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Appendix 5.11A
Soil Loss Estimates

Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)

Alamitos Energy Center

			Estimates Using Revised Universal Soil Loss Equation*		
Feature (acreage)	**Activity**	**Duration (months)**	**Soil Loss (tons) without BMPs**	**Soil Loss (tons) with BMPs**	**Soil Loss (tons/yr) No Project**
AGS Demolition (17.2 acres total)	Demolition				
	Units 1 & 2	*24*	*0.89*	*0.03*	*0.003*
	Units 3 & 4	*24*	*1.9*	*0.05*	*0.006*
	Units 5 & 6	*24*	*1.7*	*0.05*	*0.005*
	Unit 7	*8*	*0.36*	*0.01*	*0.003*
	TOTAL Demolition	80	4.9	0.14	0.017
AEC Construction (24.1 acres total)	Grading (all areas)	6	20.5	0.14	0.118
	Construction				
	Power Blocks 1 & 2	*33*	*14.4*	*0.41*	*0.063*
	Power Block 3	*30*	*5.3*	*0.15*	*0.026*
	Power Block 4	*30*	*5.9*	*0.17*	*0.029*
	TOTAL Construction	93	25.7	0.73	0.118
Off-site Sewer Line (8.0 acres for construction; 0.46 acres for trench)	Grading	2	0.13	0.02	0.002
	Construction	4	1.08	0.03	---
Project Soil Loss Estimates	**All activities listed above**	**139**	**52.2**	**1.05**	**0.26**

Notes:

*Soil losses (tons/acre/year) are estimated using RUSLE2 software available online [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm].

- The soil characteristics were estimated using the Hanford sandy loam profile, which had a less conservative estimate of erosion-potential than Sorrento loam
- Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the nearest National Weather Service station to the AEC site [online at http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca].
- Estimates of actual soil losses use the RUSLE2 soil loss times the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.

Other Project Assumptions as follows:

- Of the entire 62.3-acre property, only the AGS Demolition and AEC Construction sites will be graded (approximately 24.1 acres total, as these areas overlap).
- Assumes only 50 percent of the AEC site is exposed during construction and only 20 percent of AGS is exposed during demolition.
- The AGS demolition will occur in phases, and will take a total of 80 months to complete. The soil loss estimate only includes the demolition of the structures to their foun
- The onsite laydown areas are currently paved, and will remain so for the duration of the project, so soil losses are considered to be negligible.

RUSLE2 Assumptions as follows:

100-ft slope length. Estimated soil unit slope is the midpoint of the minimum and maximum of the unit slope class.

Construction/Demolition soil losses assume the following inputs: Management - Bare ground; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Grading soil losses assume the following inputs: Management - Bare ground/rough surface; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Construction with BMP soil losses assume the following inputs: Management - Silt fence; Contouring - Perfect contouring, no row grade; Diversion/terracing - None; Strips and Barriers - 2 fences, 1 at end of RUSLE slope.

No Project soil losses assume the following inputs: Management - Dense grass, not harvested; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Soil Loss Estimates Using RUSLE2 software (tons/ac/year)

Alamitos Energy Center

Soil Type	Acreage	Slope	Grading	Construction w/o BMPs	Construction with BMPs	No Project
Demolition Areas (s1026)						
Units 1 & 2	2.7	0.5	1.7	0.81	0.023	0.0049
			None	*0.44*	*0.013*	*0.0027*
Units 3 & 4	5.9	0.5	1.7	0.81	0.023	0.0049
			None	*0.95*	*0.027*	*0.0058*
Units 5 & 6	5.3	0.5	1.7	0.81	0.023	0.0049
			None	*0.85*	*0.024*	*0.0051*
Unit 7	3.3	0.5	1.7	0.81	0.023	0.0049
			None	*0.54*	*0.015*	*0.0033*
Demolition Subtotal	**17.2**		**None**	**2.8**	**0.079**	**0.017**
Construction Areas (s1026)						
Power Blocks 1 & 2	13.0	0.5	1.7	0.81	0.023	0.0049
			22.0	*5.25*	*0.15*	*0.0635*
Power Block 3	5.3	0.5	1.7	0.81	0.023	0.0049
			8.9	*2.13*	*0.060*	*0.0257*
Power Block 4	5.9	0.5	1.7	0.81	0.023	0.0049
			10.0	*2.38*	*0.068*	*0.0288*
Construction Subtotal	**24.1**		**40.9**	**9.8**	**0.277**	**0.118**
Off-site Sewer Line (s1026)	0.46	0.5	1.7	0.8	0.023	0.0049
Sewer Line Subtotal			**0.8**	**3.2**	**0.092**	**0.0022**
TOTAL			**41.7**	**15.8**	**0.448**	**0.137**

Assumptions:

Assumes a 0.5 percent slope overall

Laydown areas are currently paved and will remain that way during demolition and construction.

Of the entire 62.3-acre property, only the demo and construction areas will be graded (24.1 acres total)

The AEC demolition will take 80 months, and will occur in stages. The soil loss estimate only includes the demolition of the structures to their foundations.

