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June 20, 2003

Francis D. Condrick
Air Quality
Pennsylvania Department of Environmental
Protection
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Subject: Plan Approval 65-00853A

Dear Frank:

Koppers Inc. is in receipt of your letter dated April 23, 2003 and offers the following response:

PADEP Comment:

1. Review the Air Information Management System Report (AIMS) for the calendar year 2002 for the pollutants NOx and VOC and revise if necessary.

Response:

Koppers has reviewed the AIMS for calendar year 2002 and NOx and VOC and no changes are required. Summaries of the emissions/derivations are summarized in Table 1 and the detailed calculations for the revised RACT limits and actual 2002 calculations are summarized in Table 2.

PADEP Comment:

2. Provide calculations for all NOx and VOC reported in the 2002 AIMS report and provide explanation if stack test data was not used in determining the actual emissions.

Response:

Table 2 provides detail on the derivation of emission estimates used in the 2002 Actual Emissions (AIMS) calculations. The emissions factor derivation approach (i.e., stack testing, AP-42, material balance) is clearly indicated on Table 2.

PADEP Comment:

3. Explain how 85% was derived for the coke pushing capture efficiency.

Response:

85% capture for the pushing operation was taken from the Title V application. From the Title V, a 20% opacity (25 PA Code 132.41) corresponds to an 85% capture, per the 1987 USEPA report: Coke Oven Emissions from Wet-Coal Charged By-Product Coke Oven batteries - Background Information for Proposed Standards.

PADEP Comment:

4. Provide information on the fugitive NOx emission estimate for coke pushing operation, and revise the AIMS report and the RACT plan accordingly.

Response:

As discussed with PADEP on several occasions, the AIMS report is based on actual emissions for the reporting year, which the RACT permit application emission is an estimate of potential emissions based on production, equipment design capacity and control equipment. The AIMS and RACT application numbers are different and any attempt to correlate is not worthwhile. Table 2 includes the derivation of proposed RACT limits and the actual emissions as submitted for the AIMS report.

RACT Permit:

For coke pushing, the fugitive emissions proposed for the RACT application were calculated based on dividing the hourly measured stack emissions by the 85% capture efficiency (CE) to calculated uncontrolled emissions. This value was then multiplied by (1-CE) to calculate a fugitive hourly emission.

AIMS Report:

Because stack emissions vary over the years, Koppers agreed with the PADEP Air Quality inspector to use the average stack test data for the AIMS reports Kopper's adds the next years data to the existing sample population. Therefore the lb/push test results were used to establish an lb/ton coal and lb/ton coke emission factor(s). The values from the years 1998-2002 were averaged and used to calculate the actual annual emission for the AIMS report.

SEE NOTE ON TABLE 1 – NEW PUSHING LIMITS ARE MUCH LOWER AFTER GETTING RID OF EXTENDED TESTING AND USING ACTUAL PUSHING MINUTES IN AN HOUR. NOT 60 MINUTES PER HOUR.

PADEP Comment:

5. NOx emission rates from the flare, the boilers and the combustion stocks (sp), in AIMS and the revised PACT (sp) plan should reflect both the higher-than-expected Nox (sp) emission rate associated with burning coke oven gas (as compared with natural gas) and a reasonable projection for incidents, when situations occur at the facility which result in inadequately treated COG is burned.

Response:

COG emission factors derived from testing are used to calculate NOx emissions from the boilers and underfires. Flare NOx emission factors are from AP-42, which assumes the waste flared is 80% propylene and 20% propane. This is the best information currently available for NOx emissions from flaring.

PADEP Comment:

6. Show the empirical formula to predict the volume of COG produced and burned at the facility.

Response:

Koppers does not use an "empirical formula" to predict the volume of COG produced and burned at the facility.

In 2002, total COG generation was calculated using 12,626 scf of COG per ton coal, based on 1998-2002 testing data. 514,328 tons of coal was charged, therefore, a total of 6,493 mmcf/COG was generated.

COG usage is metered to the boilers and in 2002, this quantity was 2,013 mmcf. The underfires COG consumption is calculated by using the average hourly flow from 1998-2002 test data and assuming 8,760 hours of operation, which totaled 3,211 mmcf/yr. The flare is calculated by difference, i.,e 6,493 – 2,013 – 3,211 = 1,269 mmcf/yr

PADEP Comment:

7. Koppers raised objections to a number of the provisions in the draft 65-203-07 Plan Approval minor modifications at our meeting on April 8, 2003. We indicated that we would consider specific written proposals for alternatives with justification and Koppers indicated that you would do so.

