

ANNUAL PARTICULATE CONSTRUCTION EMISSIONS

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Pipeline Emissions	Date Prepared:	11/22/95
		Checked By:	C. Chapin 11/22/95

Att 2 All Subparts

Amount of smaller pipe 150000 ft
Amount of larger pipe 150000 ft

Assumptions

If smaller pipe is worked at 2400 ft per day (four crews per day), then 62.5 days are needed to construct.

assumes 1 staging area per site

If larger pipe is worked at 800 ft per day (four crews per day), then 187.5 days are needed to construct.

assumes 1 staging area per site

Smaller Pipe

					With Mitigation
Wind erosion over construction area (2.8 lbs/site/day*4 sites)	11.2 lbs/day*	62.5 days =	700 lbs/yr	350 lbs/yr	
Wind erosion over staging area (20.5 lbs/site/day *4 sites)	82 lbs/day*	62.5 days =	5125 lbs/yr	2563 lbs/yr	
Truck travel (0.8 lbs/site/day *4 sites)	3.2 lbs/day*	62.5 days =	200 lbs/yr	200 lbs/yr	
Vehicle Travel for employees (11.2 lbs/site/day*4 sites)	44.8 lbs/day*	62.5 days =	2800 lbs/yr	2800 lbs/yr	
Material handling (1.1 lbs/site/day *4 sites)	4.4 lbs/day*	62.5 days =	275 lbs/yr	138 lbs/yr	
Grading at site (20.7 lbs/site/day *4 sites)	82.8 lbs/day*	62.5 days =	5175 lbs/yr	2588 lbs/yr	
Grading at staging areas (277.8 lbs/site *4 sites)	1111.2 lbs/day*	1 days =	1111 lbs/yr	556 lbs/yr	
Exhaust from trucks (0.4 lbs/site/day *4 sites)	1.6 lbs/day*	62.5 days =	100 lbs/yr	95 lbs/yr	
Exhaust from employees (0.035 lbs/site/day *4 sites)	0.14 lbs/day*	62.5 days =	9 lbs/yr	8 lbs/yr	
Exhaust from equipment (2.58 lbs/site/day*4 sites)	10.32 lbs/day*	62.5 days =	645 lbs/yr	548 lbs/yr	
		Total	18140 lbs/yr	9845 lbs/yr	

or

8 tons	5 tons
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Larger Pipe

					With Mitigation
Wind erosion over construction area (0.8 lbs/site/day*4 sites)	2.4 lbs/day*	187.5 days =	450 lbs/yr	225 lbs/yr	
Wind erosion over staging area (20.5 lbs/site/day *4 sites)	82 lbs/day*	187.5 days =	15375 lbs/yr	7688 lbs/yr	
Truck travel (1.1 lbs/site/day *4 sites)	4.4 lbs/day*	187.5 days =	825 lbs/yr	825 lbs/yr	
Vehicle Travel for employees (11.2 lbs/site/day*4 sites)	44.8 lbs/day*	187.5 days =	8400 lbs/yr	8400 lbs/yr	
Material handling (0.6 lbs/site/day *4 sites)	2.4 lbs/day*	187.5 days =	450 lbs/yr	225 lbs/yr	
Grading at site (6.9 lbs/site/day *4 sites)	27.6 lbs/day*	187.5 days =	5175 lbs/yr	2588 lbs/yr	
Grading at staging areas (277.8 lbs/site *4 sites)	1111.2 lbs/day*	1 days =	1111 lbs/yr	556 lbs/yr	
Exhaust from trucks (0.5 lbs/site/day *4 sites)	2 lbs/day*	187.5 days =	375 lbs/yr	356 lbs/yr	
Exhaust from employees (0.035 lbs/site/day *4 sites)	0.14 lbs/day*	187.5 days =	28 lbs/yr	25 lbs/yr	
Exhaust from equipment (2.58 lbs/site/day*4 sites)	10.32 lbs/day*	187.5 days =	1935 lbs/yr	1645 lbs/yr	
		Total	34122 lbs/yr	22532 lbs/yr	

or

17 tons	11 tons
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Total Yearly

25 tons	16 tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
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		Checked By:	C. Chapin 11/22/95

Alt 3 All Subparts

Amount of smaller pipe 125000 ft
Amount of larger pipe 100000 ft

Assumptions

If smaller pipe is worked at 2400 ft per day (four crews per day), then 52 days are needed to construct.
assumes 1 staging area per site
If larger pipe is worked at 800 ft per day (four crews per day), then 125 days are needed to construct.
assumes 1 staging area per site

Smaller Pipe

				With Mitigation
Wind erosion over construction area (2.8 lbs/site/day * 4 sites)	11.2 lbs/day*	52 days =	582 lbs/yr	291 lbs/yr
Wind erosion over staging area (20.5 lbs/site/day * 4 sites)	82 lbs/day*	52 days =	4264 lbs/yr	2132 lbs/yr
Truck travel (0.8 lbs/site/day * 4 sites)	3.2 lbs/day*	52 days =	166 lbs/yr	166 lbs/yr
Vehicle Travel for employees (11.2 lbs/site/day * 4 sites)	44.8 lbs/day*	52 days =	2330 lbs/yr	2330 lbs/yr
Material handling (1.1 lbs/site/day * 4 sites)	4.4 lbs/day*	52 days =	229 lbs/yr	114 lbs/yr
Grading at site (20.7 lbs/site/day * 4 sites)	82.8 lbs/day*	52 days =	4306 lbs/yr	2153 lbs/yr
Grading at staging areas (277.8 lbs/site * 4 sites)	1111.2 lbs/day*	1 days =	1111 lbs/yr	556 lbs/yr
Exhaust from trucks (0.4 lbs/site/day * 4 sites)	1.6 lbs/day*	52 days =	83 lbs/yr	79 lbs/yr
Exhaust from employees (0.035 lbs/site/day * 4 sites)	0.14 lbs/day*	52 days =	7 lbs/yr	7 lbs/yr
Exhaust from equipment (2.58 lbs/site/day * 4 sites)	10.32 lbs/day*	52 days =	537 lbs/yr	456 lbs/yr
		Total	12988 lbs/yr	7742 lbs/yr

