	■	7.1	0.8	
4				
5				
	■	7.5	1.1	**Sand**, greenish gray, medium grained, moist

Remarks:

Log of Boring NB25

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 11/14/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3"A/C
				Gravel, brown, dry, base
1				**Sand**, dark gray, medium grained, moist
	■	7.6	0.5	
2				
3				
	■	7.4	7.1	
4				**Silty Sand**, gray, medium grained, moist
5				**Sand**, greenish gray, medium grained, moist
	■	7.4	11.3	

Remarks:

Log of Boring NB26

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 11/14/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3"A/C
				Gravel, brown, dry, base
1				**Sand**, dark gray, medium grained, moist
	■	7.5	21.3	
2				
				Silty Sand, gray, medium grained, moist
3				
	■	7.6	19.2	
4				
5				**Sand**, greenish gray, medium grained, moist
	■	7.5	18.6	

Remarks:

Log of Boring NB27

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/30/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, fine grained, gravel, dry
1				**Sand**, dark gray, medium grained, moist
	■	7.2	0.6	
2				
3				**Clayey Sand**, gray, fine grained, moist
	■	7.1	1.1	
4				
5				
	■	7.1	1.2	**Sand**, green/gray, fine grained, moist

Remarks:

Log of Boring NB28

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, fine grained, gravel, dry
1				**Silty Sand**, gray, medium grained, moist
	■	6.9	0.8	
2				
3				
	■	7.1	0.7	
4				**Clayey Sand**, gray, fine grained, moist
5				**Sand**, green/gray, fine grained, moist
	■	7.1	1	

Remarks:

Log of Boring NB29

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, fine grained, gravel, dry
1				**Silty Sand**, gray, medium grained, moist
	■	7.3	0.8	
2				
3				**Clayey Sand**, gray, fine grained, moist
	■	7.3	0.9	
4				
5				**Sand**, green/gray, fine grained, moist
	■	7.1	1.3	

Remarks:

Log of Boring NB30

Client: Southern California Edison	
Project: Alamitos Generating Station -- North Basin	
Date: 10/29/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, tan, medium grained, dry
1				**Silty Sand**, gray, fine grained, moist
	■	7.1	1	
2				
3				
	■	7.2	0.8	
4				**Clayey Sand**, gray, fine grained, stiff, moist
5				**Sand**, gray, medium grained, moist
	■	7.2	1.3	

Remarks:

Log of Boring C1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/12/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, medium grained, moist, odor
	■	8.16	
2			
3			
	■	7.88	
4			**Sandy Silt**, gray, moist
5			
6			
7			
	■	7.97	**Silty Sand**, tan, fine grained, moist
8			
9			
			Clayey Sand, gray, fine grained, moist
10			
	■	7.93	
11			

Remarks:

Log of Boring C2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/12/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description 2"A/C
1			**Gravel**, brown, dry, base **Sandy Silt**, gray, moist, strong hydrocarbon odor
2	■	7.51	
3			
4	■	8.11	**Sand**, mottled light and dark tan, medium grained, moist, odor
5			
6			**Sandy Silt**, greenish tan, moist
7			
8	■	8.09	
9			
10			**Clay**, gray, moist, plastic
11	■	8.02	

Remarks:

Log of Boring C3

Client:	Southern California Edison
Project:	Alamitos Generating Station -- Central Basin
Date: 11/12/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, medium grained, moist, odor
2	■	8.12	
3			
4	■	8.26	**Clayey Sand**, gray, fine grained, moist
5			
6			
7			**Silty Sand**, tan, fine grained, moist
8	■	7.98	
9			
10			**Sandy Clay**, dark gray, moist, plastic
11	■	7.68	

Remarks:

Log of Boring C4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/13/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description 2"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, medium grained, moist, odor
	■	8.26	
2			
3			
	■	8.51	**Sandy Silt**, gray, moist
4			
5			
6			**Silty Sand**, tan, fine grained, moist
7			
	■	8.14	
8			
9			
10			**Clayey Sand**, gray, fine grained, moist
	■	7.92	
11			

Remarks:

Log of Boring C5

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/13/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description** 2"A/C
			Gravel, brown, dry, base
1			**Sandy Silt**, gray, moist
	■	7.35	
2			
3			
	■	8.34	**Silty Sand**, gray, medium grained, moist
4			
5			
			Silty Sand, tan, fine grained, moist
6			
7			
	■	8.06	**Sandy Silt**, tan, moist
8			
9			
10			**Sandy Clay**, gray, wet, plastic
	■	7.33	
11			

Remarks: Encountered perched groundwater at 9 feet.
Installed 2-inch diameter piezometer adjacent to boring C5.

Log of Boring C6

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/13/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Clayey Sand**, gray, fine grained, moist
	■	7.33	
2			
3			
	■	7.29	
4			**Silty Sand**, gray, medium grained, moist
5			
6			**Silty Sand**, tan, fine grained, moist
7			
	■	7.69	**Sandy Silt**, tan, moist
8			
9			
10			**Sandy Clay**, gray, wet, plastic
	■	7.81	
11			

Remarks: Encountered perched groundwater at 9 feet. Collected sample for analysis.
Installed 2-inch diameter piezometer adjacent to boring C6.

Log of Boring C7

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/20/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description 2"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, medium grained, moist
	■	8.57	
2			
3			
	■	8.59	
4			**Sandy Clay**, gray, moist, plastic
5			
6			**Silty Sand**, gray, medium grained, moist
7			
	■	7.97	
8			
9			
10			**Sandy Clay**, gray, moist, plastic
	■	7.81	
11			

Remarks:

Log of Boring C8

Client: Southern California Edison

Project: Alamitos Generating Station -- Central Basin

Date: 11/20/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical

Method: Hand Auger

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, medium grained, moist
		8.36	
2			
3			
		8.43	**Silty Sand**, tan, medium grained, moist
4			
5			
6			
7			**Silty Sand**, tan, fine grained, moist
		7.91	
8			
9			
10			**Clay**, gray, wet, plastic
		7.74	
11			

Remarks: Encountered perched groundwater at 9 feet.
Installed 2-inch diameter piezometer adjacent to boring C8.

Log of Boring C9

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/13/09	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Sand**, gray, medium grained, moist
2	■	8.31	
3			
4	■	8.26	**Silty Sand**, gray, medium grained, moist
5			
6			
7			**Sandy Silt**, tan, moist
8	■	8.37	
9			
10			**Sandy Clay**, gray, moist, plastic
11	■	7.96	

Remarks:

Log of Boring C10

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 1/5/10	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Sandy Silt**, dark gray, moist
	■	7.18	
2			
3			
	■	8.06	
4			**Silty Sand**, gray, medium grained, moist
5			
6			**Sandy Silt**, tan, moist
7			
	■	8.91	
8			
9			
10			
	■	8.07	
11			

Remarks:

Log of Boring C11

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 6/8/10	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Sand**, gray, medium grained, moist
		8.66	
2			
3			
		8.04	
4			**Silty Sand**, gray, medium grained, moist
5			
6			**Silty Sand**, gray, medium grained, moist
7			
		7.71	**Clayey Sand**, gray, fine grained, moist
8			
9			
10			
		7.24	
11			

Remarks:

Log of Boring C12

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 6/8/10	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, medium grained, moist
2	■	8.73	
3			
4	■	8.79	
5			**Sandy Silt**, tan, fine grained, moist
6			
7			
8	■	7.78	**Silty Sand**, tan, medium grained, moist
9			
10			
11	■	7.71	

Remarks:

Log of Boring C13

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 6/8/10	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Sand**, gray, medium grained, moist
	■	8.86	
2			
3			
	■	8.84	
4			**Silty Sand**, gray, medium grained, moist
5			
6			
7			
	■	8.17	**Sandy Silt**, tan, moist
8			
9			
10			**Silty Sand**, gray, medium grained, moist
	■	7.89	
11			

Remarks:

Log of Boring C14

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 6/8/10	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, brown, dry, base
1			**Sandy Silt**, dark gray, moist
	■	8.44	
2			
3			
	■	8.81	
4			**Silty Sand**, gray, medium grained, moist
5			
6			
7			
	■	7.96	**Sandy Silt**, tan, moist
8			
9			**Silty Sand**, tan, medium grained, moist
10			
	■	7.77	
11			

Remarks:

Log of Boring CB1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	7.64	**Silty Sand**, gray, medium grained, moist
2			**Sand**, gray, medium grained, moist
3			
	■	8.96	**Silty Sand**, gray, medium grained, moist
4			
5			**Sand**, light gray, medium grained, moist
	■	8.5	

Remarks:

Log of Boring CB2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	8.39	**Sand**, gray, medium grained, moist
2			
3			**Silty Sand**, gray, medium grained, moist
4	■	8.72	
5	■	8.88	

Remarks:

Log of Boring CB3

Client: Southern California Edison

Project: Alamitos Generating Station -- Central Basin

Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration

Method: Hand Auger

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1		8.13	**Silty Sand**, gray, medium grained, moist
2			**Sand**, gray, medium grained, moist
3			**Silty Clay**, gray, moist, plastic
		8.69	
4			
			Silty Sand, gray, medium grained, moist
5			
		8.7	

Remarks:

Log of Boring CB4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	8.32	**Silty Sand**, gray, medium grained, moist, odor
2			**Sand**, gray, medium grained, moist
3			**Clayey Sand**, gray, fine grained, moist
	■	8.61	
4			
			Silty Sand, gray, medium grained, moist
5			
	■	8.59	

Remarks: A strong odor was noted for the drill cuttings.

Log of Boring CB5

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			2"A/C
			Gravel, orange brown, dry, base
1	■	8.52	**Sand**, gray, medium grained, moist
2			
3			**Silty Sand**, gray, medium grained, moist
4	■	8.85	
5			
	■	8.42	

Remarks:

Log of Boring CB6

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	8.79	**Sand**, gray, medium grained, moist
2			**Silty Clay**, gray, moist, plastic
3			
4	■	8.63	**Silty Sand**, gray, medium grained, moist
5			**Sand**, gray, medium grained, moist
	■	8.33	

Remarks:

Log of Boring CB7

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	8.3	**Sand**, gray, medium grained, moist
2			**Silty Sand**, gray, medium grained, moist
3			
	■	8.47	
4			**Sand**, gray, medium grained, moist
5			
	■	8.46	

Remarks:

Log of Boring CB8

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	7.85	**Silty Sand**, gray, medium grained, moist, odor
2			
3			**Sand**, gray, medium grained, moist
	■	8.24	
4			**Clayey Sand**, gray, fine grained, moist
5			
	■	8.22	

Remarks:

Log of Boring CB9

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description 2"A/C
			Gravel, orange brown, dry, base
1	■	7.52	**Silty Sand**, gray, medium grained, moist
2			
3			**Sand**, gray, medium grained, moist
	■	8.79	
4			**Silty Sand**, gray, medium grained, moist
5			
	■	8.82	

Remarks:

Log of Boring CB10

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	7.72	**Silty Sand**, gray, medium grained, moist
2			
3			**Sand**, gray, medium grained, moist
4	■	7.98	**Clayey Sand**, gray, fine grained, moist, plastic
5			**Sand**, gray, medium grained, moist
	■	8.44	Piece of wood in bottom of sample

Remarks:

Log of Boring CB11

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	8.46	**Sand**, gray, medium grained, moist
2			**Silty Sand**, gray, medium grained, moist
3			**Clayey Sand**, gray, fine grained, moist
	■	8.54	
4			**Silty Sand**, gray, medium grained, moist
5			**Sand**, gray, medium grained, moist
	■	8.84	

Remarks:

Log of Boring CB12

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	7.01	**Sand**, gray, medium grained, moist
2			
3			**Silty Sand**, gray, medium grained, moist
	■	7.6	
4			**Clayey Sand**, gray, fine grained, moist
5			**Sand**, light gray, medium grained, moist
	■	8.16	

Remarks:

Log of Boring CB13

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1		7.93	**Silty Sand**, gray, medium grained, moist
2			
3			
		8.35	
4			**Sand**, gray, medium grained, moist
5			**Clayey Sand**, gray, moist, plastic
		7.94	

Remarks:

Log of Boring CB14

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	7.87	**Silty Sand**, gray, medium grained, moist
2			
3			**Clayey Sand**, gray, moist, plastic
4	■	8.54	**Sand**, gray, medium grained, moist
5			**Silty Sand**, gray, medium grained, moist
	■	8.91	

Remarks:

Log of Boring CB15

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	7.96	**Silty Sand**, gray, medium grained, moist
2			
3			**Sand**, gray, medium grained, moist
4	■	8.23	
5			**Silty Sand**, gray, medium grained, moist
	■	8.46	

Remarks:

Log of Boring CB16

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 3/4/98	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■	8.1	**Silty Sand**, gray, medium grained, moist
2			
3			**Sand**, gray, medium grained, moist
4	■	8.14	
5			**Silty Sand**, gray, medium grained, moist
	■	8.32	

Remarks:

Log of Boring CB17

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/15/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" Concrete
				Silty Sand, gray, medium grained, moist
1				
		7.5	0.4	
2				
				Sand, gray, medium grained, moist
3				
		7.1	0.7	
4				**Silty Sand**, gray, medium grained, moist
5				
		7.4	19.7	

Remarks:

Log of Boring CB18

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/15/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" Concrete
				Silty Sand, gray, medium grained, moist
1				
	■	7.3	1.1	**Sand**, gray, fine grained, moist
2				
3				
	■	7.4	0.9	
4				**Silty Sand**, gray, medium grained, moist
5				
	■	7.1	1.4	

Remarks:

Log of Boring CB19

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/15/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" Concrete
1				**Silty Sand**, gray, medium grained, moist
	■	7.4	1.5	**Sand**, gray, fine grained, moist
2				
3				
	■	7.3	1.1	
4				**Silty Sand**, gray, medium grained, moist
5				
	■	7.5	0.9	**Clay**, gray, moist, plastic

Remarks:

Log of Boring CB20

Client:	Southern California Edison
Project:	Alamitos Generating Station -- Central Basin
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.3	1.1	
2				**Sand**, gray, medium grained, moist
3				
	■	7.4	1.4	**Sandy Clay**, greenish gray, plastic, moist
4				
5				**Silty Sand**, gray, medium grained, moist
	■	7.4	0.9	

Remarks:

Log of Boring CB21

Client:	Southern California Edison
Project:	Alamitos Generating Station -- Central Basin
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.3	1	
2				
				Sand, gray, medium grained, moist
3				
	■	7.6	0.8	**Clayey Sand**, greenish gray, fine grained, moist
4				
				Silty Sand, gray, medium grained, moist
5				
	■	7.5	0.5	

Remarks:

Log of Boring CB22

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.1	0.9	
2				
3				**Sand**, gray, medium grained, moist
	■	7.3	0.7	
4				**Clayey Sand**, greenish gray, fine grained, moist
5				
	■	7.5	1.1	

Remarks:

Log of Boring CB23

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.6	0.9	
2				
				Clayey Sand, greenish gray, fine grained, moist
3				
	■	6.9	1.3	
4				
5				**Sand**, gray, medium grained, moist
	■	7.5	0.9	

Remarks:

Log of Boring CB24

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
2	■	7.9	1.4	
3				**Sand**, gray, medium grained, moist
4	■	7.6	1.1	
5				**Silty Sand**, gray, medium grained, moist
	■	7.4	0.6	

Remarks:

Log of Boring CB25

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
2	■	7.7	0.9	
3				
4	■	7.4	1.3	**Sand**, gray, medium grained, moist
5				**Silty Sand**, gray, medium grained, moist
	■	7.6	1	

Remarks:

Log of Boring CB26

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.2	0.8	
2				**Sand**, gray, coarse grained, pea gravel, moist, possible fill
3				
	■	7.3	0.6	
4				
5				
	■	7.3	0.6	

Remarks:

Log of Boring CB27

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.5	0.5	
2				**Sand**, gray, coarse grained, pea gravel, moist, possible fill
3				
	■	7.7	0.9	
4				
5				
	■	7.9	0.7	

Remarks:

Log of Boring CB28

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
2	■	7.5	1	
3				**Sand**, gray, medium grained, moist
4	■	7.5	0.3	
5				**Clayey Sand**, gray, medium grained, plastic, moist
	■	7.4	0.6	

Remarks:

Log of Boring CB29

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
2	■	7.6	1.1	
3				**Sand**, gray, medium grained, moist
4	■	7.5	0.5	
5				
	■	7.6	0.8	**Clayey Sand**, gray, medium grained, plastic, moist

Remarks:

Log of Boring CB30

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
		7.2	0.7	
2				
3				**Sand**, gray, medium grained, moist
		7.3	0.5	
4				**Silty Sand**, gray, medium grained, moist
5				
		7.4	1.3	

Remarks:

Log of Boring CB31

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/5/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Sand, gray, medium grained, moist
1				
	■	7.7	0.6	
2				
3				**Silty Sand**, gray, medium grained, moist
	■	7.5	0.9	
4				
5				
	■	7.5	0.5	

Remarks:

Log of Boring CB32

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 11/14/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.5	1.3	
2				**Sand**, gray, medium grained, moist
3				
	■	7.6	14.2	
4				**Silty Sand**, gray, medium grained, moist
5				
	■	7.5	10.6	**Sand**, light gray, medium grained, moist

Remarks:

Log of Boring CB-1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 12/20/95	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description 2"A/C
			Gravel, orange brown, dry, base
1	■		**Silty Sand**, gray, medium grained, moist
2			
3			**Sand**, gray, medium grained, moist
4	■		**Silty Clay**, gray, moist, plastic
5			

Remarks:

Log of Boring CB-2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 12/20/95	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■		**Sand**, gray, medium grained, moist
2			
3			**Silty Clay**, gray, moist, plastic
	■		**Sand**, gray, medium grained, moist
4			
5			

Remarks:

Log of Boring CB-3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 12/20/95	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■		**Sand**, gray, medium grained, moist
2			
3			**Silty Sand**, gray, medium grained, moist
	■		**Silty Clay**, gray, moist, plastic
4			
5			

Remarks:

Log of Boring CB-4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 12/20/95	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■		**Silty Sand**, gray, medium grained, moist
2			
			Sand, gray, medium grained, moist
3			
	■		**Silty Sand**, gray, medium grained, moist
4			
5			

Remarks:

Log of Boring CB-5

Client: Southern California Edison	
Project: Alamitos Generating Station -- Central Basin	
Date: 12/20/95	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravel, orange brown, dry, base
1	■		**Silty Sand**, gray, medium grained, moist
2			
3			
	■		**Sand**, gray, medium grained, moist
4			
5			

Remarks:

Log of Boring BCCB1

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			5"A/C
1			**Gravel**, brown, dry, base
	■	6.76	**Sandy Silt**, green, moist, plastic
2			**Silty Sand**, green, medium grained, moist
3			
	■	7.3	**Peat**, dark brown, fiberous, moist
4			**Silty Sand**, greenish brown, moist
5			
	■	8.08	

Remarks:

Log of Boring BCCB2

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			5"A/C
			Gravel, brown, dry, base
1			
2			
3	■	7.55	**Sandy Clay**, green, moist, plastic
4			
			Peat, dark brown, fiberous, moist
5			**Silty Sand**, green, medium grained, moist
	■	8.07	

Remarks: Perched water on sandy clay at 2.7 feet below basin floor.

Perched water samples for analytical testing.

Log of Boring BCCB3

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			5"A/C
1			**Gravel**, brown, dry, base
2			
	■	7.22	**Sandy Clay**, green, moist, plastic
3			
4			
			Peat, dark brown, fiberous, moist
5			**Silty Sand**, green, medium grained, moist
	■	7.66	

Remarks:

Log of Boring BCCB4

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			5"A/C
1			**Gravel**, brown, dry, base
	■	7.19	**Sandy Clay**, green, moist, plastic
2			**Silty Sand**, brown, medium grained, moist
3			**Sandy Clay**, green with brown mottling, coarse grained, moist, plastic
	■	7.88	
4			
5			
	■	7.57	

Remarks:

Log of Boring BCCB5

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description 5"A/C
1			**Gravel**, brown, dry, base
	■	7.56	**Sandy Clay**, green, moist, plastic
2			**Silty Sand**, brown, medium grained, moist
3			**Sandy Clay**, green with brown mottling, coarse grained, moist, plastic
	■	7.53	**Peat**, dark brown, fiberous, moist
4			**Silty Sand**, greenish gray, moist
5			
	■	7.61	

Remarks:

Log of Boring BCCB6

Client: Southern California Edison			
Project: Alamitos Generating Station -- BCCB			
Date: 11/24/97		**Boring Depth:** 5 feet	
Logged By: P. Hamilton		**Drilling Co.:** Odyssey Exploration	
Method: Hand Auger			
Depth Feet	**Sample**	**Field pH**	**Description** 6"A/C
1			**Gravel**, brown, dry, base
	■	7.05	**Sandy Clay**, green, moist, plastic
2			**Silty Sand**, tan with orange mottling, medium grained, moist
3			**Sandy Clay**, green, moist, plastic
	■	8.11	**Silty Sand**, green, medium grained, moist
4			**Peat**, dark brown, fiberous
5			**Silty Sand**, tan, dry
	■	8.11	
Remarks:			

Log of Boring BCCB7

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			5"A/C
1			**Gravel**, brown, dry, base
2	■	7.5	**Sandy Clay**, green with brown mottling, moist, plastic
3			**Peat**, dark brown, fiberous, moist
4	■	7.92	**Sandy Clay**, green with brown mottling, moist, plastic Thin interlayers of peat
5			
	■	7.99	**Silty Sand**, greenish brown, fine grained, moist, organic material

Remarks:

Log of Boring BCCB8

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			4"A/C
1			**Gravel**, brown, dry, base
	■	5.35	**Silty Sand**, greenish brown, medium grained, moist
2			**Sand**, gray, medium grained, moist
			Clay, green, moist, plastic
3			**Silty Sand**, dark gray, medium grained, moist
4	■	5.77	**Silty Sand**, greenish brown, fine grained, moist Peat layer from 3.4 to 3.6 feet
5			
	■	7.48	**Sandy Silt**, green, fine grained, moist

Remarks:

Log of Boring BCCB9

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/24/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			5"A/C
			Gravel, brown, dry, base
1			
	■	6.91	**Sandy Silt**, green with brown mottling, moist
2			
3			**Sand**, gray, fine grained, dry
	■	7.57	Thin peat layer
4			**Sandy Silt**, tan, dry
5			
	■	7.77	

Remarks:

Log of Boring BCCB10

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, greenish gray, medium grained, moist
	■	7.2	1.3	
2				
3				**Sandy Silt**, greenish gray, fine grained, plastic, moist
	■	7.2	1.6	**Sand**, dark gray, fine grained, moist
4				
5				**Peat**, dark brown, fiberous, moist, odor
	■	7.3	4.5	

Remarks:

Log of Boring BCCB11

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, greenish gray, medium grained, moist
1				
	■	7.1	0.7	
2				**Silty Sand**, gray, medium grained, moist
3				
	■	7.3	1.9	**Sandy Clay**, dark gray, fine grained, plastic, moist
4				
5				**Peat**, dark brown, fiberous, moist, odor
	■	7.2	5.3	

Remarks:

Log of Boring BCCB12

Client: Southern California Edison				
Project: Alamitos Generating Station -- BCCB				
Date: 10/31/07			**Boring Depth:** 5 feet	
Logged By: P. Hamilton			**Drilling Co.:** Hamilton Geotechnical	
Method: Hand Auger				

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, greenish gray, medium grained, moist
	■	7.3	1.1	
2				**Sandy Silt**, gray, medium grained, moist
3				
	■	7.2	2.4	**Sandy Clay**, dark gray, fine grained, plastic, moist
4				**Peat**, dark brown, fiberous, moist, odor
5				**Silty Sand**, greenish gray, medium grained, moist
	■	7.1	1.1	

Remarks:

Log of Boring BCCB13

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/14/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3"A/C
				Gravel, brown, dry, base
1				**Sandy Silt**, greenish gray, firm, moist
	■		0.9	
2				
3				
	■		0.7	
4				**Sandy Clay**, dark gray, fine grained, plastic, moist
5				**Silty Sand**, dark gray, medium grained, moist, organic odor
	■		1.6	

Remarks:

Log of Boring BCCB14

Client: Southern California Edison				
Project: Alamitos Generating Station -- BCCB				
Date: 11/14/07				**Boring Depth:** 5 feet
Logged By: P. Hamilton				**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger				
Depth Feet	**Sample**	**Field pH**	**PID**	**Description** 3"A/C
				Gravel, brown, dry, base
1				**Sandy Silt**, greenish gray, firm, moist
	■		0.5	
2				**Silty Sand**, brown, medium grained, moist
3				
	■		0.6	
4				
5				**Silty Sand**, gray, medium grained, moist
	■		0.9	
Remarks:				

Log of Boring BCCB15

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/2/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3"A/C
				Gravel, brown, dry, base
1				**Silty Sand**, greenish gray, medium grained, moist
	■	7.2	1.2	
2				**Sandy Silt**, gray, medium grained, moist
3				
	■	7.2	1.1	
4				**Silty Sand**, gray, medium grained, moist
5				
	■	7.3	2.1	

Remarks:

Log of Boring BCCB16

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/2/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description 3"A/C
				Gravel, brown, dry, base
1				**Silty Sand**, greenish gray, medium grained, moist
		7.3	0.8	
2				**Sand**, brown, medium grained, moist
3				
		7.1	1.4	
4				**Silty Sand**, dark gray, medium grained, moist
5				
		7.2	3.4	**Sandy Silt**, greenish gray, fine grained, moist

Remarks:

Log of Boring BCCB17

Client:	Southern California Edison
Project:	Alamitos Generating Station -- BCCB
Date: 11/2/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description 3"A/C
				Gravel, brown, dry, base
1				**Silty Sand**, dark gray, medium grained, moist
	■	7.3	0.7	
2				**Sandy Clay**, gray, plastic, moist
3				**Silty Sand**, dark gray, medium grained, moist
	■	7.3	0.8	
4				
5				
	■	7.3	1	**Sandy Silt**, greenish gray, fine grained, moist

Remarks:

Log of Boring BCCB18

Client: Southern California Edison	
Project: Alamitos Generating Station -- BCCB	
Date: 11/2/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3"A/C
				Gravel, brown, dry, base
1				**Silty Sand**, dark gray, medium grained, moist
	■	7.3	1.1	
2				
3				
	■	7.2	0.9	
4				**Sandy Silt**, greenish gray, fine grained, moist
5				
	■	7.2	1.2	

Remarks:

Log of Boring SB1

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 3"A/C
		6.97	**Gravelly Sand**, brown, coarse grained, dry
1		8.16	**Silty Sand**, gray, medium grained, dry
2			
3			**Clay**, greenish gray, plactic, moist
4		7.46	**Sand**, gray, medium grained, moist
			Clay, gray, plastic, moist
5			**Sand**, gray, medium grained, moist
		7.92	

Remarks:

Log of Boring SB2

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravelly Sand, brown, coarse grained, dry
1		7.18	**Sandy Silt**, greenish gray, dry, plastic, gravel
2			
3			**Clay**, gray, plactic, moist
		7.16	
4			**Silty Sand**, gray, medium grained, moist
			Sand, greenish gray, medium grained, moist
5			
		7.89	

Remarks:

Log of Boring SB3

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 3"A/C
			Gravelly Sand, brown, coarse grained, dry
1	■	6.72	**Sandy Silt**, gray, dry
2			
3			
	■	7.25	**Sand**, greenish brown, mottled with orange staining, fine grained, moist
4			**Silty Sand**, brown, medium grained, moist
			Sand, gray, medium grained, moist
5			**Silty Sand**, black, medium grained, moist Heavy biotite concentration
	■	7.88	

Remarks:

Log of Boring SB4

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 3"A/C
	■	8.19	**Gravelly Sand**, brown, coarse grained, dry
1	■	7.3	**Sandy Silt**,dark gray, dry
2			
3			
	■	6.83	
4			
5			**Sandy Clay**, greenish brown, plactic, moist
	■	7.42	

Remarks:

Log of Boring SB5

Client: Southern California Edison			
Project: Alamitos Generating Station -- South Basin			
Date: 9/4/97			**Boring Depth:** 5 feet
Logged By: P. Hamilton			**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill			
Depth Feet	**Sample**	**Field pH**	**Description** **3"A/C**
			Gravelly Sand, brown, coarse grained, dry
1	■	7.12	**Silty Sand**, gray, fine grained, moist
2			Thin layers of gray silt and clay
3			Shell fragments observed in cuttings
	■	6.85	
4			
5			
	■	7.22	
Remarks:			

Log of Boring SB6

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description
			2"A/C
			Gravelly Sand, brown, coarse grained, dry
1	■	7.23	**Silty Sand**, gray, fine grained, moist
2			Thin layers of gray clay
3			
4	■	7.24	
5			**Sand**, gray, medium grained
	■	8.42	

Remarks:

Log of Boring SB7

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 2"A/C
	■	7.87	**Gravelly Sand**, brown, coarse grained, dry
1	■	7.23	**Silty Sand**, brown, fine grained, moist, organic material
2			
3			
	■	7.26	
4			Color change to tan
5			
	■	7.36	

Remarks:

Log of Boring SB8

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravelly Sand, brown, coarse grained, dry
1		7.22	**Silty Sand**, dark gray, fine grained, moist
2			
3			
		6.87	Color change to gray
4			
			Encountered a length of string in the drill cuttings
5			
		7.71	

Remarks: String in the cuttings may signify fill material.