Response:

Koppers provided a detailed response to draft plan approval 65-203-07 minor modification via e-mail to PADEP on April 23, 2003. Koppers would appreciate a response to comments from PADEP.

Based on conversations with PADEP and comparison of the AIMS report and the RACT application. Koppers has determined that the RACT application should be revised to delete the results of the extended testing conducted in 1997 and the Optimal test data. Therefore both submittals will use the same data set generated from 1998-2002.

Koppers looks forward to our meeting scheduled for June 25, 2003 at PADEP Southwest Regional office at 10 am.

Sincerely,

Traci I. Self

cc:
PADEP
William Charlton
Ronald Schwartz

Koppers:
J. Dietz
R. James Burkhart
G. Shamitko
L. Hyde

Enclosure(s)

Table 1. Derivation of RACT Limits, Comparison of Actual Emissions, Current RACT Limit and Proposed Emission Limits
Koppers Inc., Monessen Coke Plant, Monessen, Pennsylvania

BOILERS

	NOx (tpy)	VOC (tpy)	Emission Factor Derivation
2002 Actual Emissions	67	1.7	NOx - Average Stack Test for COG (1998-2002)/AP-42 for Natural Gas; VOC - 1999 Stack Test for COG/AP-42 for Natural Gas
Current RACT Limit	112	2.7	
New Proposed Limit	112	7.23	NOx - Average Stack Test for COG (1998-2002)/AP-42 for Natural Gas; VOC - 1999 Stack Test for COG/AP-42 for Natural Gas

COMBUSTION STACKS

	NOx				VOC				
	Battery 1B		Battery 2		Battery 1B		Battery 2		Emission Factor Derivation
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	
2002 Actual Emissions		286		160		11		4	NOx and VOC: Average Testing Data (1998-2002)
Current RACT Limit	60.7	286	55.4	246	0.3	1	0.5	1.9	
New Proposed Limit	77.8	341	60.1	263	14.9	65	4.0	17	NOx and VOC - Statistical Analysis Using Testing Data (1998-2002)

PUSHING (STACK AND FUGITIVE)

	NOx Pushing		VOC Pushing		Emission Factor Derivation
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	
2002 Actual Emissions	-	2.5	-	0.5	NOx and VOC: Average Testing Data (1998-2002); Assuming 85% CE for fugitives
Current RACT Limit	7.8	4.8	1.1	0.6	
New Proposed Limit	NO CHANGE	5.9	NO CHANGE	1.1	NOx and VOC: Statistical Analysis Using Testing Data (1998-2002); Assuming 85% CE for fugitives

FLARES

	NOx (tpy)	VOC (tpy)	Emission Factor Derivation
2002 Actual Emissions	21.52	15	NOx - AP-42, 1998-2002 Average HHV of COG; VOC - Mass Density of 0.12 VOC in COG and 99% VOC destruction Efficiency
Current RACT Limit	31.7	28	
New Proposed Limit	133	119	NOx - AP-42, Statistical Analysis of HHV of COG from 1998-2002; VOC - Mass Density of 0.12 VOC in COG and 99% VOC destruction Efficiency

BATTERY OPERATIONS, INCLUDING CHARGING, DOOR, LID AND OFFTAKE LEAKS AND SOAKING

	NOx (tpy)	VOC (tpy)	Emission Factor Derivation
2002 Actual Emissions w/Haney Factor Charging	0.59	24	Nox - AP-42; VOC - Haney Factor for charging/AP-42 for all others
2002 Actual Emissions w/ AP-42 Charging	0.59	3.45	NOx and VOC - AP-42
Current RACT Limit	0.7	36.2	
New Proposed Limit	NO CHANGE REQUESTED		

MISCELLANEOUS SOURCES, INCLUDING EQUIPMENT LEAKS, PRODUCT LOADING AND STORAGE TANKS

	VOC (tpy)	Emission Factor Derivation
2002 Actual Emissions	5.9	AP-42 for tanks/product loading/EPA fugitives guidelines for equipment leaks (No-leak factors)
Current RACT Limit	43.8	
New Proposed Limit	NO CHANGE REQUESTED	

Table 2. Derivation of RACT Limits, Summary of Proposed RACT Limits and Derivations
Koppers Inc., Monessen Coke Plant, Monessen, Pennsylvania

BOILERS

NOx

Potential Emissions

PADEP limit of 112 tons/yr. No change from current RACT limit.