Assumes the soil is 20% exposed during demolition, and 50% exposed during construction.

The RUSLE 2 values for Hanford sandy loam were used in this estimation (less conservative than those for Sorrento)

RUSLE2 Assumptions as follows:

100-ft slope length. Estimated soil unit slope is the midpoint of the minimum and maximum of the unit slope class.

Construction and Demolition soil losses assume the following inputs: Management - Bare ground; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Grading soil losses assume the following inputs: Management - Bare ground/rough surface; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Construction with BMP soil losses assume the following inputs: Management - Silt fence; Contouring - Perfect contouring, no row grade; Diversion/terracing - None; Strips and Barriers - 2 fences, 1 at end of RUSLE slope.

No Project soil losses assume the following inputs: Management - Dense grass, not harvested; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Dust from Wind Erosion - With and Without Mitigation
Alamitos Energy Center

Grading		
PM10 Emission Factor (ton/acre/month)[a]	0.11	PM10 emission factor from URBEMIS2007 per email on 5/31/12 from Elyse Engel/SJC. MRI factor of 0.011 tons/acre/month is based on 168 hours per month of construction activity.
AGS Demolition		
Duration (months):	0.0	Assumes no grading as part of demolition
Site Acreage:	3.44	Assumes no more than 20% of total area is exposed at any time
PM10 Emitted (tons):	0.000	
TSP Emitted (tons)[b]:	**0.000**	Assume TSP is 50% PM10 as per 5/31/12 email from Elyse Engel/SJC. Source: SCAQMD CEQA Handbook (1993) Table A9-9-E, Factor J
Mitigated TSP Emitted (tons):	**0.000**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
AES Construction		
Duration (months):	6	Assumes 6 months of active grading in the project site area.
Site Acreage:	12.04	Assumes no more than 50% of total area is exposed at any time
PM10 Emitted (tons):	7.95	
TSP Emitted (tons)[b]:	**15.896**	Assume TSP is 50% PM10 as per 5/31/12 email from Elyse Engel/SJC. Source: SCAQMD CEQA Handbook (1993) Table A9-9-E, Factor J
Mitigated TSP Emitted (tons):	**5.564**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Off-site Sewer Line Trench		
Duration (months):	2	Assumes 2 months to grade
Site Acreage:	0.46	Assumes 100% of trench is uncovered during construction
PM10 Emitted (tons):	0.10	
TSP Emitted (tons)[b]:	**0.201**	Assume TSP is 50% PM10 as per 5/31/12 email from Elyse Engel/SJC. Source: SCAQMD CEQA Handbook (1993) Table A9-9-E, Factor J
Mitigated TSP Emitted (tons):	**0.070**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Total Unmitigated TSP Emitted (tons):	**16.097**	
Total Mitigated TSP Emitted (tons):	**5.634**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

[a]Emission Factor Source: Jones and Stokes Associates, 2007. URBEMIS2007, available at http://www.urbemis.com/software/download.html.

[b] Conversion Factor Source: Southern California Air Quality Management District (SCAQMD). 1993. CEQA Guidelines, Estimating Emissions from Wind Erosion of Storage Piles (Table A9-9-E)

[c] Emission Control Efficiency Source: SCAQMD. 1993 CEQA Guidelines (Table 11-4)

Wind Blown Dust		
TSP Emission Factor (ton/acre/year)	0.38	Emission Factor Source: AP-42, Section 11.9 Western Surface Coal Mining Table 11.9-4, January 1995.
AGS Demolition - Units 1 & 2		
Duration (months)	24	Assumes 24 months of demolition (Q3 2025-Q3 2027)
Acres exposed	0.55	Assumes no more than 20 percent of the site is exposed during the 24 month demolition period
TSP Emitted for Site (tons):	**0.417**	
Mitigated TSP Emitted (tons):	**0.146**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
AGS Demolition - Units 3 & 4		
Duration (months)	24	Assumes 24 months of demolition (Q1 2022-Q4 2023)
Acres exposed	1.18	Assumes no more than 20 percent of the site is exposed during the 24 month demolition period
TSP Emitted for Site (tons):	**0.893**	
Mitigated TSP Emitted (tons):	**0.313**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
AGS Demolition - Units 5 & 6		
Duration (months)	24	Assumes 24 months of demolition (Q4 2018-Q3 2020)
Acres exposed	1.05	Assumes no more than 20 percent of the site is exposed during the 24 month demolition period
TSP Emitted for Site (tons):	**0.798**	
Mitigated TSP Emitted (tons):	**0.279**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
AGS Demolition - Unit 7		
Duration (months)	8	Assumes 8 months of demolition (Q1 2016-Q3 2016)
Acres exposed	0.67	Assumes no more than 20 percent of the site is exposed during the 8 month demolition period
TSP Emitted for Site (tons):	**0.169**	
Mitigated TSP Emitted (tons):	**0.059**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
AES Construction - Power Blocks 1 & 2		
Duration (months)	33	Assumes 33 months of construction (Q3 2016-Q2 2019)
Acres exposed	6.48	Assumes no more than 50 percent of the site is exposed during the 33 month construction period
TSP Emitted for Site (tons):	**6.769**	
Mitigated TSP Emitted (tons):	**2.369**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
AES Construction - Power Block 3		
Duration (months)	30	Assumes 30 months of construction (Q1 2020-Q3 2022)
Acres exposed	2.63	Assumes no more than 50 percent of the site is exposed during the 30 month construction period
TSP Emitted for Site (tons):	**2.495**	
Mitigated TSP Emitted (tons):	**0.873**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
AES Construction - Power Block 4		
Duration (months)	30	Assumes 30 months of construction (Q2 2023-Q4 2025)
Acres exposed	2.94	Assumes no more than 50 percent of the site is exposed during the 30 month construction period
TSP Emitted for Site (tons):	**2.791**	
Mitigated TSP Emitted (tons):	**0.977**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Off-site Sewer Line Construction Corridor		
Duration (months):	4	Assumes 4 months of construction after grading
Site Acreage:	4.00	Assumes up to 50% of the construction corridor is exposed during the construction period
TSP Emitted (tons)[b]:	**0.507**	
Mitigated TSP Emitted (tons):	**0.177**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Total (tons) without mitigation	**14.841**	
Total (tons) with mitigation	**5.194**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Estimate of Total Suspended Particulates (TSP) Emitted from Grading and Wind Erosion