Log of Boring SB9

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description
			3"A/C
			Gravelly Sand, brown, coarse grained, dry
1	■	7.35	**Silty Sand**, gray, fine grained, moist
2			
3			**Sand**, gray, medium grained, moist
4	■	7.81	**Sandy Silt**, gray mottled with tan, slightly plastic, moist
5			
	■	7.24	

Remarks:

Log of Boring SB10

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 2"A/C
			Gravelly Sand, brown, coarse grained, dry
1	■	7.42	**Silty Sand**, gray, medium grained, moist
2			Thin layers of gray clay
3			
	■	7.16	
4			
			At 4.3 feet, encountered a 4-inch void and wood fragments
5			Color change to black
	■	6.83	

Remarks: The void and wood encountered at 4.3 feet indicates fill material.

Log of Boring SB11

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 0"A/C
			Silty Sand, gray, medium grained, moist
1	■	7.31	
2			Color change to dark gray
3			From 2.5 to 3.5 feet, encountered pieces of asbestos board pink and gray in color, moist
4	■	7.33	
5			
	■	7.39	

Remarks: The asbestos was placed in a plastic bag and then in a drum.

Log of Boring SB12

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 1"A/C
	■	8.02	**Silty Sand**, black, coarse grained, wet, hydrocarbon odor
1	■	7.18	**Silty Sand**, gray, medium grained, moist, wood chips
2			Thin layers of gray clay
3			
	■	7.54	Sample contained pieces of plywood
4			Drill cuttings contained bolts and nails
5			
	■	7.08	

Remarks: The wood and debris encountered indicates fill material.

Log of Boring SB13

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 0"A/C
			Silty Sand, dark gray, medium grained, moist
1		7.76	
			Thin layers of gray silt and clay
2			
			Pieces of wood in cuttings
3			
		7.29	
4			
5			
		7.44	

Remarks:

Log of Boring SB14

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description 0"A/C
			Silty Sand, dark gray, medium grained, moist, gravel
1	■	7.56	
			Thin layers of gray silt and clay
2			
			Pieces of wood in cuttings
3			
	■	7.58	
4			
			At 4.3 feet, cobble layer
5			
	■	7.36	

Remarks:

Log of Boring SB15

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 9/4/97	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Odyssey Exploration
Method: SIMCO Drill	

Depth Feet	Sample	Field pH	Description
			3"A/C
	■	6.94	**Gravelly Sand**, brown, coarse grained, dry
1	■	7.05	**Silty Sand**, gray, medium grained, moist
2			
3			Pieces of wood in cuttings
	■	7.24	
4			
5			
	■	8.41	

Remarks:

Log of Boring SB16

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" Concrete
				Sand, dark gray, medium grained, moist
1				
	■	7.2	0.5	
2				
3				**Clayey Sand**, greenish gray, fine grained, moist
	■	7.5	1.9	
4				
				Sand, greenish gray, medium grained, moist
5				
	■	7.6	0.9	

Remarks:

Log of Boring SB17

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/20/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" Concrete
				Sand, dark gray, medium grained, moist
1				
	■	7.4	0.6	
2				
3				
	■	7.3	4.1	**Clayey Sand**, greenish gray, fine grained, moist
4				
5				**Sand**, greenish gray, medium grained, moist
	■	7.4	0.6	

Remarks:

Log of Boring SB18

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
2	■	7.1	0.8	**Sandy Clay**, dark gray, firm, moist
3				
4	■	7.2	0.5	**Silty Sand**, brown, medium grained, moist
5				**Clay**, dark gray, plastic, moist
				Sand, gray, medium grained, moist
	■	7.2	1.6	

Remarks:

Log of Boring SB19

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
	■	7.2	0.6	
2				**Silty Sand**, brown, medium grained, moist
3				**Sandy Clay**, dark gray, firm, moist
	■	7.2	0.7	**Silty Sand**, gray, medium grained, moist
4				**Clay**, dark gray, plastic, moist
5				**Silty Sand**, black, medium grained, moist
	■	7.2	1	

Remarks:

Log of Boring SB20

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 10/31/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, fine grained, moist
	■	7.1	0.7	
2				
3				**Sandy Clay**, dark gray, firm, moist
	■	7.2	1	
4				**Silty Sand**, gray, fine grained, moist
5				
	■	7.2	0.9	

Remarks:

Log of Boring SB21

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/2/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, fine grained, moist
1				
	■	7.4	0.6	
2				
3				
	■	7.4	1.2	
4				**Sand**, gray, medium grained, moist
5				**Silty Sand**, brown, medium grained, moist
	■	7.1	1.1	

Remarks:

Log of Boring SB22

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/2/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, fine grained, moist
2	■	7.2	0.5	
3				**Sand**, gray, medium grained, moist
4	■	7.2	0.7	**Silty Sand**, gray, medium grained, moist
5				
	■	7.2	0.9	

Remarks:

Log of Boring SB23

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/2/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, fine grained, moist
1				
		7.1	1	
2				
				Sand, gray, medium grained, moist
3				
		7.2	1	
				Silty Sand, gray, medium grained, moist
4				
5				
		7.3	1.3	

Remarks:

Log of Boring SB24

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/15/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
1				**Silty Sand**, gray, medium grained, moist
2	■	7.6	2.6	
3				**Sand**, gray, fine grained, moist
4	■	7.6	3.4	**Silty Sand**, gray, medium grained, moist
5	■	7.4	2.9	

Remarks:

Log of Boring SB25

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/15/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.4	3.8	
2				
3				
	■	7.3	2.4	
4				**Sand**, gray, fine grained, moist
5				**Silty Sand**, gray, medium grained, moist
	■	7.4	2.1	

Remarks: Below recent pipe valve replacement.

Log of Boring SB26

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/15/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.2	3.2	
2				
3				
	■	7.2	4.4	
4				
5				
	■	7.6	2.8	

Remarks: Below recent pipe valve replacement.

Log of Boring SB27

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/15/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				Silty Sand, gray, medium grained, moist
1				
	■	7.7	2.6	
2				
3				
	■	7.6	0.9	
4				
5				
	■	7.7	3.7	

Remarks:

Log of Boring SB28

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/16/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" A/C
				Silty Sand, gray, medium grained, moist
1				
	■	8.1	1.3	
2				
3				
	■	7.6	4.8	
4				
5				
	■	7.6	2.3	

Remarks:

Log of Boring SB29

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/16/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" A/C
				Silty Sand, gray, medium grained, moist
1				
	■	7.7	3.3	
2				
3				
	■	7.8	3.8	
4				
5				
	■	7.4	2.9	

Remarks:

Log of Boring SB30

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/16/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" A/C
				Silty Sand, gray, medium grained, moist
1				
	■	7.5	3.9	
2				
3				
	■	7.6	2.6	
4				
				Sand, gray, medium grained, moist
5				
	■	7.7	2.9	

Remarks:

Log of Boring SB31

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/16/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" A/C
				Silty Sand, gray, medium grained, moist
1				
	■	8.1	1.6	
2				
3				
	■	8.3	2.2	
4				
5				
	■	8.1	3.1	

Remarks:

Log of Boring SB32

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/16/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" A/C
				Silty Sand, gray, medium grained, moist
1				
	■	8	1.9	
2				
3				
	■	8.1	2.6	
4				
				Sand, gray, medium grained, moist
5				
	■	7.7	0.9	

Remarks:

Log of Boring SB33

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/16/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" A/C
1				**Silty Sand**, gray, medium grained, moist
	■	7.9	0.8	**Sandy Silt**, gray, fine grained, moist
2				
3				
	■	8	2.4	
4				
				Sandy Clay, greenish gray, plastic, moist
5				
	■	7.6	2.9	

Remarks:

Log of Boring SB34

Client: Southern California Edison	
Project: Alamitos Generating Station -- South Basin	
Date: 11/16/07	**Boring Depth:** 5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	PID	Description
				3" A/C
1				**Silty Sand**, gray, medium grained, moist
2	■	7.9	1.9	**Sandy Silt**, gray, fine grained, moist
3				**Clay**, gray, plastic, moist
4	■	7.6	1.6	**Sandy Clay**, greenish gray, plastic, moist
5				
	■	7.8	0.7	

Remarks:

Log of Boring P1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/25/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine to medium grained, moist, gravel
2			
3			
4			
5			
	■	6.95	
6			
7			
	■	7.09	**Sandy Silt**, light gray, plastic, moist, ribbons of reddish color through soil
8			
9			
10			
11			

Remarks:

Log of Boring P1-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/18/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine to medium grained, moist, gravel
2			
3			
4			
5			
6			
7			
8	■		**Sandy Silt**, light gray, plastic, moist, ribbons of reddish color through soil Piece of yellow plastic tape observed at 7 feet
9			
10	■		
11			

Remarks:

Log of Boring P1-S2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/18/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine to medium grained, moist
2			
3			
4			
5			
6			
7			
8	■		**Sandy Silt**, light gray, plastic, moist
9			**Sandy Silt**, light gray, plastic, moist, ribbons of reddish color through soil
10	■		
11			

Remarks:

Log of Boring P1-S3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/18/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine to medium grained, moist
2			
3			
4			
5			
6			
7			
8			**Sandy Silt**, light gray, plastic, moist
9			**Sandy Silt**, light gray, plastic, moist, ribbons of reddish color through soil
10			
11			

Remarks:

Log of Boring P2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/25/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Sandy Silt**, dark brown, plastic, moist, gravel
2			
3			
4			
5			
6	■	7.96	
7			
8	■	7.31	**Sandy Silt**, gray, plastic, moist
9			
10			
11			

Remarks:

Log of Boring P3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/30/12	**Boring Depth:** 11 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, moist
2			
3			Encountered thin silt layers and construction debris from 2 to 6 feet
4			
5			
6	■	7.82	
7			**Sandy Silt**, dark gray, plastic, moist
8	■	5.11	
9			**Sandy Silt**, light gray, plastic, moist, ribbons of reddish color through soil
10			
11			
	■	6.16	

Remarks:

Log of Boring P4

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/30/12	**Boring Depth:** 11 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan/brown mix, medium grained, gravel, moist
2			
3			
4			
5			
6			
	■	7.41	**Sandy Silt**, brown, fine grained, moist
7			
8			
	■	7.54	
9			
10			
			Wet
11			
	■	7.95	

Remarks: Groundwater was determined to be at 10 feet

Log of Boring P4-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/18/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan/brown mix, medium grained, gravel, moist
2			
3			
4			
5			
6			
7			**Sandy Silt**, brown, fine grained, moist
8			
9			
10			
11			

Remarks: Groundwater was determined to be at 10 feet

Log of Boring P4-S2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/18/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan/brown mix, medium grained, gravel, moist
2			
3			
4			
5			
6			
7			**Sandy Silt**, brown, fine grained, moist
8			
9	■		
10	■		
11			

Remarks: Groundwater was determined to be at 10 feet

Log of Boring P5

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/31/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, dark brown, medium grained, gravel, pods of clay, moist
2			
3			
4			
5			**Silty Clay**, dark gray, plastic, moist, hydrocarbon odor
6	■	7.82	**Sand**, gray, fine grained, hydrocarbon odor
7	■	6.95	**Sandy Silt**, gray, fine grained, wet, hydrocarbon odor
8	■	7.66	
9			
10			
11			

Remarks: Sample collected at 5 feet for TPH analysis

Log of Boring P5-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/25/13	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, pods of clay, moist Asphalt debris
2			
3			Void from 2' to 4'
4			
5			**Silty Clay**, dark gray, plastic, wet, hydrocarbon odor
6			
7			**Sandy Silt**, brown, fine grained, moist, hydrocarbon odor
8			
9			
10			
11			

Remarks: Hole began to collapse at 8 feet with influx of warm water from the 5 foot level.
Noted the movement of the warm water in the hole most likely caused the void

Log of Boring P5-S2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/25/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, pods of clay, moist Asphalt debris
2			
3			
4			**Silt**, dark gray, plastic, hydrocarbon odor
5			**Silty Sand**, dark gray, medium grained, hydrocarbon odor
6			**Sandy Silt**, gray/blue, fine grained, shell fragments, moist
7			
8			
9			
10			
11			

Remarks:

Log of Boring P6

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/30/12	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine to medium grained, moist, gravel, mottled brown
2			
3			
4			
5			
6			
	■	8.03	**Silty Sand**, tan, medium grained, moist
7			
8			
	■	7.29	**Sandy Clay**, gray, plastic, moist, thin layers of fine grained sand
9			
10			
11			

Remarks:

Log of Boring P7

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/13/12	**Boring Depth:** 16 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Geoprobe Drill	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Sandy Silt**, dark gray, plastic, fine gravel, moist
2			
3			
4			
5			
6			**Sand**, tan, coarse grained, moist
7			**Silt**, dark gray, moist
8	■	9.84	
9			
10	■	9.16	
11			**Sandy Silt**, tan, plastic, fine gravel, moist,
12			
13			
14			
15			
16			
17	■	9.19	

Remarks:

Log of Boring P7-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/29/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Sandy Silt**, dark gray, plastic, fine gravel, moist
2			
3			
4			
5			
6			**Sand**, tan, coarse grained, moist
7			
8			
9			
10			
11			Saturated

Remarks:

Log of Boring P7-S2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/29/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Sandy Silt**, dark gray, plastic, fine gravel, moist with thin layers of silty sand, tan, medium grained
2			
3			
4			
5			Encountered a thin layer of neat cement
6			**Silt**, dark gray, moist, ribbons of rust color within the silt
7			
8			
9			
10			**Sandy Silt**, tan, plastic, fine gravel, moist, ribbons of rust/orange through the soil
11			Saturated

Remarks: Attempted 3 holes that encountered concrete at 5 feet
The concrete was thin in the fourth hole and was penetrated

Log of Boring P7-S3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/29/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Sandy Silt**, dark gray, plastic, fine gravel, moist
2			
3			
4			
5			
6			
7			
8			**Sand**, tan, coarse grained, moist
9			
10			
11			Saturated

Remarks:

Log of Boring P8

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/13/12	**Boring Depth:** 16 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Geoprobe Drill	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Sandy Silt**, gray, plastic, moist
2			
3			
4			
5			
6	■	7.65	**Sand**, tan, coarse grained, moist
7			
8	■	8.12	
9			**Silt**, dark gray, moist
10			
11			**Sandy Silt**, tan, plastic, fine gravel, moist,
12			
13			
14			
15			
16			
17	■	8.48	

Remarks:

Log of Boring P9

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/1/12	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Silty Sand**, dark gray, fine grained, gravel, moist
2			
3			
4			
5			
6			
7	■	7.66	**Silty Sand**, gray, medium grained, moist
8			
9	■	7.19	**Silty Sand**, tan, medium grained, moist
10			
11			

Remarks:

Log of Boring P9-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/25/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Silty Sand**, dark gray, fine grained, gravel, moist
2			
3			
4			
5			
6			
7			**Silty Sand**, gray, medium grained, moist
8			
9			**Silty Sand**, tan, medium grained, moist
10			
11			

Remarks:

Log of Boring P10

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/1/12	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			
3			
4			
5			
6			
7	■	7.63	**Silty Sand**, gray, medium grained, moist
8			
9	■	7.85	**Silty Sand**, tan, medium grained, moist
10			
11			

Remarks:

Log of Boring P11

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/1/12	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			
3			
4			
5			
6			
	■	7.86	**Silty Sand**, gray, medium grained, moist
7			
8			
	■	8.19	**Silty Sand**, tan, medium grained, moist
9			
10			
11			

Remarks:

Log of Boring P14

Client: Southern California Edison

Project: Alamitos Generating Station -- Pipeline Investigation

Date: 11/2/12 | **Boring Depth:** 8.5 feet

Logged By: P. Hamilton | **Drilling Co.:** Hamilton Geotechnical

Method: Hand Auger

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, moist
2			
3			
4			
5			**Sand**, brown, coarse grained, moist
6			
7	■	8.55	
8			**Sandy Clay**, dark gray, plastic, moist
9	■	8.26	
10			
11			

Remarks:

Log of Boring P17

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/6/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, moist
2			
3			
4			
5			
6			
			Silty Sand, tan, fine grained, gray mottling
7	■	8.93	
8			
9	■	8.9	
10			
11			

Remarks:

Log of Boring P18

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 7.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan, fine grained, gravel, moist
2			
3			
4			
5	■	8.19	
6			
7			**Clayey Sand**, dark gray, fine grained, moist
8	■	8.04	
9			
10			
11			

Remarks:

Log of Boring P19

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 7.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan, fine grained, gravel, moist
2			
3			
	■	7.52	
4			
5			
	■	7.78	
6			
			Clayey Sand, dark gray, fine grained, moist
7			
8	■	8.04	
9			
10			
11			

Remarks:

Log of Boring P19A

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, moist
2			
3			
4			
5	■	7.88	
6			
7	■	7.67	**Silty Sand**, gray, medium grained, moist
8			
9			
10			
11			

Remarks:

Log of Boring P19A-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/1/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, moist
2			
3			
4			
5			
6			
7			**Silty Sand**, gray, medium grained, moist
8			
9			
10			
11			

Remarks:

Log of Boring P20

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 7.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan, fine grained, gravel, moist
2			
3			
4			
	■	8.13	
5			
			Clayey Sand, dark gray, fine grained, moist
6			
	■	7.68	
7			
	■	7.99	
8			
9			
10			
11			

Remarks:

Log of Boring P21

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, gravel, moist
2			
3			
4			**Silty Sand**, gray, medium grained, moist
5	■	7.92	
6			
7	■	7.87	
8			
9			
10			
11			

Remarks:

Log of Boring P22

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, gravel, moist
2			
3			
4			
5	■	8.49	
6			**Silty Sand**, gray, medium grained, moist
7	■	8.47	
8			
9			
10			
11			

Remarks:

Log of Boring P22-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/1/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, gravel, moist
2			
3			
4			
5			
6			**Silty Sand**, gray, medium grained, moist
7			
8	■		
9			
10	■		
11			

Remarks:

Log of Boring P24

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/17/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
			Silty Sand, gray, medium grained, moist, hydrocarbon odor
5	■	7.79	
6			Encountered plywood
7	■	8.29	
8			
9			
10			
11			

Remarks:

Log of Boring P24-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/30/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5			
6			**Sand**, tan, coarse grained, gravel, moist
7			**Silty Sand**, brown, medium grained, moist
8			
9			
10			
11			

Remarks:

Log of Boring P24-S2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/30/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5			
6			**Silty Sand**, brown, medium grained, moist
7			
8			
9			
10			
11			

Remarks:

Log of Boring P25

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/1713	**Boring Depth:** 7.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, plastic, moist
2			
3			
4			
5	■	7.92	
6			**Clayey Sand**, dark gray, fine grained, moist Encountered wood at 6 feet
7			
8	■	7.71	
9			
10			
11			

Remarks:

Log of Boring P26

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/17/13	**Boring Depth:** 7.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan, fine grained, gravel, moist
2			
3			
			Silty Sand,brown, medium grained, plastic, moist
4	■	7.68	
5			
			Clayey Sand, dark gray, fine grained, moist
6	■	7.4	
7			
8	■	7.88	
9			
10			
11			

Remarks:

Log of Boring P27

Client: Southern California Edison

Project: Alamitos Generating Station -- Pipeline Investigation

Date: 4/17/13	**Boring Depth:** 7.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical

Method: Hand Auger

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan, fine grained, gravel, moist
2			
3			
4			
5	■	7.64	
6			
			Clayey Sand, dark gray, fine grained, moist
7	■	7.6	
8	■	8.12	
9			
10			
11			

Remarks:

Log of Boring P28

Client:	Southern California Edison
Project:	Alamitos Generating Station -- Pipeline Investigation
Date: 4/12/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist Encountered construction debris: fiber mesh, wood, plastic tape
2			
3			
4			
			Silty Sand, dark gray, medium grained, pods of black **Silt**, moist
5	■	8.22	
6			
7	■	8.02	
8			
9			
10			
11			

Remarks:

Log of Boring P29

Client: Southern California Edison

Project: Alamitos Generating Station -- Pipeline Investigation

Date: 4/12/13 | **Boring Depth:** 6.5 feet

Logged By: P. Hamilton | **Drilling Co.:** Hamilton Geotechnical

Method: Hand Auger

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, plastic, moist Encountered construction debris: fiber mesh, wood, plastic tape
2			
3			
4			**Silty Sand**, dark gray, medium grained, layers of medium **Sand**, moist
5		7.64	
6			
7		7.66	
8			
9			
10			
11			

Remarks:

Log of Boring P30

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/17/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5	■	7.34	
6			**Silty Sand**, gray, medium grained, moist
7	■	7.98	
8			
9			
10			
11			

Remarks:

Log of Boring P31

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, plastic, moist
2			
3			
4			Hydrocarbon odor
5	■	7.86	
6			
7	■	8.65	
8			
9			
10			
11			

Remarks:

Log of Boring P32

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 4/19/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, plastic, moist
2			
3			
4			
5	■	8.21	
6			
7	■	8.33	
8			
9			
10			
11			

Remarks:

Log of Boring P33

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/12/12 - 12/13/12	**Boring Depth:** 15 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand auger and Geoprobe Drill	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, plastic, moist
2			
3			
4			**Silty Sand**, brown, medium grained, plastic, moist
5			
6			
7	■	7.28	**Silty Sand**, tan, medium grained, moist
8			Hydrocarbon odor
9	■	7.24	
10			
11			
12			
13			
14			
15			
16	■	8.06	
17			

Remarks:

Log of Boring P33-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/29/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, plastic, moist
2			
3			
4			**Silty Sand**, brown, medium grained, plastic, moist
5			
6			
7			**Silty Sand**, tan, medium grained, moist
8			
9			
10			
11			Wet

Remarks:

Log of Boring P33-S2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/29/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, plastic, moist
2			
3			
4			**Silty Sand**, brown, medium grained, plastic, moist
5			
6			
7			**Silty Sand**, tan, medium grained, moist, hydrocarbon odor
8			
9			
10			
11			Wet

Remarks:

Log of Boring P34

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/12/12 - 12/13/12	**Boring Depth:** 15 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand auger and Geoprobe Drill	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, plastic, moist
2			
3			
4			
5			**Silty Sand**, brown, medium grained, plastic, moist
6			
7	■	6.11	
8			
9	■	8.36	**Silty Sand**, tan, medium grained, moist
10			
11			
12			
13			
14			
15			
16	■	7.09	
17			

Remarks:

Log of Boring P35

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/12/12 and 12/19/12	**Boring Depth:** 15 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand auger and Geoprobe Drill	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**,brown, medium grained, moist
2			
3			
4			**Silty Sand**, gray, medium grained, moist
5			
6			
7	■	8.14	**Silty Sand**, tan, medium grained, moist
8			
9	■	7.81	
10			
11			**Silty Sand**, gray, medium grained, moist
12			
13			
14			
15			
16	■	8.12	
17			

Remarks:

Log of Boring P40

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/7/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Sandy Silt**, brown and gray layers, fine grained, plastic, moist
2			
3			
4			
5			
6			
			Sand, tan, coarse grained, moist
7	■	8.31	
8			
9	■	7.85	
10			
11			

Remarks:

Log of Boring P41

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/7/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5			
6			**Sand**, tan, coarse grained, moist
7	■	8.67	
8			
9	■	8.58	
10			
11			

Remarks:

Log of Boring P42

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/20/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5			
6			
7	■	7.9	**Sand**, tan, coarse grained, moist
8			
9	■	8.26	
10			
11			

Remarks:

Log of Boring P43

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/14/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Sand**, tan, coarse grained, dense, moist
2			
3			
4			**Sandy Clay**, tan, plastic, moist
5			
6			**Silty Sand**, tan, fine grained, moist
7	■	7.92	
8			
9	■	7.94	
10			
11			

Remarks:

Log of Boring P43-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Sand**, tan, coarse grained, dense, moist
2			
3			
4			**Sandy Clay**, tan, plastic, moist
5			
6			**Silty Sand**, tan, fine grained, moist
7			
8			
9	■		
10			
11	■		

Remarks:

Log of Boring P44

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/14/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Sand**, tan, coarse grained, dense, moist
2			
3			
4			
5			**Sandy Clay**, tan, plastic, moist
6			
7	■	9.08	**Silty Sand**, tan, fine grained, moist
8			
9	■	9.45	
10			
11			

Remarks:

Log of Boring P44-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Sand**, tan, coarse grained, dense, moist
2			
3			
4			
5			**Sandy Clay**, tan, plastic, moist
6			
7			**Silty Sand**, tan, fine grained, moist
8			
9			
10			
11			

Remarks:

Log of Boring P45

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/8/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Sand**, tan, coarse grained, dense, moist
2			
3			
4			
5			**Sandy Clay**, tan, plastic, moist
6			
7	■	8.25	
8			**Silty Sand**, tan, fine grained, moist
9	■	8.36	
10			
11			

Remarks:

Log of Boring P46

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/14/12	**Boring Depth:** 8.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Sand**, tan, coarse grained, dense, moist
2			
3			
4			**Silty Sand**, tan, fine grained, moist
5			
6			
7	■	8.78	
8			**Sandy Clay**, tan, plastic, moist
9	■	8.8	
10			
11			

Remarks:

Log of Boring P47

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/6/12	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, gravel, moist
2			Encountered debris: rocks, wood, asphalt
3			
4			
5			
6			
		8.97	
7			**Silty Sand**, tan, fine grained, gray mottling
8			
		9.58	
9			
10			
11			

Remarks:

Log of Boring P47-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 10/30/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, gravel, moist
2			Encountered debris: rocks, wood, asphalt
3			
4			
5			
6			
7			**Silty Sand**, tan, fine grained, gray mottling
8			Wet
9			
10			
11			

Remarks:

Log of Boring P47-S2

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/1/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, gravel, moist
2			Encountered debris: rocks, wood, asphalt
3			
4			
5			
6			
7			**Silty Sand**, tan, fine grained, gray mottling
8			Wet
9			
10			
11			

Remarks:

Log of Boring P47-S3

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/1/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, gravel, moist
2			Encountered debris: rocks, wood, asphalt
3			
4			
5			
6			
7			**Silty Sand**, tan, fine grained, gray mottling
8			
9			
10			
11			

Remarks:

Log of Boring P48

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/19/12	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, moist
2			
3			
4			
5			
6			**Silty Sand**, tan, medium grained, moist
	■	7.25	
7			
8			
	■	7.92	
9			
10			
11			

Remarks:

Log of Boring P49

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/19/12	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, moist
2			
3			
4			
5			
6			
7			
8	■	7.32	**Silty Sand**, tan, medium grained, moist
9			
10	■	7.3	
11			

Remarks:

Log of Boring P50

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/20/12	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, moist
2			
3			
4			
5			
6			
7			**Silty Sand**, tan, medium grained, moist
	■	7.98	
8			**Sandy Clay**, tan, plastic, moist
9			
	■	7.63	
10			
11			

Remarks:

Log of Boring P51

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 12/20/12	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, moist
2			
3			
4			
5			**Silty Sand**, tan, medium grained, moist
6			
7			
8	■	7.36	
9			**Sandy Clay**, tan, plastic, moist
10	■	7.55	
11			

Remarks:

Log of Boring P52

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/15/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Sandy Silt**, dark brown, plastic, moist, gravel Encountered pieces of asphalt and organic (roots) material
2			
3			
4			
5			
	■	8.69	**Silty Sand**, tan, fine grained, moist
6			
7			
	■	8.46	
8			
9			
10			
11			

Remarks:

Log of Boring P53

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/15/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, tan, coarse grained, well-sorted, moist
2			
3			
4			
5			
	■	8.29	
6			**Silty Sand**, tan/gray mottled, fine grained, moist
7			
	■	8.58	
8			
9			
10			
11			

Remarks:

Log of Boring P54

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/15/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Sandy Silt**, dark brown, plastic, moist, gravel Encountered pieces of asphalt and organic (roots) material
2			
3			
4			
5			
6	■	8.44	
7			**Sand**, tan, medium grained, moist
8	■	8.96	
9			
10			
11			

Remarks:

Log of Boring P55

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/15/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, moist
2			
3			
4			**Sandy Silt**, gray, plastic, moist
5			
	■	9.04	
6			**Silty Sand**, tan, fine grained, moist
7			
	■	9.18	
8			
9			
10			
11			

Remarks:

Log of Boring P56

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/14/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, moist
2			
3			
4			
5			**Silty Sand**, tan, fine grained, moist
6	■	7.99	
7			
8	■	8.04	
9			
10			
11			

Remarks:

Log of Boring P57

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/14/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Silty Sand**, brown, medium grained, moist Interlayers of **Silt**, gray, plastic
2			
3			
4			
5			
6	■	8.34	**Silty Sand**, tan, fine grained, moist
7			
8	■	8.07	
9			
10			
11			

Remarks:

Log of Boring P58

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/8/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Sand**, tan, coarse grained, dense, moist
2			
3			
4			
5			**Sandy Clay**, tan, plastic, moist
6	■	8.59	
7			**Silty Sand**, tan, fine grained, moist
8	■	8.59	
9			
10			
11			

Remarks:

Log of Boring P59

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/8/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			
5			
6	■	8.01	
7			**Silty Sand**, gray, fine grained, moist
8	■	8.41	
9			
10			
11			

Remarks:

Log of Boring P60

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/8/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Silty Sand**, brown, fine grained, moist
2			**Sand**, gray, well sorted, fill, moist
3			
4			
5			
6	■	8.11	
7			**Silty Sand**, dark gray, fine grained, moist
8	■	8.41	
9			
10			
11			

Remarks:

Log of Boring P61

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/8/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
1			**Silty Sand**, brown, fine grained, moist
2			**Sand**, gray, well sorted, fill, moist
3			
4			
5			
6	■	8.22	
7			**Silty Sand**, dark gray, fine grained, moist
8	■	8.37	
9			
10			
11			

Remarks:

Log of Boring P62

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/31/13	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			Encountered construction debris: wood, rocks
3			
4			
5	■	7.48	
6			
7			**Silty Sand**, gray, medium grained, moist
8			
9	■	7.81	
10			
11			

Remarks:

Log of Boring P63

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/31/13	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			Encountered construction debris: wood, rocks
3			
4			
5			
6	■	7.67	
			Silty Sand, gray, medium grained, moist
7	■	8.39	
8			
	■	8.44	
9			
10			
11			

Remarks: Moved hole 6" due to debris

Log of Boring P64

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/31/13	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			Encountered construction debris: wood, rocks
3			
4			
5	■	8.16	
6			
7	■	8.04	
8			**Silty Sand**, gray, medium grained, moist
9	■	7.69	
10			
11			

Remarks: Moved hole 6" three times due to debris

Log of Boring P66

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/30/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5	■	7.58	
6			**Silty Sand**, gray, medium grained, moist
7	■	7.84	
8			
9			
10			
11			

Remarks:

Log of Boring P67

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/30/13	**Boring Depth:** 19 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Geoprobe Drill	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5			
6			**Silty Sand**, gray, medium grained, moist
7	■	8.78	
8			
9	■	8.61	Wet
10			
11			**Silty Sand**, tan, medium grained, saturated
12			
13			
14			
15			
16			
17			
18			
19			
20	■	7.98	

Remarks: Groundwater level was determined to be 10.4 feet

Log of Boring P69

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/30/13	**Boring Depth:** 6.5 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5	■	8.09	
6			**Silty Sand**, gray, medium grained, moist
7	■	7.84	
8			
9			
10			
11			

Remarks:

Log of Boring P71

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/31/13	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			Encountered construction debris: wood, rocks
3			
4			
5			
6	■	8.34	
7	■	8.5	**Silty Sand**, gray, medium grained, moist
8			
9	■	8.27	
10			
11			

Remarks: Moved hole 6" due to debris

Log of Boring P72

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/31/13	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			Encountered construction debris: wood, rocks
3			
4			
5			
6	■	8.55	
7	■	8.37	
8			**Silty Sand**, gray, medium grained, moist
9	■	8.41	
10			
11			

Remarks:

Log of Boring P73

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/31/13	**Boring Depth:** 8 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			Encountered construction debris: wood, rocks
3			
4			
			Silty Sand, gray, medium grained, moist
5	■	8.02	
6			
7			
8			
9	■	8.4	
10			
11			

Remarks:

Log of Boring P74

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/30/13	**Boring Depth:** 19 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Geoprobe Drill	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, plastic, moist
2			
3			
4			
5			
6			**Silty Sand**, gray, medium grained, moist
7	■	8.06	
8			
9	■	8.44	Wet
10			
11			**Silty Sand**, tan, medium grained, saturated
12			
13			
14			
15			
16			
17			
18			
19			
20	■	8.31	

Remarks: Groundwater level was determined to be 10.4 feet

Log of Boring P73-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/13	**Boring Depth:** 10 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			
5			**Silty Sand**, gray, medium grained, moist
6			
7			
8			**Silty Sand**, brown,medium grained, moist
9	■		
10			
11	■		

Remarks:

Log of Boring P77

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/30/13	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			
5			
6	■	7.69	**Sandy Silt**, gray/brown, plastic, moist
7			
8	■	8.5	
9			
10			
11			

Remarks: Concrete around the elbow required the hole to be moved 8"

Log of Boring P77A

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 1/30/13	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			
5			
6	■	7.71	
7			**Sandy Silt**, gray/brown, plastic, moist
8	■	7.94	
9			
10			
11			

Remarks:

Log of Boring P78

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/6/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, fine grained, gravel, moist
2			
3			
4			
5			
	■	7.52	
6			
7			**Sandy Silt**, dark gray, plastic, moist
	■	7.69	
8			
9			
10			
11			

Remarks:

Log of Boring P79

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/6/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			**Silty Sand**, tan, coarse grained, moist
4			
5			**Silty Sand**, dark gray, fine grained, moist
6	■	7.89	
7			Color change to gray
8	■	8.62	
9			
10			
11			

Remarks:

Log of Boring P79-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			**Silty Sand**, tan, coarse grained, moist
4			
5			**Silty Sand**, dark gray, fine grained, moist
6			
7			Color change to gray
8	■		
9			**Silty Sand**, tan, coarse grained, moist
10	■		
11			

Remarks:

Log of Boring P80

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/6/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, gravel, moist
2			
3			
4			
5			
	■	7.8	
6			
7			**Silty Sand**, tan, medium grained, gravel, moist
	■	8.03	
8			
9			
10			
11			

Remarks:

Log of Boring P81

Client: Southern California Edison

Project: Alamitos Generating Station -- Pipeline Investigation

Date: 11/6/12 | **Boring Depth:** 7 feet

Logged By: P. Hamilton | **Drilling Co.:** Hamilton Geotechnical

Method: Hand Auger

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, gravel, moist
2			
3			
4			
5			
	■	7.97	
6			
			Sand, dark gray, coarse grained, moist
7			**Silty Sand**, dark brown, medium grained, gravel, moist
	■	7.91	
8			
9			
10			
11			

Remarks:

Log of Boring P82

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	**Sample**	**Field pH**	**Description**
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, gravel, moist
2			
3			
4			
5			**Sand**, tan, medium grained, moist, poorly sorted
6	■	7.96	
7			**Silty Sand**, light/dark brown mottled, fine grained, moist
8	■	7.99	
9			
10			
11			

Remarks:

Log of Boring P83

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description 6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			**Sand**, tan, medium grained, moist, poorly sorted
5			
6		7.81	
7			**Silty Sand**, light/dark brown mottled, fine grained, moist
8		7.76	
9			
10			
11			

Remarks:

Log of Boring P84

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			
5			**Sand**, tan, medium grained, moist, poorly sorted
6	■	8.62	
7			**Silty Sand**, light/dark brown mottled, fine grained, moist
8	■	7.89	
9			
10			
11			

Remarks:

Log of Boring P85

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/12	**Boring Depth:** 7 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			
5			
	■	8.35	
6			**Silty Sand**, dark gray, fine grained, moist
7			
	■	7.7	
8			
9			
10			
11			

Remarks:

Log of Boring P85-S1

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/5/13	**Boring Depth:** 9 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, fine grained, moist
2			
3			
4			
5			
6			**Silty Sand**, dark gray, fine grained, moist
7	■		
8			
9			
10	■		
11			

Remarks:

Log of Boring P86

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, medium grained, gravel, moist
2			**Silty Sand**, gray, fine grained, gravel, moist
3	■	8.44	
4	■	8.12	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Log of Boring P87

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, brown, coarse grained, cobbles, moist
2			
3	■	8.65	
4	■	8.9	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Log of Boring P88

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			6"A/C
			Gravel, brown, dry, base
1			**Silty Sand**, gray, coarse grained, plastic, moist
2			
3	■	8.6	
4	■	8.7	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Log of Boring P89

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Silty Sand**, tan, medium grained, moist
2			
3	■	8.43	Gravel
4	■	8.48	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Log of Boring P90

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Silty Sand**, tan, medium grained, moist
2			
3	■	8.69	Gravel
4	■	8.81	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Log of Boring P91

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Silty Sand**, tan, medium grained, moist
2			
3	■	7.86	Gravel
4	■	7.66	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Log of Boring P92

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Silty Sand**, tan, medium grained, moist
2			
3	■	8.19	Gravel
4	■	8.2	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Log of Boring P93

Client: Southern California Edison	
Project: Alamitos Generating Station -- Pipeline Investigation	
Date: 11/7/12	**Boring Depth:** 3 feet
Logged By: P. Hamilton	**Drilling Co.:** Hamilton Geotechnical
Method: Hand Auger	

Depth Feet	Sample	Field pH	Description
			Decorative Cobbles
1			**Silty Sand**, tan, medium grained, moist
2			
3	■	7.81	Gravel
4	■	7.56	
5			
6			
7			
8			
9			
10			
11			

Remarks:

Appendix 3: Quality Control Data

Quality Control Data -- Basins and Background Soil Investigation
Duplicate Soil Samples
Alamitos Generating Station

	Date		10/29/2007									10/30/2007						10/31/2007					
	Sample ID		B1-4-2	B-101	RPD	NB15-2	NB-103	RPD	NB28-2	NB-105	RPD	B2-3-2	B-107	RPD	NB21-2	NB-108	RPD	B3-4-2	B-111	RPD	SB18-2	NB-112	RPD
Parameter	**PQL**	**Units**																					
Antimony	0.5	mg/kg	0.92	0.91	1	0.96	0.96	0	0.55	0.56	2	0.88	0.71	21	ND	ND		ND	0.61		0.55	0.66	18
Arsenic	0.5	mg/kg	4.8	5.5	14	7.8	7.7	1	4.7	4.8	2	8.3	8.9	7	4.5	4.6	2	4.5	5	11	4.9	5.8	17
Barium	1	mg/kg	140	140	0	170	170	0	120	130	8	120	120	0	120	110	9	140	130	7	140	170	19
Beryllium	0.1	mg/kg	0.39	0.4	3	0.66	0.61	8	0.55	0.5	10	0.38	0.39	3	0.62	0.59	5	0.59	0.66	11	0.46	0.56	20
Cadmium	0.1	mg/kg	0.16	0.16	0	0.32	0.29	10	0.18	0.23	24	ND	0.11		0.25	0.22	13	0.32	0.3	6	ND	ND	
Chromium, Total	1	mg/kg	23	25	8	35	32	9	26	28	7	20	23	14	27	26	4	33	29	13	22	25	13
Chromium VI	2.5	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Cobalt	0.2	mg/kg	8.6	10	15	14	13	7	11	11	0	7.8	7.8	0	8.9	8.6	3	13	10	26	7.1	8.7	20
Copper	0.5	mg/kg	22	26	17	36	32	12	24	25	4	18	21	15	24	23	4	29	24	19	19	22	15
Iron	91	mg/kg	24,000	24,000	0	30,000	29,000	3	26,000	27,000	4	22,000	22,000	0	27,000	26,000	4	29,000	29,000	0	19,000	22,000	15
Lead	0.5	mg/kg	8.1	7.7	5	8.7	7.7	12	6.8	6.9	1	8.5	6	34	6.7	6.8	1	8.8	10	13	5.2	6.4	21
Mercury	0.01	mg/kg	0.038	0.054	35	0.017	0.021	21	0.01	ND		0.017	0.046	92	0.022	0.038	53	0.019	0.018	5	0.032	0.03	6
Molybdenum	0.2	mg/kg	0.63	0.73	15	1.7	1.7	0	1.1	1.6	37	1.8	1.7	6	1.3	1.6	21	1.7	2	16	9.3	8.1	14
Nickel	0.5	mg/kg	18	19	5	27	24	12	19	20	5	22	20	10	18	17	6	22	19	15	13	17	27
Selenium	0.5	mg/kg	ND	ND		ND	ND		0.57	0.55	4	ND	ND		ND	0.55		ND	ND		ND	ND	
Silver	0.1	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Thallium	0.5	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	0.5	
Vanadium	1	mg/kg	49	50	2	70	63	11	58	59	2	45	42	7	49	46	6	54	60	11	42	48	13
Zinc	5	mg/kg	55	61	10	86	78	10	70	73	4	48	54	12	74	69	7	91	75	19	45	53	16
pH		units	7	7.3	4	7.4	7.3	1	7	7.3	4	7.3	7.3	0	7.3	7.3	0	7.3	7.3	0	7.3	7.4	1
Aluminum	100	mg/kg	15,000	15,000	0	22,000	21,000	5	18,000	19,000	5	13,000	14,000	7	19,000	18,000	5	22,000	21,000	5	15,000	17,000	13
Manganese	45	mg/kg	370	420	13	580	560	4	450	550	20	400	430	7	490	470	4	530	570	7	290	310	7
Chloride	2	mg/l	25	24	4	10	8.9	12	11	11	0	17	14	19	52	57	9	130	110	17	8.8	10	13
Fluoride	0.5	mg/l	0.55	0.55	0	1.4	1.3	7	1.6	1.5	6	1	0.97	3	1.3	1.4	7	1.2	1.1	9	1.4	1.6	13
Nitrate	2	mg/l	18	18	0	8.6	7.3	16	9.6	9	6	3.8	2.9	27	ND	ND		8	6.6	19	2.5	2.5	0
Benzene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Ethylbenzene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Toluene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
m,p-Xylene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Acetone	20	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
2-Butanone	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	

Quality Control Data -- Basins and Background Soil Investigation
Duplicate Soil Samples
Alamitos Generating Station

	Date		11/2/2007						11/5/2007									11/14/2007					
	Sample ID		BCCB18-2	B-115	RPD	BCCB15-2	NB-116	RPD	CB23-2	B-119	RPD	CB27-2	NB-120	RPD	CB31-2	NB-122	RPD	NB24-2	B-124	RPD	CB32-2	B-125	RPD
Parameter	PQL	Units																					
Antimony	0.5	mg/kg	0.69	0.92	29	0.61	0.82	29	0.98	0.92	6	ND	ND		0.64	0.51	23	1	0.64	44	0.92	0.73	23
Arsenic	0.5	mg/kg	5.3	5.3	0	4.6	4.7	2	6.7	7.1	6	2.4	2	18	5.2	6.8	27	10	6.7	40	4.7	7.3	43
Barium	1	mg/kg	120	110	9	110	120	9	180	160	12	80	95	17	120	150	22	190	130	38	110	130	17
Beryllium	0.1	mg/kg	0.49	0.43	13	0.4	0.43	7	0.57	0.59	3	0.23	0.33	36	0.49	0.57	15	0.69	0.5	32	0.34	0.42	21
Cadmium	0.1	mg/kg	ND	ND		ND	ND		0.4	0.37	8	ND	0.12		0.25	0.23	8	0.31	0.17	58	0.13	0.33	87
Chromium, Total	1	mg/kg	22	21	5	19	20	5	29	31	7	15	15	0	24	26	8	34	32	6	21	27	25
Chromium VI	2.5	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Cobalt	0.2	mg/kg	9.8	9.6	2	7.9	7.9	0	11.0	11	0	5.9	6.1	3	9.0	9.9	10	13	9.8	28	10	11	10
Copper	0.5	mg/kg	22	22	0	21	21	0	29	30	3	14	13	7	23	26	12	41	33	22	21	26	21
Iron	91	mg/kg	23,000	22,000	4	19,000	20,000	5	28,000	30,000	7	18,000	20,000	11	25,000	27,000	8	31,000	27,000	14	23,000	28,000	20
Lead	0.5	mg/kg	7.8	8.2	5	6.1	5.7	7	7.7	8	4	11	6	59	6.2	7.7	22	8.9	6.9	25	5.3	6.3	17
Mercury	0.01	mg/kg	0.055	0.041	29	0.068	0.072	6	0.031	0.042	30	0.043	0.024	57	0.03	0.034	13	0.045	0.05	11	0.052	0.036	36
Molybdenum	0.2	mg/kg	4.5	4.2	7	2	2.1	5	1.9	1.9	0	0.71	0.61	15	1.4	1.6	13	1.7	1.8	6	0.98	1.7	54
Nickel	0.5	mg/kg	17	16	6	15	15	0	22	22	0	22	13	51	17	18	6	25	24	4	75	59	24
Selenium	0.5	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	0.66		ND	0.8	
Silver	0.1	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Thallium	0.5	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Vanadium	1	mg/kg	46	44	4	39	38	3	59	60	2	40	44	10	48	54	12	66	68	3	47	59	23
Zinc	5	mg/kg	49	49	0	46	41	11	73	76	4	39	42	7	62	68	9	78	74	5	58	65	11
pH		units	7.3	7.3	0	7.4	7.3	1	7.0	7.4	6	7.6	7.3	-4	7.4	7.4	0	7.4	7.3	1	7.5	7.2	4
Aluminum	100	mg/kg	14,000	13,000	7	12,000	13,000	8	19,000	21,000	10	9,600	10,000	4	17,000	18,000	6	24,000	19,000	23	14,000	18,000	25
Manganese	45	mg/kg	340	360	6	320	250	25	560	590	5	270	270	0	460	490	6	670	510	27	350	440	23
Chloride	2	mg/l	71	67	6	ND	ND		9.2	7.9	15	7.8	4.4	56	7.1	7.5	5	8.8	8.6	2	14	19	30
Fluoride	0.5	mg/l	0.64	0.54	17	0.56	ND		1.3	1.1	17	ND	ND		1	1	0	1.6	1.4	13	1.3	1.3	0
Nitrate	2	mg/l	ND	ND		ND	ND		7.3	6	20	4.3	2.6	49	4.7	5.3	12	ND	ND		ND	ND	
Benzene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Ethylbenzene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Toluene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
m,p-Xylene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Acetone	20	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		38	ND	
2-Butanone	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		11	ND	

Quality Control Data -- Basins and Background Soil Investigation
Duplicate Soil Samples
Alamitos Generating Station

	Date		11/15/2007						11/16/2007						11/20/2007								
	Sample ID		SB24-2	B-128	RPD	SB27-2	B-129	RPD	SB31-2	B-132	RPD	SB34-2	B-133	RPD	B4-4-2	B-136	RPD	SB17-2	B-137	RPD	SB16-2	B-140	RPD
Parameter	PQL	Units																					
Antimony	0.5	mg/kg	0.52	ND		0.67	0.66	2	1.2	1.3	8	0.81	0.88	8	1.2	1.2	0	0.71	0.65	9	0.97	1	3
Arsenic	0.5	mg/kg	6.7	3.2	71	7.2	7.2	0	20	20	0	5.7	7.9	32	11	11	0	5.1	5	2	8.3	8.4	1
Barium	1	mg/kg	160	150	6	130	130	0	160	170	6	210	210	0	190	230	19	75	79	5	190	170	11
Beryllium	0.1	mg/kg	0.47	0.48	2	0.44	0.5	13	0.49	0.56	13	0.51	0.61	18	0.73	0.86	16	0.39	0.29	29	0.62	0.65	5
Cadmium	0.1	mg/kg	ND	ND		0.11	0.11	0	0.19	0.19	0	0.2	0.22	10	0.33	0.39	17	ND	ND		0.23	0.19	19
Chromium, Total	1	mg/kg	21	21	0	23	22	4	27	29	7	31	32	3	37	39	5	15	16	6	32	32	0
Chromium VI	2.5	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Cobalt	0.2	mg/kg	7	10	35	9.1	9	1	9.9	11	11	11.0	12	9	15	16	6	6.3	6.8	8	13.0	13	0
Copper	0.5	mg/kg	16	13	21	24	23	4	29	31	7	36	40	11	46	49	6	18	17	6	38	34	11
Iron	91	mg/kg	21,000	20,000	5	23,000	23,000	0	24,000	27,000	12	28,000	29,000	4	32,000	34,000	6	16,000	15,000	6	28,000	28,000	0
Lead	0.5	mg/kg	4.8	4.8	0	6.6	5.8	13	10	11	10	9	8.9	2	11	11	0	4	5.3	19	10	8.8	13
Mercury	0.01	mg/kg	0.046	0.02	79	0.17	0.03	140	0.049	0.048	2	0.067	0.071	6	0.059	0.06	2	0.049	0.043	13	0.063	0.054	15
Molybdenum	0.2	mg/kg	4.1	4.2	2	2	2.5	22	2	2	0	0.49	0.69	34	2.1	2.7	25	3.5	3.5	0	1.4	4.7	108
Nickel	0.5	mg/kg	15	17	13	20	17	16	26	25	4	24	25	4	27	30	11	12	47	119	24	24	0
Selenium	0.5	mg/kg	ND	ND		ND	ND		ND	ND		0.55	0.65	17	0.59	0.7	17	ND	ND		0.84	ND	
Silver	0.1	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	0.1		ND	ND		ND	ND	
Thallium	0.5	mg/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Vanadium	1	mg/kg	40	36	11	51	46	10	57	58	2	51	54	6	72	82	13	38	78	69	60	63	5
Zinc	5	mg/kg	38	34	11	54	53	2	61	68	11	69	72	4	86	89	3	34	33	3	74	69	7
pH		units	7.4	8	8	7.6	7.5	1	8.0	7.6	5	7.5	7.7	3	7.8	7.6	3	7.4	7.4	0	7.4	7.4	0
Aluminum	100	mg/kg	18,000	15,000	18	15,000	15,000	0	18,000	20,000	11	21,000	22,000	5	25,000	27,000	8	9,500	8,700	9	21,000	20,000	5
Manganese	45	mg/kg	1,100	870	23	510	630	21	550	550	0	850	750	13	730	840	14	190	220	15	740	510	37
Chloride	2	mg/l	2.5	2.8	11	9.2	8.8	4	12	13	8	53	50	6	160	170	6	11	13	17	29	60	70
Fluoride	0.5	mg/l	2.6	2.5	4	1.3	1.3	0	1.6	1.5	6	2.6	2.5	4	3	3	4	ND	1		2	2	16
Nitrate	2	mg/l	3.2	3.3	3	2.4	2.4	0	ND	ND		ND	ND		11	10	10	ND	ND		ND	5	
Benzene	5	ug/kg	9.5	8.1	16	ND	5.7		5.8	6.4	10	5.8	6	3	ND	ND		56	23	84	5.2	ND	
Ethylbenzene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		8.7	ND		ND	ND	
Toluene	5	ug/kg	8	6.6	19	ND	ND		ND	5.3		ND	ND		ND	ND		53	23	79	ND	ND	
m,p-Xylene	5	ug/kg	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		9.2	ND		ND	ND	
Acetone	20	ug/kg	23	25	8	ND	ND		20	35	55	93	110	17	ND	ND		29	ND		46	32	36
2-Butanone	5	ug/kg	5	ND		ND	ND		ND	6.4		19	25	27	ND	ND		ND	5.4		8.2	6	31

Quality Control Data -- Basins and Background Soil Investigation
Equipment Blank Analysis
Alamitos Generating Station

	Date		10/29/2007	10/30/2007	10/31/2007	11/2/2007	11/5/2007	11/14/2007	11/15/2007	11/16/2007	11/20/2007
	Sample ID		NB-104	NB-109	NB-113	NB-117	NB-121	B-126	B-130	B-134	B-138
Parameter	**Units**	**PQL**									
Antimony	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ug/l	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ug/l	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/l	0.5	ND	ND	ND	ND	**2.1**	ND	**2.5**	ND	ND
Lead	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ug/l	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ug/l	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	**3.2**
Selenium	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ug/l	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/l	5	ND	**14**	**13**	ND	ND	ND	ND	ND	ND
pH	Units		**7.22**	**6.46**	**7.5**	**8.13**	**6.88**	**7.05**	**7.28**	**6.29**	**7.61**

Quality Control Data -- Pipeline Soil Investigation
Duplicate Soil Samples
Alamitos Generating Station

	Date			10/31/2012			11/2/2012			11/5/2012			11/6/2012			11/7/2012					
Parameter	**Units**	**MDL**	**MRL**	**P6-1**	**P-107**	**RPD**	**P14-1**	**P-111**	**RPD**	**P83-1**	**P-115**	**RPD**	**P79-1**	**P-118**	**RPD**	**P90-1**	**P-120**	**RPD**	**P87-1**	**P-122**	**RPD**
Antimony	mg/kg		0.5	ND	ND		0.61	0.65	6	0.62	0.6	3	ND	ND		0.53	0.51	4	0.58	0.55	5
Arsenic	mg/kg		0.5	2.9	3	3	4.5	4.2	7	7.8	6.4	20	4.3	3.9	10	6.1	6	2	7.8	9.1	15
Barium	mg/kg		1	79	53	39	55	61	10	120	140	15	100	99	1	120	130	8	120	130	8
Beryllium	mg/kg		0.1	0.29	0.2	37	0.21	0.19	10	0.36	0.4	11	0.48	0.57	17	0.51	0.5	2	0.4	0.46	14
Cadmium	mg/kg		0.1	ND	ND		ND	ND		0.12	0.13	8	0.15	0.15	0	0.17	0.22	26	0.15	0.12	22
Chromium, Total	mg/kg		0.5	16	12	29	13	14	7	19	22	15	22	25	13	23	24	4	20	21	5
Cobalt	mg/kg		0.2	6.1	4.9	22	5.1	4.7	8	7.7	8.3	8	8.8	9.6	9	9	8.9	1	8.4	7.9	6
Copper	mg/kg		0.5	15	11	31	14	15	7	19	21	10	20	24	18	22	21	5	20	24	18
Lead	mg/kg		0.5	3.7	2.5	39	7	45	146	5.4	6.1	12	5.8	6.4	10	8.3	8.5	-2	7.1	6.8	4
Mercury	ug/kg		0.01	0.029	0.028	4	0.041	0.031	28	0.031	0.032	3	0.025	0.028	11	0.03	0.024	22	ND	0.04	
Molybdenum	mg/kg		0.2	1.1	0.99	11	0.21	0.34	47	0.84	0.93	10	1.8	1.5	18	2.2	2.4	9	1.7	2.2	26
Nickel	mg/kg		0.5	10	9.9	1	11	10	10	15	17	13	16	18	12	17	17	0	23	19	19
Selenium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Silver	mg/kg		0.1	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Thallium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Vanadium	mg/kg		1	32	24	29	28	28	0	39	43	10	44	46	4	47	46	2	55	51	8
Zinc	mg/kg		5	33	27	20	34	53	44	45	50	11	56	60	7	59	57	3	52	87	50
pH	Units			8.1	8	1	8.4	8.4	0	8.5	8.6	1	7.6	7.8	3	8.5	8.5	0	8.4	8.4	0
Acetone	ug/kg	2.5	5	ND	ND		13	14	7	29	30	3	26	30	14	ND	30		51	30	52
Benzene	ug/kg	1.4	5	ND	ND		ND	1.4 J		6.5	6.2	5	ND	ND		7.6	4.4 J	53	8	8.6	7
2-Butanone	ug/kg	1.5	5	ND	ND		ND	ND		3.9 J	3.8 J	3	ND	ND		ND	3.1 J		3.8 J	3.8 J	0
Naphthalene	ug/kg	1.3	5	2.5 J	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
1,2-Dichlorobenzene (o-DCB)	ug/kg		5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
sec-Butylbenzene	ug/kg	0.46	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Toluene	ug/kg	1.1	5	ND	ND		ND	1.7 J		6	7.7	25	ND	ND		7.3	3.4 J	73	6.3	7	11
m,p-Xylene	ug/kg	1.4	5	ND	ND		ND	ND			1.6 J		ND	ND		ND	ND		ND	1.4 J	
1,2,4-Trimethybenzene	ug/kg	0.48	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Tetrachloroethene (PCE)	ug/kg	1.5	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
o-Xylene	ug/kg	0.52	5	ND	ND		ND	ND			0.55 J		ND	ND		0.52 J	ND		0.56 J	ND	
Ethylbenzene	ug/kg	0.36	5	ND	ND		ND	ND		0.92 J	1.3 J		ND	ND		1.2 J	0.65 J	59	1.2 J	1.1 J	9
Gasoline Range	mg/kg		2																		
Diesel Range	mg/kg		100																		
Oil Range	mg/kg		1000																		

Quality Control Data -- Pipeline Soil Investigation
Duplicate Soil Samples
Alamitos Generating Station