VOC

THC as propane

Potential Emissions

Boiler can consume 100% COG or 100% natural gas, or a combination of the two. Potential emissions calculated assuming 100% of each fuel, then taking maximum

Emission Factor

COG emission rate derived from 1999 stack test:	0.005 lb/MMBtu, maximum of 3-readings
1998-2002 Average Higher Heating Value (HHV) of COG	496 Btu/cf
HHV Adding a 99% Confidence Limit to Average	537 Btu/cf
COG VOC Emission Factor	2.68 lb/mmcf
lb/mmcf = 0.005 lb/MMBtu x 537 Btu/cf	
Natural Gas VOC Emission Factor from AP-42, Section 1.4	5.50 lb/mmcf

Maximum Fuel Usage

Rated Capacity of Boilers	143 MMBtu/hr, each
Maximum Annual COG Usage	2,693.94 mmcf/yr per boiler
Using HHV from 1998-2002 (minimum)	465 Btu/cf
mmcf/yr = 143 MMBtu/hr / 465 Btu/cf x 8760 hrs/yr	
Maximum Annual Natural Gas Usage	1,216.19 mmcf/yr per boiler
Using typical HHV	1,030 Btu/cf
mmcf/yr = 143 MMBtu/hr / 1,030 Btu/cf x 8760 hrs/yr	

Potential Annual Emissions

COG Combustion	7.2 tons/yr
tons/yr = (2.68 lb/mmcf x 2,694 mmcf/yr / 2000 lbs/ton) x 2 boilers	
Natural Gas Combustion	6.7 tons/yr
tons/yr = (5.50 lb/mmcf x 1,216 mmcf/yr / 2000 lbs/ton) x boilers	
Maximum	7.2 tons/yr

2002 Actual Emission

Emission Factor

COG emission rate derived from 1999 stack test:	0.0034 lb/MMBtu, average of 3 readings
Higher Heating Value (HHV) of COG during 1999 test	490 Btu/cf
COG VOC Emission Factor	1.66 lb/mmcf
lb/mmcf = 0.003 lb/MMBtu x 490 Btu/cf	
Natural Gas VOC Emission Factor from AP-42, Section 1.4	5.50 lb/mmcf

Actual Fuel Usage

Annual COG Usage for both boilers	2,012.87 mmcf/yr, total, metered
Annual Natural Gas Usage for both boilers	15.06 mmcf/yr, total, metered

Actual Annual Emissions

COG Combustion	1.67 tons/yr
tons/yr = 1.66 lb/mmcf x 2,013 mmcf/yr / 2000 lbs/ton	
Natural Gas Combustion	0.04 tons/yr
tons/yr = 5.5 lb/mmcf x 15.06 mmcf/yr / 2000 lbs/ton	
Total	1.72 tons/yr

BATTERY 1B COMBUSTION STACK

NOx

Potential Emissions

1998-2002 Average Hourly Emissions from Compliance Testing:	65.3 lb/hr
Proposed Hourly Limit Adding a 99% Confidence Limit to Average	77.8 lb/hr
Proposed Annual Limits (Using 8,760 hours)	341 tons/yr

2002 Actual Emissions

Emission Factor — Derived using 1998-2002 average test results

Year	Test Results lb/MMBtu	HHV Btu/scf	Factor lb/mmcf of COG	
2002	0.575	503	289	(lb/MMBtu x Btu/scf)
2001	0.539	489	264	(lb/MMBtu x Btu/scf)
2000	0.590	497	293	(lb/MMBtu x Btu/scf)
1999	0.614	465	286	(lb/MMBtu x Btu/scf)
1998	0.581	516	300	(lb/MMBtu x Btu/scf)
Average			286	

Actual Fuel Usage — Derived using the hourly flow rates from 1998-2002 test data, and assuming 8,760 hours

Year	Battery 1B COG Flow (scfh)	
2002	227,673	
2001	222,137	
2000	224,275	
1999	244,113	
1998	222,936	
Average	228,227	
Average (mmcf/yr)	1999.27	228,227 scfh x 8,760 hrs/yr 1 mmcf/1,000,000 scf