or

6 tons	4 tons
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Larger Pipe

				With Mitigation
Wind erosion over construction area (0.6 lbs/site/day * 4 sites)	2.4 lbs/day*	125 days =	300 lbs/yr	150 lbs/yr
Wind erosion over staging area (20.5 lbs/site/day * 4 sites)	82 lbs/day*	125 days =	10250 lbs/yr	5125 lbs/yr
Truck travel (1.1 lbs/site/day * 4 sites)	4.4 lbs/day*	125 days =	550 lbs/yr	550 lbs/yr
Vehicle Travel for employees (11.2 lbs/site/day * 4 sites)	44.8 lbs/day*	125 days =	5600 lbs/yr	5600 lbs/yr
Material handling (0.6 lbs/site/day * 4 sites)	2.4 lbs/day*	125 days =	300 lbs/yr	150 lbs/yr
Grading at site (6.9 lbs/site/day * 4 sites)	27.6 lbs/day*	125 days =	3450 lbs/yr	1725 lbs/yr
Grading at staging areas (277.8 lbs/site * 4 sites)	1111.2 lbs/day*	1 days =	1111 lbs/yr	556 lbs/yr
Exhaust from trucks (0.5 lbs/site/day * 4 sites)	2 lbs/day*	125 days =	250 lbs/yr	238 lbs/yr
Exhaust from employees (0.035 lbs/site/day * 4 sites)	0.14 lbs/day*	125 days =	18 lbs/yr	17 lbs/yr
Exhaust from equipment (2.58 lbs/site/day * 4 sites)	10.32 lbs/day*	125 days =	1290 lbs/yr	1097 lbs/yr
		Total	23119 lbs/yr	15206 lbs/yr

or

12 tons	8 tons
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Total Yearly

18 tons	11 tons
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Project: Santa Rosa Subregional Long-Term Wastewater Project
 Subject: Construction - Annual Pipeline Emissions

Prepared By: I. Edmonds
 Date Prepared: 11/22/95
 Checked By: C. Chapin 11/22/95

Alt 4 All Subparts

Amount of smaller pipe 0 ft
 Amount of larger pipe 185000 ft

Assumptions

If larger pipe is worked at 600 ft per day (three crews per day), then 308 days are needed to construct.
 assumes 3 staging areas

Construction will be 250 days per year

Larger Pipe

				With Mitigation
Wind erosion over construction area (0.6 lbs/site/day*3 sites)	1.8 lbs/day*	250 days =	450 lbs/yr	225 lbs/yr
Wind erosion over staging area (20.5 lbs/site/day *3 sites)	61.5 lbs/day*	250 days =	15375 lbs/yr	7688 lbs/yr
Truck travel (1.1 lbs/site/day *3 sites)	3.3 lbs/day*	250 days =	825 lbs/yr	825 lbs/yr
Vehicle Travel for employees (11.2 lbs/site/day*3 sites)	33.6 lbs/day*	250 days =	8400 lbs/yr	8400 lbs/yr
Material handling (0.6 lbs/site/day *3 sites)	1.8 lbs/day*	250 days =	450 lbs/yr	225 lbs/yr
Grading at site (6.9 lbs/site/day *3 sites)	20.7 lbs/day*	250 days =	5175 lbs/yr	2588 lbs/yr
Grading at staging areas (277.8 lbs/site *3 sites)	833.4 lbs/day*	1 days =	833 lbs/yr	417 lbs/yr
Exhaust from trucks (0.5 lbs/site/day *3 sites)	1.5 lbs/day*	250 days =	375 lbs/yr	356 lbs/yr
Exhaust from employees (0.035 lbs/site/day *3 sites)	0.105 lbs/day*	250 days =	26 lbs/yr	25 lbs/yr
Exhaust from equipment (2.58 lbs/site/day*3 sites)	7.74 lbs/day*	250 days =	1935 lbs/yr	1845 lbs/yr
		Total	33845 lbs/yr	22393 lbs/yr
			or	
			17 tons	11 tons

Alt 5 All Subparts

Amount of smaller pipe 0 ft
 Amount of larger pipe 50000 ft

Assumptions

If larger pipe is worked at 200 ft per day (1 crew per day), then 250 days are needed to construct.
 assumes 2 staging areas

