This document supplements the *Responses to CEC Data Requests of December 21, 2001* submitted to the CEC on January 8, 2002. It contains:

- Response to Data Request 130
- Copies of Items 34 through 57 listed in Table 135-1

DATA REQUEST

130. Please provide an estimate of the construction emissions (hourly, monthly, and annual) that would occur during the paving of Lurline Road.

RESPONSE

Table 130-1 provides estimated equipment usage for paving Lurline Road. The information provided in Table 130-1 is based on paving 7.44 miles of Lurline Road. Tables 130-2 through 130-9 provide emission factors, equipment usage, and estimates of criteria pollutant emissions due to the paving of Lurline Road. Equipment usage is based on the information provided in Table 130-1. As shown in Response to Data Request 134, PM_{10} offsets from agricultural burning are expected to be such that substantially less than 7.44 miles of paving would be required. This would result in a corresponding reduction in equipment usage and pollutant emissions.

Table 130-1
Estimated Construction Equipment Usage
Lurline Road Paving (7.4 mi)

Equipment Type	Number of Units Per Day																										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
14 Bottom-Dump Trucks																	X	X	X	X	X	X	X	X			
30 Bottom-Dump Trucks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											
1 Paver																	X	X	X	X	X	X	X	X			
3 Rollers																	X	X	X	X	X	X	X	X			
4 Rollers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											
1 Grader																	X	X	X	X	X	X	X	X	X	X	X
2 Graders	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											
2 Water Trucks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
1 Water Truck																									X	X	X
Pickups	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TABLE 130-2: CONSTRUCTION EQUIPMENT HOURLY EMISSIONS FACTORS													
Construction Equipment	**Fuel**	**Engine HP**	**Load Factor**	**Emission Factors, g/hp-hr**					**Hourly Emissions, lb/hr**				
				NOx	**CO**	**VOC**	**SOx**	**PM10**	**NOx**	**CO**	**VOC**	**SOx**	**PM10**
Excavator Motor Grader	Diesel	100	0.9	10.44	3.18	0.45	0.18	0.05	2.07	0.63	0.09	0.04	0.01
Roller Vibrator	Diesel	100	0.65	8.00	5.00	1.22	0.19	0.10	1.14	0.72	0.17	0.03	0.01
Water Truck	Diesel	150	0.5	9.60	2.80	0.86	0.18	0.08	1.58	0.46	0.14	0.03	0.01
Paving Machine	Diesel	100	0.85	10.44	3.18	0.45	0.18	0.05	1.95	0.59	0.08	0.03	0.01
Dump Truck	Diesel	150	0.65	9.60	2.80	0.86	0.18	0.08	2.06	0.60	0.18	0.04	0.02
Pickup Truck (1/2-ton)	Gasoline	150	0.8	10.10	2.80	0.86	0.18	0.08	2.67	0.74	0.23	0.05	0.02

NOTE: Soot filters with 90% efficiency added to engines greater than 100 hp

TABLE 130-3: CONSTRUCTION EQUIPMENT DAILY SUMMARY

Construction Equipment	Aver. Hours per Day	Average Units On Site Per Day																											Total Days
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Excavator Motor Grader	7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	43
Roller Vibrator	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3				88
Water Truck	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	51
Paving Machine	5																	1	1	1	1	1	1	1	1				8
Dump Truck	7	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	14	14	14	14	14	14	14	14				592
Pickup Truck (1/2-ton)	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	81

Notes:
1. Average hours per day are considered to be the same as for the main site construction schedule.
2. Load factor is equivalent fraction of time equipment operated at 100% capacity during work week.
3. For equipment hourly emissions, see Emission Factors Table.

