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Appendix 5.11A
Soil Loss Calculations

Table 5.11-4. Estimate of Total Suspended Particulates (TSP) Emitted from Grading and Wind Erosion

Table 5.11-3. Estimate of Total Suspended Particulates (TSP) Emitted from Grading and Wind Erosion				
Emission Source	**Acreage**	**Duration (months)**	**Unmitigated TSP (tons)**	**Mitigated TSP (tons)**
Grading Dust:				
Parcel 1 Project Site	1.764	4	0.121	0.042
Parcel 2 Project Site & Laydown Area	2.214	6	0.228	0.080
North Pipeline Alternative (trench)	0.134	10	0.023	0.008
South Pipeline Alternative (trench)	0.087	10	0.015	0.005
Gen-tie Line (trench)	0.043	3	0.002	0.001
Wind Blown Dust:				
Parcel 1 Project Site	1.764	13	0.503	0.176
Parcel 2 Project Site & Laydown Area	1.107	7	0.245	0.086
North Pipeline Alternative (corridor)	0.502	10	0.159	0.056
South Pipeline Alternative (corridor)	0.326	10	0.103	0.036
Gen-tie Line (corridor)	0.043	3	0.004	0.001
Estimated Total - North Pipeline Alternative		**13**	**1.286**	**0.450**
Estimated Total - South Pipeline Alternative		**13**	**1.222**	**0.428**

Notes:
All linear feature impacts noted above are for portions outside of the project areas footprints.

Project Assumptions:
Grading for the project site will be completed in an 4 month period and construction will extend an additional 9 months.
100% of the Parcel 1 project site will have bare soil exposure during the length of the construction period.
Parcel 2 of Project site will be laydown area only (currently about 60% paved) during construction on Parcel 1 (estimate 6 months) then will be developed (after removing existing paving).
The natural gas line will be installed in a 4-ft trench with a 15-ft construction corridor due to developed nature of the area.
The natural gas pipeline corridors will ony have 10% of area open at any one time and will be paved after closing.

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 Storage Piles (Table A9-9-E)
[c] Emission Control Efficiency Source: SCAQMD. 1993. CEQA Guidelines (Table 11-4)

Project: Stanton Energy Reliability Center Updated 10/08/2015 JLK
Dust from Wind Erosion - With and Without Mitigation

Grading

MRI factor of 0.011 tons/acre/month is based on 168 hours per month of construction activity.

PM10 Emission Factor (ton/acre/month)[a]	0.011	Fact Sheet, 4/26/2007.
Parcel 1 Project Site		
Duration (months):	4	Assumes 4 months of grading before project construction.
Site Acreage:	1.764	Assumes 100% of site will be graded
PM10 Emitted (tons):	0.078	
TSP Emitted (tons)[b]:	**0.121**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.042**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Parcel 2 Project Site & Laydown Area		
Duration (months):	6	Assumes grading will happen only when Parcel 2 is being developed (estimated 6 months in second half of project construction)
Site Acreage:	2.214	Assumes 100% of site will be graded over span of construction
PM10 Emitted (tons):	0.15	
TSP Emitted (tons)[b]:	**0.228**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.080**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
North Pipeline Alternative		
Duration (months):	10	Assumes 10 months pipeline construction.
Site Acreage:	0.1337	Assumes only 10% of pipeline is open at any time
PM10 Emitted (tons):	0.0147	
TSP Emitted (tons)[b]:	**0.0230**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.0080**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
South Pipeline Alternative		
Duration (months):	10	Assumes 10 months pipeline construction.
Site Acreage:	0.09	Assumes only 10% of pipeline is open at any time
PM10 Emitted (tons):	0.010	
TSP Emitted (tons)[b]:	**0.015**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.005**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Gen-tie Line		
Duration (months):	3	Assumes 3 months pipeline construction.
Site Acreage:	0.04	Assumes only 10% of pipeline is open at any time
PM10 Emitted (tons):	0.001	
TSP Emitted (tons)[b]:	**0.002**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.001**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Total Unmitigated TSP Emitted (tons):	**0.390**	
Total Mitigated TSP Emitted (tons):	**0.136**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

