

APPENDIX 5.11A

Soil Loss Estimates

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
Site (21.93 acres)	Grading	2	13.5	0.16	6.579
	Construction	25	34.3	0.98	---
Site Laydown Area (20.4 acres; 7 acres of which is paved)	Grading	1	2.0	0.0	0.016
	Construction	25	0.0	0.0	---
Soil Stockpile Areas (7.2 acres, 2.2 acres of which is paved)	Grading	0	0.0	0.0	0.012
	Construction	25	12.0	0.3	---
Transmission Line (17.3 acre construction corridor; 0.009 acre for pole footprints)	Grading	1	0.46	0.006	0.04133
	Construction	6	1.16	0.033	---
Transmission Line Laydown Area (0.5 acres estimated)	Grading	0	0.0	0.0	0.001
	Construction	6	0.0	0.0	---
Project Soil Loss Estimates	Construction Period	25	63.44	1.52	6.65

Notes:

- Soil losses (tons/acre/year) are estimated using RUSLE2 software available online [http://fargo.nserl.purdue.edu/rusle2_dataweb/].
 -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 CCGS project site found at [<http://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm>].
 -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.
- Acreages assume a 50 ft corridor for the transmission line and a 100x100 ft construction area for tower replacements. The transmission line pole holes each have a 4 ft by 4 ft excavation footprint.
- Assumptions for the stockpile areas are: a) Stockpile area #1 is 100% paved; b) Soil material will be stockpiled on 50% of the sites; c) Stockpiles will have slopes similar to surrounding landscape

Other Project Assumptions as follows:

- It is assumed that 100% of the CCGS project site will be graded; the site will be 50% bare soil during construction.
- It is assumed that only the project site and a portion of the project site laydown area will be graded; all other areas will be 100% covered, either through natural vegetation or gravelling/paving.
- It is assumed that grading the project site will take 2 months and construction will take a total of 25 months.
- It is assumed that 50% of the unpaved portion of the project site laydown area will be graded and that natural cover will be maintained (yielding negligible runoff).
- The overhead transmission line poles will have 4-foot x 4-foot footprints.
- It is assumed that the grading/excavation for the pole holes will be completed within 1 month and the entire installation will be completed within 6 months.

RUSLE2 Assumptions as follows:

150-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 (for project site = vineyard, perennial grass in middles); Contouring - None, rows up and down hill;

Diversion/terracing - None; Strips and Barriers - None.

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:				
Project Site	10.97	2	0.754	0.264
Project Site Laydown Area	6.49	1	0.112	0.039
Transmission Line Pole Holes	0.0092	1	0.0002	0.0001
Transmission Line Laydown Area	0.50	0	0.000	0.000
Wind Blown Dust:				
Project Site	10.97	23	7.990	2.796
Project Site Laydown Area	0.00	25	0.000	0.000
Transmission Line Corridor	1.73	6	0.32923	0.11523
Transmission Line Laydown Area	0.50	6	0.000	0.000
Soil Stockpile Area	3.60	25	2.850	0.998
Estimated Total		25	12.035	4.212

Notes:

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

Project Assumptions:

Grading for project site will be completed in a 2 month period and construction will extend an additional 23 months.

Approximately 1/10th of the project site will have bare soil exposure during the length of the construction period.

None of the laydown areas (except a portion of the project site laydown area) will be graded. It is expected that all roadway and laydown areas would be covered (gravelled or paved) for all season use.

Excavation of transmission line pole holes will take 1 month followed by a 6 month construction period.

The transmission poles will have a 4 by 4 foot area.

The 50 ft construction corridors will remain in natural vegetation, with approximately 10% bare soil exposed.

Data Sources:

^a PM10 Emission Factor Source: Midwest Research Institute, South Coast AQMD Project No. 95040, Level 2 Analysis Procedure, March 1996

^b PM10 to TSP Conversion Factor Source: Bay Area Air Quality Management District CEQA Guidelines, Assessing the Air Quality Impacts of Projects, December 1999.

