

217/782-2113

FEDERALLY ENFORCEABLE STATE OPERATING PERMIT -- REVISED

PERMITTEE

Carus Chemical Company  
Attn: Kenneth Krogulski  
1500 Eighth Street  
LaSalle, Illinois 61301-3500

Application No.: 72100536

I.D. No.: 099030AAB

Applicant's Designation:

Date Received: August 25, 2000

Subject: Permanganate Plant, Pilot Plant and Boilers

Date Issued: November 17, 2000

Expiration Date: December 28, 2004

Location: 1500 Eighth Street, LaSalle

This Permit is hereby granted to the above-designated Permittee to OPERATE emission source(s) and/or air pollution control equipment consisting of a Cairox process ( $KMnO_4$ ) with two scrubbers and cyclones and baghouses, a Carulite process with two scrubbers and dust collectors, a 2,3 Pyridine Dicarboxylic Acid (PDC) process with scrubber, a Sodium Permanganate process, a pilot plant, and two boilers, pursuant to the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

- 1a. This federally enforceable state operating permit (FESOP) is issued to limit the emissions of air pollutants from the source to less than major source thresholds (i.e., 100 tons per year of PM-10, 10 and 25 tons per year of HAPs, 100 tons per year of  $NO_x$  and 100 tons per year of CO). As a result, the source is excluded from the requirements to obtain a Clean Air Act Permit Program permit. The maximum emissions of this source, as limited by the conditions of this permit are described in Attachment A.
- b. Prior to issuance, a draft of this permit has undergone a public notice and comment period.
- c. This permit supersedes all operating permit(s) for this location.
2. The Permittee shall, in accordance with the manufacturer(s) and/or vendor(s) recommendations, perform periodic maintenance on the pollution control equipment covered under this permit such that the pollution control equipment be kept in proper working condition and not cause a violation of the Environmental Protection Act or regulations promulgated therein.
3. Limits on monthly and annual operation of facility equipment:
  - a. The monthly production shall not exceed the following limits in tons per month:

<u>Product</u>	<u>Production (Tons/Month)</u>
Potassium Permanganate	2,790
Carulite	40
PDC	174
Sodium Permanganate	95

- b. Each month, the previous monthly production shall be added into a 12 month rolling total for potassium permanganate, Carulite, PDC, and sodium permanganate. The 12 month rolling totals shall not exceed the following values, in tons per year:

<u>Product</u>	<u>Production (Tons/Year)</u>
Potassium Permanganate	22,320
Carulite	300
PDC	1,392
Sodium Permanganate	756

- c. Each month, the previous monthly emissions shall be calculated based on the hours of operation and other operational parameters as outlined in Attachments B through G. Monthly facility emissions of PM<sub>10</sub> shall not exceed 3 tons, and monthly facility emissions of manganese compounds shall not exceed 1.5 tons.
  - d. The monthly emissions shall be added into a 12 month rolling average. PM<sub>10</sub> emissions shall not exceed 18 tons per year and manganese compound emissions shall not exceed 9.0 tons per year during any 12 months rolling total.
- 4a. Emissions of particulate matter from the PDC scrubber shall not exceed 0.12 lb/hr and 0.6 ton/yr. This limit is based on the maximum emission rate indicated in the stack test and the maximum hours of operation (8,736 hr/yr). Compliance with annual limits shall be determined from a running total of 12 months of data.
  - b. Emissions of nitrogen oxides from the pilot plant scrubber shall not exceed 0.6 lb/hr and 2.7 ton/yr. This limit is based on the maximum emission rate indicated in the permit application and the maximum hours of operation (8,736 hr/yr). Compliance with annual limits shall be determined from a running total of 12 months of data.
  - c. This permit is issued based on negligible emissions of hydrogen chloride from the pilot plant scrubber. For this purpose, emissions shall not exceed nominal emission rates of 0.1 lb/hour and 0.44 ton/year.
- 5. This Permit is issued based upon a minimal hourly emission rate and negligible annual emissions (less than 0.1 ton/year) of organic materials and particulate matter from the PDC process.