[a]Emission Factor Source: Midwest Research Institute, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure

[b] Conversion Factor Source: Bay Area Air Quality Management District (BAAQMD) BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans. December 1999

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.
Parcel 1 Project Site		
Acres exposed	1.764	Assumes 100% of Parcel 1 will be exposed during project construction because it is currently unpaved.
Duration (months)	9	
TSP Emitted for Site (tons):	**0.503**	
Mitigated TSP Emitted (tons):	**0.176**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Parcel 2 Project Site & Laydown Area		
Acres exposed	1.107	Assumes 50 percent of Parcel 2 may be exposed at any one time as the site is developed in second half of construction
Duration (months)	7	
TSP Emitted for Site (tons):	**0.245**	
Mitigated TSP Emitted (tons):	**0.086**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
North Pipeline Alternative		
Acres exposed	0.50	Assumes construction will occur in phases, therefore only 10% of the construction corridor will be unprotected at any one time.
Duration (months)	10	
TSP Emitted for Site (tons):	**0.159**	
Mitigated TSP Emitted (tons):	**0.056**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
South Pipeline Alternative		
Acres exposed	0.33	Assumes construction will occur in phases, therefore only 10% of the construction corridor will be unprotected at any one time.
Duration (months):	10	
TSP Emitted (tons)[b]:	**0.103**	
Mitigated TSP Emitted (tons):	**0.036**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Gen-tie Line		
Acres exposed	0.043	Assumes construction will occur in phases, therefore only 10% of the construction corridor will be unprotected at any one time.
Duration (months):	3	
TSP Emitted (tons)[b]:	**0.004**	
Mitigated TSP Emitted (tons):	**0.001**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Total Wind Blown Dust (tons) without mitig	**1.014**	
Total WBD (tons) with mitigation	**0.355**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Project total without mitigation	**1.404**	tons
Project total with mitigation	**0.491**	tons

Table 5.11-3. Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)

Table 5.11-2. Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)

Feature (acreage)[2]	Activity	Duration (months)	Estimates Using Revised Universal Soil Loss Equation[1]		
			Soil Loss (tons) without BMPs	Soil Loss (tons) with BMPs	Soil Loss (tons/yr) No Project[3]
Parcel 1 Project Site (1.764 acres)	Grading	4	1.47	1.47	0.0004
	Construction	9	0.009	0.0003	---
Parcel 2 Project Site and Laydown Area (2.214 acres)	Grading	6	2.77	2.77	0.0002
	Construction	7	0.009	0.0003	---
North Pipeline Alternative (4 foot trench; 15-foot construction corridor)	Grading	10	0.24	0.24	0.0000
	Construction	10	0.003	0.0001	---
South Pipeline Alternative (4 foot trench; 15-foot construction corridor)	Grading	10	0.17	0.17	0.0000
	Construction	10	0.002	0.0001	---
Gen-tie Line (4 foot trench; 15-foot construction corridor)	Grading	3	0.007	0.007	0.0000
	Construction	3	0.00008	0.000002	---
Project Soil Loss Estimates - North Pipeline Alternative	**Construction Period**	**13**	**4.51**	**4.49**	**0.0005**
Project Soil Loss Estimates - South Pipeline Alternative	**Construction Period**	**13**	**4.44**	**4.42**	**0.0005**

Notes:

1. 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 RUSLE2 soil profiles corresponding to the mapped NRCS soil unit.
   - -Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the MREC project site found 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.
2. Pipeline acreages assume a 15 ft wide corridor with a 4 ft wide trench.
3. Soil Loss estimate for 'No Project' alternative for North and South Pipeline Alternates, and the Gen-Tie Line is considered to be zero because these areas are currently paved.

Other Project Assumptions as follows:

-It is assumed that 100% of Parcel 1 of Project site will be bare soil during grading (currently unpaved).
-It is assumed that Parcel 2 of Project site will be laydown area only (currently about 60% paved) during construction on Parcel 1 (estimate 6 months) then will be developed (after removing existing paving).
-It is assumed that grading the project site will take 4 and 6 months for Parcels 1 and 2, respectively.
-It is assumed that grading/excavation and construction of the natural gas pipeline will take a total of 10 months but only 10% of total will be active at any time.