SCAQMD CEQA Handbook (1993) Table 11-4 for mitigation efficiency rates (as summarized in Table 8.9-4)

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						
DaC	21.93	5.5	3.7	1.5	0.043	0.3
		Subtotal (tons)	81.14	16.45	0.47	6.58
Site Laydown Area						
DaC	12.98	5.5	3.7	1.5	0.04	0.0024
	0.00	Subtotal	24.0	0.0	0.0	0.016
Transmission Line						
DaC	13.9642	5.5	3.7	1.5	0.043	0.0024
So	0.3884	1	1.7	0.76	0.021	0.0025
ZaA	2.9752	1.0	1.5	0.66	0.02	0.0023
		Subtotal	5.553	2.321	0.067	0.04133
T-Line Laydown						
DaC	0.50	5.5	3.7	1.5	0.043	0.0024
	0.00	Subtotal	0.00	0.00	0.00	0.0012
Soil Stockpiles						
Stockpile Area#1 - DaC	2.22	5.5	N/A	1.5	0.043	0.0024
Stockpile Area #2 - DaC	2.68	5.5	N/A	1.5	0.043	0.0024
Stockpile Area #3 - DaC	2.30	5.5	N/A	1.5	0.043	0.0024
		Subtotal	0.00	5.77	0.17	0.012

Assumptions:

Assumes slope is the mid-point of the slope class; slope for stockpiled soils is assumed to be similar to that of surrounding landscape

Assumes grading on 50% of the unpaved portion of the project site laydown area, and no grading at the t-line laydown area

Assumes ~36% (7 acres) of the site laydown area is already paved; remainder is currently 50% vegetated, and will be completely paved or graveled during construction.

Assumes t-line laydown area will not be graded and will be graveled during construction

100% of project site would be bare soil during grading and construction.

100% of pole holes will be bare soil during grading/excavation.

Assumes stockpile area #1 is 100% paved, and all stockpile areas are 50% covered in soil material during construction

with slopes same as surrounding area; existing condition is 10% bare soil. Assumes stockpiles will not require grading.

Transmission pole impact area assumes a 4 ft by 4 ft footprint times the number of poles

The No Project soil loss assumes a 'dense grass, not harvested' management scenario.

Project: Contra Costa Generating Station - Kathy Rose

OBJECTID	AREASYMBOL	Length	Shape_Area_SF	Acres	Acreage_tot	
Contra Costa Site	DaC			21.93	21.93	Acres from Mike Haskell, 3/19/2009 0.00 Assumes 100% bare soil during construction
Access to Site	DaC					0.00 Assumes access is via existing paved roads to the site 0.00
Site Laydown Area	DaC			20.38	20.38	Total laydown area acres (Mike Haskell 4/24/09) 7.40 Paved laydown acres (Mike Haskell 4/24/09). This is 36% of the area. 12.98 Total unprotected area
Access to Laydown Area	DaC			0.00		Assumes access to laydown area will be via existing paved roads on the site 0.00
			# of poles	Pole Holes		Construction Corridor
Transmission Line	DaC	10138.00	20	0.0074	13.964	Assumes 16 sq ft (4 feet x 4 feet) hole for each pole spaced at 500 ft. Assumes 50 ft construction corridor along length, and 100x100 ft construction corridor at each pole.
	So	282.00	1	0.0002	0.388	Assumes 16 sq ft (4 feet x 4 feet) hole for each pole spaced at 500 ft. Assumes 50 ft construction corridor along length, and 100x100 ft construction corridor at each pole.
	ZaA	2160.00	4	0.0016	2.975	Assumes 16 sq ft (4 feet x 4 feet) hole for each pole spaced at 500 ft. Assumes 50 ft construction corridor along length, and 100x100 ft construction corridor at each pole.
		subtotal	25	0.0092	17.33	Assumes pole hole footprint unprotected until pole installed 1.733 Assumes 10% of the corridor is unprotected during construction
T Line Laydown Area	DaC			0.5	0.5	Location of laydown area for tower replacement TBD and is assumed to need about 1/2 acre 0.50 Assumes no grading and laydown area is completely covered (paved or gravelled) during construction
Stockpile Area1	DaC			2.2200	0.000	Assumes 100% of area is paved
Stockpile Area 2	DaC			2.6800	0.268	Assumes no grading, assumes 10% of the site is unprotected during construction
Stockpile Area 3	DaC			2.3000	0.230	Assumes no grading, and 10% of the site is unprotected during construction
				7.2000	0.4980	Area is for land surface only; does not take into account stockpile itself.
Water Supply Pipeline	Assumes connection is on project site					
Water Supply Laydown Area	Assumes no separate laydown area needed					
Natural Gas Supply Pipeline	Assumes all connections on project site					
Sewer Line	Assumes all connections onsite					