Actual Annual Emissions

286 tons/yr — 286 lb/mmcf x 1999 mmcf/yr / 2000 lbs/ton

VOC as propane

Potential Emissions

1998-2002 Average Hourly Emissions from Compliance Testing:	2.5 lb/hr
Proposed Hourly Limit Adding a 99% Confidence Limit to Average	14.9 lb/hr
Proposed Annual Limits (Using 8,760 hours)	65 tons/yr

2002 Actual Emissions

Emission Factor — Derived using 1998-2002 average test results

Year	Test Results lb/MMBtu	HHV Btu/scf	Factor lb/mmcf of COG	
2002	0.009	503	4.41	(lb/MMBtu x Btu/scf)
2001	0.000	489	0.00	(lb/MMBtu x Btu/scf)
2000	0.000	497	0.00	(lb/MMBtu x Btu/scf)
1999	0.007	465	3.48	(lb/MMBtu x Btu/scf)
1998	0.090	516	46.49	(lb/MMBtu x Btu/scf)
Average			11	

Actual Fuel Usage — Derived using the hourly flow rates from 1998-2002 test data, and assuming 8,760 hours

Year	Battery 2 COG Flow (scfh)	
2002	227,673	
2001	222,137	
2000	224,275	
1999	244,113	
1998	222,936	
Average	228,227	
Average (mmcf/yr)	1999.27	228,227 scfh x 8,760 hrs/yr 1 mmcf/1,000,000 scf

Actual Annual Emissions

11 tons/yr — 11 lb/mmcf x 1999 mmcf/yr / 2000 lbs/ton

BATTERY 2 COMBUSTION STACK

NOx

Potential Emissions

1998-2002 Average Hourly Emissions from Compliance Testing:	36.7 lb/hr
Proposed Hourly Limit Adding a 99% Confidence Limit to Average	60.1 lb/hr
Proposed Annual Limits (Using 8,760 hours)	263 tons/yr

2002 Actual Emissions

Emission Factor — Derived using 1998-2002 average test results

Year	Test Results lb/MMBtu	HHV Btu/scf	Factor lb/mmcf of COG	
2002	0.512	500	256	(lb/MMBtu x Btu/scf)
2001	0.553	502	278	(lb/MMBtu x Btu/scf)
2000	0.619	480	297	(lb/MMBtu x Btu/scf)
1999	0.574	505	290	(lb/MMBtu x Btu/scf)
1998	0.390	517	202	(lb/MMBtu x Btu/scf)
Average			264	

Actual Fuel Usage — Derived using the hourly flow rates from 1998-2002 test data, and assuming 8,760 hours

Year	Battery 2 COG Flow (scfh)	
2002	164,233	
2001	159,219	
2000	115,386	
1999	137,503	
1998	114,482	
Average	138,165	
Average (mmcf/yr)	1210.32	138,165 scfh x 8,760 hrs/yr 1 mmcf/1,000,000 scf

Actual Annual Emissions

160 tons/yr — 264 lb/mmcf x 1210 mmcf/yr / 2000 lbs/ton

VOC as propane

Potential Emissions

1998-2002 Average Hourly Emissions from Compliance Testing:	1.0 lb/hr
Proposed Hourly Limit Adding a 99% Confidence Limit to Average	4.0 lb/hr
Proposed Annual Limits (Using 8,760 hours)	17 tons/yr

2002 Actual Emissions

Emission Factor — Derived using 1998-2002 average test results

Year	Test Results lb/MMBtu	HHV Btu/scf	Factor lb/mmcf of COG	
2002	0.010	500	4.89	(lb/MMBtu x Btu/scf)
2001	0.014	502	7.23	(lb/MMBtu x Btu/scf)
2000	0.008	480	4.01	(lb/MMBtu x Btu/scf)
1999	0.001	505	0.62	(lb/MMBtu x Btu/scf)
1998	0.036	517	18.43	(lb/MMBtu x Btu/scf)
Average			7.03	

Actual Fuel Usage — Derived using the hourly flow rates from 1998-2002 test data, and assuming 8,760 hours

Year	Battery 2 COG Flow (scfh)	
2002	164,233	
2001	159,219	
2000	115,386	
1999	137,503	
1998	114,482	
Average	138,165	
Average (mmcf/yr)	1210.32	138,165 scfh x 8,760 hrs/yr 1 mmcf/1,000,000 scf