Larger Pipe

				With Mitigation
Wind erosion over construction area (0.6 lbs/site/day*1 site)	0.6 lbs/day*	250 days =	150 lbs/yr	75 lbs/yr
Wind erosion over staging area (20.5 lbs/site/day *1 site)	51 lbs/day*	250 days =	12750 lbs/yr	6375 lbs/yr
Truck travel (1.1 lbs/site/day *1 site)	1.1 lbs/day*	250 days =	275 lbs/yr	275 lbs/yr
Vehicle Travel for employees (11.2 lbs/site/day*1 site)	11.2 lbs/day*	250 days =	2800 lbs/yr	2800 lbs/yr
Material handling (0.6 lbs/site/day *1 site)	0.6 lbs/day*	250 days =	150 lbs/yr	75 lbs/yr
Grading at site (6.9 lbs/site/day *1 site)	6.9 lbs/day*	250 days =	1725 lbs/yr	863 lbs/yr
Grading at staging areas (277.8 lbs/site *2 site)	555.78 lbs/day*	1 days =	556 lbs/yr	278 lbs/yr
Exhaust from trucks (0.5 lbs/site/day *1 site)	0.5 lbs/day*	250 days =	125 lbs/yr	119 lbs/yr
Exhaust from employees (0.035 lbs/site/day *1 site)	0.035 lbs/day*	250 days =	9 lbs/yr	8 lbs/yr
Exhaust from equipment (2.58 lbs/site/day*1 site)	2.58 lbs/day*	250 days =	645 lbs/yr	548 lbs/yr
		Total	18406 lbs/yr	10740 lbs/yr
			or	
			9 tons	5 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2A Tolay A	Checked By:	C. Chapin

Wind erosion over construction surface

The water surface area for this reservoir will cover over 800 acres.
assuming half of this area will be disturbed

Emissions = emission factor * acres = $5.2 \times 400 = 2080$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 478400 pounds

or

239.2 tons

With mitigation

47.84 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds

or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds

or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 102 days/year * 46 miles/trip on average

Emissions = 0.01 pounds/VMT 469200 VMT

Annual emissions = 4692 pounds

or

2.3 tons

With mitigation

2.3 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds

or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 5.9 pounds/day * 160 days

Annual emissions = 944 pounds

or

0.5 tons

With mitigation

0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2A Tolay A	Checked By:	C. Chapin

Grading of construction site

400 acres = 4174 ft * 696 trips = 2905104 ft*mile/5280 ft = 550.2091 mile
Emissions = 20.2 pounds/vmt * 550.2091 miles

Emissions = 11114.22 pounds

or

5.6 tons

With mitigation

2.8 tons

Grading of staging area

Emissions = 417.3 pounds

or

0.2 tons

With mitigation

0.1 tons

Exhaust from truck travel for disposal

Emissions = 1.4 pounds/day x 90 days

or

0.1 tons

With mitigation

0.1 tons

Exhaust from truck travel for import material

Emissions = 54.1 pounds/day x 160 days

or

4.3 tons

With mitigation

4.1 tons

Exhaust from truck travel for employees

Emissions = 0.2 pounds/day x 160 days

or

0.0 tons

With mitigation

0.0 tons

Exhaust from equipment

Emissions = 91.59 pounds/day x 160 days

or

7.3 tons

With mitigation

6.2 tons

Total for Alt 2A

268.2 tons

With mitigation

69.1 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2B Adobe Road and Lakeville Hillside	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface area for these reservoirs will cover 325 acres.
 assuming half of this area will be disturbed
 Emissions = emission factor * acres = $5.2 \times 163 = 847.6$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 194948 pounds

or

97.5 tons

With mitigation

19.5 tons

Wind erosion over staging area

The staging area will cover 15 acres. (twice)

Emissions = 70.6 pounds/day* 230 days

Annual emissions = 16238 pounds

or

8.1 tons

With mitigation

1.6 tons

Truck travel for disposal (twice)

Emissions = 6 pounds/day* 90 days

Annual emissions = 540 pounds

or

0.3 tons

With mitigation

0.3 tons

Truck travel for import material (two sites)

VMT = 100 trips/day*160 days/year*57 miles/trip + 100 trips/day*52 days/year*42 miles/trip

Emissions = 0.01 pounds/VMT 1130400 VMT

Annual emissions = 11304 pounds

or

5.7 tons

With mitigation

5.7 tons

Travel for employees (twice)

Emissions = 112 pounds/day* 160 days

Annual emissions = 17920 pounds

or

9.0 tons

With mitigation

9.0 tons

Material handling (twice)

Emissions = 11.8 pounds/day* 160 days

Annual emissions = 1888 pounds

or

0.9 tons

With mitigation

0.5 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2B Adobe Road and Lakeville Hillside	Checked By:	C. Chapin 11/22/95

Grading of construction site

163 acres =	2664 ft * 444 trips =	1696524 ft*mile/5280 ft =	321.3114 mile
Emissions =	20.2 pounds/vmt * 321.3114 miles		
Emissions =	6490.49 pounds		
	or		
	3.2 tons	With mitigation	1.6 tons

Grading of 2 staging areas

Emissions =	834.6 pounds		
	or		
	0.4 tons	With mitigation	0.2 tons

Exhaust from truck travel for disposal (two sites)

Emissions =	2.8 pounds/day x 90 days		
	or		
	0.1 tons	With mitigation	0.1 tons

Exhaust from truck travel for import material for (two sites)

Emissions =	108.2 pounds/day x 160 days		
	or		
	8.7 tons	With mitigation	8.2 tons

Exhaust from truck travel for employees (two sites)

Emissions =	0.4 pounds/day x 160 days		
	or		
	0.0 tons	With mitigation	0.0 tons

Exhaust from equipment (two sites)

Emissions =	119.55 pounds/day x 160 days		
	or		
	9.6 tons	With mitigation	8.1 tons

Total for Alt 2B	143.5 tons	With mitigation	54.8 tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2C Telay C	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface area for this reservoir will cover over 390 acres.
assuming half of the area will be disturbed

Emissions = emission factor * acres = $5.2 * 195 = 1014$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 233220 pounds

or

116.6 tons

With mitigation

23.3 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds

or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds

or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 160 days/year * 46 miles/trip