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 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, 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 Type	Acreage		Soil Loss Estimates Using RUSLE2 software (tons/ac/year)			
		Slope	Grading	Construction w/o BMPs	Construction with BMPs	No Project
Project Site Parcel 1						
158 - Hueneme fine sandy loam, drained	1.764	1.0	2.5	0.007	0.0002	0.0002
		Subtotal (tons/ac)	**4.410**	**0.0123**	**0.0004**	**0.0004**
Site & Laydown Area Parcel 2						
158 - Hueneme fine sandy loam, drained	2.214	1.0	2.5	0.007	0.0002	0.0002
		Subtotal (tons/ac)	**5.535**	**0.015**	**0.0004**	**0.0002**
North Pipeline Alternate						
146 - Corralitos loamy sand	0.1822	2.5	4.4	0.012	0.00034	0.0000
158 - Hueneme fine sandy loam, drained	0.5274	1.0	2.5	0.007	0.0002	0.0000
163 - Metz loamy sand	3.4934	1.0	2.0	0.0057	0.00016	0.0000
164 - Metz loamy sand, moderately fine substratum	0.7082	1.0	2.0	0.0057	0.00016	0.0000
196 - San Emigdio fine sandy loam, moderately fine substrat	0.1040	1.0	2.9	0.0082	0.00023	0.0000
		Subtotal (tons/ac)	**0.3**	**0.003**	**0.0001**	**0.0000**
South Pipeline Alternate						
158 - Hueneme fine sandy loam, drained	2.16	1.0	2.5	0.007	0.0002	0.0000
163 - Metz loamy sand	0.92	1.0	2.0	0.0057	0.00016	0.0000
194 - San Emigdio fine sandy loam, 0 to 2 percent slopes	0.18	1.0	2.9	0.0082	0.00023	0.0000
		Subtotal (tons/ac)	**0.2**	**0.002**	**0.0001**	**0.0000**
Gen-tie Pipeline						
158 - Hueneme fine sandy loam, drained	0.43	1.0	2.5	0.007	0.0002	0.0000
		Subtotal (tons/ac)	**0.03**	**0.0003**	**0.000009**	**0.0000**

Assumptions:

Slope used in the soil loss calculations is the midpoint of the NRCS slope class.
Parcel 1 of Project site will be 100% bare soil during grading (currently unpaved).
Parcel 2 of Project site will be laydown area only (currently about 60% paved) during construction on Parcel 1 (estimate 6 months) then will be developed (after removing existing paving).
Parcel 2 may be as much as 50 percent exposed while it is being developed.
Pipeline grading applies only to 4-foot trench width while pipeline construction applies to 15-foot construction corridor width.
Only 10% of pipeline trenches will be bare soil during grading/excavation and will be covered as the construction progresses to next section.
Soil Loss estimate for 'No Project' alternative for North and South Pipeline Alternates, and the Gen-Tie Line is considered to be zero because these areas are currently paved.

Project Site

Feature	Soil Map Unit	Acres		
Parcel 1	158 - Hueneme fine sandy loam, drained	1.764		Parcel A is unpaved and will be used for construction of electrical generation facilities. As per fact sheet, changed from 1.406 acres to 1.764 acres on 9/8/2016.
Parcel 2	158 - Hueneme fine sandy loam, drained	2.214	0.8856	Parcel B will be used as a Laydown Area during construction of Parcel A and then will be developed for stormwater treatment and battery energy storage. It is currently about 60% paved so second number, in cell D7, reflects soil loss acreage for No Project Alternative.
Total Project Site		3.978		As per Scott Stewart 8-23-16