Actual Annual Emissions

4 tons/yr — 7.03 lb/mmcf x 1210 mmcf/yr / 2000 lbs/ton

PUSHING

NOx

Potential Emissions

Stack Emission

NOx Emission Rate	0.31	lb/push, 99% Confidence Interval
Maximum pushes per hour	9	pushes/hr, per Greg Shamitko, 4/24/03 - operational limitation
Maximum Hourly Emissions	2.8	lbs/hr
lb/hr = 0.31 lb/push x 9 pushes/hr		
Minimum tons of coke per push	11.5	tons coke/push, per Greg Shamitko, 4/24/03 (minimum)
NOx Emission Factor, based on coke	0.027	lb/ton coke, (lb/push) / (tons coke/push)
lb/ton coke = 0.31 lb/push / 11.5 tons coke/push		
Coal/Coke Ratio	1.44	tons coal/tons coke, average rate from 1998-2002
NOx Emission Factor, based on coal	0.019	lb/ton coal
lb/ton coal = 0.027 lb/ton coke / 1.44 tons coal/ton coke		
Maximum Coal Usage	541,000	tons coal/yr
Maximum Annual Stack Emissions	5.01	tons/yr, (lb/ton coal) x (tons coal/yr) / 2000 lbs/ton
tons/yr = 0.019 lb/ton coal x 541,000 tons coal/yr / 2000 lb/ton		

Fugitive Emissions

Capture Efficiency (CE):	85	%
Baghouse Control Efficiency:	0	%, for gaseous pollutants
Uncontrolled Hourly Emissions:	3.24 lbs/hr	lb/hr (stack emissions) / CE
Uncontrolled Annual Emissions:	5.90 tons/yr	tons/yr (stack emissions) / CE
Fugitive Hourly Emissions	0.49 lb/hr	lb/hr (uncontrolled emissions) x (1-CE)
Fugitive Annual Emissions	0.88 tons/yr	tons/yr (uncontrolled emissions) x (1-CE)

2002 Actual Emissions

Stack Emission

Emission Factor — Derived using 1998-2002 average test results

Year	Test Results lb/push	Tons Coke per Push[1]	Coal:Coke Ratio	Emission Factor (lb/ton coke)	(lb/ton coal)
2002	0.17	12	1.42	0.014	0.0101
2001	0.09	12	1.42	0.007	0.0051
2000	0.11	12	1.43	0.009	0.0062
1999	0.18	12	1.46	0.015	0.0105
1998	0.18	12	1.46	0.015	0.0102
Average					0.0084

[1] Typical quantity, per Greg Shamitko, 4/25/03

lb/ton coke = (lb/push) / (tons of coke per push)

lb/ton coal = (lb/ton coke) / (coal:coke ratio)

Actual Throughput

Coal: 514,328 tons/yr, supplied by Koppers

Actual Annual Emissions

2.2 tons/yr — 0.0084 lb/ton coal x 514,328 tons coal/yr / 2000 lbs/ton

Fugitive Emissions

CE:	85	%
Baghouse Control Efficiency:	0	%, for gaseous pollutants
Uncontrolled Annual Emissions:	2.55 tons/yr	tons/yr (stack emissions) / CE
Fugitive Annual Emissions	0.38 tons/yr	tons/yr (uncontrolled emissions) x (1-CE)

PUSHING (continued)

VOC THC as propane

Potential Emissions

Stack Emission

VOC Emission Rate	0.06	lb/push, 99% Confidence Interval
Maximum pushes per hour:	9	pushes/hr, per Greg Shamitko, 4/24/03 - operational limitation
Maximum Hourly Emissions:	0.5	lbs/hr
lb/hr = 0.06 lb/push x 9 pushes/hr		
Minimum tons of coke per push	11.5	tons coke/push, per Greg Shamitko, 4/24/03 (minimum)
VOC Emission Factor, based on coke:	0.005	lb/ton coke, (lb/push) / (tons coke/push)
lb/ton coke = 0.06 lb/push / 11.5 tons coke/push		
Coal/Coke Ratio:	1.44	tons coal/tons coke, average rate from 1998-2002
VOC Emission Factor, based on coal:	0.003	lb/ton coal
lb/ton coal = 0.003 lb/ton coke / 1.44 tons coal/ton coke		
Maximum Coal Usage	541,000	tons coal/yr
Maximum Annual Stack Emissions	0.93	tons/yr, (lb/ton coal) x (tons coal/yr) / 2000 lbs/ton
tons/yr = 0.003 lb/ton coal x 541,000 tons coal/yr / 2000 lb/ton		

