

APPENDIX 5.11A

Soil Loss Estimates Calculations

Table 5.11-3. 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 (4.4 acres)	Grading	2	0.8	0.010	0.0233
	Construction	22	4.1	0.113	---
Laydown Areas (A through D - 9.8 acres) (0 acres exposed; paved or gravelled)	Grading	1	0.9	0.011	0.0519
	Construction	23	0.0	0.0	---
Gas Supply Pipeline (1.21 acre trench; 9.09 acre construction corridor)	Grading	3	2.50	0.0318	0.0482
	Construction	3	1.16	0.0318	---
Transmission Line Pole (0.0004 acre for pole footprint)	Grading	0	0.00	0.00	0.0000
	Construction	0	0.00	0.00	---
Project Soil Loss Estimates	All activities listed above	20	9.48	0.20	0.12

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 soil unit.
 - Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the LEC 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.

Other Project Assumptions as follows:

- It is assumed that 100% of the LEC site and laydown areas will be exposed during grading, and approximately 10% of the site will be bare soil during construction.
- It is assumed that grading the site will take 2 months and construction will take 22 months.
- It is assumed that grading for laydown area will take 1 month and the area will be covered (gravelled or paved) immediately thereafter.
- It is assumed that soil loss will be negligible from the laydown areas once it is covered.
- It is assumed that the 2.5-mile gas pipeline will be installed within a 4-ft wide trench and a 30-ft construction corridor along existing roadways.
- It is assumed that the gas pipeline will take 3 months to construct and will take another 3 months before permanent cover is established.
- The water and sewer lines will be completed on-site, so no additional soil losses are estimated for them.
- It is assumed that no new off-site transmission poles are required.

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	Slope	Soil Loss Estimates Using RUSLE2 software (tons/ac/year)			
			Grading	Construction w/o BMPs	Construction with BMPs	No Project
Site	4.40	1.0	1.1	0.51	0.014	0.0053
subtotal			4.84	2.24	0.06	0.0233
Laydown Areas (A through D)	9.80	1.0	1.1	0.51	0.014	0.0053
subtotal			10.78	5.00	0.137	0.0519
Gas Supply Pipeline	9.09	1.0	1.1	0.51	0.014	0.0053
subtotal			10.00	4.64	0.127	0.0482
Transmission Line Pole	0.00	1.0	1.1	0.51	0.014	0.0053
subtotal			0.00	0.00	0.00	0.00
Process Water Line	0.00	1.0	1.1	0.51	0.014	0.0053
subtotal			0.00	0.00	0.00	0.00
Sewer Line	0.00	1.0	1.1	0.51	0.014	0.0053
subtotal			0.00	0.00	0.00	0.00

Assumptions:

Assumes slope is the mid-point of the slope class

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

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

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

Table 5.11-4. 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	4.40	2	0.151	0.053
Laydown Areas (A through D)	9.80	1	0.108	0.059
Gas Supply Pipeline	1.21	3	0.382	0.134
Transmission Line Pole Holes	0.000	0.00	0.000	0.000
Wind Blown Dust:				
Project Site	4.40	22	0.307	0.107
Laydown Areas (A through D)	0.00	23	0.000	0.000
Gas Supply Pipeline	9.09	3	1.170	0.410
Transmission Line Pole Holes	0.000	0	0.0000	0.0000
Estimated Total			2.118	0.763

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 18 months.

Grading for laydown will be completed in a 1 month period and the site will be covered (gravelled or paved) immediately.

No new excavation for transmission line pole will be required

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

Water and sewer line connections will be on site.

The gas supply line will be 2.6 miles long and installed along roadway rights-of-way in a 4-ft trench with 30-ft construction corridor.