	Date			11/8/2012			11/14/2012			11/15/2012			12/7/2012			12/12/2012			12/13/2012		
Parameter	**Units**	**MDL**	**MRL**	**P45-1**	**P-124**	**RPD**	**P44-1**	**P-127**	**RPD**	**P52-1**	**P-130**	**RPD**	**P41-1**	**P-135**	**RPD**	**P33-1**	**P-137**	**RPD**	**P7-1**	**P-140**	**RPD**
Antimony	mg/kg		0.5	0.64	0.77	18	1.5	1.4	7	0.61	ND		0.62	0.56	10	0.69	0.69	0	ND	ND	
Arsenic	mg/kg		0.5	5.3	8	41	8.7	9.5	9	5.6	4.4	24	6.1	6.5	6	7.9	8	1	1.7	2.4	34
Barium	mg/kg		1	110	140	24	240	240	0	150	110	31	120	130	8	150	130	14	22	33	40
Beryllium	mg/kg		0.1	0.36	0.38	5	0.8	0.75	6	0.62	0.47	28	0.35	0.37	6	0.46	0.32	36	0.12	0.15	22
Cadmium	mg/kg		0.1	ND	0.13		0.28	0.27	4	0.25	0.17	38	ND	ND		0.18	0.15	18	ND	0.13	
Chromium, Total	mg/kg		0.5	18	19	5	34	32	6	26	20	26	19	20	5	130	160	21	16	21	27
Cobalt	mg/kg		0.2	7.1	7.3	3	13	13	0	10	8.2	20	7	7.9	12	17	15	13	4.2	6.2	38
Copper	mg/kg		0.5	19	22	15	42	40	5	28	18	43	16	16	0	220	220	0	66	77	15
Lead	mg/kg		0.5	5.8	5.7	2	10	10	0	7.7	5.1	41	4.2	16	117	13	15	14	8.1	13	46
Mercury	ug/kg		0.01	0.026	0.033	24	0.066	0.061	8	0.025	0.027	8	0.025	0.022	13	0.066	0.051	26	0.081	0.096	17
Molybdenum	mg/kg		0.2	0.92	1.9	70	1	1.2	18	1.5	1.1	31	0.48	0.86	57	4.3	4.5	5	0.5	0.92	59
Nickel	mg/kg		0.5	23	15	42	24	24	0	18	14	25	14	16	13	460	410	11	110	160	37
Selenium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		0.6	0.6	0	ND	ND	
Silver	mg/kg		0.1	ND	ND		0.16	0.1	46	ND	ND		ND	ND		0.15	0.16	6	ND	ND	
Thallium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Vanadium	mg/kg		1	41	41	0	57	56	2	50	44	13	35	36	3	360	360	0	69	95	32
Zinc	mg/kg		5	39	42	7	75	72	4	70	56	22	38	38	0	100	88	13	49	64	27
pH	Units			8	7.58	5	9	8.6	5	8.1	8.6	6	8.4	8.5	1	7.8	7.8	0	10.9	10.3	6
Acetone	ug/kg	2.5	5	23	40	54	15	14	7	23	14	49	17	22	26	29	71	84	ND	35	
Benzene	ug/kg	1.4	5	4.5 J	3.7 J	20	27	26	4	2.4 J	6.3	90	ND	ND		ND	ND		ND	ND	
2-Butanone	ug/kg	1.5	5	ND	ND		3.4 J	3.6 J	6	ND	ND		ND	ND		ND	5.4		ND	ND	
Naphthalene	ug/kg	1.3	5	ND	ND		2.8 J	3.5 J	22	ND	ND		ND	ND		ND	ND		ND	ND	
1,2-Dichlorobenzene (o-DCB)	ug/kg		5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
sec-Butylbenzene	ug/kg	0.46	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Toluene	ug/kg	1.1	5	3.6 J	2.4 J	40	25	25	0	1.1 J	3.6 J	106	ND	ND		ND	ND		ND	ND	
m,p-Xylene	ug/kg	1.4	5	ND	ND		5.3	5.3	0	ND	ND		ND	ND		ND	ND		ND	ND	
1,2,4-Trimethybenzene	ug/kg	0.48	5	ND	ND		0.90 J	0.84 J	7	ND	ND		ND	ND		ND	ND		ND	ND	
Tetrachloroethene (PCE)	ug/kg	1.5	5	2.6 J	2.3 J	12	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
o-Xylene	ug/kg	0.52	5	ND	ND		2.1 J	2.2 J	5	ND	ND		ND	ND		ND	ND		ND	ND	
Ethylbenzene	ug/kg	0.36	5	0.55 J	ND		3.8 J	3.6 J	5	ND	ND		ND	ND		ND	ND		ND	ND	
Gasoline Range	mg/kg		2																		
Diesel Range	mg/kg		100																		
Oil Range	mg/kg		1000																		

Quality Control Data -- Pipeline Soil Investigation
Duplicate Soil Samples
Alamitos Generating Station

	Date			12/19/2012			12/20/2012			1/30/2013			1/31/2013			4/17/2013					
Parameter	**Units**	**MDL**	**MRL**	**P35-2**	**P-144**	**RPD**	**P51-1**	**P-147**	**RPD**	**P67-1**	**P-150**	**RPD**	**P62-1**	**P-153**	**RPD**	**P25-2**	**P-158**	**RPD**	**P24-2**	**P-160**	**RPD**
Antimony	mg/kg		0.5	ND	ND		ND	ND		0.64	0.65	2	ND	0.8		0.65	ND		ND	0.58	
Arsenic	mg/kg		0.5	6.4	5.7	12	7.7	6.9	11	4.1	3.9	5	5.2	8.3	46	6.5	3.3	65	1.8	2.4	29
Barium	mg/kg		1	110	100	10	150	130	14	100	93	7	120	170	34	140	71	65	37	84	78
Beryllium	mg/kg		0.1	0.37	0.36	3	0.52	0.44	17	0.32	0.29	10	0.61	0.74	19	0.35	0.2	55	0.17	0.39	79
Cadmium	mg/kg		0.1	0.1	ND		0.11	0.12		0.18	0.15	18	0.36	0.61	52	0.12	ND		ND	0.21	
Chromium, Total	mg/kg		0.5	20	19	5	23	21	9	17	16	6	23	28	20	22	12	59	17	20	16
Cobalt	mg/kg		0.2	8.1	7.6	6	9.4	8.8	7	7.2	7.7	7	12	15	22	8.7	4.7	60	4.9	8.7	56
Copper	mg/kg		0.5	20	19	5	24	22	9	20	19	5	20	32	46	21	11	63	9.2	24	89
Lead	mg/kg		0.5	5.3	4.8	10	5.9	5.5	7	6.1	4.7	26	6.8	10	38	5.8	3.3	55	3.3	5.5	50
Mercury	ug/kg		0.01	0.032	0.035	9	0.025	0.035	33	0.039	0.025	44	0.026	0.024	8	0.039	0.06	42	0.027	0.032	42
Molybdenum	mg/kg		0.2	3	2.7	11	2.5	2	22	3.5	4.5	25	1.3	2	42	2.3	0.93	85	0.72	1.2	50
Nickel	mg/kg		0.5	24	22	9	17	16	6	15	15	0	150	180	18	17	9.2	60	15	19	24
Selenium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Silver	mg/kg		0.1	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Thallium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Vanadium	mg/kg		1	82	82	0	48	45	6	40	38	5	46	52	12	40	22	58	21	39	60
Zinc	mg/kg		5	47	45	4	50	48	4	45	48	6	60	69	14	39	29	29	28	48	53
pH	Units			8.2	8.1	1	7.7	7.7	0	8.6	8.6	0	7.6	7.4	3	8.1	8.6	6	8.5	9	6
Acetone	ug/kg	2.5	5	18	26	36	13	16	21	ND	32		140	22	146	19	29	42	28	43	42
Benzene	ug/kg	1.4	5	1.8 J	2.2 J	20	3.0 J	3.0 J	0	ND	ND		ND	ND		3.5 J	4.6 J	27	ND	6.4	
2-Butanone	ug/kg	1.5	5	1.1 J	2.8 J	87	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Naphthalene	ug/kg	1.3	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	1.6 J		13	12	8
1,2-Dichlorobenzene (o-DCB)	ug/kg		5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		7.4	5.1	37
sec-Butylbenzene	ug/kg	0.46	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		8.1	12	39
Toluene	ug/kg	1.1	5	ND	1.5 J		3.0 J	2.6 J	14	ND	ND		ND	ND		2.8 J	3.2 J	13	ND	6.2	
m,p-Xylene	ug/kg	1.4	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	2.0 J	
1,2,4-Trimethybenzene	ug/kg	0.48	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Tetrachloroethene (PCE)	ug/kg	1.5	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
o-Xylene	ug/kg	0.52	5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Ethylbenzene	ug/kg	0.36	5	ND	ND		0.49 J	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Gasoline Range	mg/kg		2																75	41	59
Diesel Range	mg/kg		100																1300	2100	47
Oil Range	mg/kg		1000																3200	4400	32

Quality Control Data -- Pipeline Soil Investigation
Duplicate Soil Samples
Alamitos Generating Station

	Date			4/19/2013						10/18/2013			10/29/2013			10/30/2013			11/1/2013		
Parameter	**Units**	**MDL**	**MRL**	**P18-1**	**P-162**	**RPD**	**P22-2**	**P-164**	**RPD**	**P4-S1-1**	**P-166**	**RPD**	**P7-S1-1**	**P-169**	**RPD**	**P47-S1-1**	**P-171**	**RPD**	**P22-S1-1**	**P-173**	**RPD**
Antimony	mg/kg		0.5	0.78	0.63	21	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Arsenic	mg/kg		0.5	7.9	7.2	9	2.2	2	10	2.8	2.7	4	1.8	1.8	0	5.4	5.4	0	12	7.5	46
Barium	mg/kg		1	140	130	7	46	47	2	35	27	26	20	21	5	92	88	4	190	150	24
Beryllium	mg/kg		0.1	0.56	0.47	17	0.27	0.22	20	0.18	0.19	5	ND	ND		0.36	0.37	3	0.58	0.52	11
Cadmium	mg/kg		0.1	0.16	0.18	12	0.17	0.18	6	ND	0.11		ND	ND		ND	ND		0.11	0.15	31
Chromium, Total	mg/kg		0.5	24	19	23	15	16	6	9.2	10	8	6.9	6.6	4	20	21	5	25	21	17
Cobalt	mg/kg		0.2	10	7.4	30	4.9	4.6	6	4.6	7	41	2	2	0	8.4	8.4	0	11	9.8	12
Copper	mg/kg		0.5	26	22	17	39	37	5	8.7	23	90	5	4.5	11	18	18	0	26	22	17
Lead	mg/kg		0.5	7.7	6.8	12	6.9	6.7	3	4.6	4.4	4	2.4	3.1	25	4.5	4.4	2	7.1	6.2	14
Mercury	ug/kg		0.01	0.036	0.045	22	0.032	0.022	37	0.021	0.019	10	0.01	ND		0.03	0.025	18	0.057	0.074	26
Molybdenum	mg/kg		0.2	1.6	1.8	12	0.52	0.56	7	0.36	0.36	0	ND	ND		5.4	5.4	0	6.4	4.4	37
Nickel	mg/kg		0.5	27	16	51	46	46	0	69	160	79	46	44	4	13	14	7	20	18	11
Selenium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Silver	mg/kg		0.1	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Thallium	mg/kg		0.5	ND	ND		ND	ND		ND	ND		ND	ND		ND	ND		ND	ND	
Vanadium	mg/kg		1	45	39	14	26	23	12	22	41	60	9.9	10	1	36	38	5	43	39	10
Zinc	mg/kg		5	59	42	34	78	78	0	31	37	18	14	13	7	40	43	7	55	49	12
pH	Units			8.1	8	1	8.5	8.9	5	8.2	8.3	1	8.2	8.6	5	7.7	8.6	11	7.9	7.7	3
Acetone	ug/kg	2.5	5	30	20	40	19	22	15												
Benzene	ug/kg	1.4	5	5.2	7.8	40	ND	1.5 J													
2-Butanone	ug/kg	1.5	5	2.6 J	ND		ND	ND													
Naphthalene	ug/kg	1.3	5	ND	ND		ND	ND													
1,2-Dichlorobenzene (o-DCB)	ug/kg		5	ND	ND		ND	ND													
sec-Butylbenzene	ug/kg	0.46	5	ND	ND		ND	ND													
Toluene	ug/kg	1.1	5	4.6 J	6.5	34	ND	ND													
m,p-Xylene	ug/kg	1.4	5	ND	ND		ND	ND													
1,2,4-Trimethybenzene	ug/kg	0.48	5	ND	ND		ND	ND													
Tetrachloroethene (PCE)	ug/kg	1.5	5	ND	ND		ND	ND													
o-Xylene	ug/kg	0.52	5	ND	ND		ND	ND													
Ethylbenzene	ug/kg	0.36	5	ND	0.91 J		ND	ND													
Gasoline Range	mg/kg		2																		
Diesel Range	mg/kg		100																		
Oil Range	mg/kg		1000																		

Quality Control Data -- Pipeline Soil Investigation
Equipment Blank Analysis
Alamitos Generating Station

	Date		10/25/2012	10/30/2012	10/31/2012	11/1/2012	11/2/2012	11/5/2012	11/6/2012	11/7/2012	11/8/2012	11/14/2012	11/15/2012	12/6/2012	12/7/2012	12/12/2012
Parameter	**Units**	**PQL**	**P-101**	**P-104**	**P-106**	**P-109**	**P-112**	**P-114**	**P-117**	**P-121**	**P-125**	**P-128**	**P-131**	**P-132**	**P-136**	**P-139**
Antimony	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ug/l	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ug/l	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/l	0.5	**1.3**	**1.1**	ND	ND	ND	**0.55**	ND	ND	ND	ND	ND	ND	**5.8**	ND
Lead	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.6**	ND
Mercury	ug/l	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ug/l	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ug/l	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/l	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**91**	ND
pH	Units		**6.18**	**6.36**	**6.07**	**6.02**	**7.20**	**6.43**	**6.78**	**6.72**	**7.58**	**7.87**	**7.67**	**7.43**	**7.17**	**7.72**

	Date		12/13/2012	12/19/2012	12/20/2012	1/30/2013	1/31/2013	4/12/2013	4/17/2013	4/19/2013	10/18/2013	10/25/2013	10/29/2013	10/30/2013	11/1/2013
Parameter	**Units**	**PQL**	**P-142**	**P-145**	**P-148**	**P-151**	**P-154**	**P-156**	**P-159**	**P-163**	**P-165**	**P-165**	**P-170**	**P-172**	**P-174**
Antimony	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ug/l	1	**1.3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium, Total	ug/l	0.5	**0.27**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ug/l	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/l	0.5	**55**	**5.8**	**6.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	ug/l	0.5	**4.2**	**4.5**	**4.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ug/l	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ug/l	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/l	0.5	**1.4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	ug/l	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ug/l	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/l	5	**11**	**86**	**61**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH	Units		**7.80**	**7.77**	**7.87**	**5.77**	**6.66**	**7.18**	**6.81**	**7.14**	**6.88**	**6.46**	**7.63**	**7.56**	**6.97**

Hazardous Materials Management (146-149)

BACKGROUND

Section 2.1.12.2 of the SAFC states that a new 40,000 gallon aqueous ammonia tank and appurtenances would be installed for the AEC CCGT. Section 2.1.13.3 of the SAFC states that the AEC SCGT would make use of a single 40,000 gallon aqueous ammonia tank. However, section 5.5.3.2 of the SAFC states that the site would have one 40,000 gallon and one 30,000 gallon aqueous ammonia tank. The SAFC does not state whether the 30,000 gallon tank is pre-existing or proposed. If this second tank is pre- existing, staff needs to know the condition of the tank, its age, and the size and type of secondary containment to ascertain whether it meets current code.

DATA REQUEST

146. Please clarify the discrepancy between Section 2.0 and Section 5.5 about the capacity of the ammonia tank(s) for the AEC SCGT and confirm whether this aqueous ammonia tank is an existing one currently on site.

Response: The AEC will include two new aqueous ammonia storage tanks, a 40,000 gallon tank to support the CCGT and a 30,000 gallon tank for the SCGT. Existing ammonia storage tanks that serve the existing AGS Units 1-6 are not part of the AEC.

147. Please provide the current age of any existing tank that would serve AEC SCGT along with a narrative describing to which tank standard it was built.

Response: See the response to Data Request 146.

148. Please provide a narrative analysis for the existing tank's anchorage that would show that it is compliant with the current seismic code.

Response: See the response to Data Request 146.

149. Please describe what form of passive mitigation the existing tank's secondary containment uses and its size. Please confirm that the existing secondary containment meets current standards for a 24-hour, 25-year storm event plus 100 percent of the capacity of the largest tank within its boundary.

Response: See the response to Data Request 146.

Noise and Vibration (150-153)

AMBIENT NOISE MONITORING DATA

BACKGROUND

Continuous ambient noise monitoring was conducted between August 23, 2011 and August 31, 2011 to determine the existing noise levels in the project area. Long-term (25 hours or more) measurements were collected at three representative residential locations near the project where permission for long-term monitoring was obtained (M1 - 6333 Eliot Street, Long Beach; M2 - 6810 East Septimo Street, Long Beach; and M3 - Leisure World, Seal Beach).

Since the monitoring data was collected over four years ago, staff needs to determine whether the data is representative of current site conditions.

DATA REQUEST

150. Please provide justification for using ambient noise monitoring data collected in August 2011 as representative for current conditions at each of the three monitoring locations. Additionally, please explain whether there have been any changes to the surrounding area since 2011 that could potentially affect current ambient noise.

Response: Since the August 2011 noise monitoring data collection, the only change in the surrounding area has been the construction and operation of 6 General Electric LMS100 simple-cycle combustion turbines at the adjacent Los Angeles Department of Water and Power Haynes Generating Station (Haynes). The operation of Haynes simple-cycle units, which are designed to operate during peak hours, is expected to increase the ambient noise levels during those peak intermittent hours above those measured in August 2011 and, accordingly, the use of the 2011 noise data (without the Haynes units in the ambient) will tend to result in a conservative assessment of AEC's operational noise impacts. Therefore, with the exception of the increased sound levels of the Haynes units, because there have been no changes to the surrounding area since 2011 that could potentially affect current ambient noise, the ambient noise monitoring data collected in support of the AFC is still representative of current conditions at each of the three monitoring locations.

151. If in response to Data Request #150 any changes to the ambient environment are identified that could potentially affect current ambient noise conditions in the project area as compared to the monitoring data collected in August 2011, please conduct new continuous ambient noise monitoring data to more accurately represent those conditions.

Response: See the response to Data Request 150. The 2011 noise monitoring data will provide a more conservative assessment of the AEC operational noise impacts and should be used as provided.

NOISE IMPACT MODELING

BACKGROUND

Supplemental Application for Certification (SAFC) Section 5.4.7.3, Operational Impacts, describes that a noise model of the proposed project has been developed using the CADNA/A noise model. It is explained that the model divides the proposed facility into a list of individual noise sources representing each piece of equipment that produces a significant amount of noise. Using these noise levels as a basis, the model calculates the noise level that would occur at each receptor from each source after losses from distance, air absorption, enclosures, and blockages are considered. The sum of all these individual levels is the total plant level at the modeling point. A-weighted sound power (noise) levels used to estimate project noise are summarized in SAFC Table 5.7-9. The estimated plant operational noise impacts at each receptor are presented in SAFC Table 5.7-10.

To complete its analysis, staff needs to better understand the modeling parameters and the assumptions made surrounding these parameters.

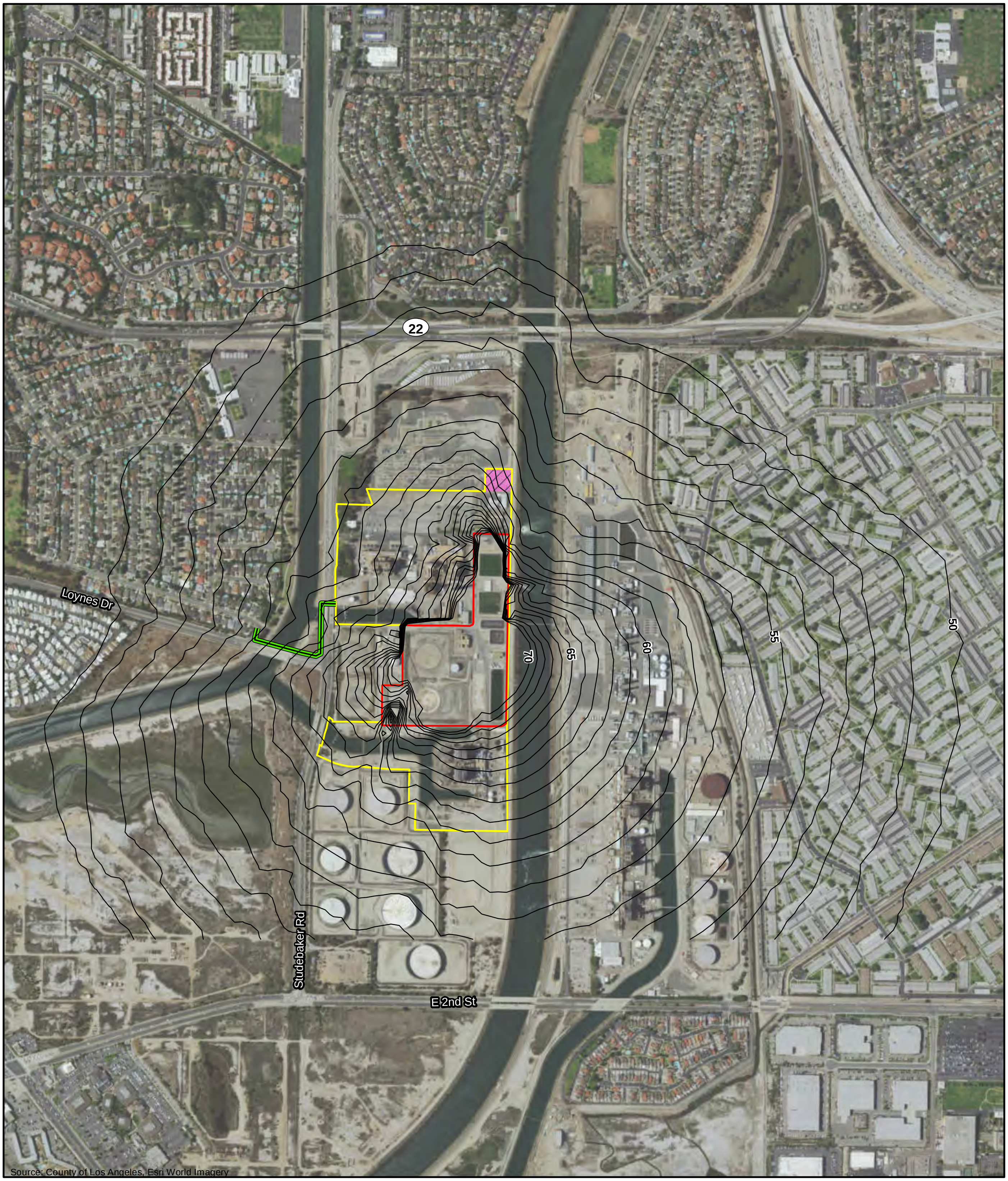
DATA REQUEST

152. Please provide a modeling protocol that explains how the modeling was conducted, including a discussion of any assumptions made to conduct the modeling, such as ground absorption factors, meteorological data, and specifics on atmospheric propagation, wind directions, and sound shielding, and any other information that would help staff understand how the noise modeling was completed.

Response: The sound propagation factors used in the model have been adopted from International Organization for Standardization (ISO) 9613-2, Acoustics – Sound Attenuation during Propagation Outdoors (ISO, 1996) with an ambient temperature of 10 degrees Celsius and a relative humidity of 70 percent. The ISO 9613 standard is on an omnidirectional downwind condition. That is, the sound prediction algorithms assume every point at which sound level is calculated is downwind of all noise-emitting equipment simultaneously. In essence, the prediction assumes each receiver or prediction point is a “black hole” and the wind is blowing from each noise source and into this “black hole.” While this is physically impossible, the ISO 9613-2 model has been widely and successfully used to develop acoustical models for power facilities. ISO 9613-2 states that “These equations also hold, equivalently, for average propagation under a well-developed moderate ground-based temperature inversion…” Flat ground with a ground absorption factor of G=0.2 was used, where G=1.0 is fully absorptive and G=0.0 is fully reflective. Localized noise barriers around various pieces of equipment have been preliminary identified and are subject to change as the project progresses to full design. The potential shielding afforded by offsite structures has not been incorporated.

153. Please provide a contour plot of the facility showing operational noise contour lines that extend to the project’s noise-sensitive receptors.

Response: The anticipated noise contours depicted in Figure DR153-1 reflect the preliminary modeling.



Legend

AGS Boundary

AEC Site

Natural Gas Metering Station

Proposed New Process/
Sanitary Wastewater Pipeline to First Point of Interconnection

Preliminary Sound Contour

0 550 1,100 Feet

N

FIGURE DR153-1
AEC Operational Noise Contours

Alamitos Energy Center
Long Beach, California
December 2015

CH2MHILL

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Traffic and Transportation (154-159)

CONSTRUCTION ACCESS ROAD

BACKGROUND

Figure 1.1-3 (Site Location Map) in the Supplemental Application for Certification (SAFC) for the proposed Alamitos Energy Center (AEC) shows a proposed access road connecting to the project site's construction laydown area and worker parking from the Loynes Drive/North Studebaker Road intersection. The SAFC does not provide any further information about the construction access road.

DATA REQUEST

154. Please provide information for a private vehicular access easement (PVAE) plan for the construction access road across private property. The information shall include a diagram that shows: the power plant property, the location and dimensions of the proposed PVAE, its connection to the public right-of-way and the proposed vehicle access road (driveway) on the power plant property. Also, the PVAE plan shall include an executed maintenance/ repair agreement with the affected property owner.

Response: An easement agreement for the construction access road with the property owner has not been secured. The construction access road was included in the SAFC to ensure sufficient CEC review if an agreement can be secured. Until an agreement is secured, preparation of a private vehicular access easement (PVAE) plan is premature.

UPDATED EXISTING TRAFFIC COUNTS

BACKGROUND

Staff had requested the applicant to provide updated traffic counts with the filing of the SAFC for the proposed AEC (*Draft List of Information Staff Requests be Included in the Alamitos SAFC and List of Potential Issues Identified Regarding Previous Project Configuration*, dated January 2015). However, upon review of the Traffic and Transportation section of the SAFC, staff notes that these updated traffic counts have not been provided. Rather, the traffic analysis relies on the same sources the AFC used. These sources were somewhat outdated at the time of the filing of the AFC, but are now well outdated for use in this SAFC.

According to the text on page 5.12-6 of the SAFC, a.m. and p.m. peak hour turning movement counts were obtained from the 2010 Traffic Impact Analysis for the 2nd Street and PCH Development (by Linscott, Law & Greenspan, Engineers), and used to represent existing conditions. The traffic counts for the 2nd and PCH Development Traffic Impact Analysis were collected in August and September of 2009. These counts showed four of the eight AEC study intersections with unacceptable Levels of Service (LOS).

DATA REQUESTS

155. Please provide updated intersection a.m. and p.m. peak turning movement counts, including volume to capacity (V/C) and LOS data. Present this information in a table, as shown with Table 5.12-5 in the SAFC, and in a figure, as shown in Figure 5.12-4 in the SAFC.

Response: The City of Long Beach Public Works Department was contacted on December 9, 2015 (personal communication, Teresa Dennis, City of Long Beach Public Works Department, Traffic Services) to determine if more recent traffic counts were available for the study intersections. The City confirmed that the SAFC is using the most recent information available. The City conducts daily roadway traffic counts, on an annual basis, but does not regularly collect peak hour intersection counts. The City also stated that they were not aware of any other reports or studies that would contain this information. An online search was also completed to determine if more current daily vehicle capacity data were available and confirmed that there are no available traffic studies or other documents with more current data (for the study intersections or roadway). Therefore, the 2009 traffic data is the most current data available. This same data is used by the City and other agencies in their CEQA-compliant processes and has apparently withstood legal challenges since development projects continue to be approved in the vicinity.

156. Because the existing traffic data was used as a basis for estimating 2021 conditions and the previous request asks for updated existing traffic data, the 2021 traffic data will need to be updated and presented in a table, as shown in Tables 5.12-10 and 5.12-11 in the SAFC, and presented in a figure, as shown in Figure 5.12-6 and 5.12-7.

Response: Although the AEC traffic analysis relies on data from 2009, an annual average growth rate was applied to the existing traffic volumes to estimate the 2021 traffic conditions, when AEC will generate the greatest number of construction-related trips. The potential traffic impacts were evaluated for 2021 conditions, and not 2009 conditions. The growth rate was obtained from the 2012-2035 Regional Transportation Plan, prepared by the Southern California Association of Governments (SCAG), and is estimated to be 1.2 percent per year for the SCAG region (SCAG, 2010). The growth rate was applied for the 12 year period (2009 to 2021). It is reasonable to assume, as the City and other local governments do routinely, that the growth rate conservatively accounts for potential increases in traffic from 2009 through existing 2015 conditions, as well as through 2021 when the project will be under construction.