Fugitive Emissions

Capture Efficiency (CE):	85	%	
Baghouse Control Efficiency:	0	%, for gaseous pollutants	
Uncontrolled Hourly Emissions:	0.60	lbs/hr	lb/hr (stack emissions) / CE
Uncontrolled Annual Emissions:	1.09	tons/yr	tons/yr (stack emissions) / CE
Fugitive Hourly Emissions	0.09	lb/hr	lb/hr (uncontrolled emissions) x (1-CE)
Fugitive Annual Emissions	0.16	tons/yr	tons/yr (uncontrolled emissions) x (1-CE)

2002 Actual Emissions

Stack Emission

Emission Factor — Derived using 1998-2002 average test results

Year	Test Results lb/push	Tons Coke per Push[1]	Coal:Coke Ratio	Emission Factor (lb/ton coke)	(lb/ton coal)
2002	0.003	12	1.42	0.0002	0.0002
2001	0.04	12	1.42	0.003	0.0024
2000	0.03	12	1.43	0.003	0.0020
1999	0.02	12	1.46	0.002	0.0012
1998	0.03	12	1.46	0.003	0.0019
Average					0.0015

[1] Typical quantity, per Greg Shamitko, 4/25/03

lb/ton coke = (lb/push) / (tons of coke per push)

lb/ton coal = (lb/ton coke) / (coal:coke ratio)

Actual Throughput

Coal: 514,328 tons/yr, supplied by Koppers

Actual Annual Emissions

0.4 tons/yr — 0.0084 lb/ton coal x 514,328 tons coal/yr / 2000 lbs/ton

Fugitive Emissions

CE:	85	%	
Baghouse Control Efficiency:	0	%, for gaseous pollutants	
Uncontrolled Annual Emissions:	0.46	tons/yr	tons/yr (stack emissions) / CE
Fugitive Annual Emissions	0.07	tons/yr	tons/yr (uncontrolled emissions) x (1-CE)

FLARES
NOx

Potential Emissions

AP-42, Section 13.5, 9/91 Emission Factor for COG	0.068 lb/MMBtu
1998-2002 Average Higher Heating Value (HHV) of COG	496 Btu/cf
HHV Adding a 99% Confidence Limit to Average	537 Btu/cf
Derived Emission Factor Using AP-42 and HHV	36.50 lb/mmcf
0.068 lb/MMBtu x 537 Btu/cf	
Maximum COG Consumption (Capacity of Flares):	0.833 mmcf/hr
	7,270.80 mmcf/yr
Hourly Emissions	30.40 lb/hr
lb/hr = 36.50 lb/mmcf x 0.833 mmcf/hr	
Annual Emissions	133 ton/yr
ton/yr = 36.50 lb/mmcf x 7,271 mmcf/yr / 2000 lbs/ton	

Note: Emissions from natural gas combustion are negligible

2002 Actual Emissions

Emission Factor

AP-42, Section 13.5, 9/91 Emission Factor for COG	0.068 lb/MMBtu
1998-2002 Average Higher Heating Value (HHV) of COG	496 Btu/cf
Derived Emission Factor Using AP-42 and HHV	33.72 lb/mmcf
0.068 lb/MMBtu x 496 Btu/cf	

Actual COG Flare

It is first necessary to derive total COG generated. This is done by deriving COG make (scf/ton coal) using 1998-2002 data as follows:

Year	Total COG Flow (scfh)	Average Coal Throughput During Test (tons/day)	COG Make (scf/ton coal)
2002	699,385	1,504	11,160
2001	797,617	1,464	13,076
2000	795,253	1,403	13,604
1999	754,100	1,330	13,608
1998	790,089	1,617	11,727
Average			12,635

Total COG Generated, "A" : 6,498.47 mmcf/yr 12,635 scf/ton coal x 514,328 tons coal/yr / 1,000,000
Coal: 514,328 tons/yr, supplied by Koppers

COG consumed at boilers is metered, "B"	2,012.87 mmcf/yr
COG consumed at Underfire 1B (refer to calculations above), "C"	1999.27 mmcf/yr
COG consumed at Underfire 2 (refer to calculations above), "D"	1210.32 mmcf/yr
Total of B, C, and D	5,222.46 mmcf/yr
Amount flared, A - B - C - D	1,276.01 mmcf/yr

