COOLING TOWER FUGITIVE EMISSIONS CONTROL PLAN

The Vista VCM Plant Cooling Tower Fugitive Emissions Control Plan is designed to provide a formalized procedure for detecting and controlling emissions from exchangers in VOC (Volatile Organic Compound) service into the cooling water return to the main plant cooling tower. This plan will be reviewed periodically to determine if the plan meets the original purpose.

I. Cooling Water Sampling

A. Purpose

The daily sampling of the cooling water return to the main plant cooling tower and analysis for VCM, EDC, and Ethylene (the major constituents of the plant process streams which could get into the cooling water) will be used as a check for emissions from exchangers in VOC service.

B. Definition of an Action Level

A cooling water return sample which indicates a level of 1 ppm or more (of EDC plus VCM plus Ethylene) requires that a second sample be taken and analyzed. If the second sample also indicates a level of 1 ppm, then an Action Level is detected and the Action Plan will be implemented.

C. Definition of a Release

A cooling water return sample which indicates a level of 2 ppm or more (of EDC plus VCM plus Ethylene) for two consecutive samples indicates that a release has occurred, and the Louisiana Department of Environmental Quality must be notified.

D. Description of Analytical Equipment

A Perkin Elmer Sigma 2000 Gas Chromotograph with an HS-100 Headspace sampler, or equivalent instrumentation, will be used to analyze the cooling water samples.

E. Calibration and Maintenance

The analytical equipment will be calibrated periodically and maintained as necessary to insure reliable analyses. A standard sample is run with each batch of samples.

The analytical results for this standard sample are compared against a range of acceptable values to check the calibration of the analytical equipment.

F. Sample Point Location and Sampling Procedure

A four ounce sample of the cooling water return is caught from a sample line located at the southeast corner of the Main Plant Cooling Tower. The sample line continuously drains a slipstream of water from the cooling water return header to the cooling tower basin.

II. Action Plan For Response To An Action Level

If the cooling water return analysis indicates that two consecutive samples exceed 1 ppm (total of EDC, VCM, and Ethylene), a search, identification, and elimination program shall be initiated.

The action plan will consist of the following steps:

1. Additional samples will be taken of the main headers and the effluents of the individual exchangers in order to pinpoint the source of the increased emissions. Sampling will be prioritized based on the specific component or components (EDC, VCM, and/or Ethylene) which had increased in the cooling water return.

2. Immediate action will be taken, if possible, to control the increased emissions.

3. If the increased emissions are not controlled, the Operations Superintendent will be notified. The Operations Superintendent will take one of the following actions:

   a. Act to control the increased emissions, if practical, or

   b. Notify the Maintenance Department to take corrective action to control the increased emissions.

4. All increased emissions will be controlled and/or repaired as soon as is practical. If a delay of repair is justified, the justification shall be documented by the Operations Superintendent or his designee.

APPENDIX 2

CALCULATIONS FOR EIQ MODIFICATIONS TO PERMIT 1603T-M1

IIA. Cracking Furnace Stack

This point source is currently included in the EIQ. The emissions reported in the EIQ are being revised to reflect the emission differences between firing Refinery Fuel Gas and our current fuel, Natural Gas, and to update the permit to reflect current AP-42 emission factors.

A. Basis for calculations.

1. The maximum continuous capacity of the furnace is 59.4 million BTU's (lower heating value) per hour, the same as in the existing permit.

2. The lower heating value of natural gas burned in the furnace is 935 BTU's per standard cubic foot (SCF) based on information from our natural gas suppliers. The lower heating value for Refinery Fuel Gas used to be about 1200 BTU/SCF; however, the Refinery has changed their process and the lower heating value can be approximated by that of natural gas.

3. The furnace is assumed to operate 8568 hours per year.

4. The maximum instantaneous emissions rate is calculated to be 1.30 times the maximum continuous emissions rate based on the maximum capacity of all the burners at maximum fuel gas supply pressure.

5. The emissions for each pollutant except SO2 are based on AP-42 factors for natural gas (based on Table 1.4-1 of the Fourth Edition of AP-42 dated September 1985). The SO2 emissions factor of 30 pounds per million SCF is based on the back-up fuel of Refinery Fuel Gas.

Pollutant	Pounds per million SCF
Particulates	5
NOx	140
Hydrocarbons	5.8
Carbon Monoxide	35

B. Calculations

1. The annual emissions are based on the annual natural gas fuel usage of

59.4 million BTU/hour * SCF/935 BTU * 8568 hour/year =

544.3 million SCF per year.

Pollutant	Lbs/MMSCF	Lbs/year	Tons/year
Particulates	5	2721.5	1.361
SO2	30	16329	8.165
NOx	140	76202	38.101
Hydrocarbons	5.8	3156.9	1.578
Carbon monoxide	35	19050.5	9.525

2. The average emission rates are calculated by dividing the pounds emitted annually for each pollutant by 8760 hours per year. The maximum emission rates are calculated by dividing the pounds emitted annually for each pollutant by 8568 hours per year and multiplying by 1.30.

Pollutant	Average lbs/hour	Maximum lbs/hour
Particulates	0.311	0.413
SO2	1.864	2.478
NOx	8.699	11.562
Hydrocarbons	0.360	0.479
Carbon monoxide	2.175	2.890

C. Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
Particulates	1.361	0.311	0.413
SO2	8.165	1.864	2.478
NOx	38.101	8.699	11.562
Hydrocarbons	1.578	0.360	0.479
Carbon monoxide	9.525	2.175	2.890

IIB. Cracking Furnace Stack

This point source is currently included in the EIQ. The emissions reported in the EIQ are being revised to reflect the emission differences between firing Refinery Fuel Gas and our current fuel, Natural Gas, and to update the permit to reflect current AP-42 emission factors.

The calculations for this point source are identical to those for point source IIA, Cracking Furnace Stack.

Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
Particulates	1.361	0.311	0.413
SO2	8.165	1.864	2.478
NOx	38.101	8.699	11.562
Hydrocarbons	1.578	0.360	0.479
Carbon monoxide	9.525	2.175	2.890

IID. Cracking Furnace Decoking Scrubber Stack

This point source is a grandfather source which is being added to make a complete accounting of all emissions sources. The basis for the emissions listed in the EIQ are as given below.

A. Basis for Calculations

1. The initial coke volume prior to decoking is assumed to increase from 0 inches thickness to 0.5 inches thickness over the length of the last sixteen passes of each of the two coils in each furnace. The last sixteen passes are the only tubes in the radiant section and are therefore subject to the highest tube metal wall temperatures. The coke volume has been observed to be approximately 0.5 inches thick at the outlet. The steadily increasing thickness is based on the fact that the process temperature steadily increases over the sixteen tube passes in the radiant section. The furnace tubes are 62 feet long each and have an inside diameter of 7 inches.