UPDATED TRAFFIC COUNTS

BACKGROUND

Table 5.10-4 (Existing Roadway Segment Level of Service) in the Traffic and Transportation section of the AEC SAFC reports a daily vehicle capacity for the roadway segment of State Route 22 (SR-22) from Studebaker Road to the Orange County line as 79,400. State Route 22 becomes a freeway east of Studebaker Road and a note in the table reports the freeway capacity is based on Florida Department of Transportation (FDOT) Level of Service/ Quality Handbook.

DATA REQUESTS

157. Please provide the daily vehicle capacity for SR-22 for the roadway segment between Studebaker Road and the Orange County line, consistent with the Transportation Research Board's (TRB) Highway Capacity Manual (HCM), 2010.

Response: The City of Long Beach Circulation Element does not identify specific roadway capacities for City streets or highways. Florida Department of Transportation's (FDOT) Level of Service/Quality (Q/LOS) Handbook is a commonly used resource for the development and review of roadway capacity and LOS (at the planning level) when other more specific local roadway capacity data is unavailable.

The Q/LOS Handbook is derived from the Highway Capacity Manual (HCM) methods and is appropriate for conducting planning-level analyses, as was done for this analysis. According to the FDOT Systems Planning Office, FDOT is transitioning to the use of the 2010 HCM. During the transition period, the generalized Annual Average Daily Volumes tables (which provide capacity data) using the methods of both the 2000 and 2010 HCM are acceptable. A capacity of 79,400 was assumed for State Route (SR)-22 based on the 2009 Q/LOS Handbook and is based on the HCM 2000. Based on the current 2013 Q/LOS Handbook (which is derived from the HCM 2010), a capacity of 84,600 average daily vehicles could be assumed for SR-22. However, even with a slightly higher assumed capacity, this segment of SR-22 is estimated to operate at LOS F (V/C greater than 1.00) and the project would result in the same increase in the V/C (an increase of 0.011). The LOS and project-related impact findings would be the same regardless of which daily capacity is assumed.

158. Please ensure the updated existing traffic counts and 2021 traffic counts requested in the previous data requests (155 and 156) include the freeway capacity consistent with TRB's HCM, 2010.

Response: See the response to Data Requests 155 and 156.

FAA NOTIFICATION

BACKGROUND

The Federal Aviation Administration (FAA) Regulations Part 77.9 requires the filing of Form 7460-1 (Notice of Proposed Construction or Alteration) when proposed construction or alternation is over 200 feet in height above ground level (AGL) and also when proposed construction or alteration exceeds an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of an airport with its longest runway more than 3,200 feet in actual length.

The closest airport to AEC is the Los Alamitos Army Airfield, approximately 2.5 miles to the northeast. The two runways are longer than 3,200 feet, thus 100 to 1 is the applicable slope ratio for this airport. The printed results of the FAA Notice Criteria Tool included in Appendix 3B in the AEC SAFC show the tallest structures proposed, the 140 foot tall HRSG stacks, exceed the slope ratio for a runway longer than 3,200 feet, and thus require the applicant file Form 7460-1 (Notice of Proposed Construction or Alteration) with the FAA. The applicant stated on page 5.12-18 that they will file Form7460-1 with the FAA.

DATA REQUEST

159. Please submit a copy of the submitted FAA Form 7460-1, as well as the FAA's Determination (when available).

Response: Please see Attachment DR159-1 for copies of the submitted Federal Aviation Administration (FAA) Form 7460-1 and the FAA's determination that AEC does not pose a hazard to air navigation.

Attachment DR159-1
FAA Form 7460-1 Submittal and Determination

Please Type or Print on This Form

Form Approved OMB No.2120-0001
Expiration Date: 10/31/2017

U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY
Aeronautical Study Number

1. Sponsor *(person, company, etc. proposing this action)*:
Attn. Stephen O'Kane, Vice President of:
Name: AES Southland Development, LLC
Address: 690 N. Studebaker Road
City: Long Beach State: CA Zip: 90803
Telephone: (562) 493-7891 Fax: (562) 493-7320

2. Sponsor's Representative *(if other than #1)*:
Attn. of:
Name: CH2M HILL
Address: 6 Hutton Centre Drive, Ste 700
City: Santa Ana State: CA Zip: 92707
Telephone: (714) 429-2000 Fax: (714) 429-2050

3. Notice of: ☑ New Construction ☐ Alteration ☐ Existing

4. Duration: ☑ Permanent ☐ Temporary (___ months, _____days)

5. Work Schedule: Beginning 2nd Quarter 2017 End 3rd Quarter 2021

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line ☐ Landfill ☐ Water Tank ☑ Other Exhaust Stack

7. Marking/Painting and/or Lighting Preferred:
- ☐ Red Lights and Paint
- ☐ White-Medium Intensity
- ☐ White -High Intensity
- ☐ Dual - Red and Medium Intensity
- ☐ Dual - Red and high Intensity
- ☐ Other

8. FCC Antenna Structure Registration Number *(if applicable)*:
Not Applicable

9. Latitude: 33 deg ° 46 min ' 3.404 sec " ______

10. Longitude: -118 deg ° 6 min ' 3.157 sec " ______

11. Datum: ☑ NAD 83 ☐ NAD 27 ☐ Other

12. Nearest: City: Long Beach State CA

13. Nearest *Public-use* *(not private-use)* or Military Airport or Heliport:
Los Alamitos Army Airfield (SLI)

14. Distance from #13. to Structure: Approx. 2.25 miles

15. Direction from #13. to Structure: The structure is southwest of SLI

16. Site Elevation *(AMSL)*: 15 ft.

17. Total Structure Height *(AGL)*: 140 ft.

18. Overall Height (#16 + #17) *(AMSL)*: 155 ft.

19. Previous FAA Aeronautical Study Number *(if applicable)*:
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20. Description of Location: *(Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey)*

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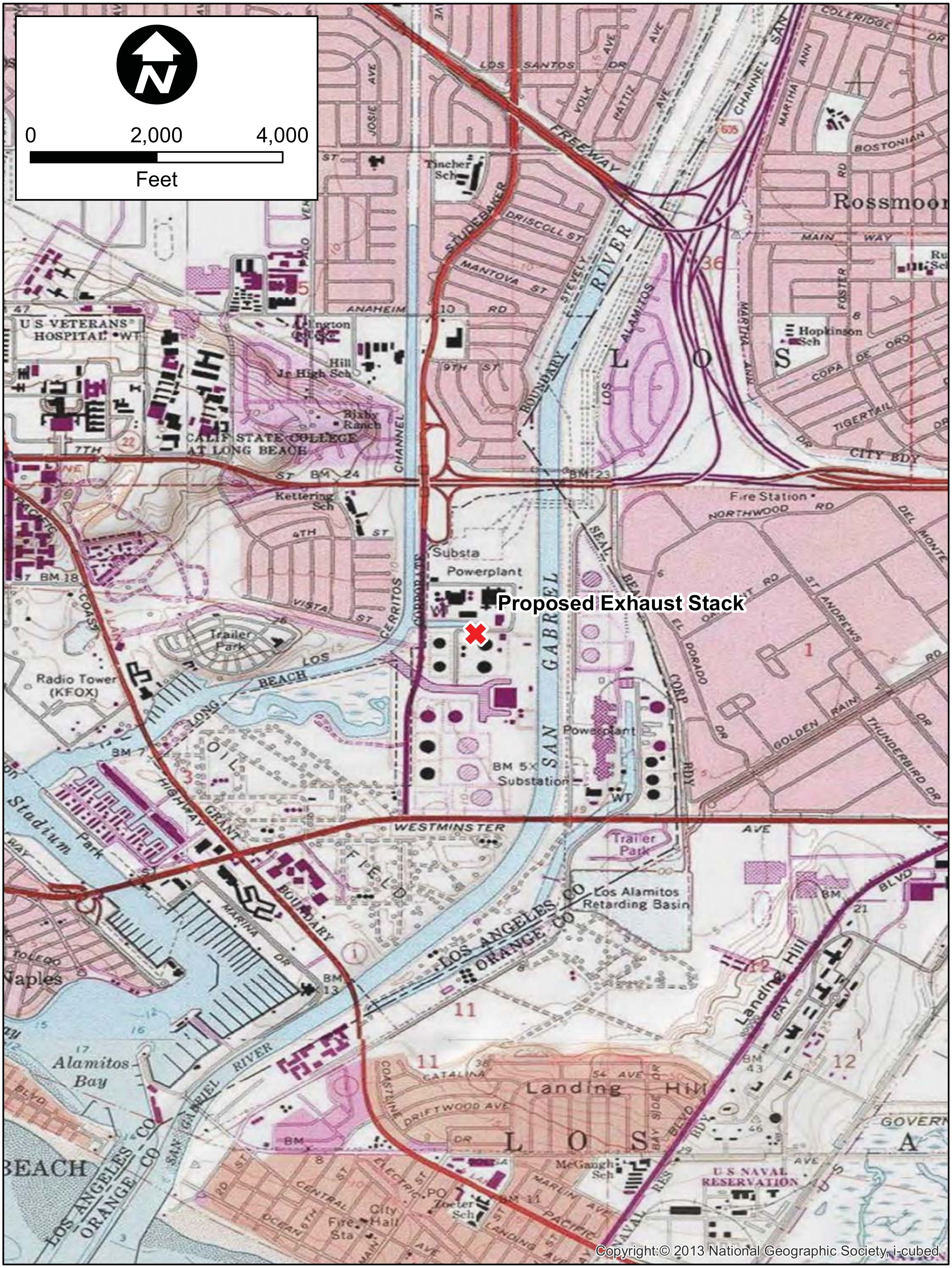
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Feet
Proposed Exhaust Stack
Rossmoor
U S VETERANS HOSPITAL
CALIF STATE COLLEGE AT LONG BEACH
Bixby Ranch
Hill Jr High Sch
Kettering Sch
Tincher Sch
Hopkinson Sch
Powerplant
Substa
Substation
Fire Station
Trailer Park
Radio Tower (KFOX)
Los Alamitos Retarding Basin
LOS ANGELES CO
ORANGE CO
SAN GABRIEL RIVER
LOS ALAMITOS CHANNEL
LONG BEACH
Stadium Park
Naples
Alamitos Bay
Landing Hill
WESTMINSTER AVE
U S NAVAL RESERVATION
McGaugh Sch
City Hall
Fire Sta
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Telephone: (562) 493-7891 Fax: (562) 493-7320

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3. Notice of: ☑ New Construction ☐ Alteration ☐ Existing

4. Duration: ☑ Permanent ☐ Temporary (___ months, _____days)

5. Work Schedule: Beginning 2nd Quarter 2017 End 3rd Quarter 2021

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line ☐ Landfill ☐ Water Tank ☑ Other Exhaust Stack

7. Marking/Painting and/or Lighting Preferred:
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☐ White-Medium Intensity
☐ White -High Intensity
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☐ Dual - Red and high Intensity
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8. FCC Antenna Structure Registration Number *(if applicable)*:
Not Applicable

9. Latitude: 33 deg ° 46 min ' 1.972 sec , ___ "

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11. Datum: ☑ NAD 83 ☐ NAD 27 ☐ Other

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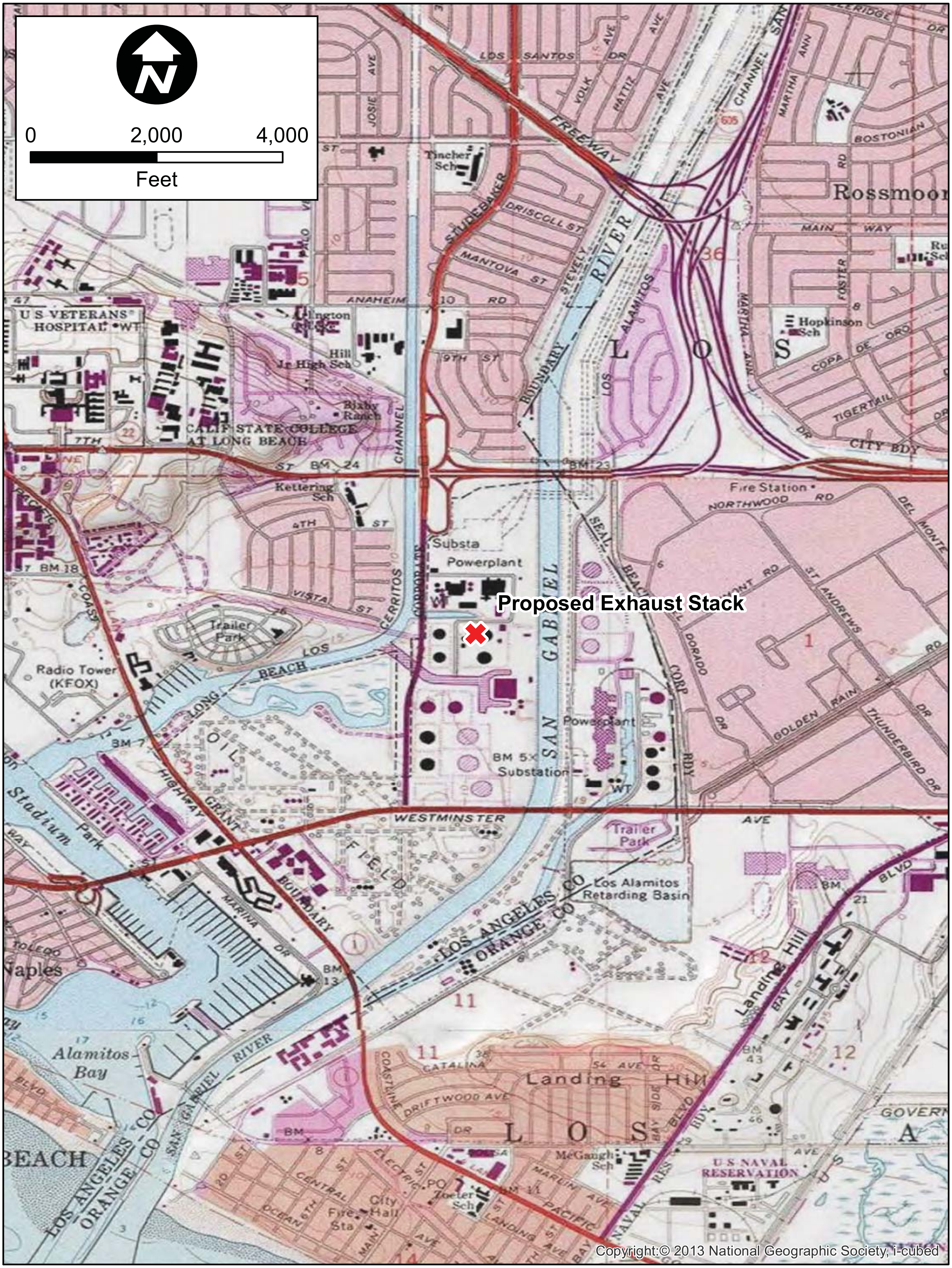
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Feet
Proposed Exhaust Stack
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U S VETERANS HOSPITAL
CALIF STATE COLLEGE AT LONG BEACH
Substa
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Trailer Park
Trailer Park
Radio Tower (KFOX)
Los Alamitos Retarding Basin
LOS ANGELES CO
ORANGE CO
SAN GABRIEL RIVER
Alamitos Bay
Naples
Landing Hill
U S NAVAL RESERVATION
WESTMINSTER AVE
Fire Station
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7. Marking/Painting and/or Lighting Preferred:
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☐ White-Medium Intensity ☐ Dual - Red and high Intensity
☐ White -High Intensity ☐ Other

8. FCC Antenna Structure Registration Number *(if applicable)*:
Not Applicable

9. Latitude: 33 deg ° 46 min ' 10.12 sec , ____ "
10. Longitude: -118 deg ° 5 min ' 55.69 sec , ____
11. Datum: ☑ NAD 83 ☐ NAD 27 ☐ Other
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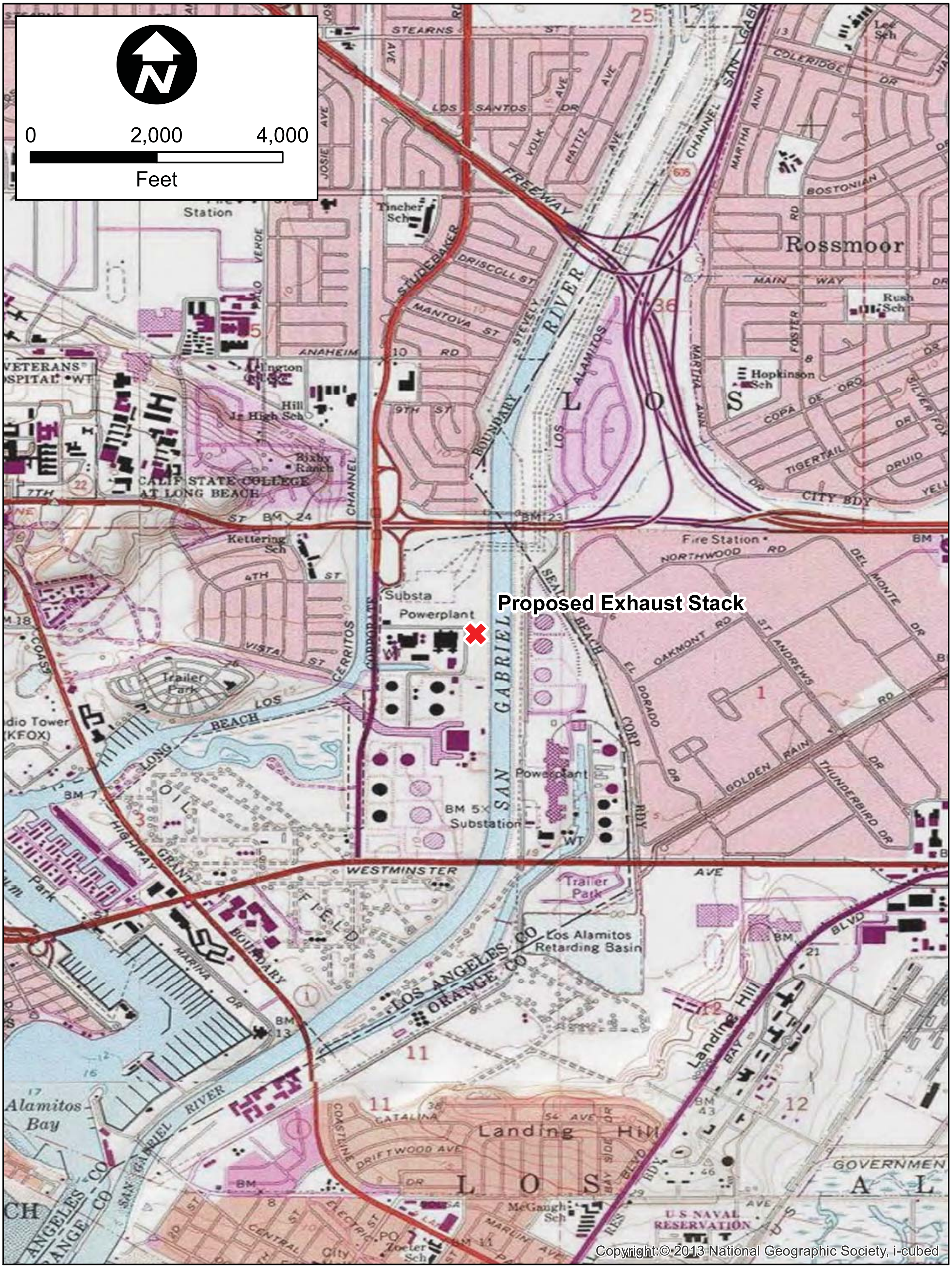
0
2,000
4,000
Feet
Proposed Exhaust Stack
Substa
Powerplant
Powerplant
BM 5X
Substation
SAN GABRIEL
RIVER
LOS ALAMITOS
Rossmoor
STEARNS ST
COLERIDGE DR
LOS SANTOS DR
FREEWAY
BOSTONIAN
MAIN WAY
DRISCOLL ST
MANTOVA ST
ANAHEIM RD
9TH ST
STUDEBAKER
BOUNDARY
Tincher Sch
Hopkinson Sch
Rush Sch
Lee Sch
COPA DE ORO
TIGERTAIL
DRUID
CITY BDY
VETERANS
Jr High Sch
Bixby Ranch
CALIF STATE COLLEGE AT LONG BEACH
7TH
Kettering Sch
4TH
VISTA ST
CERRITOS CHANNEL
Trailer Park
LOS
LONG BEACH
Fire Station
NORTHWOOD RD
DEL MONTE DR
OAKMONT RD
ST ANDREWS
EL DORADO DR
GOLDEN RAIN RD
THUNDERBIRD DR
SEAL BEACH
CORP BDY
WESTMINSTER AVE
Trailer Park
Los Alamitos Retarding Basin
LOS ANGELES CO
ORANGE CO
GRANT
HIGHWAY
BOUNDARY
MARINA DR
FIELD
OIL
Alamitos Bay
Landing Hill
CATALINA
DRIFTWOOD AVE
COASTLINE
McGaugh Sch
U S NAVAL RESERVATION
GOVERNMEN
CENTRAL
ELECTRIC
MARLIN AVE
Zoeter Sch
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5. Work Schedule: Beginning 2nd Quarter 2017 End 3rd Quarter 2021

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7. Marking/Painting and/or Lighting Preferred:
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10. Longitude: -118 deg ° 5 min ' 55.69 sec .

11. Datum: ☑ NAD 83 ☐ NAD 27 ☐ Other

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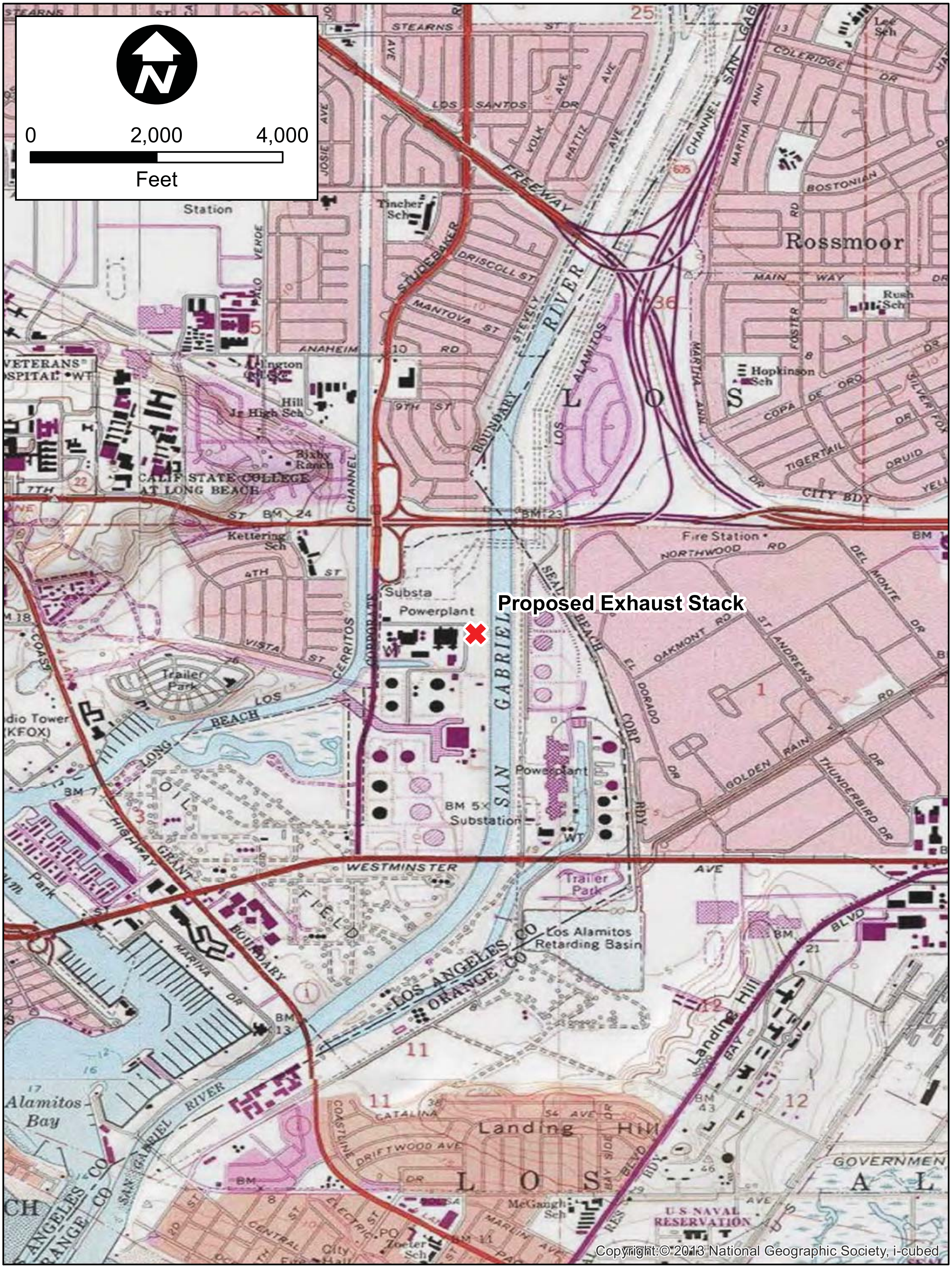
N
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Feet
Proposed Exhaust Stack
Powerplant
Substa
Substation
Rossmoor
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LOS ALAMITOS
WESTMINSTER AVE
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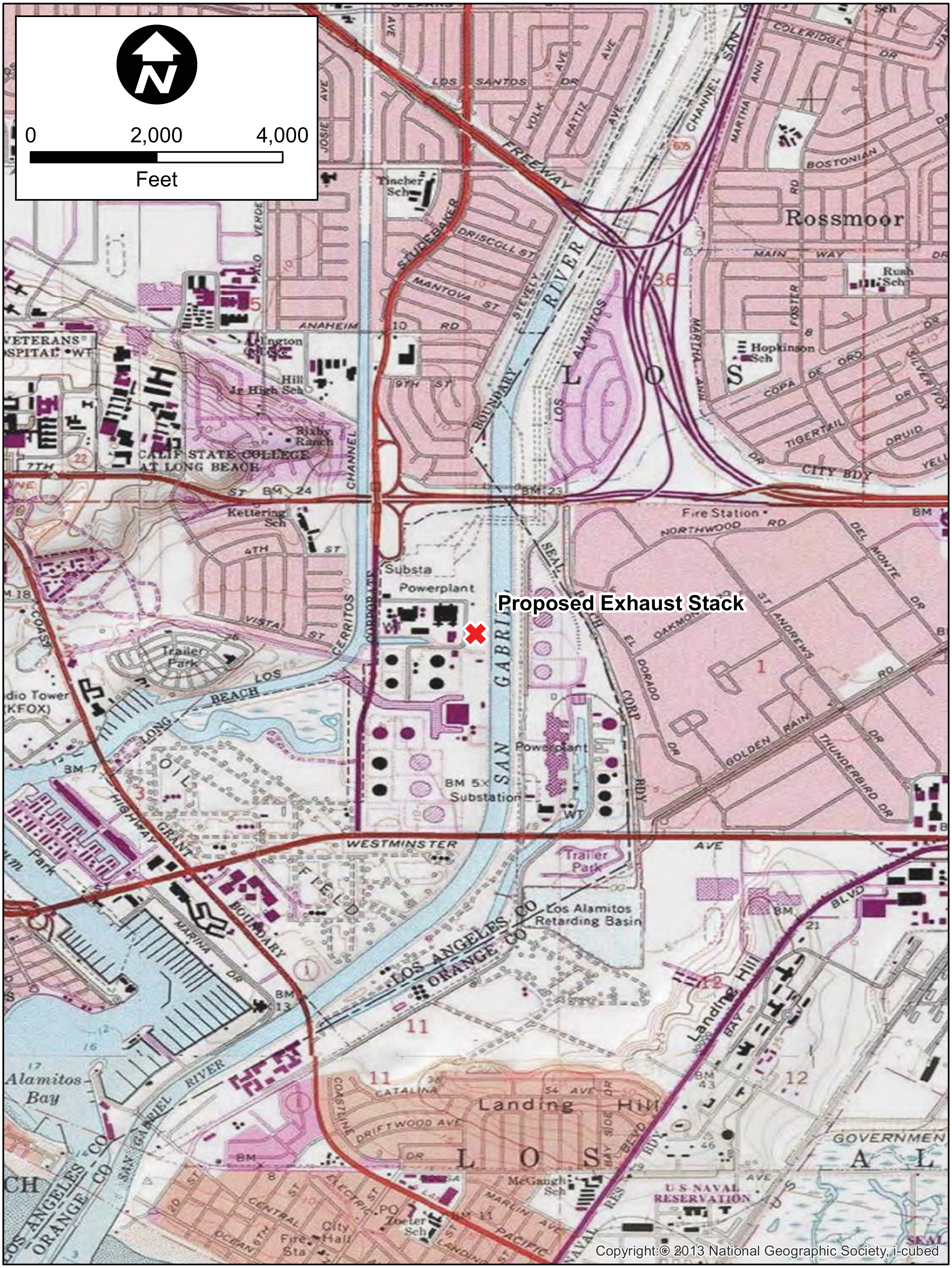
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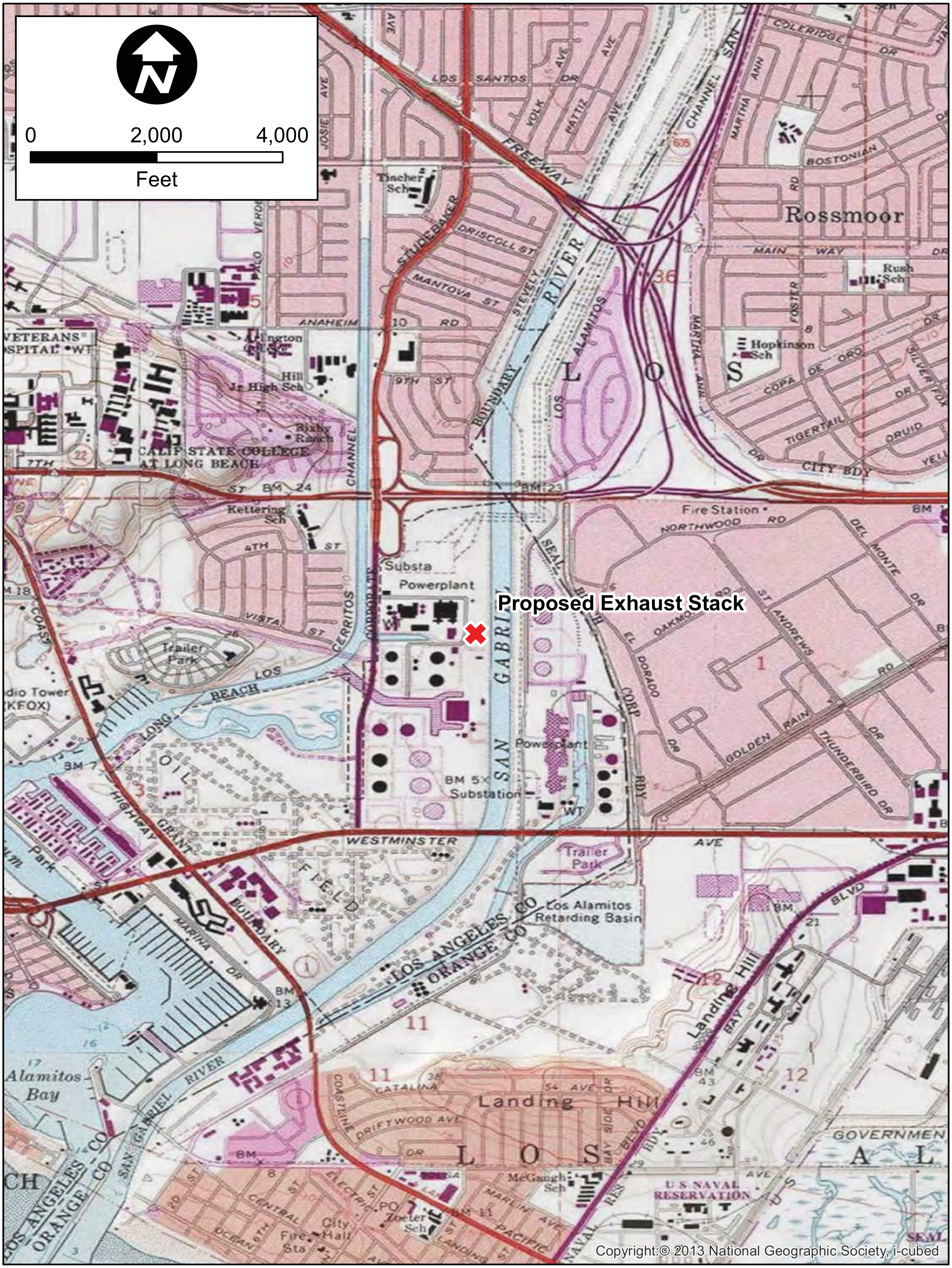
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☐ White-Medium Intensity ☐ Dual - Red and high Intensity
☐ White -High Intensity ☐ Other