- 6a. This permit is issued based upon negligible emissions of particulate matter from the three (3) Carulite tanks (RE-214, RE-250, and RE-547), Carulite mixer, Carulite dryer, Carulite calciner and Carulite sizing/packaging system with baghouse. For this purpose, emission from each piece of equipment shall not exceed nominal rates of 0.1 pound per hour and 0.44 ton per year.
- b. Emissions of nitrogen oxides (NO<sub>x</sub>) and operation of equipment shall not exceed the following limits:

<u>Item of Equipment</u>	<u>Operating Hours (Hrs/Hr)</u>	<u>NO<sub>x</sub> Emissions</u>	
		<u>(Lb/Hr)</u>	<u>(Ton/Yr)</u>
Carulite Calciner	8,760	2.59	11.34

These limits are based on the maximum nitric acid emission rate and maximum hours of operation indicated in the application. The annual limits are the product of the hourly limits and the hours of operation. Compliance with annual limits shall be determined from a running total of 12 months of data.

- 7a. Operation in excess of the applicable emission standards during startup of the boilers is allowed. This condition supersedes standard condition No. 9a as it applies to startup.
- b. Operation in excess of the applicable emission standards during malfunction and breakdown of the boilers is allowed. This condition supersedes standard condition No. 9a as it applies to malfunction or breakdown.
- c. At the above location, the Permittee shall not keep, store, or utilize distillate fuel oil (Grades No. 1 and 2) with a sulfur content greater than the larger of the following two values:
  - i. 0.28 weight percent, or
  - ii. The wt. percent given by the formula: Maximum wt. percent sulfur = (0.000015) x (Gross heating value of oil, Btu/lb).
- d. Organic liquid by-products or waste materials shall not be used in these fuel combustion emission sources without written approval from the Illinois EPA.
- e. The Illinois EPA shall be allowed to sample all fuels stored at the above location.
- f. Fuel usage is limited to natural gas with distillate fuel backup. Any proposed change requires Illinois EPA notification.
- g. The total of all fuel usage shall not exceed the following limits:

Natural Gas		#2 Fuel Oil	
(Mft <sup>3</sup> /Mo)	(Mft <sup>3</sup> /Yr)	(wt. % Sulfur)	(Gallon/Year)
167	1,000	0.28	150,000

h. Emissions from all fuel combustion units shall not exceed the following limits:

<u>Sources &gt; 0.3 to &lt; 100 mmBtu/hour</u>			[Emission Factors (lb/MM cu ft)]				
			Emissions (TPY)				
<u>SOURCE</u>	<u>FUEL</u>	<u>SCF/Yr</u>	<u>NO<sub>x</sub></u> [100]	<u>SO<sub>x</sub></u> [0.6]	<u>PM/PM<sub>10</sub></u> [7.6]	<u>CO</u> [84]	<u>VOM</u> [5.5]
Plant Combustion	Natural Gas	1,000,000,000	50.00	0.30	3.80	42.00	2.75

<u>Distillate Oil Combustion</u>			[Emission Factors (lb/1000 gal)]				
			Emissions (TPY)				
<u>SOURCE</u>	<u>FUEL</u>	<u>GALLONS/YR</u>	<u>NO<sub>x</sub></u> [20]	<u>SO<sub>x</sub></u> [142(s)]	<u>PM/PM<sub>10</sub></u> [2]	<u>CO</u> [5]	<u>VOM</u> [0.34]
Boiler 3	#2 Oil	150,000	1.50	2.98	0.15	0.38	0.026
Totals (tons/year)			51.50	3.28	3.95	42.38	2.78

Note: All emission factors from AP-42 for natural gas and fuel oil combustion

8. The Permittee shall notify the Illinois EPA's regional office by telephone as soon as possible during normal working hours upon the occurrence of excess emissions due to malfunctions, or breakdowns. The Permittee shall comply with all reasonable and safe directives of the regional office regarding such malfunctions and breakdowns. Within five (5) working days of such occurrence the Permittee shall give a written follow-up notice to the Illinois EPA's regional office providing an explanation of the occurrence, the length of time during which operation continued under such conditions, measures taken by the Permittee to minimize excess emissions and correct deficiencies, and when normal operation resumed.
9. In the event that the operation of this source results in an odor nuisance or any other nuisance due to the operation of the equipment described in the permit application or through any other cause, the Permittee shall take all appropriate and necessary action, including but not limited to, changes in operating procedures or installation of controls, in order to eliminate the nuisance.
10. This permit is issued based on negligible emissions of particulate matter from the sodium permanganate process. For this purpose, emissions shall not exceed nominal emission rates of 0.1 lb/hour and 0.44 ton/year.
11. This permit is issued based upon a minimal hourly emission rate and negligible annual emissions (less than 0.1 ton/year) of particulate matter from lime storage and transfer system.