Therefore, the total amount of coke in the furnace at decoke is:

((7**2)-(6.5**2))*pi/4 in2 * ft2/144 in2 * 62 ft/pass

* 16 pass/coil * 2 coils/furnace = 73.0 ft3

2. Approximately 15 cubic feet of coke is collected from the decoking scrubber in the collection box and scrubber water filter after each decoke. This volume is based on the dimensions of the box and the coke level in the box after decoking.

3. Essentially all the other coke is converted to carbon dioxide (CO2) or carbon monoxide (CO). Based on a laboratory analysis, the composition of the stack gas has approximately equal quantities of CO2 and CO on a molar (or volume) basis.

4. Nine decokes per year per furnace are based on actual furnace operation.

5. The density of coke is assumed to be 102 lb/ft3. This density is based on the specific gravity of 1.63 given for petroleum coke in Table 8-3 of The 5th Edition of Perry and Chilton's Chemical Engineers' Handbook.

6. The particle size distribution of the coke is assumed to be similar to that of pulverized coal (see Figure 20-92 of The 5th Edition of Perry and Chilton's Chemical Engineers' Handbook). The distribution shown is between 3 microns and 400 microns in diameter. The actual weight percentage for each particle size is assumed to be normally distributed about the average with the entire range consisting of six standard deviations about the mean. The parameters for the distribution are, therefore:

Average diameter = (3 + 400)/2 microns = 201.5 microns
Standard deviation = (400 - 3)/6 microns = 66.17 microns

This model is believed to be conservative because it predicts more very fine particles (the most difficult to remove from stack gases) and fewer large particles than are actually observed. Therefore, particulate emissions are likely to be overstated by using this model.

7. The removal efficiency for the cyclone scrubber is based on the removal efficiency shown for medium efficiency scrubbers in Figure 3-5 Comparison of PM Control Device Fractional Efficiencies in Louisiana New Source Review Manual, Volume 1 dated August 15, 1986. A copy of the figure extrapolated for particles larger than 10 microns is included on the next page. The values read from the graph for various particle size ranges is:

Size range in microns	% removal efficiency
50 to 400	100.00
30 to 50	99.99
10 to 30	99.00
0 to 10	20.00

8. The coke is assumed to be essentially all carbon for purposes of determining CO emissions.

9. The emissions are assumed to decrease over the course of an 18 hour decoke. The maximum rate for CO emissions is based on the maximum air rate used in decoking, about 12,000 pounds per hour. The maximum rate for particulate emissions is assumed to be equal to the average particulate emissions rate multiplied by the ratio of the maximum CO emissions rate divided by the average CO emissions rate.

B. Calculations

1. The weight percentage of coke for the particle size ranges based on the normal distribution and the percent emitted for each size range are given below:

Size range	Zmin	Zmax	Area(*)	% Emitted	Fraction Emitted
50 plus	-2.29	inf.	0.9890	0.00	0.000000
30 to 50	-2.59	-2.29	0.0062	0.01	0.000001
10 to 30	-2.89	-2.59	0.0029	1.00	0.000029
0 to 10	-inf.	-2.89	0.0019	80.00	0.001520
TOTALS			1.0000		0.001550

* - Based on area under a normal (gaussian) curve between the values of z given.

2. The total amount of coke emitted is equal to the fraction emitted multiplied by the amount of uncombusted coke per decoke multiplied by the number of decokes per year, or

0.001550 * 15 ft3/decoke * 102 lb/ft3 * 9 decokes/year =

21.3 lbs of particulate matter emissions per year, or

21.3 lbs/year / 2000 lbs/ton = 0.011 tons per year

3. The combusted coke equals the total coke less the collected coke and the coke particulate matter emitted, or

73.0 ft3 - 15 ft3 - (21.3 lbs / 102 lbs/ft3) = 57.8 ft3

or, 57.8 ft3 * 102 lbs/ft3 = 5895 lbs per decoke.

4. The CO emissions are formed from half the combusted coke, or

5895 lbs * 0.5 * 28 lbs CO / 12 lbs carbon = 6878 lbs CO

or, 6878 lbs / 2000 lbs/ton = 3.44 tons CO per decoke

5. The annual CO emissions are, for nine decokes,

3.44 tons/decoke * 9 decokes/year = 30.96 tons per year

6. The average emissions for each pollutant is:

Particulate Matter.

0.011 tons/year * 2000 lbs/ton / 8760 hours/year =

0.0025 lbs/hour

CO. 30.96 tons/year * 2000 lbs/ton / 8760 hours/year =

7.07 lbs/hour

7. The maximum emission rate for CO is based on the equal mole split of the combusted coke to CO and CO2 and the maximum air rate used in decoking.

Max air rate = 12000 lbs air/hour * 379 ft3/28.964 lbs air

* .21 (fraction O2 in air) * 32 lbs O2/379 ft3 =

2784 lbs O2/hour

Two-thirds of the O2 reacts to form CO2, one-third forms CO.

Max CO rate = 2784 lbs O2/hour / 3 * 28 lbs CO/ 16 lbs O2 =

1624 lbs CO/hour

8. The maximum emission rate for particulate matter (PM) is based on the same ratio of the maximum rate to the average rate for CO:

.011 tons PM/year * (1624 lbs CO/hour / 30.96 tons CO/year) =

0.58 lbs of PM/hour

C. Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
CO	30.96	7.07	1624
Particulate Matter	0.011	0.0025	0.58

IIE. Cracking Furnace Decoking Scrubber Stack

This point source is a grandfather source which is being added to make a complete accounting of all emissions sources. The basis for the emissions listed in the EIQ are as given below.

The calculations for this point source are identical to those for point source IID, Cracking Furnace Decoking Scrubber Stack.

Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
CO	30.96	7.07	1624
Particulate Matter	0.011	0.0025	0.58

IV-A. C-500 Vent Stack

This point source is currently included in the EIQ. The emissions reported in the EIQ are being revised to reflect actual operating data for the composition of the material released through C-500 during Oxychlorination Unit shutdowns.

A. Basis for Calculations

1. The basis for the calculations is identical to the basis used in the existing EIQ with one exception:

The existing EIQ was prepared based on design material balances because the pure oxygen-based Oxychlorination Unit had not been operating for any significant length of time at the time of the EIQ submittal. The pure oxygen-based Oxychlorination Unit has now operated for about five years, and the emissions reported in the Oxy Unit Semi-Annual Shutdown Report are based on analysis of the actual compositions in the equipment purged during the shutdown.

2. The actual emissions are based on a complicated computer program which takes into account the volume purged during typical shutdowns. The compositions used were based on the compositions in the equipment during the actual oxychlorination unit shutdowns from 1984 through 1987. These emissions have been submitted in the annual EIS/PS report for each of the years from 1984 to 1987.

3. The average emissions are given as zero since the emissions from Oxychlorination Unit shutdowns occur only during emergencies.