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)

Project: LEC Lodi Project
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.
Project Site		
Duration (months):	2	Assumes 2 months of active grading.
Site Acreage:	4.40	Assumes 100% of site is graded
PM10 Emitted (tons):	0.10	
TSP Emitted (tons) ^b :	0.151	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	0.053	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Laydown Areas (A through D)		
Duration (months):	1	Assumes one month to grade
Site Acreage:	9.80	Sum of Laydown areas A, B, C, and D
PM10 Emitted (tons):	0.11	
TSP Emitted (tons) ^b :	0.168	Assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	0.059	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Gas Supply Line Trench		
Duration (months):	3.0	Assumes 3 months to construct pipeline
Site Acreage:	1.212	Assumes a 4-ft wide trench
PM10 Emitted (tons):	0.0400	
TSP Emitted (tons) ^b :	0.0625	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	0.0219	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Transmission Line Pole Hole		
Duration (months):	0.00	Assumes no transmission lines poles needed to connect
Site Acreage:	0.000	
PM10 Emitted (tons):	0.000	
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
Process Water Line Trench		
Duration (months):	0.0	Assumes on-site construction
Site Acreage:	0.000	
PM10 Emitted (tons):	0.000	
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
Sewer Line Trench		
Duration (months):	0.0	Assumes on-site construction
Site Acreage:	0.000	
PM10 Emitted (tons):	0.000	
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
Total Unmitigated TSP Emitted (tons)	0.382	
Total Mitigated TSP Emitted (tons)	0.134	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

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	4.40	
Duration (months)	22	Assumes 22 months of construction for Project site area after grading
TSP Emitted for Site (tons):	0.307	Assumes 1/10th of the site is bare soil during 18 month construction period
Mitigated TSP Emitted (tons):	0.107	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Laydown Areas (A through D)		
Acres exposed	0.000	Sum of 4 laydown areas is 8.99 acres but all these areas are covered with gravel or other material after grading
Duration (months)	23	Assume 24 months for construction period (minus 1 month for grading)
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
Gas Supply Line Corridor		
Acres exposed	9.091	Assumes 2.6 mile pipeline to east of site and construction corridor is 30 feet along side of road
Duration (months)	3	Assumes 3 months after excavating trench that permanent cover (i.e., paving) is established
TSP Emitted for Site (tons):	0.864	
Mitigated TSP Emitted (tons):	0.302	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Transmission Line Pole Footprint		
Acres exposed	0.000	Assumes no new poles are needed to connect to existing T-line
Duration (months)	0.0	
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
Process Water Line Corridor		
Acres exposed	0.000	Assumes on-site construction
Duration (months)	0	
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
Sewer Line Corridor		
Acres exposed	0.000	Assumes on-site construction
Duration (months)	0	
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
Total (tons) without mitigation	1.170	
Total (tons) with mitigation	0.410	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

Project: LEC- Steve Long input for areas on 5/30/08 - subject to revision

OBJECTID	AREASYMBOL	Portion	Area or Leng	Acres	Acreage	tot
LEC Site	149- Devries SL	100.0%		3.79	4.40	From Sarah Madams email dated 7/10/08
					0.44	Assumes only 10% of site is bare soil during construction
Laydown Area A	149- Devries SL	100.0%		2.49	2.49	From Mike Haskell email dated 5/5/08
Laydown Area B	149- Devries SL	100.0%		2.22	2.22	From Mike Haskell email dated 5/5/08
Laydown Area C	149- Devries SL	100.0%		1.54	1.54	From Mike Haskell email dated 5/5/08
Laydown Area D	149- Devries SL	100.0%		2.74	2.74	From Mike Haskell email dated 5/5/08
					9.80	Assumes laydown areas are completely covered (paved or gravelled) during construction. Revised by email from Sarah Madams Aug 27.
Natural gas supply pipeline - trench	149- Devries SL	100.0%	13200	1.2121	1.21	Edit from 2.6 miles to 2.5 miles in text from Sarah Madams on 7/10/2008 stating 2.5 mile length. Assumes 4 foot wide trench
Natural gas supply pipeline-corridor	149- Devries SL	100.0%	13200	9.0909	9.09	Edit from 2.6 miles to 2.5 miles in text from Sarah Madams on 7/10/2008 stating 2.5 mile length. Assumes 30 foot wide construction corridor
					10.30	
					Sum	20.543 Assumes 100% exposed during construction
						Construction
						Pole Holes
Tranmission Line Pole	149- Devries SL		0	0.0000	0.0000	Assumes no 4x4 ft holes are needed off site to connect to existing OH lines
0	sum	0	0	0.0000	0.0000	
					0.0000	Assumed pole hole footprint will be unprotected until pole installed
						Construction
						Corridor
Process water supply pipeline	-	0			Trench acres	0 Assumes on-site connection
					acres	