Emissions = 0.01 pounds/VMT * 736000 VMT

Annual emissions = 7360 pounds

or

3.7 tons

With mitigation

3.7 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds

or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 5.9 pounds/day * 160 days

Annual emissions = 944 pounds

or

0.5 tons

With mitigation

0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2C Toley C	Checked By:	C. Chapin 11/22/95

Grading of construction site

195	acres =	2914 ft * 486 trips =	2832501	ft*mile/5280 ft =	536.4585	mile
Emissions =		20.2 pounds/vmt * 536.4585 miles				
Emissions =		10836.46	pounds			
		or				
		5.4	tons	With mitigation	2.7	tons

Grading of staging area

Emissions =		417.3	pounds			
		or				
		0.2	tons	With mitigation	0.1	tons

Exhaust from truck travel for disposal

Emissions =		1.4	pounds/day x 90	days		
		or				
		0.1	tons	With mitigation	0.1	tons

Exhaust from truck travel for import material

Emissions =		54.1	pounds/day x 160	days		
		or				
		4.3	tons	With mitigation	4.1	tons

Exhaust from truck travel for employees

Emissions =		0.2	pounds/day x 160	days		
		or				
		0.0	tons	With mitigation	0.0	tons

Exhaust from equipment

Emissions =		73.8	pounds/day x 160	days		
		or				
		5.9	tons	With mitigation	5.0	tons

Total for Alt 2C		145.4	tons	With mitigation	44.7	tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2D Sears Point and Lakeville Hillside	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface area for these reservoirs will cover 425 acres.
assuming half of the area will be disturbed

Emissions = emission factor * acres = $5.2 \times 213 = 1107.6$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 254748 pounds

or

127.4 tons

With mitigation

25.5 tons

Wind erosion over 2 staging areas

The staging area will cover 15 acres. (twice)

Emissions = 70.6 pounds/day * 230 days

Annual emissions = 16238 pounds

or

8.1 tons

With mitigation

1.6 tons

Truck travel for disposal (twice)

Emissions = 6 pounds/day * 90 days

Annual emissions = 540 pounds

or

0.3 tons

With mitigation

0.3 tons

Truck travel for import material (two sites)

VMT = 100 trips/day * 160 days/year * 36 miles/trip + 100 trips/day * 52 trips/year * 42 trips/day

Emissions = 0.01 pounds/VMT * 794400 VMT

Annual emissions = 7944 pounds

or

4.0 tons

With mitigation

4.0 tons

Travel for employees (twice)

Emissions = 112 pounds/day * 160 days

Annual emissions = 17920 pounds

or

9.0 tons

With mitigation

9.0 tons

Material handling (twice)

Emissions = 11.8 pounds/day * 160 days

Annual emissions = 1888 pounds

or

0.9 tons

With mitigation

0.5 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2D Sears Point and Lakeville Hillside	Checked By:	C. Chapin 11/22/95

Grading of construction site

213 acres =	3042 ft * 507 trips =	1542294 ft*mile/5280 ft =	292.1011 mile
Emissions =	20.2 pounds/vmt * 292.1011 miles		
Emissions =	5900.443 pounds		
	or		
	3.0 tons	With mitigation	1.5 tons

Grading of 2 staging areas

Emissions =	834.6 pounds		
	or		
	0.4 tons	With mitigation	0.2 tons

Exhaust from truck travel for disposal (two sites)

Emissions =	2.8 pounds/day x 90 days		
	or		
	0.1 tons	With mitigation	0.1 tons

Exhaust from truck travel for import material (two sites)

Emissions =	108.2 pounds/day x 160 days		
	or		
	8.7 tons	With mitigation	8.2 tons

Exhaust from truck travel for employees (two sites)

Emissions =	0.4 pounds/day x 160 days		
	or		
	0.0 tons	With mitigation	0.0 tons

Exhaust from equipment (two sites)

Emissions =	119.55 pounds/day x 160 days		
	or		
	9.6 tons	With mitigation	8.1 tons

Total for Alt 2D	171.4 tons	With mitigation	59.0 tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2E Smaller Tolay A and ASR	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface area for this reservoir will cover over 700 acres.
assuming half the area will be disturbed

Emissions = emission factor * acres = $5.2 \times 350 = 1820$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 418600 pounds

or

209.3 tons

With mitigation

41.9 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds

or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds

or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 102 days/year * 48 miles/trip

Emissions = 0.01 pounds/VMT * 469200 VMT

Annual emissions = 4692 pounds

or

2.3 tons

With mitigation

2.3 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds

or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 5.9 pounds/day * 160 days

Annual emissions = 944 pounds

or

0.5 tons

With mitigation

0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 2E Smaller Tolay A and ASR	Checked By:	C. Chapin 11/22/95

Grading of construction site

350 acres = 3905 ft * 651 trips = 2542155 ft*mile/5280 ft = 481.4688 mile
Emissions = 20.2 pounds/vmt * 481.4688 miles

Emissions = 9725.669 pounds
or

4.9 tons

With mitigation

2.4 tons

Grading of staging area

Emissions = 417.3 pounds
or

0.2 tons

With mitigation

0.1 tons

Exhaust from truck travel for disposal

Emissions = 1.4 pounds/day x 90 days
or

0.1 tons

With mitigation

0.1 tons

Exhaust from truck travel for import material

Emissions = 54.1 pounds/day x 160 days
or

4.3 tons

With mitigation

4.1 tons

Exhaust from truck travel for employees

Emissions = 0.2 pounds/day x 160 days
or

0.0 tons

With mitigation

0.0 tons

Exhaust from equipment

Emissions = 91.59 pounds/day x 160 days
or

7.3 tons

With mitigation

6.2 tons

Total for Alt 2E

237.6 tons

With mitigation

62.8 tons

Project: Santa Rosa Subregional Long-Term Wastewater Project
Subject: Construction - Annual Reservoirs Emissions
Alt 3A Two Rock

Prepared By: I. Edmonds
Date Prepared: 11/22/95
Checked By: C. Chapin 11/22/95

Wind erosion over construction surface

This water surface area for this reservoir will cover over 230 acres.
assuming half of the area will be disturbed.