B. Calculations

1. The calculations are not attached, but the change is relatively minor as shown by this comparison:

Pollutant	Tons/year, existing EIQ	Tons/year, this EIQ
HCl	12.41	12.41
Total Hydrocarbons	3.54	3.57
Carbon monoxide	0.8	0.03
Individual Hydrocarbons		
Methane	0.08	0.06
Ethane	0.01	0.04
VCM	0.01	0.02
EDC	1.06	0.89
(1)	0.09	0.08
(2)	2.28	2.48

(1) Miscellaneous chlorinated hydrocarbons.
(2) Miscellaneous hydrocarbons.

C. Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
HCl	12.41	0	2500
Total Hydrocarbons	3.57	0	713.23
Carbon monoxide	0.03	0	6.23
Individual Hydrocarbons			
Methane	0.06	0	10.82
Ethane	0.04	0	7.61
VCM	0.02	0	3.80
EDC	0.89	0	176.87
(1)	0.08	0	16.13
(2)	2.48	0	550.48

(1) Miscellaneous chlorinated hydrocarbons.
(2) Miscellaneous hydrocarbons.

IV-C. Propylene Vent Stack

This point source is a grandfather source which is being added to make a complete accounting of all emissions sources. The basis for the emissions listed in the EIQ are as given below.

A. Basis for calculations.

1. This point source emits approximately once per year: twice every two years during a maintenance outage for turnaround (once to clear equipment for entry and once to purge nitrogen used in drying equipment after turnaround) and as much as twice every other year between turnarounds for shorter maintenance outages. The emissions occur when the propylene system is vented to atmosphere after the pressure has been drawn down as much as possible by compressing and condensing the propylene.

2. The approximate volume of the system is based on the volume of the equipment in the system.

Equipment	Volume, ft3
T-503	314
T-504	314
T-506	96
H-501 (shell side)	96
H-502 (both sides)	146
H-306 (shell side)	250
H-204 (tubes and top head)	242
BL-501	200
Piping	379
Total	2037

2100 ft3 will be used in the calculations.

3. The density is based on a pressure of 25 psia and the saturation temperature of propylene at this pressure, -32 F or 428 Rankine. The density is

25 psia * 42 lbs/lbmole / 428 R / (10.73) = 0.23 lbs/ft3

where 10.73 is the universal gas constant in the appropriate units.

4. The maximum emissions rate is based on the initial purge from 25 psia to 14.7 psia and 68 F (atmospheric pressure and ambient temperature) taking five hours and the emissions occurring at a constant rate over these five hours. The remainder of the propylene is purged out with nitrogen at a slower rate.

B. Calculations

1. The annual emissions are

2100 ft3 * 0.23 lbs/ft3 * 2/year = 966 lbs per year

966 lbs/year / 2000 lbs/ton = 0.48 tons

2. The average rate is

966 lbs/year / 8760 hours/year = 0.110 lbs/hour

3. The maximum rate is calculated as

Temperature in Rankine after initial purge =

460 + 68 F = 528 R

Density after initial purge =

14.7 psia * 42 lbs/lb-mole / 528 R / (10.73) = .11 lbs/ft3

Quantity purged in the first five hours =

2100 ft3 * (0.23 - 0.11) lbs/ft3 = 252 lbs

Maximum rate = 252 lbs / 5 hours = 50.4 lbs/hour

C. Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
Propylene	0.48	0.11	50.4

V-A. Vent Incinerator

This point source is currently included in the EIQ. The emissions reported in the EIQ are being revised to reflect emissions for two components that are expected in flue gas from the vent incinerators and were not previously reported. The two components are HCl and Chlorine. The NOx emissions are also being corrected for two numbers that were transcribed.

A. Basis for Calculations

1. The chlorine emissions are based on the permit basis flue gas rate of 1,536,900 dry SCF per hour and a maximum concentration (design basis) of 20 ppm chlorine (volume basis) in the flue gas. The chlorine is formed in the incinerator firebox by the reaction

(2)HCl + (1/2)O2 --> (1)H2O + (1)Cl2

The chlorine is removed by countercurrent scrubbing first with water and then with a caustic (NaOH) solution. The caustic removes the chlorine by the reaction

(1)Cl2 + (2)NaOH --> (1)NaOCl + (1)NaCl + (1)H2O

The scrubber removal efficiency for chlorine is conservatively estimated to be 80 percent.

2. The HCl emissions are based on the permit basis flue gas rate of 1,536,900 dry SCF per hour and an average concentration of 15.90 lbs of HCl per million dry SCF determined in the performance test (Report 79-15189 from Kemron Environmental Services on Emission Testing for Conoco) of the vent incinerators.

3. The lbs of HCl per hour fed to the flue gas scrubbers at the incinerator unit is 6781 based on the feed composition and combustion calculations for the permit basis flue gas rate.

4. The NOx emissions were mistakenly reported as 27.81 pounds per hour rather than 28.71 pounds per hour, due to transcribed numbers. The incorrect number was used to calculate the tons per year of NOx emissions, also. The correct number is 125.40 tons per year.

B. Calculations

1. The annual emissions for Cl2 are

1536900 SCF/hour * 8760 hour/year * 20 SCF Cl2/ 1000000 SCF of flue gas * 70.91 lbs Cl2/379 SCF Cl2 = 50300 lbs/year

50300 lbs/year / 2000 lbs/ton = 25.15 tons per year

The average emissions equal the maximum emissions and are

50300 lbs/year / 8760 hours/year = 5.74 lbs/hour

2. The annual emissions for HCl are

1536900 SCF/hour * 8760 hours/year * 15.90 lbs HCl per million SCF = 214100 lbs per year

214100 lbs/year / 2000 pounds/ton = 107.05 tons/year

The average emissions equal the maximum emissions and are

214100 lbs/year / 8760 hours/year = 24.44 lbs/hour

The pounds of HCl fed to the flue gas scrubbers (per million dry SCF of flue gas) is:

(6781 lbs/hour) * (hour/1.5369 million dry SCF) = 4412 lbs HCl per million dry SCF of flue gas

This equates to a removal efficiency of

(4412 -15.90)lbs HCl removed / 4412 lbs HCl feed * 100% = 99.6 % removal efficiency

C. Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
Chlorine	25.15	5.74	5.74
HCl	107.05	24.44	24.44
NOx	125.40	28.71	28.71

V-B. Cooling Tower Fugitive Emissions

This point source is a grandfather source which is being added to make a complete accounting of all emissions sources. The basis for the emissions listed in the EIQ are as given below.

A. Basis for calculations.

1. Emissions from this point source occur as a result of fugitive emissions from process heat exchangers that use cooling water as a cooling medium.