Alamitos Energy Center

Emission Source	Acreage	Duration (months)	Unmitigated TSP (tons)	Mitigated TSP (tons)
Grading Dust:				
AGS Demolition	3.4	0	0.00	0.00
AES Construction	12.0	6	15.90	5.56
Off-site Sewer Line	0.5	2	0.20	0.07
Wind Blown Dust:				
AGS Demolition	3.4	80	2.28	0.80
AES Construction	12.0	93	12.06	4.22
Off-site Sewer Line	4.0	4	0.51	0.18
Estimated Total			**30.94**	**10.83**

Notes:

Wind blown dust estimates are based on assumption of 50 percent exposed soils during construction, and 20 percent exposed soils for demolition.

Project Assumptions:

'- Of the entire 62.3-acre property, only the AGS Demolition and AEC Construction sites will be graded (approximately 24.1 acres total, as these areas overlap).

- Assumes only 50 percent of the AEC site is exposed during construction and only 20 percent of AGS is exposed during demolition.

'- The AGS demolition will occur in phases, and will take a total of 80 months to complete. The soil loss estimate only includes the demolition of the structures to t

'- The onsite laydown areas are currently paved, and will remain so for the duration of the project, so soil losses are considered to be negligible.

Data Sources:

[a]Emission Factor Source: Jones and Stokes Associates, 2007. URBEMIS2007, available at http://www.urbemis.com/software/download.html.

[b] Conversion Factor Source: Southern California Air Quality Management District (SCAQMD). 1993. CEQA Guidelines, Estimating Emissions from Wind Erosion of St

[c] Emission Control Efficiency Source: SCAQMD. 1993. CEQA Guidelines (Table 11-4)

Project: Alamitos Generating Station - Jenny Krenz-Ruark, updated 6-25-2013

OBJECTID	AREASYMBOL	Length (ft)	Shape_Area_SF	Acres	Affected Acreage	
Alamitos Site	s1026			62.27	62.3	Acreage per email from Karen Mino 6/24/2013
Laydown Area	s1026			8.00	0.00	Area already paved and will remain so during construction - per email from Jerry Salamy 6/24/2013
Demo Areas						*Only ground disturbance will be at demo/contruction areas - per Jerry Salamy 6/26/2013
Demo U7 & NE Warehouses			145,276	3.34	3.34	
Demo U5 & U6			228,830	5.25	5.25	
Demo U1 & U2			119,630	2.75	2.75	
Demo U3 & U4	s1026		255,954	5.88	5.88	Per "Land Disturbance" map from Sarah Madams/Jerry Salamy 6/24/2013
			Total Demo	17.2	17.21	
					3.44	Assumes 20% exposed during demolition
Construction Areas						
Block 1 & 2			564,350	12.96	12.96	
Block 3			228,830	5.25	5.25	
Block 4	s1026		255,954	5.88	5.88	Per "Land Disturbance" map from Sarah Madams/Jerry Salamy 6/24/2013
			Total Construction	24.1	24.08	
					12.04	Assumes 50% exposed during construction
				Trench acres	**Construction Corridor acres**	
Sewer Line	s1026	4980.34		0.46	8.00	Assumes 4 ft wide trench and 70 foot wide construction corridor
				0.46	**4.00**	Assumes 100% of trench and 50% of corridor is uncovered during construciton

Access to Site	Assumes access is via existing paved roads to the site
Transmission Line	Assumes all connections on project site
Water Supply Pipeline	Assumes all connections on project site
Natural Gas Supply Pipeline	Assumes all connections on project site