12. Emissions and operation of equipment shall not exceed the following limits:

<u>Item of Equipment</u>	<u>Throughput (Lb/Hr)</u>	<u>Particulate Matter Emissions (Lb/Hr)</u>	<u>Emissions (Tons/Yr)</u>
Bulk Silos	6,060	0.353	1.55

These limits are based on an uncontrolled grain loading of 50 gr/dscf and the dust collectors meeting a 99.95% overall efficiency. Compliance with annual limits shall be determined at least monthly, from a running total of 12 months of data.

13. Emissions and operation of equipment shall not exceed the following limits:

<u>Item of Equipment</u>	<u>Throughput (Tons/Yr)</u>	<u>Hydrogen Chloride Emissions (Tons/Yr)</u>
Bulk HCL Tank with Jet Pump Scrubber	5,000	0.022

These limits are based on vapor balance, the solubility of HCL in water and a scrubber efficiency of at least 99.9%. Compliance with annual limits shall be determined at least monthly, from a running total of 12 months of data.

14. Emissions of particulate matter (TSP), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO) and volatile organic materials (VOM) from the #2 oxidizer burner shall not exceed the following limits:

<u>Equipment</u>	<u>Firing Rate (mmBtu/Hr)</u>	<u>Pollutant</u>	<u>Hourly Emission Rate (Lbs/Hr)</u>	<u>Annual Emission Limit/Tons/Yr</u>
#2 Oxidizer Burner	10.0	TSP	0.030	0.13
		SO <sub>2</sub>	0.006	0.03
		NO <sub>x</sub>	1.00	4.38
		CO	0.21	0.92
		VOM	0.025	0.11

The limits for #2 oxidizer burner are based on the maximum heat input rate, continuous operation (8,760 hour/year) and standard emission factors for the natural gas combustion. Compliance with annual limits shall be determined from a running total of 12 months of data.

15. The 12 month rolling average limitations in this permit shall be calculated once 12 months of data has been collected. The monthly limits shall be met during this time.
16. This federally enforceable state operating permit is issued to limit the emissions of air pollutants from the source to less than major source thresholds (i.e., 25 tons/year for VOM, 10 tons/year for a single HAP and 25

tons/year for totaled HAP). As a result, the source is excluded from the requirements to obtain a Clean Air Act Permit Program permit. The maximum emissions of this source, as limited by the conditions of this permit are described in Attachment A.

- 17a. The Permittee shall maintain and record the following data on at least a monthly basis:
- i. Potassium permanganate production (lb/month);
  - ii. Carulite production (lb/month);
  - iii. Bulk silos/packaging throughput (lb/month);
  - iv. Bulk HCL throughput (lb/month);
  - v. Nitric acid and metal nitrate usage;
  - vi. Material Safety Data Sheets (MSDSs) for any new chemical components used in the processes, if any;
  - vii. Natural gas usage (Mft<sup>3</sup>/month);
  - viii. Fuel oil usage (gallon/month);
  - ix. Nitrogen oxides emissions (ton/month and ton/year);
  - x. Particulate matter 10 emissions (tons/month and tons/year); and
  - xi. HAP emissions (tons/month and tons/year).
- b. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Illinois EPA and USEPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA request for records during the course of a source inspection.
18. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedances or violation and efforts to reduce emissions and future occurrences.
19. Two (2) copies of required reports and notifications concerning equipment operation or repairs, performance testing or a continuous monitoring system shall be sent to:

Illinois Environmental Protection Agency  
Bureau of Air  
Compliance Section (#40)  
P.O. Box 19276  
Springfield, Illinois 62794-9276

and one (1) copy shall be sent to the Illinois EPA's regional office at the following address unless otherwise indicated:

Illinois Environmental Protection Agency  
Division of Air Pollution Control - Regional Office  
5415 North University  
Peoria, Illinois 61614

20. The Permittee shall submit the following additional information with the Annual Emission Report, due May 1st of each year: production totals and emissions. If there have been no exceedances during the prior calendar year, the Annual Emission Report shall include a statement to that effect.