2. Emissions are determined by multiplying the cooling water circulation rate (typically 500 million pounds of water per day) by the concentration of hydrocarbons in the cooling water return. It is assumed that all the hydrocarbons are air stripped from the cooling water returned to the cooling tower; in other words, the concentration of hydrocarbons in the cooling water supply to the process heat exchangers is zero.

3. Only three hydrocarbons are analyzed for (VCM, EDC, and ethylene) because they make up more than 99 percent of the constituents in the process streams which are cooled by cooling water in process heat exchangers. Any other hydrocarbons are assumed to be negligible when compared to these three components, hence the total emissions for all hydrocarbons from the cooling tower are assumed to be equal to those calculated for these three components.

4. The fugitive emissions are based on the average concentration of EDC, VCM, and ethylene measured in the cooling water return for the years 1985, 1986, and 1987 excluding major releases from the cooling tower as a result of exchanger leaks. The average concentration for EDC, VCM, and ethylene combined in the cooling water return, excluding the releases, was 0.4 ppm (parts per million).

5. The maximum emissions rate is based on a maximum concentration of 2 ppm total for these three components in the cooling water return. This concentration is consistent with the Cooling Tower Fugitive Emissions Control Plan which is included in the permit application.

B. Calculations

1. The annual emissions are

0.4 ppm * 500 million pound/day * 365 days/year =

73000 lbs/year, or

73000 lbs/year / 2000 lbs/ton = 36.5 tons per year

2. The average emissions rate is

73000 lbs/year / 8760 hours/year = 8.33

3. The maximum emissions rate is

2 ppm * 500 million lbs/day * day/24 hours = 41.67 lbs/hour

C. Summary of Results

The emissions for the EIQ are as follows:

Pollutant	Tons/year	Average lbs/hr	Maximum lbs/hr
Hydrocarbons	36.5	8.33	41.67

AIR QUALITY DIVISION

P.O. Box 44096, Baton Rouge, LA. 70804
Telephone: (504) 342-1206

EMISSION INVENTORY QUESTIONNAIRE (Revision of 11/74)

VISTA CHEMICAL COMPANY
(name of company)

(parent company; if above is a division)

Submitted by company on April 15, 1988
(date)

Please file a separate report for each of your plants physically located in Louisiana. This inventory covers the following plant location:

CHECK ONE OF THE BLOCKS BELOW:
☒ This inventory includes only presently existing emissions.
☐ This inventory includes both those old emissions (expected to be still existing) and those proposed additional emissions included in our permit request for

(type of new facility/modification) which was submitted to the commission on (date) and which new emissions are to be existing by (date).

VISTA VCM PLANT	WESTLAKE	CALCASIEU
(plant's name, if any)	(nearest town)	(parish of plant site)

INSTRUCTIONS: *Keep the original of this form; return a photocopy to this agency. Do not write information in the top or left side margins of this form, as file folder bindings may cover the information. We have tried to ask only for the information we need, please do your best to answer each question. Our authority to ask for this information is contained in R.S. 40:2201 et sec. Copies of this law are available upon request. Air pollutant emission data provided on this form shall be available to the general public, without exception. All other data and information provided on this form and attachments shall also be available to the public, except that upon a showing satisfactory to the Technical Secretary that such other data and information, if made public, would divulge methods or processes entitled to protection as trade secrets, the data will be kept from all persons other than employees, or other agents, of the Louisiana and federal air pollution agencies.*

☐ Confidentiality of all information, except the air pollutant emission rates, is requested, and our justification for this request is attached to the back of this form. (Check the block if this is the case.)

If certain questions are not applicable, indicate "none" or "not applicable" (N.A.). Terms such as "not significant", "nil", "trace", "negligible", etc. are not acceptable. Please attach additional sheets if more space is needed.

An updated report should be submitted in the future when the annual emission rate of any pollutant from any stack changes more than 10% from reported values.

ITEM 1 . . . ORGANIZATION ACTIVITIES

A. Circle any days of the week normally not operating: M Tu W Th F Sat Sun
B. This facility, as a whole, typically operates 365 days per year.
C. The peak production season is NA.
D. The facility normally operates ☐ 1 ☐ 2 ☒ 3 eight hour shifts per day, or specify the hours normally worked per day.
E. Approximate number of employees at this location is 113.

F. If the facility, as a whole, operates intermittently, give details on the lines below: _____

G. Ownership of facility. Please check one of the following:

☒ corporation, partnership, or sole proprietorship ☐ regulated utility
☐ city government ☐ state government ☐ federal government
☐ other, specify _____

H. Please check off, or write below, the descriptive name which applies to your operation:

☒ chemical industry ☐ lumber industry ☐ asphaltic concrete
☐ natural gas industry ☐ pulp & paper ☐ fertilizer
☐ petroleum industry ☐ cement industry ☐ metals industry
☐ sugar cane industry ☐ particleboard ☐ fish meal
☐ other, specify _____ ☐ plywood ☐ brick making

I. Please give a very brief description of your operations, with emphasis on any possible sources of air pollution. REFER TO PROCESS DESCRIPTION IN ATTACHMENT 1.

ITEM 2 . . . FUEL USE BY FACILITY AS A WHOLE Check one of the blocks below, and supply information as requested:

☒ *If this inventory is for "presently existing" conditions (as checked for page 1), please give the information requested below for the latest 12 month period for which you have data. Data for the 12 months ending Month:* DECEMBER *Year:* 1987 *(fill in) has been given. If future use is expected to be materially different (other than as outlined in a current permit request) give details on a separate sheet.*

☐ *If this inventory is being submitted in conjunction with a permit request (as checked on page 1), please give the annual consumption rates expected for the total plant for the 12 months following the date the new facility or modification becomes operational. This date is listed on page 1.*

Type of fuel	Annual Consumption (M = thousands)	Sulfur % (by weight)	Heating value *
Natural gas	1,200 million cubic feet	(1 grain/100 SCF	935 MM BTU/ MM ft³ *
Process gas	million cubic feet	10 grain/100 SCF	1050 MM BTU/ MM ft³
No. 1 to 4 fuel oil	M gallons		MM BTU/ M gal
No. 5 or 6 fuel oil	M gallons		MM BTU/ M gal
Bark/ wood cuips	tons		MM BTU/ ton
Coal (specify asn % & anthracite/bituminous)	tons		MM BTU/ ton
Other _____			MM BTU/
Other _____			MM BTU/