Emissions = emission factor * acres = $5.2 * 115 = 598$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 137540 pounds
or

68.8 tons

With mitigation

13.8 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds
or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds
or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 113 days/year * 71 miles/trip

Emissions = 0.01 pounds/VMT * 802300 VMT

Annual emissions = 8023 pounds
or

4.0 tons

With mitigation

4.0 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds
or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 5.9 pounds/day * 160 days

Annual emissions = 944 pounds
or

0.5 tons

With mitigation

0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3A Two Rock	Checked By:	C. Chapin 11/22/95

Grading of construction site

115 acres =	2238 ft * 373 trips =	7921774 ft*mile/5280 ft =	1500.336 mile
Emissions =	20.2 pounds/vmt * 1500.336 miles		
Emissions =	30306.79 pounds		
	or		
	15.2 tons	With mitigation	7.6 tons

Grading of staging area

Emissions =	417.3 pounds		
	or		
	0.2 tons	With mitigation	0.1 tons

Exhaust from truck travel for disposal

Emissions =	1.4 pounds/day x 90 days		
	or		
	0.1 tons	With mitigation	0.1 tons

Exhaust from truck travel for import material

Emissions =	54.1 pounds/day x 160 days		
	or		
	4.3 tons	With mitigation	4.1 tons

Exhaust from truck travel for employees

Emissions =	0.2 pounds/day x 160 days		
	or		
	0.0 tons	With mitigation	0.0 tons

Exhaust from equipment

Emissions =	59.78 pounds/day x 160 days		
	or		
	4.8 tons	With mitigation	4.1 tons

Total for Alt 3A	106.5 tons	With mitigation	39.4 tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3B Bloomfield	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface for this reservoir will cover over 195 acres.
assuming half of the area will be disturbed

Emissions = emission factor * acres = $5.2 * 98 = 509.6$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 117208 pounds
or

58.6 tons

With mitigation

11.7 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds
or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds
or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 160 days/year * 82 miles/trip

Emissions = 0.01 pounds/VMT * 1312000 VMT

Annual emissions = 13120 pounds
or

6.6 tons

With mitigation

6.6 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds
or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 5.9 pounds/day * 160 days

Annual emissions = 944 pounds
or

0.5 tons

With mitigation

0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3B Bloomfield	Checked By:	C. Chapin 11/22/95

Grading of construction site

98 acres = 2066 ft * 344 trips = 710704 ft*mile/5280 ft = 134.603 mile
 Emissions = 20.2 pounds/vmt * 134.603 miles
 Emissions = 2718.981 pounds
 or
 1.4 tons With mitigation 0.7 tons

Grading of staging area

Emissions = 417.3 pounds
 or
 0.2 tons With mitigation 0.1 tons

Exhaust from truck travel for disposal

Emissions = 1.4 pounds/day x 90 days
 or
 0.1 tons With mitigation 0.1 tons

Exhaust from truck travel for import material

Emissions = 54.1 pounds/day x 160 days
 or
 4.3 tons With mitigation 4.1 tons

Exhaust from truck travel for employees

Emissions = 0.2 pounds/day x 160 days
 or
 0.0 tons With mitigation 0.0 tons

Exhaust from equipment

Emissions = 59.78 pounds/day x 160 days
 or
 4.8 tons With mitigation 4.1 tons

Total for Alt 3B 85.1 tons With mitigation 33.0 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3C Carroll Road	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface area for this reservoir will cover over 235 acres, assuming half of the area will be disturbed

Emissions = emission factor * acres = $5.2 * 118 = 613.6$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 141128 pounds

or

70.6 tons

With mitigation

14.1128 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds

or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds

or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 147 days/year * 83 miles/trip

Emissions = 0.01 pounds/VMT * 1220100 VMT

Annual emissions = 12201 pounds

or

6.1 tons

With mitigation

6.1 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds

or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 0.9 pounds/day * 160 days

Annual emissions = 144 pounds

or

0.1 tons

With mitigation

0.0 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3C Carroll Road	Checked By:	C. Chapin 11/22/95

Grading of construction site

118	acres =	2267 ft * 378 trips =	856926	ft*mile/5280 ft =	162.2966	mile
Emissions =		20.2 pounds/vmt * 162.2966 miles				
Emissions =		3278.391 pounds				
		or				
		1.6 tons	With mitigation		0.8 tons	

Grading of staging area

Emissions =		417.3	pounds			
		or				
		0.2 tons	With mitigation		0.1 tons	

Exhaust from truck travel for disposal

Emissions =		1.4	pounds/day x 90	days		
		or				
		0.1 tons	With mitigation		0.1 tons	

Exhaust from truck travel for import material

Emissions =		54.1	pounds/day x 160	days		
		or				
		4.3 tons	With mitigation		4.1 tons	