Actual Annual Emissions

21.52 tons/yr 33.72 lb/mmcf x 1,276 mmcf/yr / 2000 lbs/ton

FLARES (continued)

VOC

Potential Emissions

Mass Density of VOC in COG (from Title V Application)	0.12 lb VOC/lb COG
COG Density	27,200 lb COG/mmcf
Flare VOC Destruction Efficiency	99 %
Derived Emission Factor	32.64 lb/mmcf

lb/mmcf = 0.12 lb VOC/lb COG x 27,200 lb COG/mmcf x (1-.99)

Maximum COG Consumption (Capacity of Flares):	0.833 mmcf/hr
	7,270.80 mmcf/yr
Hourly Emissions	27.19 lb/hr

lb/hr = 32.64 lb/mmcf x 0.833 mmcf/hr

Annual Emissions	119 ton/yr

ton/yr = 32.64 lb/mmcf x 7,271 mmcf/yr / 2000 lbs/ton

Note: Emissions from natural gas combustion are negligible

2002 Actual Emissions

Emission Factor

Mass Density of VOC in COG	0.085 lb VOC/lb COG, Actual 2002 Data
COG Density	27,200 lb COG/mmcf
Flare VOC Destruction Efficiency	99 %
Derived Emission Factor	23.12 lb/mmcf

lb/mmcf = 0.085 lb VOC/lb COG x 27,200 lb COG/mmcf x (1-.99)

Actual COG Flare

1,276.01 mmcf/yr Refer to Actual NOx Emissions for derivation of COG flared

Actual Annual Emissions

14.8 tons/yr 23.12 lb/mmcf x 1,276 mmcf/yr / 2000 lbs/ton

Battery Operations, Including charging, door, lid and offtake leaks and soaking

NOx

Potential Emissions

AP-42 (draft 2001) Section 12.2 Emission Factor Charging:	NA
AP-42 (draft 2001) Section 12.2 Emission Factor Door Leaks	0.0013 lb/ton coal
AP-42 (draft 2001) Section 12.2 Emission Factor Lid Leaks	NA
AP-42 (draft 2001) Section 12.2 Emission Factor Offtake Leaks	NA
AP-42 (draft 2001) Section 12.2 Emission Factor Soaking	0.001 lb/ton coal
Maximum Coal Usage:	541,000 tons coal/yr
Potential Emissions	0.622 tons/yr

2002 Actual Emissions

Coal: 514,328 tons/yr, supplied by Koppers

Actual Emissions from Charging	0.00 tons/yr, using same emission factor as above
Actual Emissions from Door Leaks	0.33 tons/yr, using same emission factor as above
Actual Emissions from Lid Leaks	0.00 tons/yr, using same emission factor as above
Actual Emissions from Offtake Leaks	0.00 tons/yr, using same emission factor as above
Actual Emissions from Soaking	0.26 tons/yr, using same emission factor as above
Total	0.59 tons/yr

VOC

Potential Emissions

AP-42 (draft 2001) Section 12.2 Emission Factor Charging:	0.0011 lb/ton coal
AP-42 (draft 2001) Section 12.2 Emission Factor Door Leaks	0.0055 lb/ton coal
AP-42 (draft 2001) Section 12.2 Emission Factor Lid Leaks	0.000191 lb/ton coal
AP-42 (draft 2001) Section 12.2 Emission Factor Offtake Leaks	0.000638 lb/ton coal
AP-42 (draft 2001) Section 12.2 Emission Factor Soaking	0.006 lb/ton coal
Maximum Coal Usage:	541,000 tons coal/yr
Potential Emissions	3.633 tons/yr

2002 Actual Emissions

Coal: 514,328 tons/yr, supplied by Koppers

Actual Emissions from Charging	0.28 tons/yr, using same emission factor as above
Actual Emissions from Door Leaks	1.41 tons/yr, using same emission factor as above
Actual Emissions from Lid Leaks	0.05 tons/yr, using same emission factor as above
Actual Emissions from Offtake Leaks	0.16 tons/yr, using same emission factor as above
Actual Emissions from Soaking	1.54 tons/yr, using same emission factor as above
Total	3.45 tons/yr

(Note that Haney factor was used for charging in the 2002 AIMS report, which yielded VOC emissions of 21 tons/yr.)