* – NET HEATING VALUE

ITEM 3 . . . MATERIALS USED, PRODUCED, STORED, OR TRANSPORTED BY TOTAL PLANT

A. Raw materials or materials being transported Name of material	Quantity used or transported Annual average MM Lbs.	Hourly average lb/hr	Hourly maximum lb/hr	How stored (Be specific - floating roof tank, fixed roof, etc.)	How moved (Pipeline, tanktruck, etc.)
Ethylene	378	43,096	45,333	not stored	Pipeline
Chlorine	475	54,224	57,308	Pressure tank	Pipeline/railcar
Oxygen	112.2	12,811	13,476	not stored	Pipeline
Hydrogen Chloride	88	10,046	19,200	not stored	Pipeline
B. Products or byproducts Intermediate Products					
1. Hydrogen Chloride	456.1	52,069	54,772	Pressure Tank	Pipeline
2. 1,2,Dichloroethane	1,292.9	147,589	155,249	Nitrogen padded fixed roof tanks	ship,railcar,
Vinyl Product:					
1. Vinyl Chloride	800	91,324	105,000	Pressure spheres	ship,railcar,pipeli
Byproducts:					
1. Muriatic Acid	4.337	495.1	520.8	Fixed Roof Tank	truck
2. Light Ends	1.452	165.7	174.3	Fixed Roof Tanks	Railcar

ITEM 4 . . . EMISSION INFORMATION ON THE ENTIRE PLANT AS A WHOLE *The rates given should correspond, in most cases, to the sum of the individual average rates of the point sources listed in the Item 5 pages for each type of air pollutant.*

A. PARTICULATE SOLIDS OR LIQUIDS	Material name (if must specify)	Emission rate lbs/hr	Emission rate tons/yr
soot from combustion		17.887	78.33
mineral dust			
other, specify:			
other, specify:			
other, specify:			
B. ORGANIC GASES OR VAPORS			
alkanes/ paraffins	methane and ethane	0	0.10
alkenes/ olefins, specify: miscellaneous hydrocarbons		9.60	44.606
alkynes/ acetylenes			
aromatics, specify:			
alcohols, specify:			
other, specify:	1,2 Dichloroethane	0	0.89
other, specify:	Vinyl Chloride	2.54	11.10
other, specify: misc. halogenated hydrocarbons		0	0.08
C. INORGANIC GASES OR VAPORS			
sulfur dioxide	SO_2	4.188	18.35
hydrogen sulfide			
carbon monoxide	CO	19.02	83.43
nitrogen oxides	NO_2	46.108	201.602
ammonia			
halogens, specify:	HCl & Cl2	30.18	144.61
organic sulfides (except H_2S)			
other, specify:			

* SEE PAGE 6 (SUBPAGE 7 OF 9).

NOTES TO ITEM 5 Please read all notes before attempting to fill out page(s) 6.

1. Use any number you wish, but please be consistent in identifying this point by the same number on calculations, maps, future correspondence, computer printouts, etc.

2. If the emission point is not a vertically discharging stack, or if there is no clear-cut point of emission (e.g., dust from moving equipment, multiple leaking valves, evaporation from storage tanks, etc.), put a zero in this column.

3. Give the inside diameter at the top. For non-round exits, use the equivalent diameter, equal to 1.128 times the square root of the cross-sectional area at the point of discharge. Diameter, volume flow rate, and exit velocity must be consistent!

4. A "boiler", for purposes of this form, is to be understood to be any combustion device which heats a fluid and is separated from such fluid by a partition. *Therefore oil heaters, Dowtherm heaters, etc. are included.* Internal combustion engines and incinerators are not included. Direct fired kilns are not included.

5. Enter the proper code number, taken from the list below:

000 No control equipment
001 Wet scrubber, above 95% efficiency
002 Wet scrubber, 80% - 95% efficient
003 Wet scrubber, below 80% efficiency
004 Gravity collector, above 95% efficiency
005 Gravity collector, 80% - 95% efficient
006 Gravity collector, below 80% efficiency
007 Centrifugal collector above 95% efficiency
008 Centrifugal collector 80% - 95% efficient
009 Centrifugal collector below 80% efficiency
010 Electrostatic Precip. above 95% efficiency
011 Electrostatic Precip. 80% - 95% efficient
012 Electrostatic Precip. below 80% efficient
013 Gas scrubber, general
014 Mist eliminator
017 Fabric filter
019 Catalytic afterburner
020 Catalytic afterburner, with heat exchanger
021 Direct flame afterburner
022 Direct flame afterburner with exchanger
023 Flaring
039 Catalytic oxidation - flue gas desulfurization
040 Alkalized aluminia
041 Dry limestone injection
042 Wet limestone injection
043 Sulfuric acid plant, contact process
044 Sulfuric acid plant, double contact process
045 Sulfur recovery plant use
046 Reduced emissions by changing process
047 Vapor recovery system
048 Activated carbon adsorption
050 Gas absorption column, packed.
052 Spray tower for gases
053 Venturi scrubber for gases
049 Liquid filtration system
051 Gas absorption column, tray-type

6. Give the percent by weight of uncontrolled emission removed. If unknown, leave blank; if there is no effective removal, enter a zero in the column.

7. Enter the number of the method used, as follows:

(1) By actual stack test

(2) By material balance, provided that this method is applicable. *(i. e., this method obviously cannot be used where the inaccuracies in measurement are equal to or greater than the absolute magnitude of the losses. An example of proper use would be where solvent emissions are not directly measured, but all solvent purchased is eventually lost to the atmosphere, and therefore material bought divided by operating hours equals loss rate.)*

(3) By the use of E.P.A. emission factors. (See the "Compilation of Air Pollution Emission Factors", E.P.A. publication AP-42)

(4) By making a conservative estimate.

(5) By the use of emission factors other than those supplied by the E.P.A.

NOTES TO ITEM 5, CONTINUED (-continuing with note 7:)

(6) Use this number if and only if you are submitting this form in connection with a permit request, and the emissions referred to have no present existence, but are simply the result of design calculations.

(7) Sources ceasing emissions must be reported on one inventory document after they cease operation (see note 8). Emissions will be zero, and a number 7 should be placed in the "emission estimation method" column.

8. If this particular pollutant, from this particular stack (point source), was not included in the stack or point source information submitted on your last Emissions Inventory Questionnaire, or if this is the first Emissions Inventory Questionnaire you are submitting, write "add" in this column.

If this particular pollutant, from this particular point, was included on the last Emissions Inventory Questionnaire (EIQ) submitted, but the amount has been increased or decreased (to other than zero), write "change" in this column.

If a point source has ceased operation since your last EIQ, the pollutants from that point should be reported as having zero emission rates on next submitted EIQ, and you should write "delete" in this column. *AFTER A DELETION HAS BEEN ONCE REPORTED, DO NOT REPORT THE POINT AT ALL ON ANY FUTURE EIQ'S AND DO NOT USE THAT POINT'S INDENTIFICATION (ID) NUMBER IN THE FUTURE FOR ANY OTHER POINT.*

9. Report the concentration of particulate matter only for incinerator flue gases, in grains per standard cubic foot of dry flue gas. (See Regulation 20.6.1). If this point is not an incinerator flue, write "N.A." in the column. Report SO_2 concentrations for any stack in which it is found, in PPM by volume at standard conditions. Stack exit concentrations need not be reported for other pollutants.