Exhaust from truck travel for employees

Emissions =		0.2	pounds/day x 160	days		
		or				
		0.0 tons	With mitigation		0.0 tons	

Exhaust from equipment

Emissions =		59.78	pounds/day x 160	days		
		or				
		4.8 tons	With mitigation		4.1 tons	

Total for Alt 3C		96.4 tons	With mitigation		34.9 tons	
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3D Valley Ford	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface area for this reservoir will cover over 235 acres.
assuming half of the area will be disturbed

Emissions = emission factor * acres = $5.2 \times 118 = 613.6$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 141128 pounds
or

70.6 tons

With mitigation

14.1 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds
or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds
or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 160 days/year * 85 miles/trip

Emissions = 0.01 pounds/VMT * 1360000 VMT

Annual emissions = 13600 pounds
or

6.8 tons

With mitigation

6.8 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds
or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 0.9 pounds/day * 160 days

Annual emissions = 144 pounds
or

0.1 tons

With mitigation

0.0 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3D Valley Ford	Checked By:	C. Chapin 11/22/95

Grading of construction site

118 acres =	2267 ft * 378 trips =	856926 ft ² /mile/5280 ft =	162.2966 mile
Emissions =	20.2 pounds/vmt * 162.2966 miles		
Emissions =	3278.391 pounds		
	or		
	1.6 tons	With mitigation	0.8 tons

Grading of staging area

Emissions =	417.3 pounds		
	or		
	0.2 tons	With mitigation	0.1 tons

Exhaust from truck travel for disposal

Emissions =	1.4 pounds/day x 90 days		
	or		
	0.1 tons	With mitigation	0.1 tons

Exhaust from truck travel for import material

Emissions =	54.1 pounds/day x 160 days		
	or		
	4.3 tons	With mitigation	4.1 tons

Exhaust from truck travel for employees

Emissions =	0.2 pounds/day x 160 days		
	or		
	0.0 tons	With mitigation	0.0 tons

Exhaust from equipment

Emissions =	59.78 pounds/day x 160 days		
	or		
	4.8 tons	With mitigation	4.1 tons

Total for Alt 3D	97.1 tons	With mitigation	35.6 tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3E Huntley	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

The water surface area for this reservoir will cover over 175 acres.
assuming half of the area will be disturbed

Emissions = emission factor * acres = $5.2 \times 88 = 457.6$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 105248 pounds

or

52.6 tons

With mitigation

10.5 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds

or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds

or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VM T = 100 trips/day * 160 days/year * 78 miles/trip

Emissions = 0.01 pounds/VM T * 1248000 VM T

Annual emissions = 12480 pounds

or

6.2 tons

With mitigation

6.2 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds

or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 5.9 pounds/day * 160 days

Annual emissions = 944 pounds

or

0.5 tons

With mitigation

0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3E Huntley	Checked By:	C. Chapin 11/22/95

Grading of construction site

88	acres =	1958 ft * 326 trips =	638308	ft*mile/5280 ft =	120.8917 mile
Emissions =		20.2 pounds/vmt * 120.8917 miles			
Emissions =		2442.012 pounds			
		or			
		1.2 tons	With mitigation		0.6 tons

Grading of staging area

Emissions =		417.3	pounds		
		or			
		0.2 tons	With mitigation		0.1 tons

Exhaust from truck travel for disposal

Emissions =		1.4	pounds/day x 90	days	
		or			
		0.1 tons	With mitigation		0.1 tons

Exhaust from truck travel for import material

Emissions =		54.1	pounds/day x 160	days	
		or			
		4.3 tons	With mitigation		4.1 tons

Exhaust from truck travel for employees

Emissions =		0.2	pounds/day x 160	days	
		or			
		0.0 tons	With mitigation		0.0 tons

Exhaust from equipment

Emissions =		59.78	pounds/day x 160	days	
		or			
		4.8 tons	With mitigation		4.1 tons

Total for Alt 3E		78.6 tons	With mitigation		31.4 tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3F Smaller Two Rock + ASR	Checked By:	C. Chapin 11/22/95

Wind erosion over construction surface

This water surface area for this reservoir will cover over 150 acres.
assuming half of the area will be disturbed

Emissions = emission factor * acres = $5.2 \times 75 = 390$ pounds/day

Assuming area will be exposed for 230 days per year

Annual emissions = 89700 pounds

or

44.9 tons

With mitigation

9.0 tons

Wind erosion over staging area

The staging area will cover 15 acres.

Emissions = 35.3 pounds/day * 230 days

Annual emissions = 8119 pounds

or

4.1 tons

With mitigation

0.8 tons

Truck travel for disposal

Emissions = 3 pounds/day * 90 days

Annual emissions = 270 pounds

or

0.1 tons

With mitigation

0.1 tons

Truck travel for import material

VMT = 100 trips/day * 113 days/year * 71 miles/trip

Emissions = 0.01 pounds/VMT * 802300 VMT

Annual emissions = 8023 pounds

or

4.0 tons

With mitigation

4.0 tons

Travel for employees

Emissions = 56 pounds/day * 160 days

Annual emissions = 8960 pounds

or

4.5 tons

With mitigation

4.5 tons

Material handling

Emissions = 5.9 pounds/day * 160 days

Annual emissions = 944 pounds

or

0.5 tons

With mitigation

0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Reservoirs Emissions	Date Prepared:	11/22/95
	Alt 3F Smaller Two Rock + ASR	Checked By:	C. Chapin 11/22/95