8. FCC Antenna Structure Registration Number *(if applicable)*:
Not Applicable

9. Latitude: 33 deg ° 45 min ' 57.758 sec , ____ "

10. Longitude: -118 deg ° 6 min ' 0.27 sec , ____

11. Datum: ☑ NAD 83 ☐ NAD 27 ☐ Other

12. Nearest: City: Long Beach State CA

13. Nearest *Public-use* *(not private-use)* or Military Airport or Heliport:
Los Alamitos Army Airfield (SLI)

14. Distance from #13. to Structure: Approx. 2.25 miles

15. Direction from #13. to Structure: The structure is southwest of SLI

16. Site Elevation *(AMSL)*: 15 ft.

17. Total Structure Height *(AGL)*: 104 ft.

18. Overall Height (#16 + #17) *(AMSL)*: 119 ft.

19. Previous FAA Aeronautical Study Number *(if applicable)*:
Not Applicable -OE

20. Description of Location: *(Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey)*

See attached map. The proposed structure will be located on the site of the existing AES Alamitos Generating Station, which is southeast of the intersection of N Studebaker Road and E 7th Street in Long Beach, California. The generating station address is:

690 N. Studebaker Road
Long Beach, CA 90803

This proposed air cooled condenser is a rectangular structure that will be approximately 300' x 200'. Coordinates (NAD83) of each of the four corners are as follows:
NW: 33° 45' 58.78", -118° 6' 2.01"
NE: 33° 45' 58.74", -118° 5' 58.51"
SW: 33° 45' 56.74", -118° 6' 2.019"
SE: 33° 45' 56.73", -118° 5' 58.53"

21. Complete Description of Proposal:

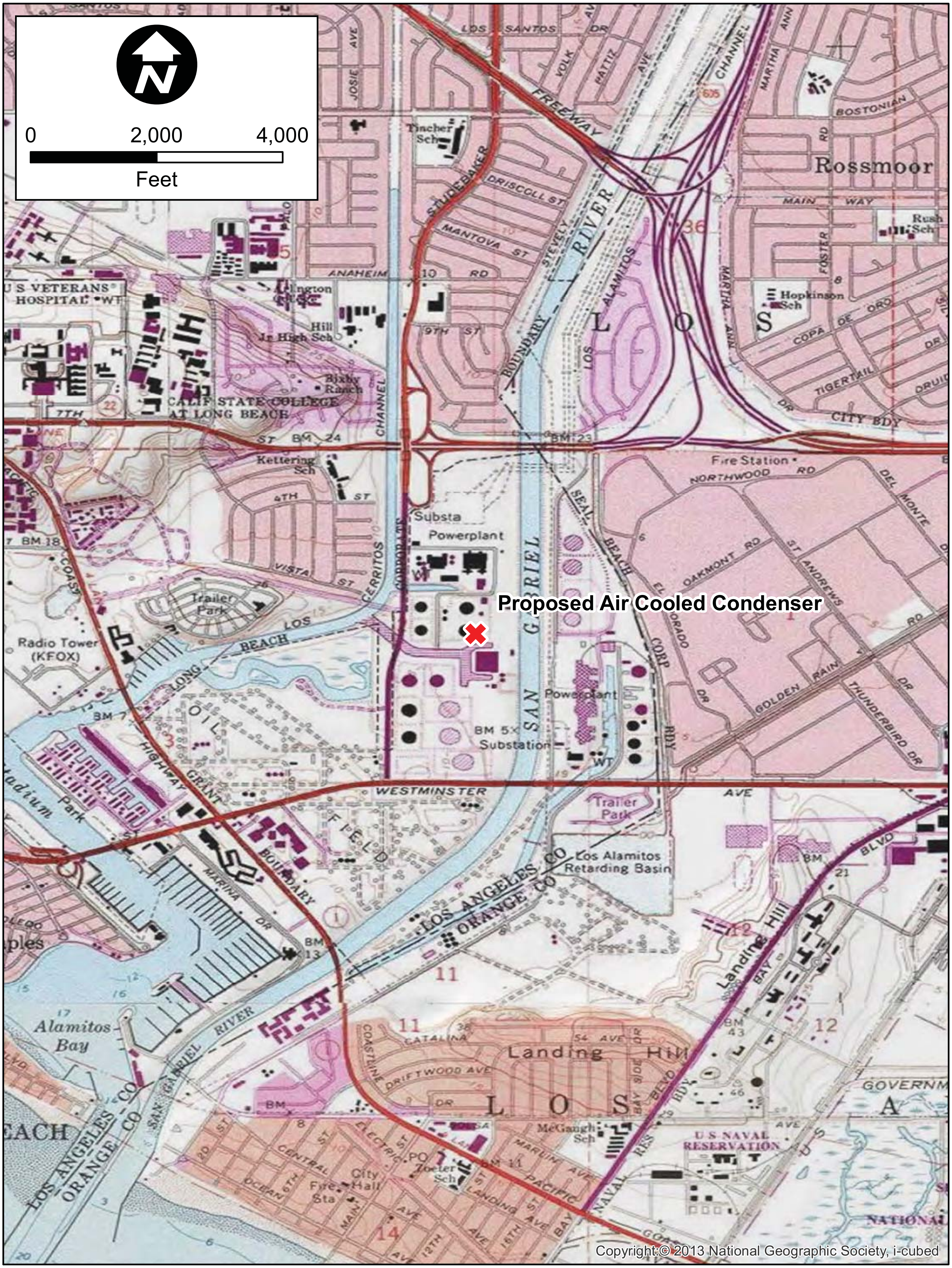
The Alamitos Energy Center (AEC) is a nominal 1,040 megawatts (MWs) natural-gas-fired, combined-cycle and simple-cycle, air-cooled electrical generating facility that will be constructed on the site of the AES Alamitos Generating Station (AGS), an existing and operating power plant in Long Beach, California.

Frequency/Power (kW)	

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to 49 U.S.C., Section 46301(a)

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking & lighting standards as necessary.

Date	Typed or Printed Name and Title of Person Filing Notice	Signature


0 2,000 4,000
Feet
Proposed Air Cooled Condenser
Copyright:© 2013 National Geographic Society, i-cubed

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10953-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Air Cooled Condenser
Location:	Long Beach, CA
Latitude:	33-45-57.76N NAD 83
Longitude:	118-06-00.27W
Heights:	15 feet site elevation (SE)
	104 feet above ground level (AGL)
	119 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 05/23/2017 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

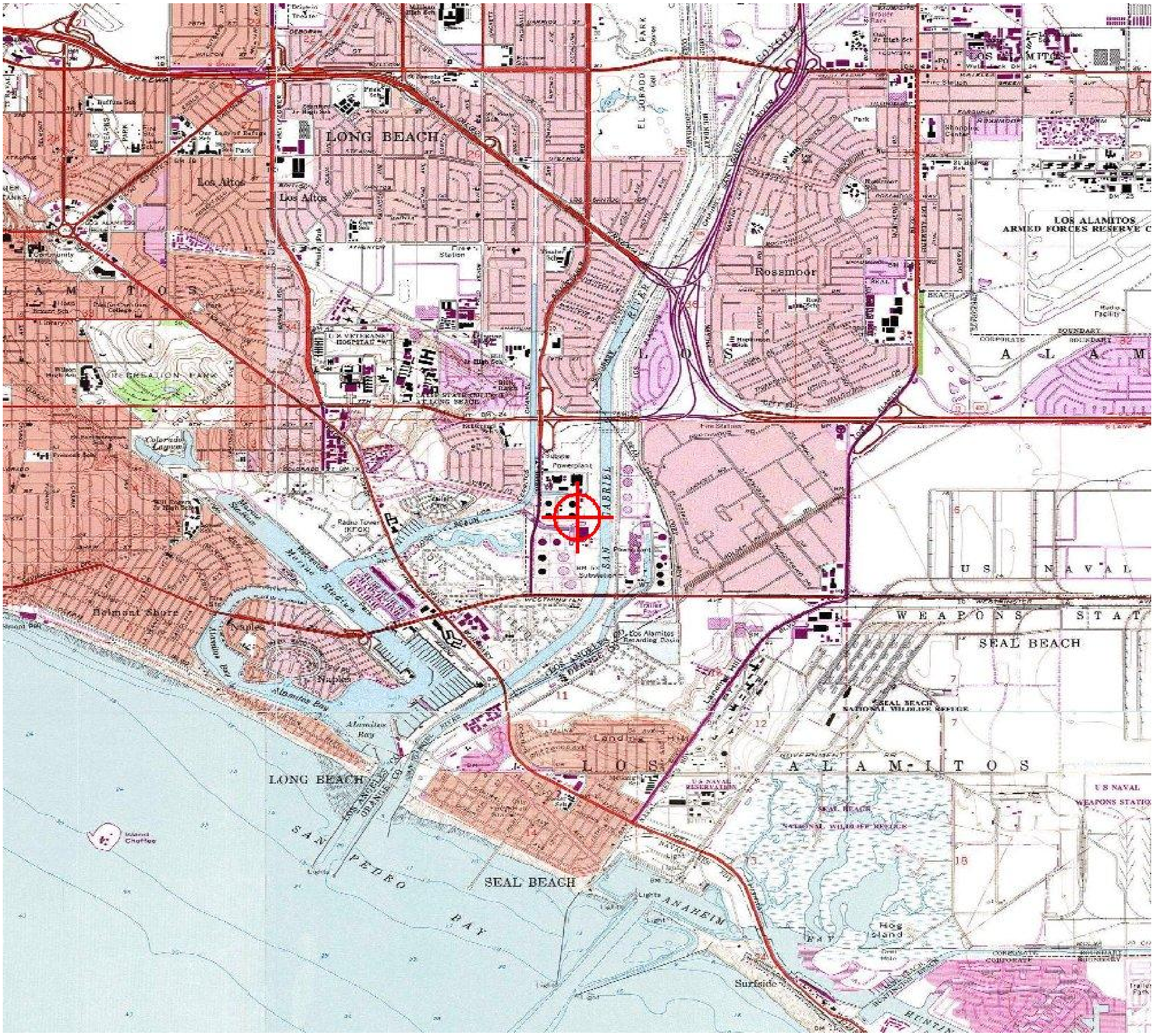
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10953-OE.

Signature Control No: 270628227-273429015 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10953-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10952-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Stack LMS04
Location:	Long Beach, CA
Latitude:	33-46-05.50N NAD 83
Longitude:	118-05-55.67W
Heights:	15 feet site elevation (SE)
	80 feet above ground level (AGL)
	95 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 05/23/2017 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

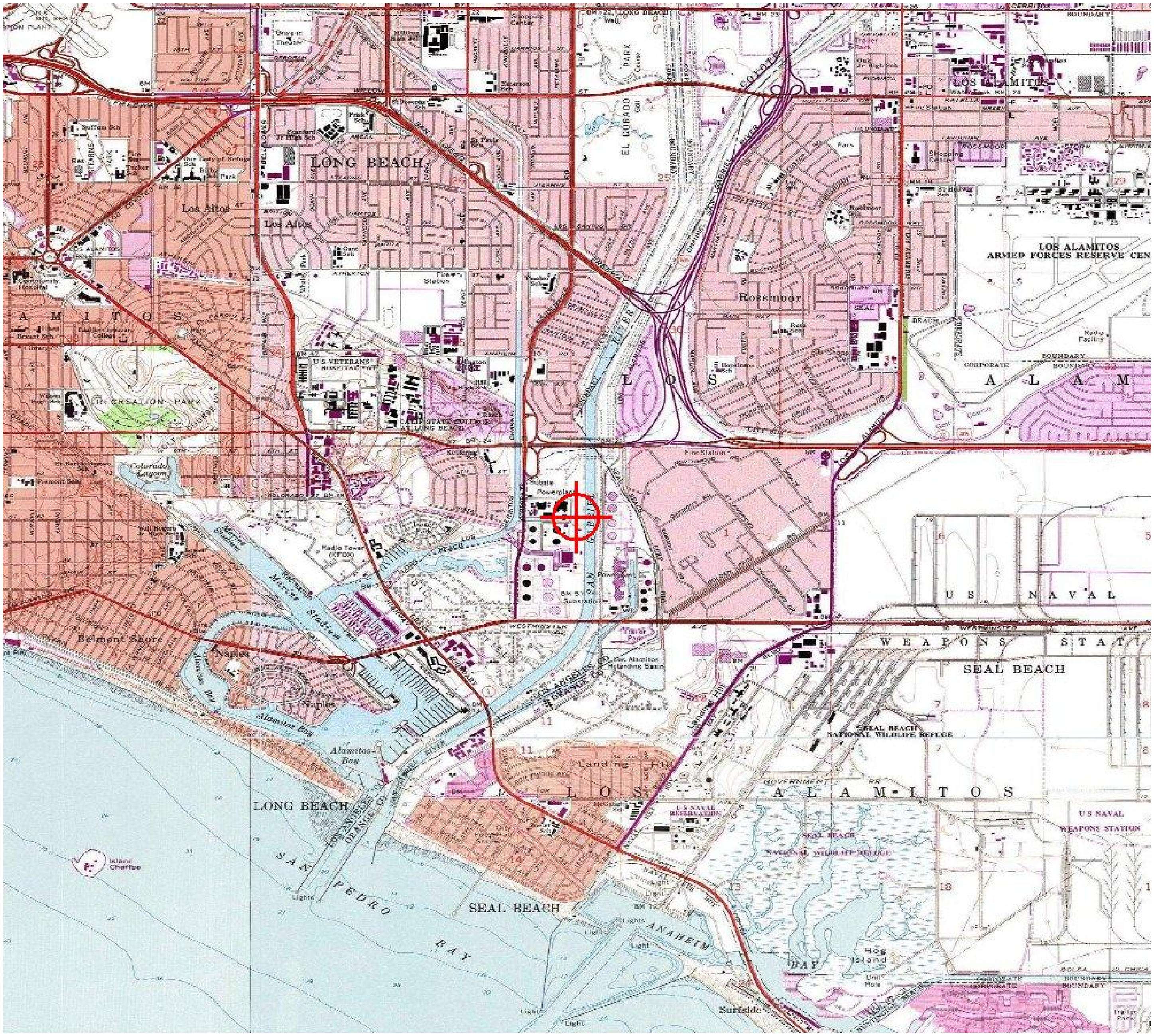
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10952-OE.

Signature Control No: 270628225-273429021 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10952-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10951-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Stack LMS03
Location:	Long Beach, CA
Latitude:	33-46-06.00N NAD 83
Longitude:	118-05-55.68W
Heights:	15 feet site elevation (SE)
	80 feet above ground level (AGL)
	95 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 05/23/2017 unless:

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(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

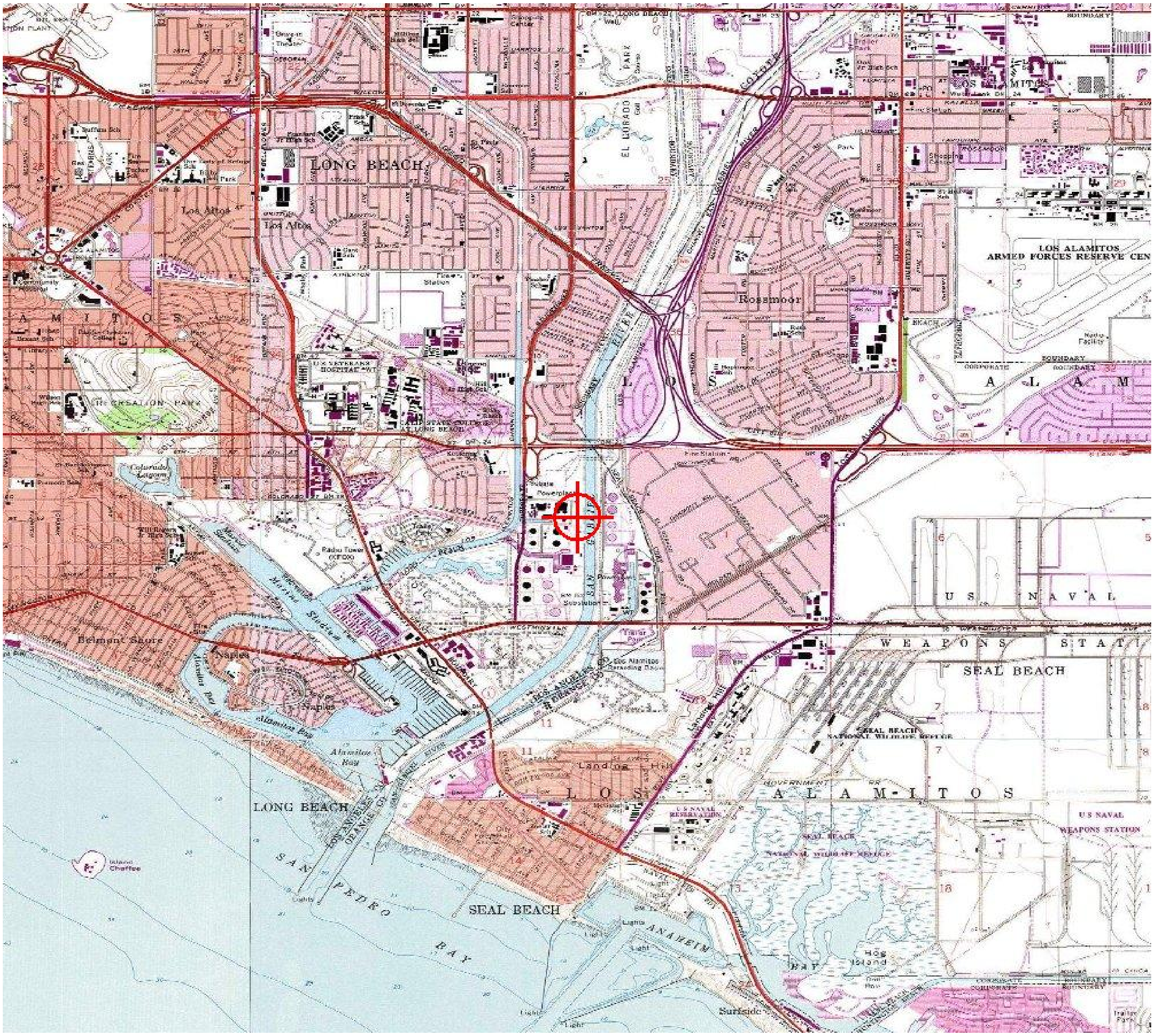
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10951-OE.

Signature Control No: 270628224-273429020 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10951-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10950-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Stack LMS02
Location:	Long Beach, CA
Latitude:	33-46-09.63N NAD 83
Longitude:	118-05-55.69W
Heights:	15 feet site elevation (SE)
	80 feet above ground level (AGL)
	95 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 05/23/2017 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
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A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

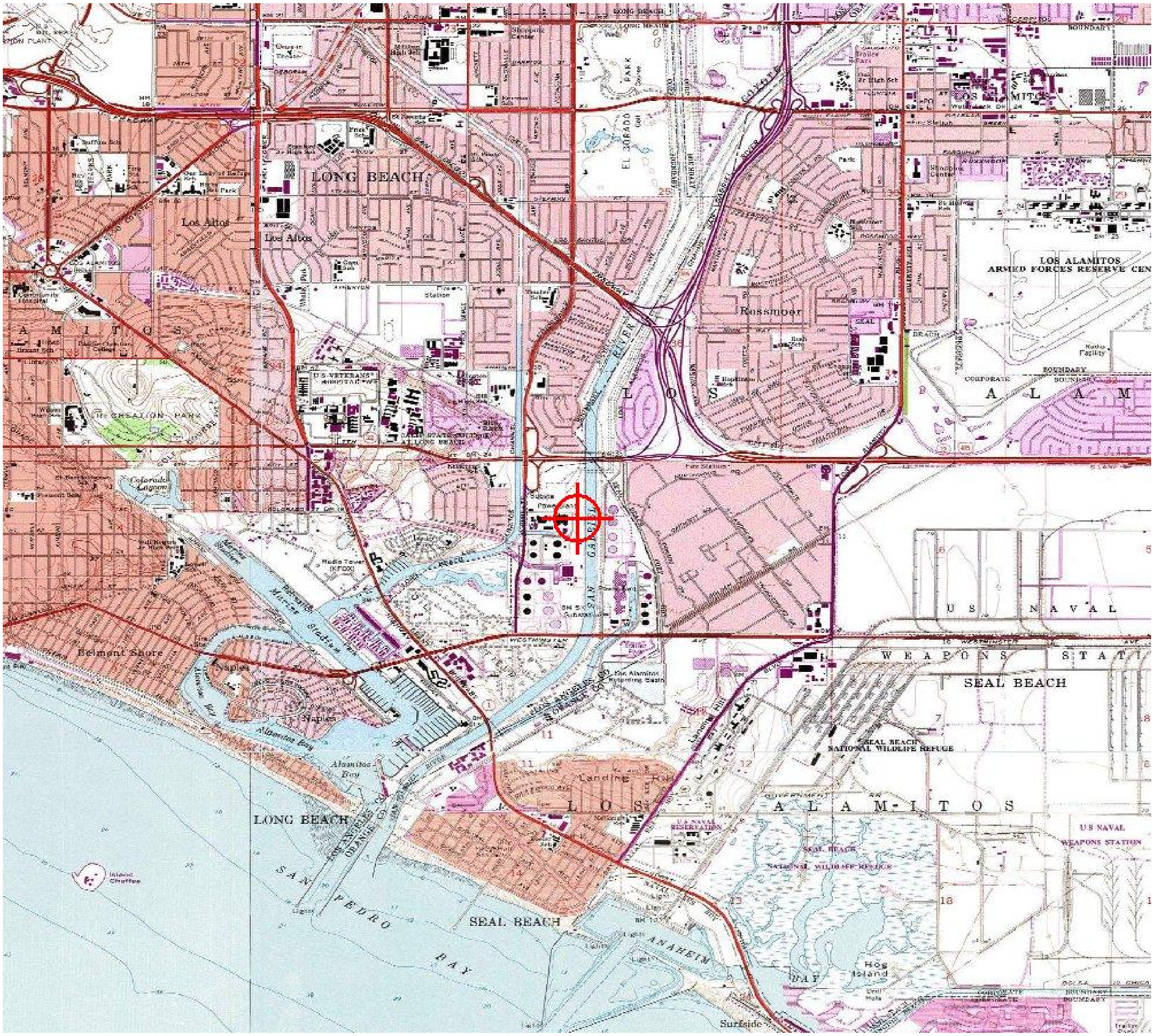
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10950-OE.