3.62 acres

Linear Features

Feature	Soil Map Unit	Length (ft)	Corridor Acres	Trench Acres	Adjusted Corridor Acres (assumes 10% open at a time)	Adjusted Trench Acres (assumes 10% open at a time)			
							Corridor area assumes a 15-foot construction width and trench area assumes a 4-foot wide trench		
	146 - Corralitos loamy sand								
North Pipeline Alternate		529.02	0.18217	0.04858	0.01822	0.00486	Adjusted pipeline area assumes that only 10 percent of pipeline may be open at any time.		
	158 - Hueneme fine sandy loam, drained								
North Pipeline Alternate		1531.57	0.52740	0.14064	0.05274	0.01406		529.02	feet
North Pipeline Alternate	163 - Metz loamy sand	10144.79	3.49338	0.93157	0.34934	0.09316		**1531.57**	feet
North Pipeline Alternate	164 - Metz loamy sand, moderately fine substratum	2056.61	0.70820	0.18885	0.07082	0.01889		10144.79	feet
	196 - San Emigdio fine sandy loam, moderately fine								
North Pipeline Alternate	substratum, 0 to 2 percent slopes	302.11	0.10403	0.02774	0.01040	0.00277		2056.61	feet
	Subtotal	14564.1			**0.50152**	**0.13374**	Subtotal	302.11	feet
	miles	2.758352273						14564.1	feet
			Acres				Corridor area assumes a 15-foot construction width and trench area assumes a 4-foot wide trench		
	158 - Hueneme fine sandy loam, drained								
South Pipeline Alternate		6261.75	2.15625	0.57500	0.21563	0.05750	Adjusted pipeline area assumes that only 10 percent of pipeline may be open at any time.		
South Pipeline Alternate	163 - Metz loamy sand	2680.15	0.92292	0.24611	0.09229	0.02461		6261.75	feet
	194 - San Emigdio fine sandy								
South Pipeline Alternate	loam, 0 to 2 percent slopes	525.1	0.18082	0.04822	0.01808	0.00482		2680.15	feet
	Subtotal	9467			**0.32600**	**0.08693**	Subtotal	525.1	feet
	miles	1.793							
	158 - Hueneme fine sandy loam,								
Gen-tie Line	drained	1258.93	0.43352	0.11560	0.04335	0.01156			

This information provided by Scott Stewart in an email on August 23, 2016

Project site of 3.62 acres is within

158 - Hueneme fine sandy loam, drained	3.62	acres		
North Pipeline Alternate:			Slope	Midpoint
146 - Corralitos loamy sand contains 529.02 feet of pipeline.	529.02	feet	0 to 5	2.5
158 - Hueneme fine sandy loam, drained contains 1531.57 feet of pipeline.	**1,531.57**	feet	0 to 2	1.0
163 - Metz loamy sand contains 10144.79 feet of pipeline.	10,144.79	feet	0 to 2	1.0
164 - Metz loamy sand, moderately fine substratum contains 2056.61 feet of pipeline.	2,056.61	feet	0 to 2	1.0
196 - San Emigdio fine sandy loam, moderately fine substratum, 0 to 2 percent slopes contains 302.11 feet of pipeline.	302.11	feet	0 to 2	1.0
	14,564.10	feet		
South Pipeline Alternate:				
158 - Hueneme fine s 1.0	6,261.75	feet	0 to 2	1.0
163 - Metz loamy sand contains 2680.15 feet of pipeline.	2,680.15	feet	0 to 2	1.0
194 - San Emigdio fine sandy loam, 0 to 2 percent slopes contains 525.1 feet of pipeline.	525.10	feet	0 to 2	1.0
	9,467.00	feet		

Buffer area contains:
123 - Bolsa silt loam, drained contains 8.04 acres.
146 - Corralitos loamy sand contains 80.78 acres.
158 - Hueneme fine sandy loam, drained contains 748.76 acres.
163 - Metz loamy sand contains 1608.51 acres.
164 - Metz loamy sand, moderately fine substratum contains 165.98 acres.
166 - Mocho loam, 0 to 2 percent slopes, warm MAAT, MLRA 19 contains 32.27 acres.
194 - San Emigdio fine sandy loam, 0 to 2 percent slopes contains 521.29 acres.
196 - San Emigdio fine sandy loam, moderately fine substratum, 0 to 2 percent slopes contains 129.75 acres.
Grand Total: 3295.375141 acres

The Gen-tie Line is 1258.93 feet and it is in 158 - Hueneme fine sandy loam, drained from Scott Stewart on Aug 25, 2016