10. If the hydrocarbons being emitted are of unknown type or have been obtained from emission factors which do not indicate the hydrocarbon type, simply report the data requested on the line marked "hydrocarbons". If, however, you know more about the specific hydrocarbons being emitted (for example - that they are non-methane hydrocarbons, or that they are paraffinic hydrocarbons, or that they are, say, 20 weight % alkenes with remainder paraffins, or if you know the specific name of the hydrocarbon being emitted, say, benzene or methanol or methylethylketone or whatever) please leave the line marked hydrocarbons blank, write in the name or partial identification of your specific hydrocarbons in one of the blank lines below, and give the data requested on that line.

11. Report the fuel charging rate, if any, in units of MM ft^3 (million cubic feet) for gases, M gal for fuel oil, and tons for coal, bagasse, sawdust, etc. Report the process materials charging rate, if any, in units such as M Bbl. (thousand barrels), tons (of material processed or produced), tons (air dried unbleached pulp), M gal (storage capacity of tanks; breathing losses), etc. Please telephone us and ask if unsure of what units to use. Do not list air or water as "process materials". In determining rates, do not include any recycle amount unless asked to do so, in general the rates should be determined on a "fresh feed" basis. For storage tanks, list separately under "Name of fuel/ process material" the two catagories of breathing losses and working losses. The "rate" of the breathing loss determinant is M gal (storage capacity) and, of the working loss, is also M gal (throughput).

If any one pollutant type (i.e., SO_2, particulate matter, etc.) is emitted from more than one stack (or other emission point) serving the same piece of equipment, please explain briefly on the reverse side of the page 6 subsheet, and write "See reverse side" prominently at the bottom of the form side.

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
IIA	CRACKING FURNACE STACK	119.97 ft	4.50 ft	824 °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)
39,000 ft^3/min	41 ft/sec	NATURAL GAS type(s) of fuel 59.4 x 10^6 BTU/hr 1st fuel (2) 10^6 BTU/hr 2nd fuel, if any (2) REFINERY GAS IS BACK-UP FUEL ETHANE IS BACK-UP FUEL

% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs/day	days/week	wks/yr
25%	25%	25 %	25%	24	7	51

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter	000	0	0.311	0.413	1.361	3	change	NA gr/std ft^3
sulfur dioxide	000	0	1.864	2.478	8.165	2	change	NA PPM (VOL)
nitrogen dioxide	000	0	8.699	11.562	38.101	3	change	
hydrocarbons[10]	000	0	0.360	0.479	1.578	3	change	Fill in this column only as required by note 9.
carbon monoxide	000	0	2.165	2.890	9.525	3	change	

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

0 % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
NATURAL GAS	544.3 MM SCF /yr	82.6M SCF /hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

VAV 00000218

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
IIB	CRACKING FURNACE STACK	119.97 ft	4.50 ft	824 °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)	% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
		NATURAL GAS type(s) of fuel	Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs/day	days/week	wks/yr
39,000 ft³/min	41 ft/sec	59.4 x 10⁶ BTU/hr 1st fuel (2) 10⁶ BTU/hr 2nd fuel, if any	25%	25%	25%	25%	24	7	51
		(1) REFINERY FUEL GAS IS BACK-UP FUEL (2) ETHANE IS BACK-UP FUEL							

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter	000	0	0.311	0.413	1.361	3	change	NA gr/std ft³
sulfur dioxide	000	0	1.864	2.478	8.165	2	change	NA PPM (VOL)
nitrogen dioxide	000	0	8.699	11.562	38.101	3	change	Fill in this column only as required by note 9.
hydrocarbons[10]	000	0	0.360	0.479	1.578	3	change	
carbon monoxide	000	0	2.165	2.890	9.525	3	change	

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

0 % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
NATURAL GAS	544.3 MM SCF /yr	82.6M SCF /hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

VVV 00000219

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
IID	CRACKING FURNACE DECOKING SCRUBBER STACK	37 ½ ft	1 ft	212 °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)
3,632 ft^3/min	77 ft/sec	NA type(s) of fuel 10^6 BTU/hr 1st fuel 10^6 BTU/hr 2nd fuel, if any

% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs/day	days/week	wks/yr
25%	25%	25 %	25 %	18	1	6

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter	001	99.8	0.0025	0.58	0.011	4	add	NA gr/std ft^3
sulfur dioxide								PPM (VOL)
nitrogen dioxide								
hydrocarbons[10]								Fill in this column only as required by note 9.
carbon monoxide	000		7.07	1624	30.96	4	add	

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

0 % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
FURNACE COKE	33.5 tons/yr	0.2 tons /hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

VVV 00002920

ITEM NO. 5 EMISSION INVENTORY QUESTIONNAIRE (Revised 11/74) Page 6 of 9 (SUBPAGE NO. 4 OF 9)

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
IIE	CRACKING FURNACE DECOKING SCRUBBER STACK	37 ½ ft	1 ft	212 °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)
3,632 ft^3/min	77	NA type(s) of fuel 10^6 BTU/hr 1st fuel 10^6 BTU/hr 2nd fuel, if any

% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs/day	days/week	wks/yr
25 %	25%	25 %	25 %	18	1	6

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter	001	99.8	0.0025	0.58	0.011	4	add	NA gr/std ft^3
sulfur dioxide								PPM (VOL)
nitrogen dioxide								
hydrocarbons[10]								Fill in this column only as required by note 9.
carbon monoxide	000		7.07	1624	30.96	4	add	

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

0 % "apace heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
FURNACE COKE	33.5 tons/yr	0.2 tons /hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

VVV 00002921

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
IV-A	C-500 (MAIN PLANT VENT STACK)	148 ft	3.0 ft	Ambient °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)	% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
			Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs day	days week	wks yr
(1) ft³/min	(1) ft/sec	NA type(s) of fuel 10⁶ BTU/hr 1st fuel 10⁶ BTU/hr 2nd fuel, if any	25 %	25 %	25 %	25 %	(1)	(1)	(1)

(1) THERE WILL BE NO FLOW EXCEPT DURING OXY SHUTDOWNS.