Grading of construction site

75 acres =	1807 ft * 301 trips =	543907 ft*mile/5280 ft =	103.0127 mile
Emissions =	20.2 pounds/vmt * 103.0127 miles		
Emissions =	2080.856 pounds		
	or		
	1.0 tons	With mitigation	0.5 tons

Grading of staging area

Emissions =	417.3 pounds		
	or		
	0.2 tons	With mitigation	0.1 tons

Exhaust from truck travel for disposal

Emissions =	1.4 pounds/day x 90 days		
	or		
	0.1 tons	With mitigation	0.1 tons

Exhaust from truck travel for import material

Emissions =	54.1 pounds/day x 160 days		
	or		
	4.3 tons	With mitigation	4.1 tons

Exhaust from truck travel for employees

Emissions =	0.2 pounds/day x 160 days		
	or		
	0.0 tons	With mitigation	0.0 tons

Exhaust from equipment

Emissions =	59.78 pounds/day x 160 days		
	or		
	4.8 tons	With mitigation	4.1 tons

Total for Alt 3F	68.4 tons	With mitigation	27.5 tons
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Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Pump Station Emissions	Date Prepared:	11/22/95
		Checked By:	C. Chapin 11/22/95

Alt 2A

PM emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	16		
Emissions = emission factor * number of stations			
PM =	349.28 pounds	with mitigation	303.84 pounds
	or		or
	0.2 tons		0.2 tons

Alt 2B

PM emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	22		
Emissions = emission factor * number of stations			
PM =	480.26 pounds	with mitigation	417.78 pounds
	or		or
	0.2 tons		0.2 tons

Alt 2C

PM emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	24		
Emissions = emission factor * number of stations			
PM =	523.92 pounds	with mitigation	455.76 pounds
	or		or
	0.3 tons		0.2 tons

Alt 2D

PM Emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	22		
Emissions = emission factor * number of stations			
PM =	480.26 pounds	with mitigation	417.78 pounds
	or		or
	0.2 tons		0.2 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Pump Station Emissions	Date Prepared:	11/22/85
		Checked By:	C. Chapin 11/22/95

Alt 2E

PM Emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	21		
Emissions = emission factor * number of stations			
PM =	458.43 pounds	with mitigation	398.79 pounds
	or		or
	0.2 tons		0.2 tons

Alt 3A

PM Emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	18		
Emissions = emission factor * number of stations			
PM =	392.94 pounds	with mitigation	341.82 pounds
	or		or
	0.2 tons		0.2 tons

Alt 3B

PM Emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	18		
Emissions = emission factor * number of stations			
PM =	392.94 pounds	with mitigation	341.82 pounds
	or		or
	0.2 tons		0.2 tons

Alt 3C

PM Emission factor =	21.83 pounds/day/station	with mitigation	18.99 pounds/day/station
Number of pump stations =	19		
Emissions = emission factor * number of stations			
PM =	414.77 pounds	with mitigation	360.81 pounds
	or		or
	0.2 tons		0.2 tons

Project: Santa Rosa Subregional Long-Term Wastewater Project
Subject: Construction - Annual Pump Station Emissions

Prepared By: I. Edmonds
Date Prepared: 11/22/95
Checked By: C. Chapin 11/22/95

AK 3D

PM Emission factor = 21.83 pounds/day/station with mitigation 18.99 pounds/day/station

Number of pump stations = 19

Emissions = emission factor * number of stations

PM = 414.77 pounds
or
0.2 tons

with mitigation 360.81 pounds
or
0.2 tons

AK 3E

PM Emission factor = 21.83 pounds/day/station with mitigation 18.99 pounds/day/station

Number of pump stations = 17

Emissions = emission factor * number of stations

PM = 371.11 pounds
or
0.2 tons

with mitigation 322.83 pounds
or
0.2 tons

AK 3F

PM Emission factor = 21.83 pounds/day/station with mitigation 18.99 pounds/day/station

Number of pump stations = 28

Emissions = emission factor * number of stations

PM = 567.58 pounds
or
0.3 tons

with mitigation 493.74 pounds
or
0.2 tons

AK 4

PM Emission factor = 21.83 pounds/day/station with mitigation 18.99 pounds/day/station

Number of pump stations = 4

Emissions = emission factor * number of stations

PM = 87.32 pounds
or
0.04 tons

with mitigation 75.96 pounds
or
0.04 tons

Project: Santa Rosa Subregional Long-Term Wastewater Project
 Subject: Construction - Annual ASR

Prepared By: I. Edmonds
 Date Prepared: 11/28/95
 Checked By: C. Chapin 11/28/95

Pipelines

Amount of pipe 27000 ft

Assumptions

If pipe is worked at 600 ft per day (1 crew per day), then 45 days are needed to construct.
 assumes 14 staging areas

				With Mitigation
Wind erosion over construction area (2.8 lbs/site/day*1 site)	2.8 lbs/day*	45 days =	126 lbs/yr	63 lbs/yr
Wind erosion over staging area (20.5 lbs/site/day *1 site)	20.5 lbs/day*	45 days =	923 lbs/yr	461 lbs/yr
Truck travel (0.8 lbs/site/day *1 site)	0.8 lbs/day*	45 days =	36 lbs/yr	36 lbs/yr
Vehicle Travel for employees (11.2 lbs/site/day*1 site)	11.2 lbs/day*	45 days =	504 lbs/yr	504 lbs/yr
Material handling (1.1 lbs/site/day *1 site)	1.1 lbs/day*	45 days =	50 lbs/yr	25 lbs/yr
Grading at site (27.6 lbs/site/day *1 site)	27.6 lbs/day*	45 days =	1242 lbs/yr	621 lbs/yr
Grading at staging areas (277.8 lbs/site *1 site)	277.8 lbs/day*	14 days =	3889 lbs/yr	1945 lbs/yr
Exhaust from trucks (0.4 lbs/site/day *1 site)	0.4 lbs/day*	45 days =	18 lbs/yr	17 lbs/yr
Exhaust from employees (0.035 lbs/site/day *1 site)	0.035 lbs/day*	45 days =	2 lbs/yr	1 lbs/yr
Exhaust from equipment (2.58 lbs/site/day*1 site)	2.58 lbs/day*	45 days =	116 lbs/yr	59 lbs/yr
		Total	6905 lbs/yr	3772 lbs/yr
		or	3 tons	2 tons