Please note that this permit is revised to include a cyclone (Pack-Cyc-001) after scrubber (131-50C-2), and a cyclone (Pack-Cyc-002) after wet impingement collector (Pack-DCL-001), without any increase in emissions.

If you have any questions on this, please call John Blazis at 217/782-2113.

Donald E. Sutton, P.E.  
Manager, Permit Section  
Division of Air Pollution Control

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cc: Illinois EPA, FOS, Region 2  
Illinois EPA, Compliance Section  
USEPA

ATTACHMENT A

This attachment provides a summary of the maximum emission from this inorganic chemical manufacturing plant operating in compliance with the requirements of this federally enforceable permit. In preparing this summary, the Illinois EPA used the annual operating scenario that results in maximum emissions from such a plant. The resulting maximum emissions are well below the levels, i.e., 100 tons per year of PM-10 and NO<sub>x</sub>, 10 and 25 tons per year of HAPs, at which this source would be considered a major source for purposes of the Clean Air Act Permit Program. Actual emissions from this source will be less than predicted in this summary to the extent that less material is handled, and control measures are more effective than required in this permit.

1. See Attachments B - G for production and emission limits.
2. As a consequence of the requirements of this permit, the emissions of hazardous air pollutants (HAP) as listed in Section 112(b) of the Clean Air Act from this source will be less than 10 tons/year of any single HAP and 25 tons/year of any combination of such HAPs so that HAP emissions do not trigger the requirements to obtain a Clean Air Act Permit Program permit from the Illinois EPA.

3.	<u>Source Emission Totals</u>	<u>Ton/Year</u>
	Particulate Matter-10	18.0
	Manganese Compounds	9.0
	Nitrogen Oxides	51.5
	Carbon Monoxide	42.4

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ATTACHMENT B

List of Carus Chemical Company Emission Sources and Emission Factors

<u>IEPA Source No.</u>	<u>Source Name</u>	<u>Control No.</u>	<u>Control Name</u>	<u>PM-10 Emission Factor</u>	<u>Manganese Emission Factor</u>
<u>Permanganate Plant</u>					
DC-1	Surge Hopper #1	DC-1	Dust Collector	0.256 lb PM-10/day	0.256 lb Mn/day
DC-2	Surge Hopper #2	DC-2	Dust Collector	0.256 lb PM-10/day	0.256 lb Mn/day
DC-3	Weigh Hopper	DC-3	Dust Collector	4.01 x 10 <sup>-7</sup> lb PM-10/ (Prod. - USP) lb	4.01 x 10 <sup>-7</sup> lb Mn/(Prod. - USP) lb
DC-4	Blender Transporter	DC-4	Dust Collector	3.51 x 10 <sup>-6</sup> lb PM-10/ (Prod. - USP) lb	3.51 x 10 <sup>-6</sup> lb Mn/(Prod. - USP) lb
DC-5	S. Silo (Recycle-P.P.)	DC-5	Dust Collector	2.838 x 10 <sup>-6</sup> lb PM-10/lb	2.838 x 10 <sup>-6</sup> lb PM-10/lb
DC-6	SC Silo (Tech)	DC-6	Dust Collector	2.838 x 10 <sup>-6</sup> lb PM-10/lb	2.838 x 10 <sup>-6</sup> lb PM-10/lb
DC-7	NC Silo (S.7.7.)	DC-7	Dust Collector	2.838 x 10 <sup>-6</sup> lb PM-10/lb	2.838 x 10 <sup>-6</sup> lb PM-10/lb
DC-8	N Silo (N.7.7.)	DC-8	Dust Collector	2.84 x 10 <sup>-6</sup> lb PM-10/ (lb FF/2)	2.84 x 10 <sup>-6</sup> lb Mn/ (lb FF/2)
DC-9	Recycle TK	DC-9	Dust Collector	2.48 x 10 <sup>-6</sup> lb PM-10/ (lb Rework)	2.48 x 10 <sup>-6</sup> lb Mn/ (lb Rework)
DC-10	M291 Tech Cycle Bin	DC-10	Dust Collector	2.021 x 10 <sup>-6</sup> lb PM-10/lb	2.021 x 10 <sup>-6</sup> lb MN/lb
DC-11	Bulk FF Bin	DC-11	Dust Collector	1.565 x 10 <sup>-6</sup> lb PM-10/lb	1.565 x 10 <sup>-6</sup> lb MN/lb
DC-11	Bulk Tech	DC-11	Dust Collector	2.021 x 10 <sup>-6</sup> lb PM-10/lb	2.021 x 10 <sup>-6</sup> lb MN/lb
DC-12	Packaging Bins	DC-12	Dust Collector	1.793 x 10 <sup>-6</sup> lb/PM-10	1.793 x 10 <sup>-6</sup> lb MN/lb
0037	New Cell Construction Equipment	N/A	N/A	N/A	N/A
---	2 Evaporator Marley Cooling Towers	N/A	N/A	0.336 lb/day for Each	N/A