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter								gr/std ft³
sulfur dioxide								PPM (VOL)
nitrogen dioxide								
hydrocarbons[10]	SEE ATTACHMENT A							Fill in this column only as required by note 9.
carbon monoxide								

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

0 % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
NA	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

VVV 00000922

ATTACHMENT A

C-500 VENT STACK (IV-A)

INTERMITTENT EMISSIONS DUE TO OXY SHUTDOWNS

Name of Pollutant	Pollution Control Equipment Code 5	Control Equipment Efficiency 6	Average Emission Rate Lbs./Hr.	Maximum Emission Rate Lb./Hr.	Annual Emission Rate Tons/Yr.	Emission Estimation Method 7	Add,Chang or Delete Code 8
Carbon Monoxide	000		0	6.23	0.03	(2)	change
HCl	002	80%	0	2500	12.41	(2)	change
Total Hydrocarbons	000		0	713.23	3.57	(2)	change
Methane	000		0	10.82	0.06	(2)	change
Ethane	000		0	7.61	0.04	(2)	change
VCM	000		0	3.80	0.02	(2)	change
EDC	000		0	176.87	0.89	(2)	change
Misc. Chlorinated HC	000		0	16.13	0.08	(2)	change
Misc. HC	000		0	550.48	2.48	(2)	change

ITEM NO. 5 EMISSION INVENTORY QUESTIONNAIRE (Revised 11/74) Page 6 of 9 (SUBPAGE NO. 5 OF 9)

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
IV-C	PROPYLENE VENT (BL-501)	148 ft	0.666 ft	AMBIENT °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)
7.6 ft^3/min	0.36 ft/sec	NA type(s) of fuel 10^6 BTU/hr 1st fuel 10^6 BTU/hr 2nd fuel, if any

% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs/day	days/week	wks/yr
* %	* %	* %	* %	*	*	*

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter								NA gr/std ft^3
sulfur dioxide								NA PPM (VOL)
nitrogen dioxide								
hydrocarbons[10] *	000		0.11	50.40	0.48	(4)	add	Fill in this column only as required by note 9.
carbon monoxide								

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

_____ % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
PROPYLENE	0.48 tons/yr	50.40 lbs. /hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

* PROPYLENE UNIT VENTS ONLY DURING TURNAROUNDS AND MAINTENANCE OUTAGES WHERE THE PROPYLENE SYSTEM MUST BE CLEARED.

VVV 00000294

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
V-A	VENT INCINERATOR	145 ft	3.0 ft	125 °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)	% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
			Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs/day	days/week	wks/yr
28,817 ft³/min	67.9 ft/sec	NA type(s) of fuel; ____ 10⁶ BTU/hr 1st fuel; ____ 10⁶ BTU/hr 2nd fuel, if any	25%	25 %	25 %	25 %	24	7	52

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter	022		17.26	17.26	75.586	(4)		0.079 gr/std ft³
sulfur dioxide	022		0.46	0.46	2.02	(4)		1.78 PPM (VOL)
nitrogen dioxide	022		28.71	28.71	125.40	(4)		
hydrocarbons[10]	022		2.98	2.98	13.07	(4)		Fill in this column only as required by note 9.
carbon monoxide	022		0.55	0.55	2.43	(4)		
vinyl chloride	022		2.54	2.54	11.08	(4)		
hydrogen chloride	001	99.6%	24.44	24.44	107.05	(4)		
chlorine	003	80%	5.74	5.74	25.15	(4)		

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

0 % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

VVV 00002925

This page is to be used to record the data from one stack (or other emission point) only. Photocopy this page as many times as there are individual emission points, and use one page for each point. Note that the subscripted numbers indicate explanatory notes on pages 4 and 5.

Point source ID number[1]	Descriptive name of the equipment served by this stack	Height of stack above grade[2]	Stack diameter[3]	Stack gas exit temperature
V-B	VCM PLANT COOLING TOWER	56 ft	48 ft	90 °F

Stack gas flow rate at process conditions, not at standard	Stack gas exit velocity	If this stack serves a "boiler"[4], give the type(s) of fuel used and the heat input (i.e., fuel rate x heating value)	% of annual throughput of pollutants through this emission point (totals 100%)				Normal operating time of this point		
			Dec-Feb	Mar-May	June-Aug	Sept-Nov	hrs/day	days/week	wks/yr
3.8MM ft^3/min	36 ft/sec	NA type(s) of fuel 10^6 BTU/hr 1st fuel 10^6 BTU/hr 2nd fuel, if any	25%	25 %	25 %	25 %	24	7	52

Name of pollutant	Pollution control equipment code[5]	Control equipment efficiency[6]	Average emission rate lbs/hr	Maximum emission rate lbs/hr	Annual emission rate tons/yr	Emission estimation method[7]	Add, change or delete code[8]	Concentration in gases exiting the stack[9]
particulate matter								NA gr/std ft^3
sulfur dioxide								NA PPM (VOL)
nitrogen dioxide								
hydrocarbons[10]	000		8.33	41.67	36.5	(2)	add	Fill in this column only as required by note 9.
carbon monoxide								

If this stack is from equipment which burns fuel, give the % of the total fuel used by the equipment which is used, either directly or indirectly, for space heating (or cooling) at the plant. (i.e., to heat or cool the air in a room) If this stack is not from a fuel burning equipment, or if fuel is burned but none of the heat is intended to heat or cool air in a room, enter a zero below:

0 % "space heat"

Give below the fuel or process materials charging rate to the unit served by this stack.[11]

Name of fuel/ process material	Annual rate	Maximum hourly rate
NA	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr
	/yr	/hr

VVV 00002926

ITEM 6 . . . PLANT LOCATION FOR AIR POLLUTION DISPERSION MODELING

Give below the Universal Transverse Mercator zone number and Universal Transverse Mercator (UTM) coordinates, to the nearest one-tenth kilometer, of your facility. We must have this information since we are required to report it to the U. S. Environmental Protection Agency for wide area dispersion modeling purposes.

The coordinates can be obtained from most U. S. Geological Survey maps, scale 1:24,000 or 1:62,000 for your particular area. These maps, if not already in your possession, may be found in your local library, or can be purchased from the U. S. Geological Survey (USGS) at the address shown below for 75¢ each (1974 price). An index of all the maps available for Louisiana, together with prices and detailed instructions for ordering, may be obtained free by addressing a request to:

U. S. Geological Survey, Distribution Center, Denver Federal Center, Bldg. 41
Denver, Colorado 80225

If the map has the Universal Transverse Mercator (UTM) coordinates listed, it will have the UTM zone number mentioned among the writing along the bottom of the map. This zone number will be either 15 or 16 for Louisiana.

Please note that latitude and longitude are not what we need, and that the USGS maps do not show UTM grid lines as they do latitude and longitude; however, tick marks along the edges of the maps do indicate the UTM grid locations. A straight edge must be used to connect tick marks at the opposite sides of USGS maps when interpolating between UTM tick marks because the map grid is drawn on the latitude-longitude system and, therefore, the UTM grid may appear quite skewed. For the scales mentioned, tick marks appear for every 1000 meters (1 kilometer), with every fifth tick mark and the tick marks nearest the southeast and northwest corners of the map giving the value in meters. The 1:24,000 scale is preferred to accurately locate the facility, but the 1:62,000 scale may be used if the 1:24,000 scale map is unavailable for your area.