Miscellaneous Sources, Including equipment leaks, product loading and storage tank emissions

VOC

Equipment Leaks

Potential Emissions

Equipment leak emissions calculated using EPA's "Protocol for Equipment Leak Emission Estimates", November 1995. SOCMI average emissions factors were used for all equipment.

Potential Emissions from Equipment Leaks: 13.54 tons/yr

2002 Actual Emissions

Equipment leak emissions calculated using EPA's "Protocol for Equipment Leak Emission Estimates", November 1995. SOCMI screening range emission factors used for parts of plant where LDAR is implemented. SOMCI average factors were used for everything else.

Actual 2002 Emissions: 3.40 tons/yr

Product Loading

Potential Emissions

Emissions calculated using methodology contained in AP-42, Section 5.2, which uses the principals of the ideal gas law with a splash saturation factor. Maximum product loaded calculated as follows:

Crude Tar

1998 to 2002 Average Crude Tar to Coal Ratio	7.11	gal/ton coal
Adding a 99% Confidence Limit to Average	9.02	gal/ton coal
Potential Coal Throughput:	541,000	tons/yr
Potential Crude Tar Loaded:	4,880,022	gal/yr
Temperature:	170	F
Potential Annual Emissions:		1.02 tons/yr

Light Oil

1998 to 2002 Average Crude Tar to Coal Ratio	1.51	gal/ton coal
Adding a 99% Confidence Limit to Average	2.69	gal/ton coal
Potential Coal Throughput:	541,000	tons/yr
Potential Crude Tar Loaded:	1,454,327	gal/yr
Temperature:	85	F
Potential Annual Emissions		4.00 tons/yr

Total Product Loading Potential Emissions 5.02 tons/yr

2002 Actual Emissions

Emissions calculated using methodology contained in AP-42, Section 5.2, which uses the principals of the ideal gas law with a splash saturation factor. All assumptions same as above, except actual product loaded and emissions as follows:

Crude Tar: Quantity Loaded	3,416,393	gal/yr
VOC Emissions	0.7	tons/yr
Light Oil Quantity Loaded	682,229	gal/yr
VOC Emissions	1.7	tons/yr
TOTAL VOC Emissions	2.4	tons/yr

Storage Tanks

Potential Emissions

Emissions calculated using methodology contained in AP-42, Section 7.1. For working losses, it was assumed that 100% of the total throughput went through each tank dedicated to the particular commodity. For standing losses, it was assumed that the tank was half full all year. All tanks are blanketed (except wash oil) with an assumed control efficiency of 98%. The control efficiency was not used in the potential calculations. Detailed Assumptions and Emissions:

	Temp	Maximum Throughput		
Crude Tar	170	4,880,022	gal/yr	Refer to Product Loading
Potential Annual Emissions:		1.751	tons/yr	
Light Oil	85	1,454,327	gal/yr	Refer to Product Loading
Potential Annual Emissions:		2.877	tons/yr	
Flushing Liquor	140	1,626,674	gal/yr	1/3 Crude Tar Throughput
Potential Annual Emissions:		0.000	tons/yr	
Ammonia Liquor	130	1,626,674	gal/yr	1/3 Crude Tar Throughput
Potential Annual Emissions:		0.000	tons/yr	
Light Oil Residue	60	145,433	gal/yr	10% Light Oil Throughput
Potential Annual Emissions:		0.001	tons/yr	
Wash Oil	90	100,000	gal/yr	GUESS
Potential Annual Emissions:		0.043	tons/yr	
TOTAL		4.672	tons/yr	

Miscellaneous Sources, Including equipment leaks, product loading and storage tank emissions, (Continued)

Storage Tanks, continued

2002 Actual Emissions

Crude Tar Tanks	39.027 lbs/yr	0.020 tons/yr
Light Oil Tanks	95.683 lbs/yr	0.048 tons/yr
Flushing Liquor Tanks	0.006 lbs/yr	0.000 tons/yr
Ammonia Liquor Tanks	0.008 lbs/yr	0.000 tons/yr
Light Oil Residue Tanks	1.46 lbs/yr	0.001 tons/yr
Wash Oil Tanks	35.912 lbs/yr	0.018 tons/yr
TOTAL		0.086 tons/yr

Total for Miscellaneous Sources, including Equipment Leaks, Product Loading and Storage Tanks

Total Potential Emissions	23.23 tons/yr
Total 2002 Actual Emissions	5.9 tons/yr