**Project: Contra Costa Generating Station
Dust from Wind Erosion - With and Without Mitigation**

Grading

PM10 Emission Factor (ton/acre/month)^a 0.011 MRI factor of 0.011 tons/acre/month is based on 168 hours per month of construction activity.
Fact Sheet, 4/26/2007.

Project Site

Duration (months): 2 Assumes 2 months of active grading.
Site Acreage: 21.93 Assumes 100% of site is graded
PM10 Emitted (tons): 0.48
TSP Emitted (tons)^b: **0.754** assume TSP is 64% PM10
Mitigated TSP Emitted (tons): 0.264 Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Project Site Laydown Area

Duration (months): 1 Assumes 1 month of active grading
Site Acreage: 6.49 Assumes 50% of currently unpaved project site laydown area will be graded
PM10 Emitted (tons): 0.07
TSP Emitted (tons)^b: **0.112** assume TSP is 64% PM10
Mitigated TSP Emitted (tons): 0.039 Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Transmission Line Pole Holes

Duration (months): 1 Assumes 1 month to grade
Site Acreage: 0.0092
PM10 Emitted (tons): 0.0001
TSP Emitted (tons)^b: **0.0002** assume TSP is 64% PM10
Mitigated TSP Emitted (tons): 0.0001 Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Transmission Line Laydown Area

Duration (months): 0 Assumes transmission line laydown area WILL NOT be graded.
Site Acreage: 0.50
PM10 Emitted (tons): 0.00
TSP Emitted (tons)^b: **0.000** assume TSP is 64% PM10
Mitigated TSP Emitted (tons): 0.000 Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Soil Stockpile Area

Assumes no grading.

Total Unmitigated TSP Emitted (tons): 0.866

Total Mitigated TSP Emitted (tons): 0.303 Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

^aEmission 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

**Project: Contra Costa Generating Station
Dust from Wind Erosion - With and Without Mitigation**

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.

Project Site

Acres exposed 10.97 Assumes that 50% of the project area is exposed during construction

Duration (months) 23 Assumes 23 months of construction after grading

TSP Emitted for Site (tons): **7.990**

Mitigated TSP Emitted (tons): 2.796 Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Project Site Laydown Area

Acres exposed 0.00 Assumes project site laydown area is completely covered (natural veg, gravelled or paved) during construction

Duration (months) 25 Assumes 25 months of construction traffic

TSP Emitted for Site (tons): **0.000**

Mitigated TSP Emitted (tons): 0.000 Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Transmission Line Corridor

Acres exposed 1.7328 Assumes 10% of the corridor is unprotected during construction

Duration (months) 6 Assumes 6 months of excavation & installation

TSP Emitted for Site (tons): **0.32923**

Mitigated TSP Emitted (tons): 0.115230 Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Transmission Line Laydown Area

Acres exposed 0.000 Assumes transmission line laydown area is completely covered (natural veg, gravelled or paved) during construction

Duration (months): 6 Assumes 6 months of construction

TSP Emitted (tons)^b: **0.000**

Mitigated TSP Emitted (tons): 0.000 Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Stockpile Area

Acres exposed 3.60 Assumes stockpiled soil occupies 1/2 of stockpile areas

Duration (months): 25 Assumes 25 months of construction

TSP Emitted (tons)^b: **2.850**

Mitigated TSP Emitted (tons): 0.998 Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Total Wind Blown Dust (tons) without mitigation: 11.169

Total WBD (tons) with mitigation: 3.909 Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Project total without mitigation: 12.035

Project total with mitigation: 4.212