Wells

Area 1

				With Mitigation
Wind erosion over construction area (0.005 lbs/site/day*2 site)	0.01 lbs/day*	63 days =	1 lbs/yr	0 lbs/yr
Drilling (0.007 lbs/site * 2 sites)	0.014 lbs/day*	63 days =	1 lbs/yr	0 lbs/yr
Truck travel (0.3 lbs/site/day *2 sites)	0.6 lbs/day*	63 days =	38 lbs/yr	38 lbs/yr
Vehicle Travel for employees (11.2 lbs/site/day*2 sites)	22.4 lbs/day*	63 days =	1411 lbs/yr	1411 lbs/yr
Material handling (0.03 lbs/site/day *2 sites)	0.06 lbs/day*	63 days =	4 lbs/yr	2 lbs/yr
Grading at site (0.08 lbs/site/day *2 sites)	0.16 lbs/day*	63 days =	10 lbs/yr	5 lbs/yr
Exhaust from trucks (0.14 lbs/site/day *2 sites)	0.28 lbs/day*	63 days =	18 lbs/yr	17 lbs/yr
Exhaust from employees (0.035 lbs/site/day *2 sites)	0.07 lbs/day*	63 days =	4 lbs/yr	4 lbs/yr
Exhaust from equipment (9.43 lbs/site/day*2 sites)	18.86 lbs/day*	63 days =	1188 lbs/yr	1010 lbs/yr
		Total	2675 lbs/yr	2488 lbs/yr
		or	1 tons	1 tons

Area 2

				With Mitigation
Wind erosion over construction area (0.005 lbs/site/day*2 site)	0.01 lbs/day*	63 days =	1 lbs/yr	0 lbs/yr
Drilling (0.002 lbs/site * 2 sites)	0.004 lbs/day*	63 days =	0 lbs/yr	0 lbs/yr
Truck travel (0.12 lbs/site/day *2 sites)	0.24 lbs/day*	63 days =	15 lbs/yr	15 lbs/yr
Vehicle Travel for employees (11.2 lbs/site/day*2 sites)	22.4 lbs/day*	63 days =	1411 lbs/yr	1411 lbs/yr
Material handling (0.01 lbs/site/day *2 sites)	0.02 lbs/day*	63 days =	1 lbs/yr	1 lbs/yr
Grading at site (0.08 lbs/site/day *2 sites)	0.16 lbs/day*	63 days =	10 lbs/yr	5 lbs/yr
Exhaust from trucks (0.05 lbs/site/day *2 sites)	0.1 lbs/day*	63 days =	6 lbs/yr	6 lbs/yr
Exhaust from employees (0.035 lbs/site/day *2 sites)	0.035 lbs/day*	63 days =	2 lbs/yr	2 lbs/yr
Exhaust from equipment (9.43 lbs/site/day*2 sites)	18.86 lbs/day*	63 days =	1188 lbs/yr	1010 lbs/yr
		Total	2635 lbs/yr	2450 lbs/yr
		or	1 tons	1 tons

Total

6 tons 4 tons

Project:	Santa Rosa Subregional Long-Term Wastewater Project	Prepared By:	I. Edmonds
Subject:	Construction - Annual Geysers Emissions	Date Prepared:	11/29/95
		Checked By:	C. Chapin 11/29/95

Does not include pump station construction, already calculated under pump stations

				With Mitigation
Wind erosion over construction area (9.1 lbs/site*2 sites)	18.2 lbs/day*	35 days =	637 lbs/yr	319 lbs/yr
Wind erosion over staging area (35.3 lbs/site*2 sites)	70.6 lbs/day*	35 days =	2471 lbs/yr	1236 lbs/yr
Truck travel (30.3 lbs/site/day *2 sites)	60.6 lbs/day*	35 days =	2121 lbs/yr	2121 lbs/yr
Vehicle Travel for employees (11.2 lbs/site*2 sites)	22.4 lbs/day*	35 days =	784 lbs/yr	784 lbs/yr
Material handling (0.9 lbs/site *2 sites)	1.8 lbs/day*	35 days =	63 lbs/yr	32 lbs/yr
Grading at site (441.9 lbs/site *2 sites)	883.8 lbs/day*	1 days =	884 lbs/yr	442 lbs/yr
Exhaust from trucks (13.6 lbs/site *2 sites)	27.2 lbs/day*	35 days =	952 lbs/yr	904 lbs/yr
Exhaust from employees (0.035 lbs/site *2 sites)	0.035 lbs/day*	35 days =	1 lbs/yr	1 lbs/yr
Exhaust from equipment (10.04 lbs/site*2 sites)	20.08 lbs/day*	35 days =	703 lbs/yr	597 lbs/yr
		Total	8616 lbs/yr	6435 lbs/yr
			or	
			4 tons	3 tons