Signature Control No: 270628223-273429019 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10950-OE



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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10949-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Stack LMS01
Location:	Long Beach, CA
Latitude:	33-46-10.12N NAD 83
Longitude:	118-05-55.69W
Heights:	15 feet site elevation (SE)
	80 feet above ground level (AGL)
	95 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 05/23/2017 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
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NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

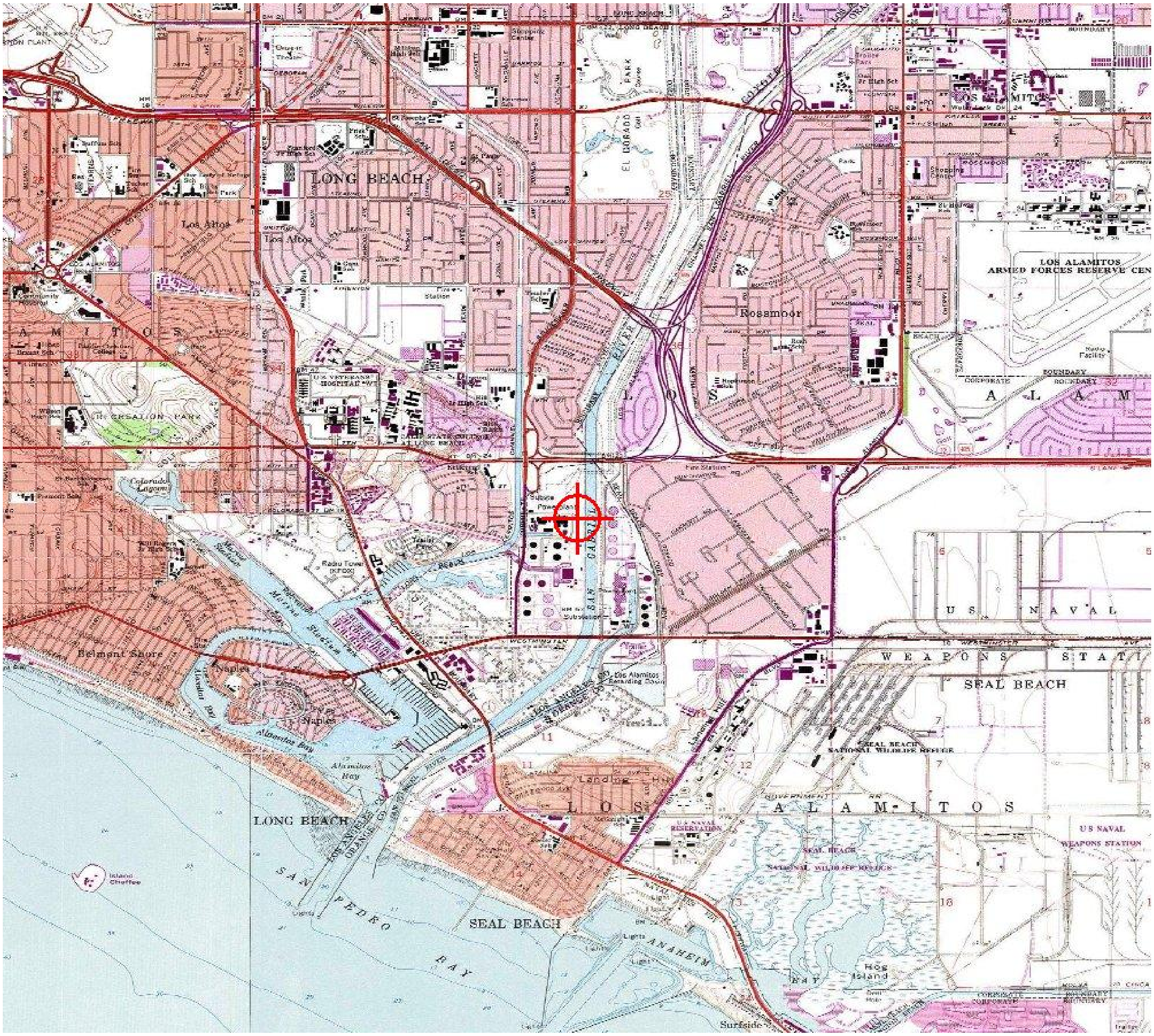
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10949-OE.

Signature Control No: 270628222-273429014 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10949-OE



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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10948-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Stack 7FA02
Location:	Long Beach, CA
Latitude:	33-46-01.97N NAD 83
Longitude:	118-06-03.15W
Heights:	15 feet site elevation (SE)
	140 feet above ground level (AGL)
	155 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 05/23/2017 unless:

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NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

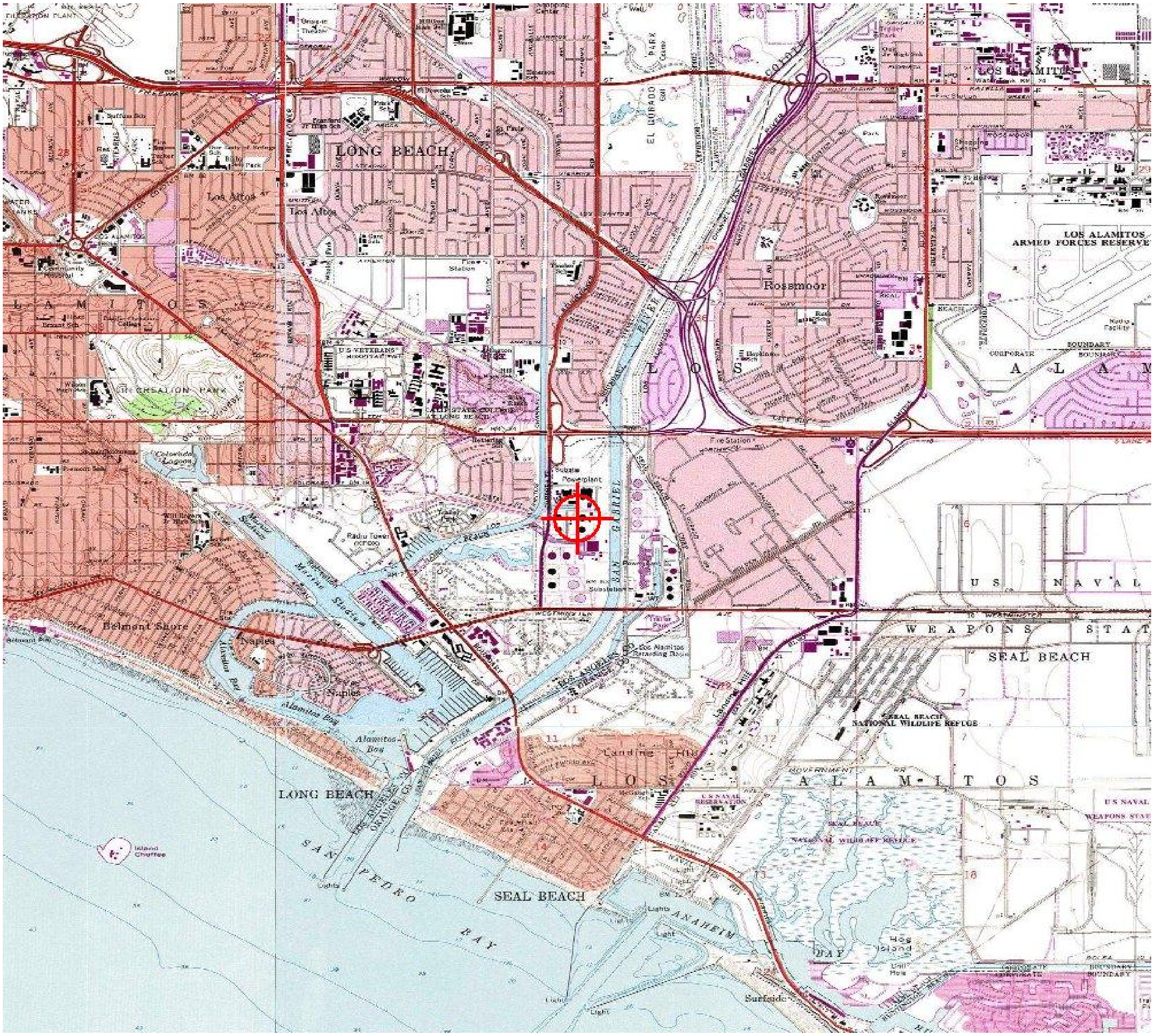
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10948-OE.

Signature Control No: 270628221-273429013 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10948-OE



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Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10947-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Stack 7FA01
Location:	Long Beach, CA
Latitude:	33-46-03.40N NAD 83
Longitude:	118-06-03.16W
Heights:	15 feet site elevation (SE)
	140 feet above ground level (AGL)
	155 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 05/23/2017 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

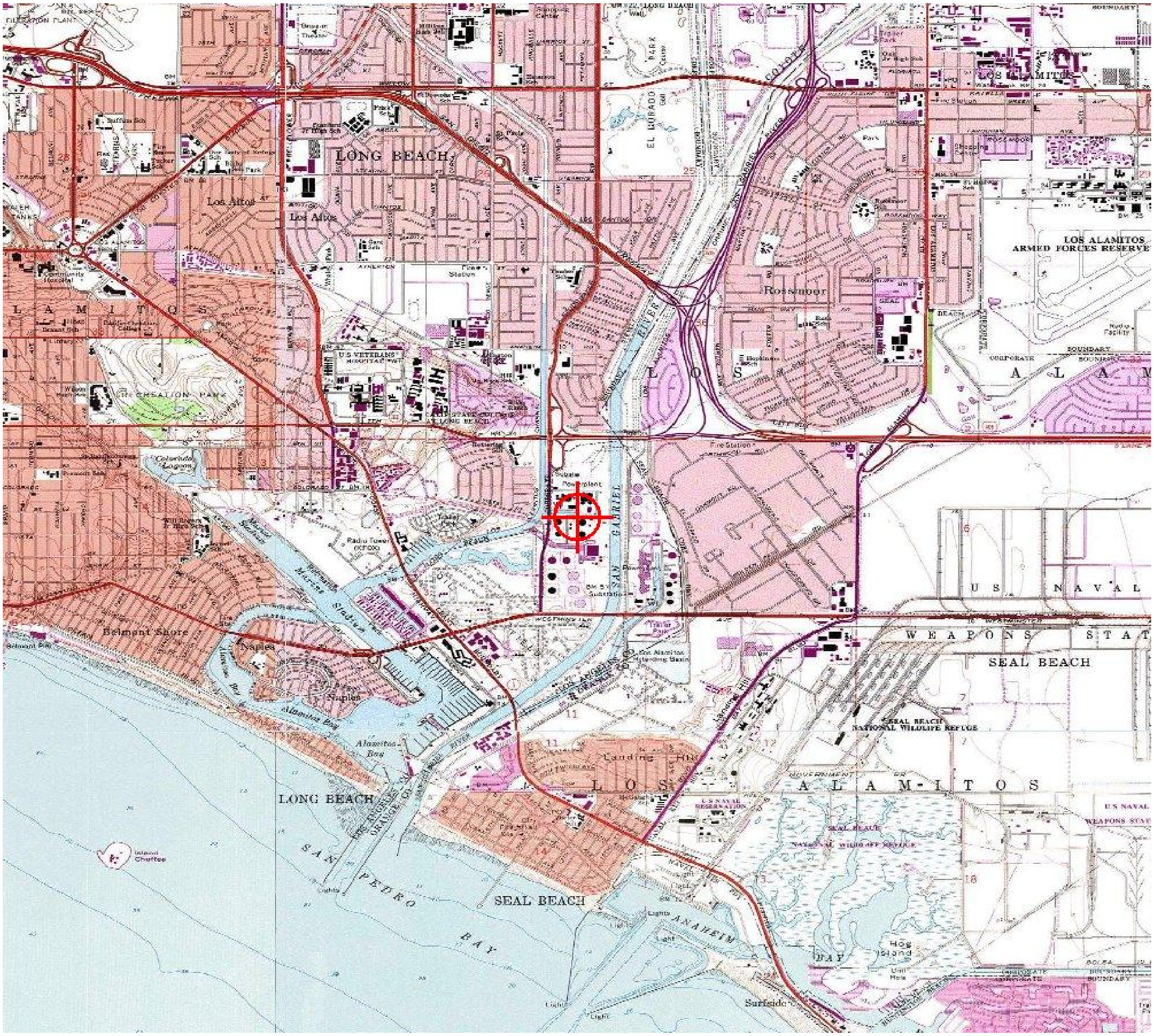
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10947-OE.

Signature Control No: 270628220-273429011 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10947-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10957-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Air Cooled Condenser SW Corner
Location:	Long Beach, CA
Latitude:	33-45-56.74N NAD 83
Longitude:	118-06-02.02W
Heights:	15 feet site elevation (SE)
	104 feet above ground level (AGL)
	119 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

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A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

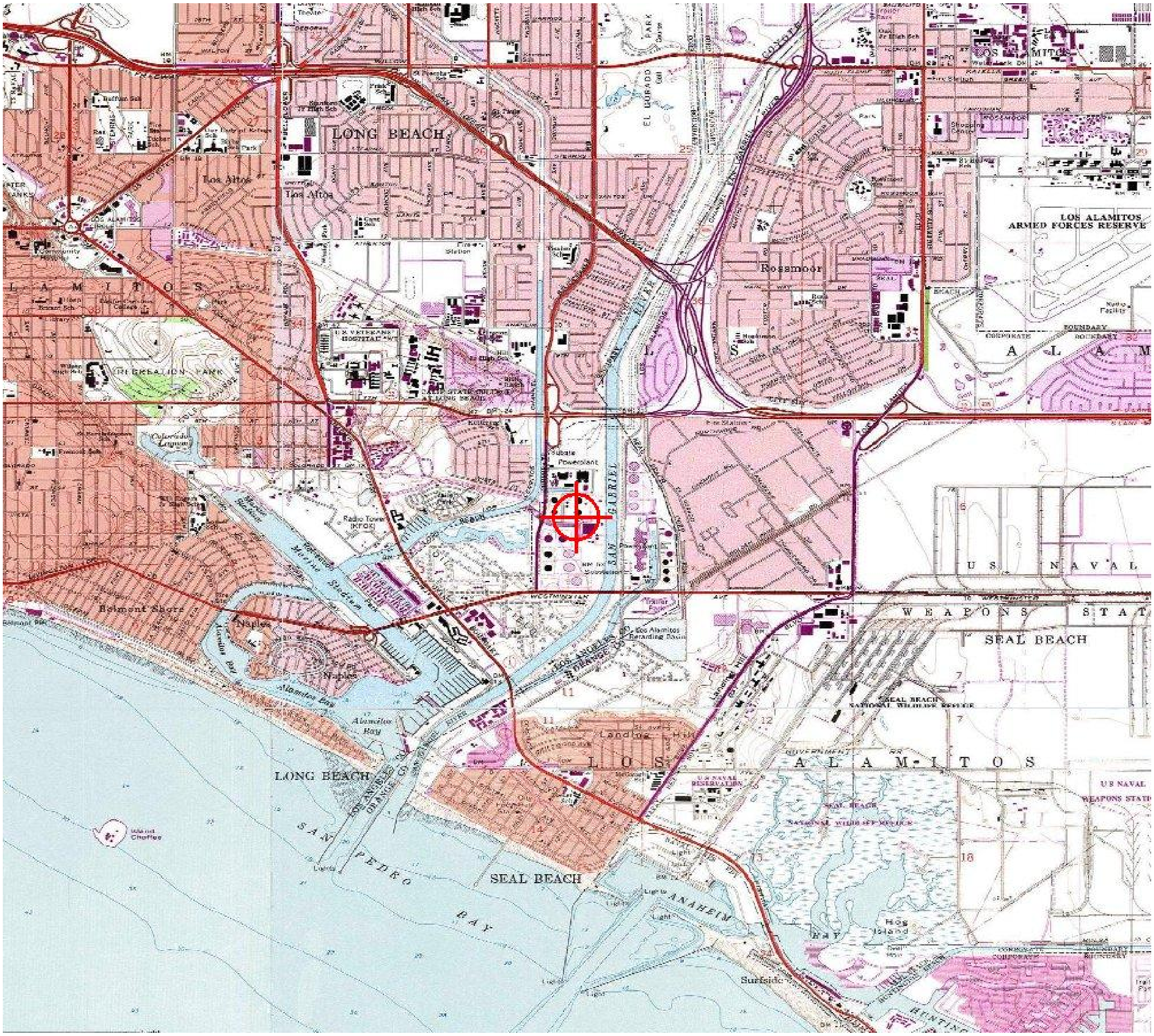
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10957-OE.

Signature Control No: 270628231-273429016 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10957-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10956-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Air Cooled Condenser SE Corner
Location:	Long Beach, CA
Latitude:	33-45-56.73N NAD 83
Longitude:	118-05-58.53W
Heights:	15 feet site elevation (SE)
	104 feet above ground level (AGL)
	119 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

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This determination expires on 05/23/2017 unless:

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A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

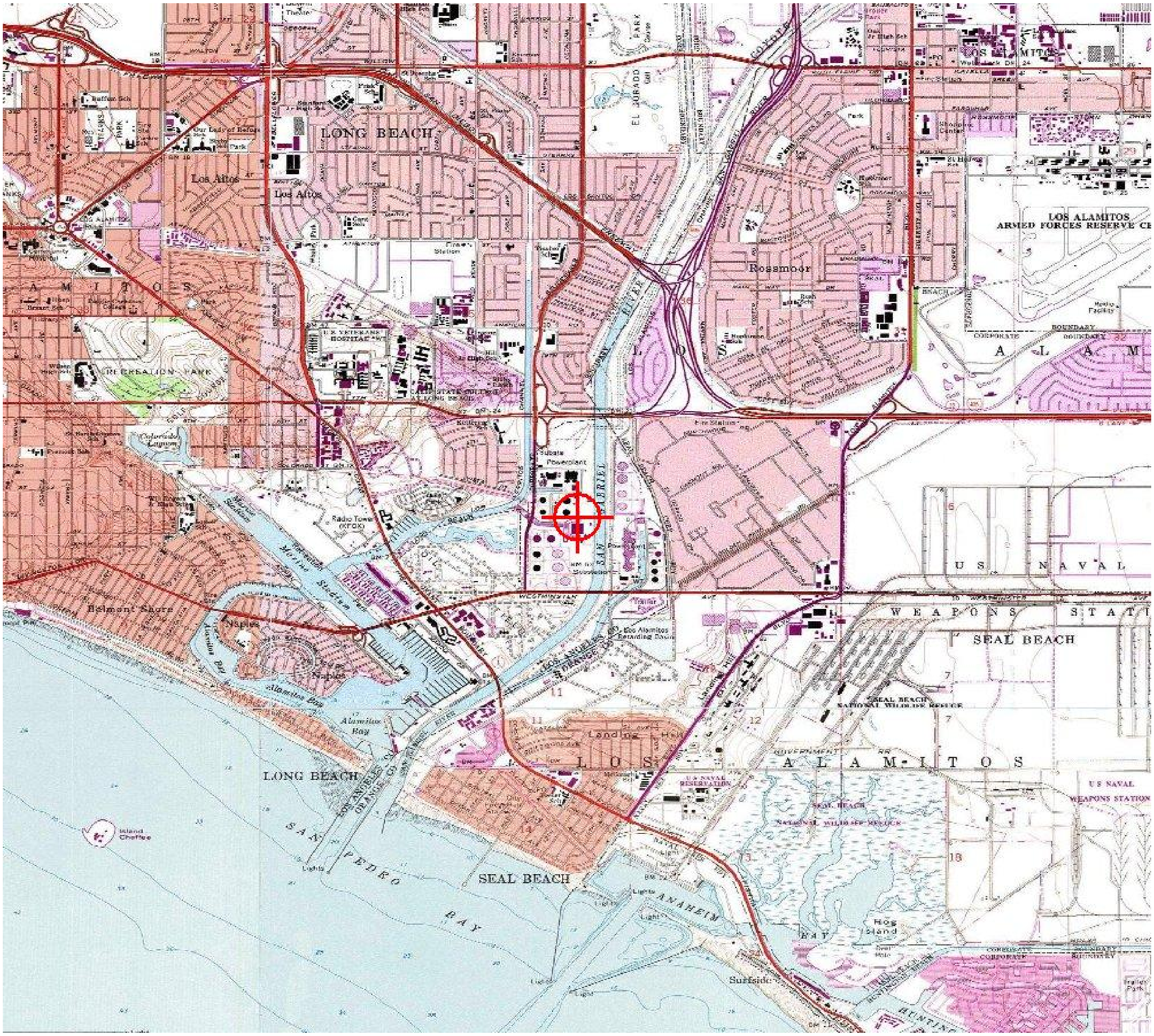
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10956-OE.

Signature Control No: 270628230-273429017 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10956-OE



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Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10955-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Air Cooled Condenser NW Corner
Location:	Long Beach, CA
Latitude:	33-45-58.78N NAD 83
Longitude:	118-06-02.01W
Heights:	15 feet site elevation (SE)
	104 feet above ground level (AGL)
	119 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

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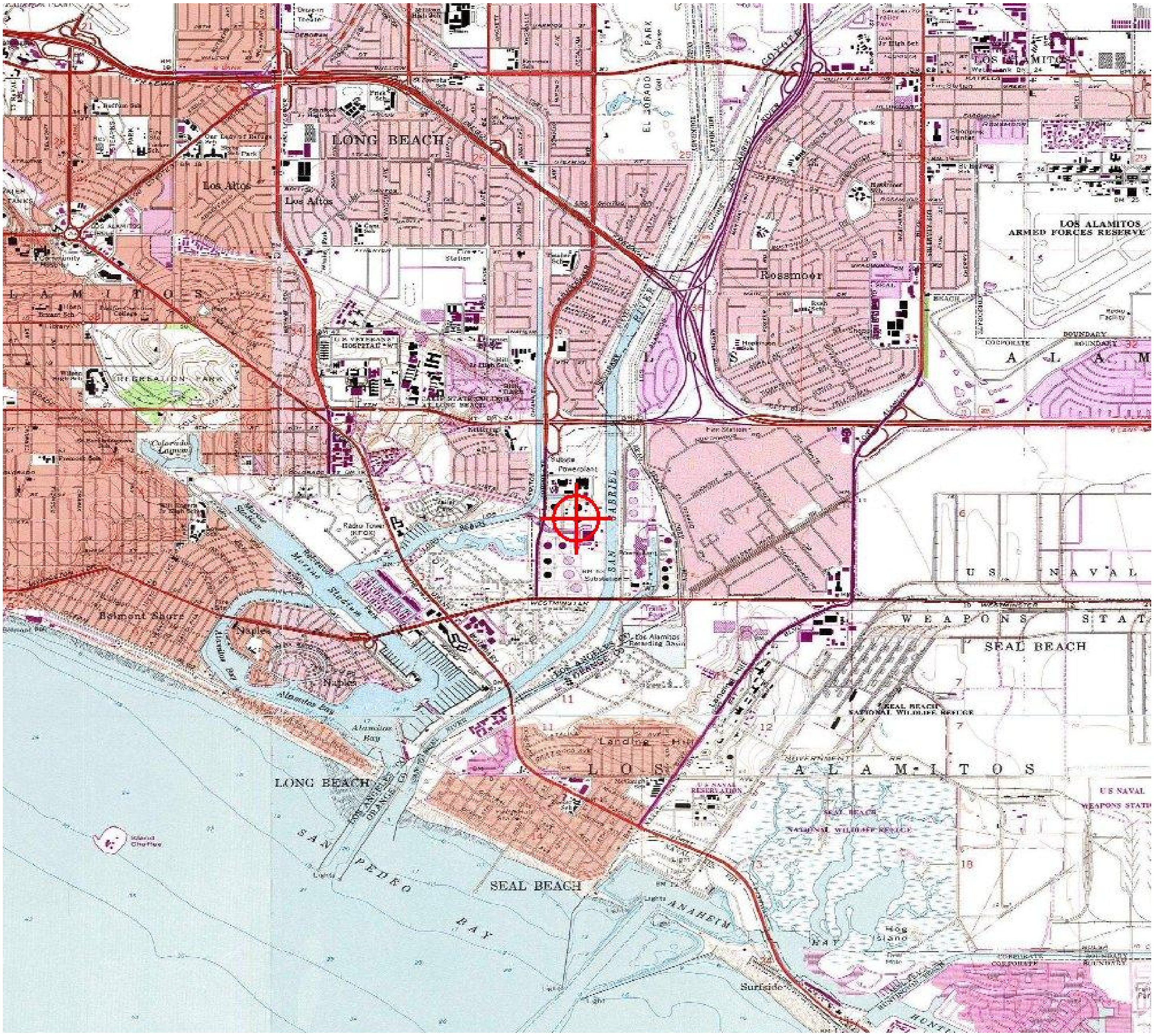
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10955-OE.

Signature Control No: 270628229-273429012 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10955-OE



Mail Processing Center
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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-AWP-10954-OE

Issued Date: 11/23/2015

Stephen O'Kane, Vice President
AES Southland Development, LLC
690 N. Studebaker Road
Long Beac, CA 90803

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Air Cooled Condenser NE Corner
Location:	Long Beach, CA
Latitude:	33-45-58.74N NAD 83
Longitude:	118-05-58.51W
Heights:	15 feet site elevation (SE)
	104 feet above ground level (AGL)
	119 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

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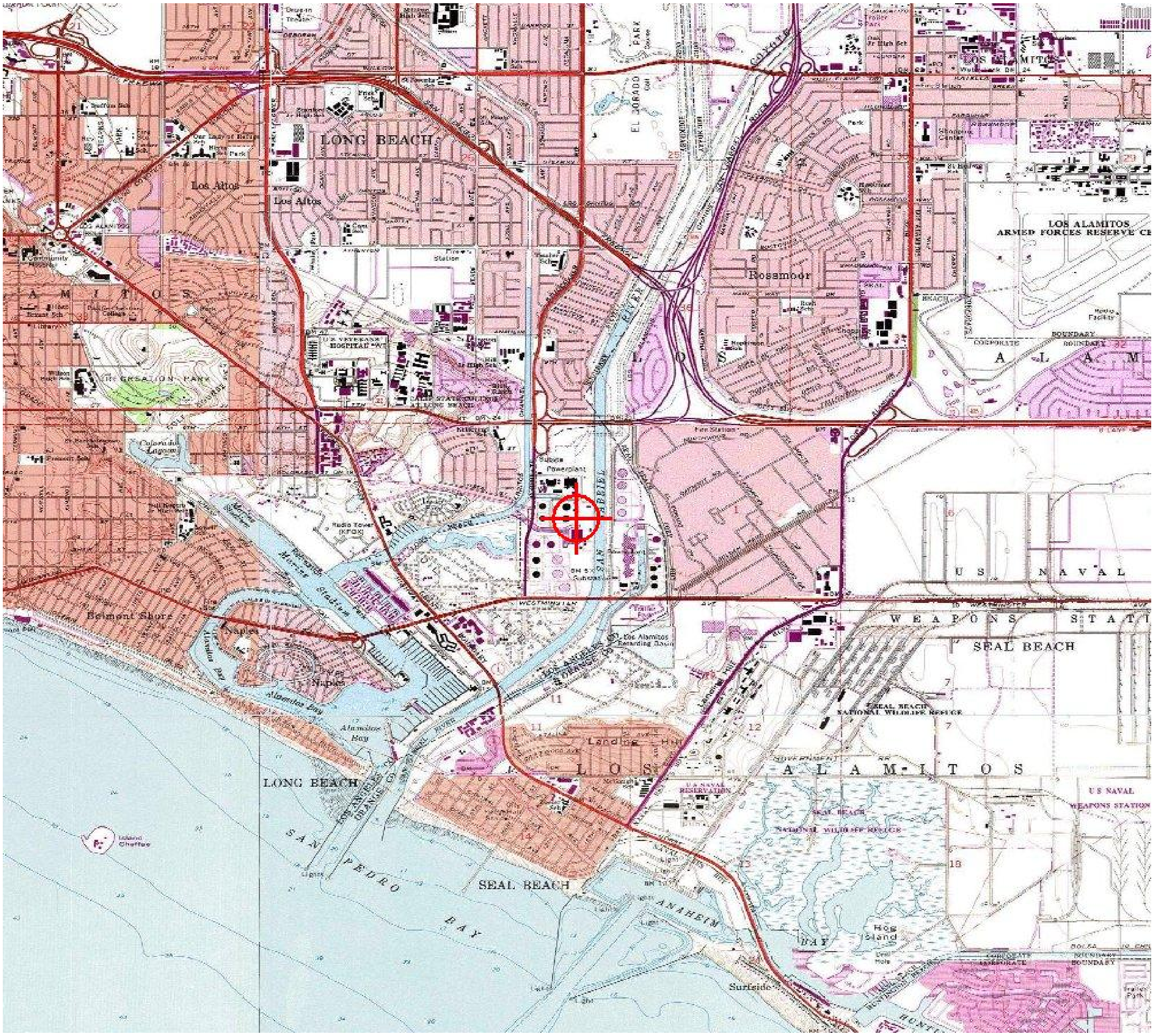
If we can be of further assistance, please contact our office at (310) 725-6557. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-AWP-10954-OE.

Signature Control No: 270628228-273429018 (DNE)
Karen McDonald
Specialist

Attachment(s)
Map(s)

cc: FCC

TOPO Map for ASN 2015-AWP-10954-OE



Transmission System Engineering (160-166)

Staff needs to determine the transmission system impacts of the project and to identify the interconnection facilities, including downstream facilities, needed to support the reliable interconnection of the proposed Alamitos Energy Center (AEC) in the Southern California Edison Company (SCE) System. The proposed interconnection facilities must comply with the utility (SCE) rules for new interconnection, California Public Utilities Commission (CPUC) General Order (GO) 95 and the CPUC GO 128. The interconnection must also comply with the SCE Reliability and Planning Criteria, North American Electric Reliability Corporation (NERC) Reliability Standards, Western Electricity Coordinating Council (WECC) Regional System Performance Criteria, and the California Independent System Operator (California ISO) Planning Standards for impacts in the California ISO system. In addition, the California Environmental Quality Act (CEQA) requires the identification and description of the "Direct and indirect significant effects of the project on the environment." For the compliance with planning and reliability standards and the identification of indirect or downstream transmission impacts, staff relies on the System Impact Study (SIS) and Facilities Study (FS) as well as review of these studies by the agencies responsible for insuring the interconnecting transmission grid meets reliability standards. The studies analyze the effect of the proposed project on the ability of the transmission network to meet reliability standards. When the studies determine that the project will cause the transmission system to violate reliability requirements, the potential mitigation or upgrades required to bring the system into compliance are identified. The mitigation measures often include modification and construction of downstream transmission facilities. The CEQA requires environmental analysis of any downstream facilities for potential indirect impacts of the proposed project.