TABLE 130-4: CONSTRUCTION DAILY NOx EMISSIONS SUMMARY

Construction Equipment	NOx Emissions Per Day of Construction																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Excavator Motor Grader	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
Roller Vibrator	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	-	-	-
Water Truck	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	9.5	9.5	9.5
Paving Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	-	-	-
Dump Truck	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	201.8	201.8	201.8	201.8	201.8	201.8	201.8	201.8	-	-	-
Pickup Truck (1/2-ton)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	547.8	305.6	305.6	305.6	305.6	305.6	305.6	305.6	305.6	64.0	64.0	64.0

Worst-Case Emissions	
Worst Day	547.8 lb/day
Worst 1-hr	22.8 lb/hr
Worst Month	11402.2 lb/month

Yearly Emissions	11,402.2	lbs/yr

TABLE 130-5: CONSTRUCTION DAILY CO EMISSIONS SUMMARY

Construction Equipment	CO Emissions Per Day of Construction																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Excavator Motor Grader	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Roller Vibrator	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	-	-	-
Water Truck	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	2.8	2.8	2.8
Paving Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	-	-	-
Dump Truck	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	126.1	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	-	-	-
Pickup Truck (1/2-ton)	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
Total	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	95.7	95.7	95.7	95.7	95.7	95.7	95.7	95.7	18.3	18.3	18.3

Worst-Case Emissions	
Worst Day	168.7 lb/day
Worst 1-hr	7.0 lb/hr
Worst Month	3520.5 lb/month

Yearly Emissions	3,520.5	lbs/yr

TABLE 130-6: CONSTRUCTION DAILY VOC EMISSIONS SUMMARY

Construction Equipment	VOC Emissions Per Day of Construction																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Excavator Motor Grader	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Roller Vibrator	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	-	-	-
Water Truck	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9
Paving Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-	-	-
Dump Truck	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	-	-	-
Pickup Truck (1/2-ton)	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Total	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	4.9	4.9	4.9

Worst-Case Emissions	
Worst Day	49.3 lb/day
Worst 1-hr	2.1 lb/hr
Worst Month	1022.1 lb/month

Yearly Emissions	1,022.1	lbs/yr

TABLE 130-7: CONSTRUCTION DAILY SOx EMISSIONS SUMMARY

Construction Equipment	SOx Emissions Per Day of Construction																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Excavator Motor Grader	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Roller Vibrator	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	-	-	-
Water Truck	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2
Paving Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-
Dump Truck	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	-	-	-
Pickup Truck (1/2-ton)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	1.1	1.1	1.1

Worst-Case Emissions	
Worst Day	10.2 lb/day
Worst 1-hr	0.4 lb/hr
Worst Month	212.5 lb/month

Yearly Emissions	212.5	lbs/yr

TABLE 130-8: CONSTRUCTION DAILY PM10 EMISSIONS SUMMARY

Construction Equipment	PM10 Emissions Per Day of Construction																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Excavator Motor Grader	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Roller Vibrator	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-
Water Truck	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Paving Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Dump Truck	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	-	-	-
Pickup Truck (1/2-ton)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.5	0.5	0.5

Worst-Case Emissions		
Worst Day	4.5	lb/day
Worst 1-hr	0.2	lb/hr
Worst Month	94.3	lb/month

Yearly Emissions	94.3	lbs/yr

Table 130-9 Fugitive Dust

Uncontrolled Emission Factor[a]	0.11	tons PM10/acre-month	7.3333333	lbs PM10/acre-day
Controlled Emission Factor	0.011	tons PM10/acre-month	0.7333333	lbs PM10/acre-day
Control Efficiency[b]	90%			

[a]Uncontrolled emission factor from Midwest Research Institute (MRI, 1996).

[b]A 90% control efficiency was assumed due to fugitive dust compliance program.

Lurline Rd length: 7.4 miles
Area of construction width: 35 ft

Total area of construction:	1367520	sqf	31.4	acres
Uncontrolled Emissions:			3.454	tons PM10/month
Controlled Emissions:			**0.31086**	**tons PM10**
			23.02667	**lbs PM10/day**