For example: The state capitol building in Baton Rouge would be:

UTM zone No. 1 5	horizontal coordinate:	6 7 4.1 Km. E
	vertical coordinate:	3 3 7 0.6 Km. N
Your facility: UTM zone No. 1 5	horizontal coordinate:	4 7 2.9 Km. E
	vertical coordinate:	3 3 4 6.5 Km. N

ITEM 7 . . . COMPLIANCE STATUS

Check one of the blocks below, regarding your facility's "Compliance Schedule":

☒ Such a document has not been requested of us, so far as we know.

☐ Such a document was requested, or submitted, but we haven't yet received notification that it was accepted at a public hearing by the Commission.

☐ We were notified that the document was accepted at a public hearing; no schedule of actions to achieve compliance was necessary.

☐ We were notified that the document was accepted at a public hearing; our schedule of actions to achieve compliance by _ _ (month), 197 _ (year) was approved. The most recent "increment of progress" date in our schedule of actions was achieved on _ _ (month) _ _ (day) 7 _ (year). [YOU MUST FILL IN THE DATE BLANKS IF YOU HAVE CHECKED THIS PARAGRAPH.]

ITEM 8 . . . REFUSE COLLECTION AND DISPOSAL

A. Amount of combustible refuse disposed of per year: 5915 Tons
(give the applicable units)

B. Description of refuse; check off applicable catagories:
- ☒ Paper scrap
- ☒ Wood scraps & sawdust
- ☒ Other, specify: Rubbish
- ☐ Rubber scrap
- ☐ Wet garbage or animal wastes

C. Method of refuse disposal; check off applicable catagories:
- ☐ City pickup
- ☒ Contractor pickup
- ☐ Other, specify:
- ☐ On-site dump
- ☐ On-site outdoor burning
- ☐ On-site incineration
- ☐ On-site landfill

D. If disposal is by contractor pickup, give the name and address of the contractor:
Browning-Ferris Industries of Louisiana Inc. Solid Waste Division-Cities Service Highway - Sulphur, LA 70663

E. The on-site incinerator, if any, has the following design features:
- ☐ No on-site incinerator
- ☐ Single chamber
- ☐ Multiple chamber
- ☐ Afterburners
- ☐ Primary & secondary burners installed
- ☐ Water scrubber installed
- ☐ Waste material disposed of by burning in a boiler

F. Incinerator equipment data (if applicable):
Manufacturer: NA Model:
Capacity: Installation date:
Auxiliary fuel used: (type, how used, rate of use)

ITEM 9 . . . SUPPLEMENTARY INFORMATION

A. *Please supply a unit plot plan or map which shows the locations of stacks (or other sources), together with the source identification numbers from Item 5, the plant boundaries, a distance scale, and the direction North. Please also show, on a separate diagram if necessary, the location of the plant in relation to nearest highways, residential areas, and towns. Attach the maps to the back of this form.*

B. Approximately how much money have you spent on air pollution control equipment and operation in the past 12 years? Equipment $23,223,000 Operation $4,161,000

ITEM 10 . . . TOXIC GASES & HAZARDOUS MATERIALS

A. Are there any substances used or produced in your facility which could cause immediate injury to life or property, if they were emitted to the atmosphere, which are not already listed in this form as one which is presently being emitted to the atmosphere? (e.g., chlorine for water treatment, toxic gases, gases used as catalysts, etc., which ordinarily do not escape) Please list such substances below. If none, please so state. No

B. Does your facility use or produce asbestos, mercury (other than laboratory use), or beryllium in any amount whatsoever? If answer is yes, give details below or on separate sheet. If answer is no, please write "no" below: Yes, asbestos is present in some of the plant's older insulation.

ITEM 11 . . . PERSONNEL & CERTIFICATION

A. The manager of the facility, on location at the plant site, is as follows:

Name:	Richard A. Conrad
Title:	Plant Manager - VCM Plant
Name of Company:	Vista Chemical Co.
Business street address/ P. O. Box:	P. O. Box 605
City or town, parish, Zip code:	Westlake, LA 70669
Business area code/ telephone No.:	(318) 494-5063

B. Person to cantact at the site of the facility about air pollution control, if different from the above:

Name:	Ed Taylor
Title:	Environmental Coordinator
Business telephone No./ extension:	(318) 494-5031

C. If the company's air pollution control correspondence and documents are prepared at a headquarters office, at a different site, give the information on the person to be contacted below:

Name:	Mike Hayes
Title:	Director of Environmental Control
Name of company; or parent company:	Vista Chemical Co.
Business street address/ P. O. Box:	P. O. Box 727
City, state, Zip code:	Westlake, LA 70669
Business area code; telephone No.:	(318) 494-5437

D. Person who prepared this report: (If one of the above, just check appropriate block:) ☐ A. ☐ B. ☐ C.

Name:	William P. Swan
Title:	Sr. Process Engineer
Firm: (if prepared by a consultant)	
Company: (if prepared in-house)	Vista Chemical Company
Street address/ P. O. Box:	P O Box 605
City, state, Zip code:	Westlake, LA 70669
Area code, telephone #, extension:	(318) 494-5058

E. CERTIFICATION. *I certify, under the provisions in Louisiana and United States law which provide criminal penalties for false statements, that this Emission Inventory Questionnaire, including all attachments thereto, contains information which is true and correct to the best of my knowledge and belief.*

R A Conrad

(signature of manager, or other company agent)

R.A. Conrad, Plant Manager - VCM Plant

(printed or typed name & title of person above)

4/19/88

(date signed)

ATTACHMENT 1

Brief Process Description

Gaseous chlorine (supplied by pipeline from PPG Industries) and gaseous ethylene (supplied across the fence by a Vista ethylene plant) is reacted to form crude 1, 2 dichloroethane (EDC). The crude EDC is purified by two stages of distillation to produce a relatively pure EDC.

Pure EDC is thermally cracked in a gas-fired furnace at about 500°C and cracks into vinyl chloride (VCM) and anhydrous HCl. This mixture is purified by two stages of distillation to separate the heavy tars and the HCl from the VCM. The VCM is then redistilled to separate uncracked EDC (which is recycled back to the process) and the pure VCM is dried, neutralized and stored in pressure spheres at about 80 psig.

The HCl separated in the above process is reacted in a multi-stage catalytic reactor with oxygen and ethylene to form additional EDC. This extra EDC is fed into the two stage EDC distillation process and blends with the EDC produced by the chlorine/ethylene reactor. The tail gas from this reactor is fed to the chlorine/ethylene reactor.

An incinerator burns vent streams from process equipment and loading operations, and neutralizes the exhaust gases before discharging them to atmosphere, and produces Muriatic Acid for sale.

Storage is provided in the plant for several grades of EDC, VCM product and two liquid organic by-products. Essentially all of the VCM product is shipped out by ship or railcars. A small amount of EDC is also sold in ships or railcars. Design capacity of the plant is 800,000,000 lbs/yr. of VCM