BACKGROUND

The description of the AEC switchyard and interconnection facilities between the generators and the SCE Alamitos 230 kV switchyard, including the generators, major equipment and their ratings in the October, 2015 Supplemental Application, is incomplete (Section 3.1, Pages 3-1 to 3-2, Figures 3.1-1 & 3.1-2).

DATA REQUEST

160. Resubmit the Electrical System One-Line Diagram, Figure 3.1-1, and provide a complete and labeled electrical one-line diagram of the proposed AEC switchyard showing the generators with their respective nominal MW ratings, and all equipment for each generator's interconnection with the switchyard. The diagram should show:

a. Each Generator's nominal MW rating and voltage.

b. Any bus duct connectors or cables with ampere ratings from the 13.8 kV/16 kV breaker/switchgear to each new generator and to low side of each generator step-up transformer.

c. The percentage impedance of each generator step-up transformer at its base MVA rating.

d. The short overhead lines or conductors on the 230 kV side of each step-up transformer with their respective size, ampere rating, and configuration between each generator step-up transformer high side and each AEC switchyard 230 kV bus.

e. Provide ampere ratings of each AEC 230 kV switchyard bus with their configuration including generator tie lines and their respective ratings.

Response: Figure DR160-1 presents a revised electrical system one-line diagram of the proposed AEC switchyard.

161. Provide a legible physical layout drawing (plan view) of the pre and post-project AEC switchyard along with the SCE Alamitos center 230 kV switchyard showing fence lines, all major equipment, gen tie lines and transmission line outlet(s) with proper labeling.

Response: Figure DR161-1 presents a legible plan view of the pre- and post-project AEC switchyard along with the SCE Alamitos center 230 kilovolt (kV) switchyard showing fence lines, all major equipment, gen tie lines and transmission line outlet(s) with proper labeling.

162. Provide pre and post-project electrical one-line diagrams of the SCE Alamitos center 230 kV switchyard for interconnection of the two proposed 230 kV gen tie lines with their conductor size lengths and ampere ratings from the AEC switchyard. The diagrams should show all the breakers, buses, and disconnect switches with their configuration and their respective ratings.

Response: The pre-project electrical one-line diagrams were submitted as part of the original AFC and are included with Figure DR160-1, which provides the AEC gen tie lines with their conductor size lengths and ampere ratings from the AEC switchyard. The diagrams should show all the breakers, buses, and disconnect switches with their configuration and their respective ratings.

163. Refer to the Typical Transmission Tower Design Figure 3.1.2 and submit new, legible drawings of the transmission structures including dead- end and intermediate structures which will be used for construction of the two Gen Tie overhead lines.

Response: Figure 3.1-2R presents a legible drawing of the transmission structures, including dead-end and intermediate structures which will be used for construction of the two gen tie overhead lines.

BACKGROUND

Staff will not be able to complete Transmission System Reliability analysis and testimony without the California ISO System Impact study or in this case, the study related to California ISO tariff section 25.1.2 exemption.

DATA REQUEST

164. Provide a copy of the completed application for the California ISO 25.1.2 exemption.

Response: The Applicant recently met with CAISO regarding the 25.1.2 exemption and is preparing an exemption application for submittal in January 2016. The Applicant expects the CAISO and SCE to issue an exemption letter 90 days after the exemption application is submitted.

165. Provide regular updates on the expected submittal date of the completed California ISO study. This can be included as part of the monthly Status Reports.

Response: The Applicant will provide updates on the CAISO 25.1.2 exemption application in its monthly Status Reports.

166. Submit the completed study and final California ISO determination on the 25.2.1 exemption.

Response: The Applicant will docket the completed CAISO 25.2.1 exemption application when submitted to CAISO and SCE.

ELECTRIC POWER ENGINEERS, INC.
Registration # 3386
13001 Highway 71, Suite G100
Austin, TX 78738
Office: (512) 382-6700
Fax: (866) 379-3635
Email: contact@epeconsulting.com

This document is released for the purpose of preliminary design for generation interconnection under the authority of Hugo E. Mena, P.E. 110112 on 10/20/15. It is not to be used for construction and/or procurement process.

STATE OF TEXAS HUGO E. MENA 110112 LICENSED PROFESSIONAL ENGINEER

"The seal appearing on this document was authorized by Hugo E. Mena, P.E. 110112, on October 20, 2015."

DATE	REVISIONS
12/11/15	Update CC & LMS Block Ratings

ALAMITOS PROJECT
SIMPLIFIED ONE-LINE DIAGRAM
AES Southland

ELECTRIC POWER ENGINEERS, INC. AUSTIN, TEXAS

FIGURE DR160-1
Revised One-Line Diagram
Alamitos Energy Center
Long Beach, California
October 2015

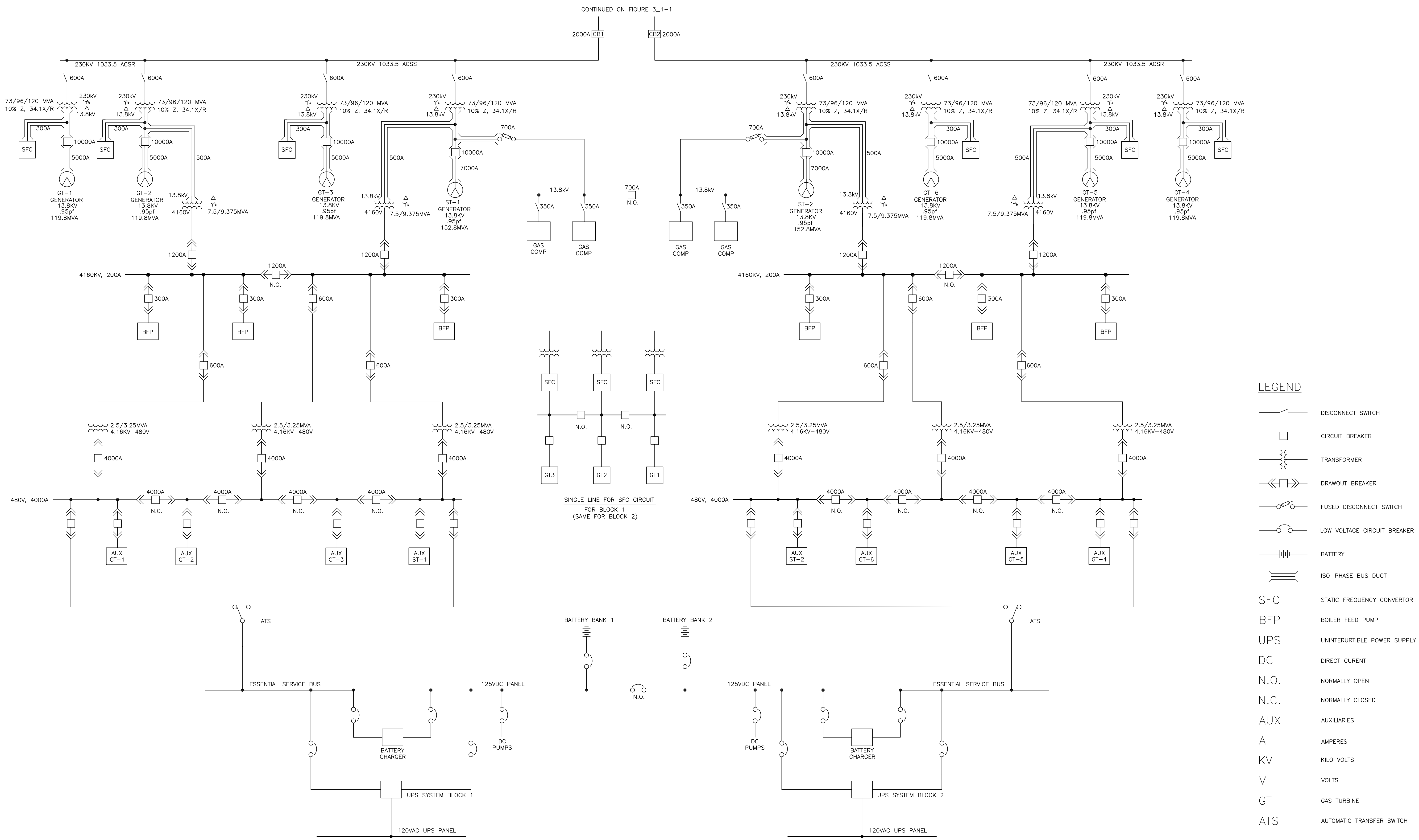
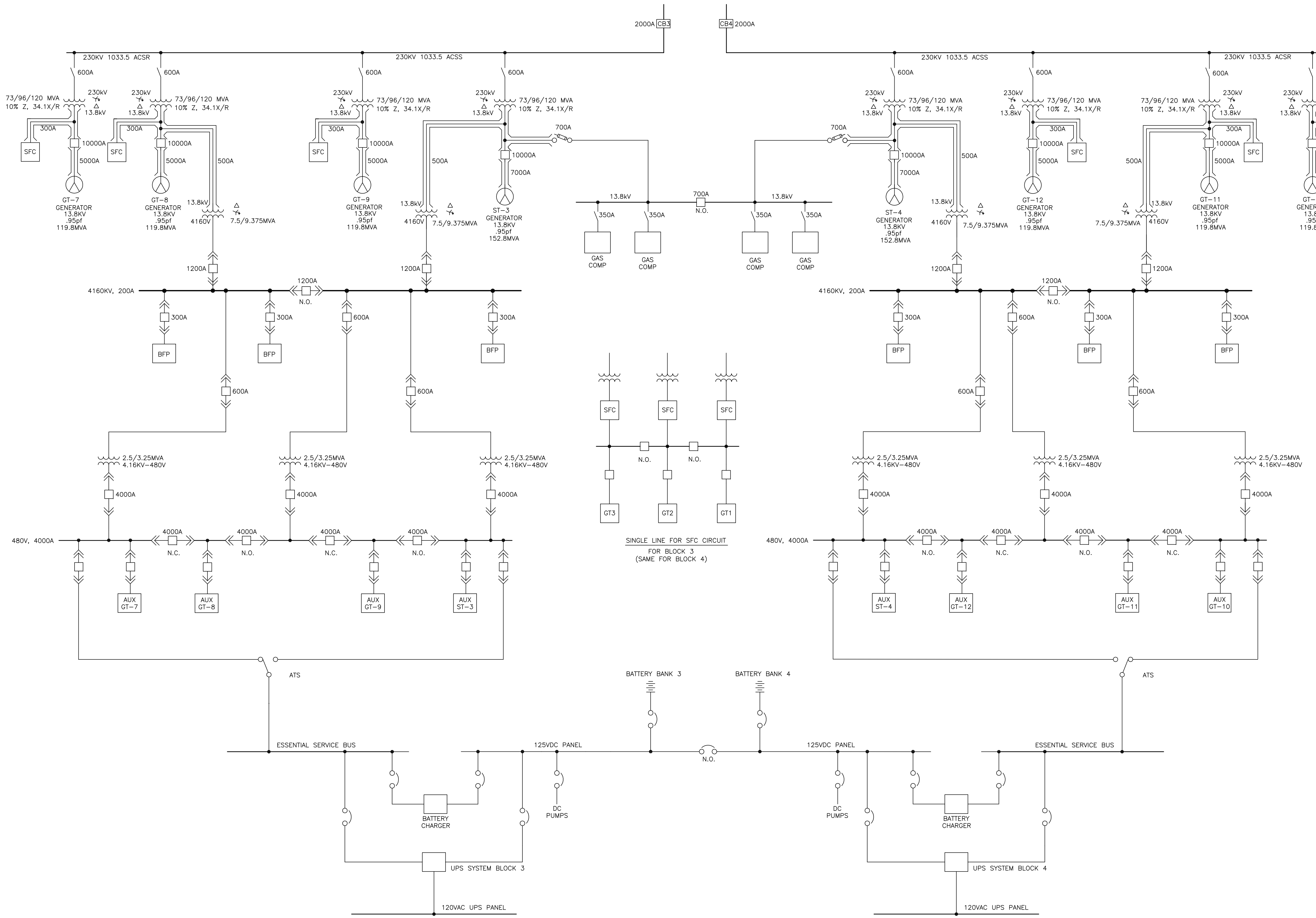


FIGURE 3.1-1a
System One Line Diagram - Power Island, Units 1 and 2
Alamitos Energy Center
Long Beach, California

Source: Power Engineers Collaborative, LLC., 3/18/2013.

CONTINUED ON FIGURE 3_1-1



LEGEND

	DISCONNECT SWITCH
	CIRCUIT BREAKER
	TRANSFORMER
	DRAWOUT BREAKER
	FUSED DISCONNECT SWITCH
	LOW VOLTAGE CIRCUIT BREAKER
	BATTERY
	ISO-PHASE BUS DUCT
SFC	STATIC FREQUENCY CONVERTOR
BFP	BOILER FEED PUMP
UPS	UNINTERURTIBLE POWER SUPPLY
DC	DIRECT CURENT
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
AUX	AUXILIARIES
A	AMPERES
KV	KILO VOLTS
V	VOLTS
GT	GAS TURBINE
ATS	AUTOMATIC TRANSFER SWITCH

FIGURE 3.1-1b
System One Line Diagram - Power Island, Units 3 and 4
Alamitos Energy Center
Long Beach, California

Source: Power Engineers Collaborative, LLC., 3/18/2013.

CH2MHILL.

NOT TO SCALE

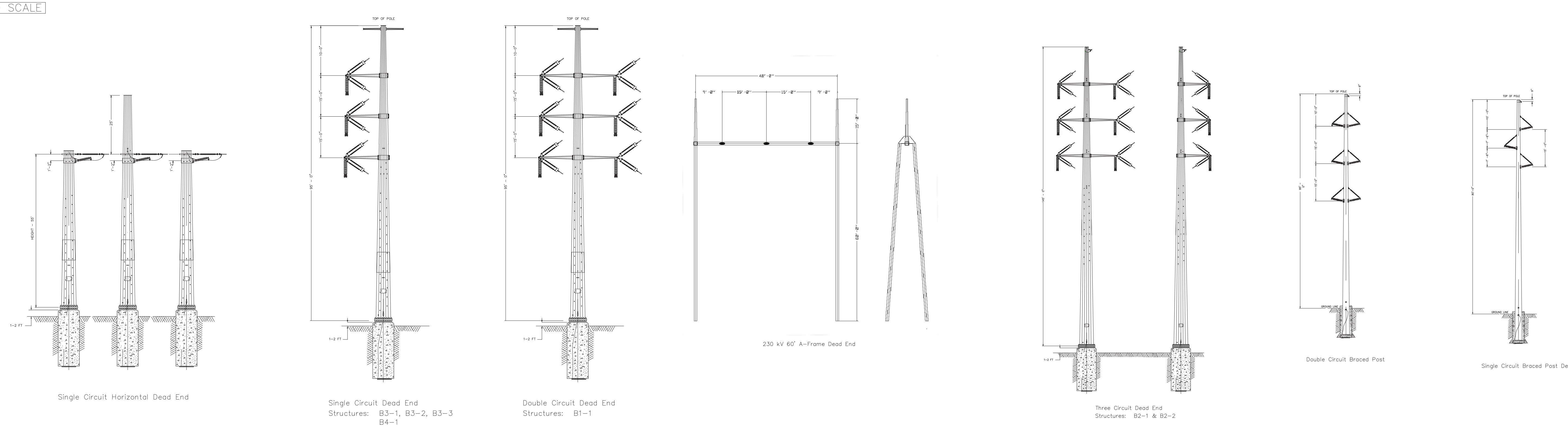


FIGURE 3.1-2R
Typical Transmission Tower Design
Alamitos Energy Center
Long Beach, California

Source: Electric Power Engineers, 10/15/2013.

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Worker Safety and Fire Protection (167-168)

BACKGROUND

Section 2.1.1.1 of the AFC states that the existing Alamitos Generating Station (AGS) electric fire pumps will be reused to serve both the new facility and existing Units 1-6. Because the AGS pumps will be reconfigured and will now serve a larger fire protection water system that includes the AGS (through the interim of construction) and AEC CCGT and SCGT, staff needs to know the specifications and current condition of the existing AGS electric fire pumps to understand if adequate reliability should be expected of the proposed reconfigured and combined fire protection system.

DATA REQUEST

167. Please provide a written narrative with the current age and condition of the existing electric pumps with an emphasis on their expected reliability, adequacy to support an added new fire suppression infrastructure that conforms to NFPA 850.

Response: The Applicant's existing AGS fire suppression systems comply with current National Fire Protection Association (NFPA) guidelines as the existing AGS represents a significant financial asset. As such, the existing fire suppression system is maintained to protect these assets. Attachment DR167-1 presents the specifications for the existing AGS fire suppression pumps. These pumps, originally installed when AGS Units 1 and 2 were constructed, are sufficient to cover the entire AGS site, including the former fuel storage tanks located where the combined-cycle power block will be located.

The primary source of fire protection water will be supplied via a connection to the existing water distribution system. A new 8-inch onsite fire water loop and hydrants will be constructed around each of the new power blocks and tied into existing onsite firewater hydrant lines. No new offsite linears will be needed for fire protection. The secondary source of fire protection water will be supplied from a new, 600,000-gallon onsite fire/service water storage tank, which will be operated in accordance with NFPA guidelines to provide 2 hours of protection for the onsite worst-case single fire.

Two existing electric fire pumps, connected to two independent power feeds from SCE distribution system, will be provided to pump water from the onsite storage tank. Fire protection water from the existing water supply connection and service water storage tank will be provided to a dedicated underground fire loop piping system. Fixed fire-suppression systems will be installed at determined fire risk areas. Sprinkler systems also will be installed in the administration and maintenance buildings as required by NFPA and local code requirements. The combustion turbine generating units will be protected by a carbon dioxide fire protection system. Hand-held fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility.

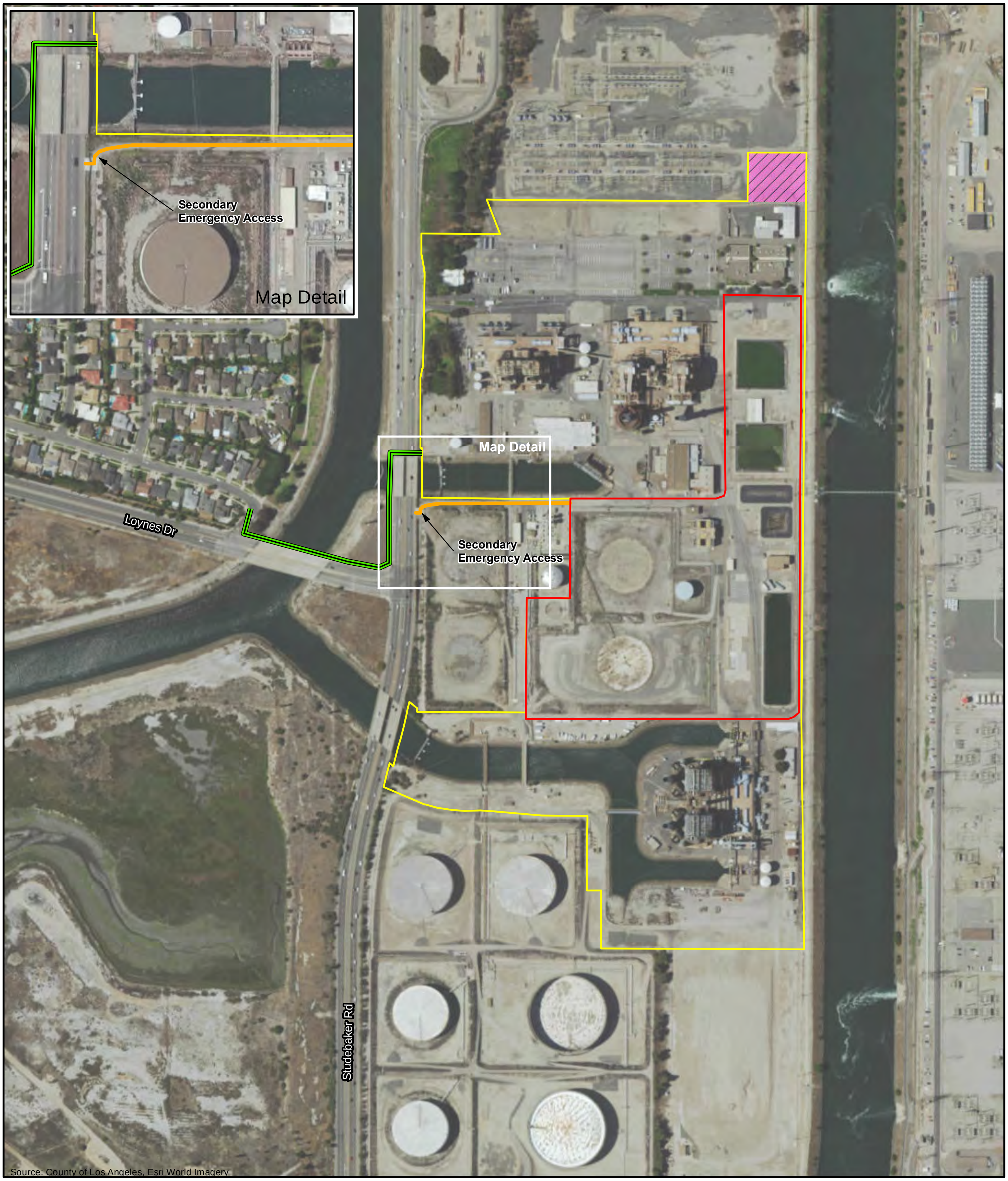
BACKGROUND

Except for the construction access road shown in Figure 2.1-1, the AFC does not address whether there will be a permanent secondary emergency access road to the site for possible use by emergency response services.

DATA REQUEST

168. Please clarify if a permanent secondary access road will be provided to the AEC site.

Response: A current emergency secondary access road exists off of Studebaker Road, just south of the northern intake water canal (see Figure DR168-1). This emergency access road has a locked gate and concrete aprons on the Studebaker Road and AGS project site. This secondary access road will be widened and upgraded for the AEC project.



Legend

- AGS Boundary
- AEC Site
- Natural Gas Metering Station
- Proposed New Process/ Sanitary Wastewater Pipeline to First Point of Interconnection
- Secondary Emergency Access Road

0 250 500 Feet

N

FIGURE DR168-1
AEC Data Response Set #6
Alamitos Energy Center
Long Beach, California
December 2015

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Attachment DR167-1
AGS Fire Suppression Pumps Specifications

ALAMITOS STEAM STATION
UNITS 1 & 2

FIRE PUMP

Manufacturer & Quantity	Peerless Pump	(2)
Specification No.		BA150
Purchase Order No.		BA150

GENERAL

Type	Horizontal, centrifugal, single stage, double suction
Model	5SAF-10

PERFORMANCE

Capacity, GPM	1000
Total dynamic head, ft.	277
psi	120
Efficiency %	76.4
Brake HP @ Rating	91
Liquid Handled	City Water
Temp. of Liquid, °F Average	70
Max. Suction pressure of liquid on pump, ft.	46
psia	34.7
Pump, RPM	1760
Coupling	Thomas Flexible
Connections Suction, in.	8X6 Eccentric Suction Reducer
Discharge, in.	5
Flange Ratings, lb.	125

MATERIALS

Case: Inner	---
Outer	Cast Iron
Impeller Wear Rings	Bronze
Case Wear Rings	Bronze
Shaft	1040 Steel
Shaft Sleeves	Bronze
Impeller	Bronze
Packing	Garlock-730
Lantern Ring	Bronze
Throat Bushing	---
Casing Gasket	Vellumoid
Casing Studs	1040 Steel
Gland Bolts	Bronze
Base Plate	Cast Iron
Glands	Cast Iron

Fire Pump - continued

Materials (continued)

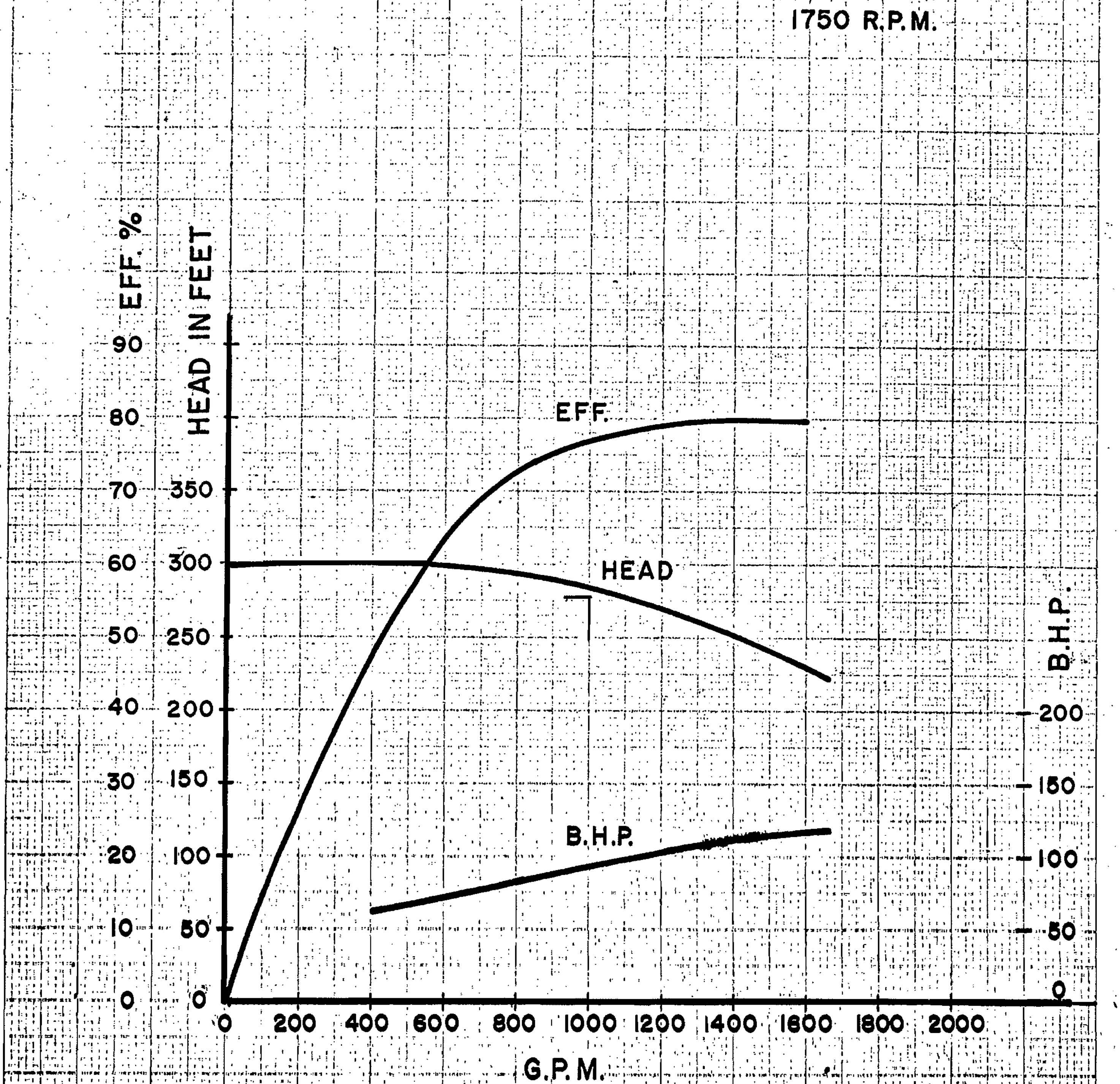
Shaft Sleeves	Bronze
Impeller	Bronze
Packing	Garlock-730
Lantern Ring	Bronze
Throat Bushing	---
Casing Gasket	Vellumoid
Casing Studs	1040 Steel
Gland Bolts	Bronze
Base Plate	Cast Iron
Glands	Cast Iron

MOTOR DATA

Manufacturer	U.S. Motors
HP	125
RPM	1800
Enclosure	Splash Proof
Insulation	Special Class A Moisture Resistant
Voltage	440
Phase	3
Frequency, Cycles	60
Auxiliaries	0.4KW. Space Heater

REFERENCE DRAWINGS

Drawing No.	Title	Bechtel Foreign Print No.
2763886	Pump No. 114,127128	2300 BA150-1-1
A175-1086	Hose Valve Heads For Outside Mounting	2300 BA150-2-0
A150-15929	Eccentric Suction Reducer	2300 BA150-3-0
2858691	Air Release & Casing Relief Valve Mounting	2300 BA150-4-0
P581730	Splashproof Motor With Short Shaft & Space Heaters for 440V Operation for Fire Pump Duty With 3" Conduit Opening	
2863760	Size of Pump 5AF-10	
Instr. Book	Instr. for Installation & Operation of Peerless Centrifugal Pumps	
2864762	Performance Information	
2863755	Size of Pump 5AF10	



PERFORMANCE CURVE

FIRE PUMP
PEERLESS PUMP DIVISION
OF
FOOD MACHINERY AND CHEMICAL CORP.

EL SEGUNDO UNITS 1&2 TYPE 5AF-10 ALAMITOS UNITS 1&2