IEPA Source No.	Source Name	Control No.	Control Name	PM-10 Emission Factor	Manganese Emission Factor
0002	Cairox Ore Use Bin #3, 41TA	0002	Semco DC310 Baghouse 10DC	0.0021 lb/hr	0.00249 lb/hr
0004	North Ore Storage Bin, 148TA, Sta. 001	0004	Semco DC310 Baghouse, DC10-148TA	0.0021 lb/hr	0.00249 lb/hr
0005	South Ore Storage Bin, 149TA, Sta. 001	0005	Semco DC310 Baghouse, DC10-149TA	0.0021 lb/hr	0.00249 lb/hr
0001	Ore Conveying System Sta. 001	0001	Semco VPS-100 Baghouse	0.0021 lb/hr	0.00249 lb/hr
0007	Cairox Ore Use Bin #2, 49TA	0007	Semco DC310 Baghouse, 10DC-23TA	0.0021 lb/hr	0.00249 lb/hr
0008	Cairox Ore Use Bin #1, 23TA	0008	Baghouse 10DC-41TA	0.00249 lb/hr	0.0033 lb/hr
0010	Reactor Heater-Gas Burner-1 BU46TA Sta. 111	N/A	N/A	0.096 lb/hr	N/A
0011	Cooling Towers TA171 Sta. 129 & TA 31 Sta. 129 Old/New	N/A	N/A	0.036 lb/hr for Each	N/A
0012	1 Burner, Jeffry Dryer	0010 & 0011	Schneible Wet Collector & Cyclone	0.0000053 lb PM/lb Cairox	0.0000053 lb PM/lb Cairox
0013	TA101 Concentrator	N/A	N/A	0.036 lb/hr	0.1 lb/hr
0014	Cairox Packaging & Blending Sta. 131 Dust Pickups	D	Scrubber (131-5DC-2) & Cyclone (Pack-Cyc- 001)	0.00006 lb PM-10/lb Cairox Produced	0.00006 lb Mb/lb Cairox Produced
0015	Cairox Storage TK & Bulk Loading 129TA Sta. 131	0012 & 0013	Semco Baghouse 10DC-219TA Scrubber 131-5DC-2	0.0532 lb/hr	0.0532 lb/hr
0027	Cooling Tower TA 31 Sta. 134 (No Process Emission)	---	N/A	0.036 lb/hr	N/A
0029	Burner 4BU Sta. 110, Gas Fired Mode	N/A	N/A	0.01 lb/hr	N/A
0034	Pneumatic Trans of Lime to Stg. Bin from Tank Truck	0020	Baghouse Semco Model DCU 310 10DC27TA	0.006 lb/hr	N/A
0035	Lime Slaker Tank	N/A	N/A	N/A	N/A
0036	Screw Conveyor & Weigh Hopper for Lime Slaker	N/A	N/A	0.00	0.00

IEPA Source No.	Source Name	Control No.	Control Name	PM-10 Emission Factor	Manganese Emission Factor
0038	Oxidizer Burner	N/A	N/A	0.096 lb/hr	N/A
0039	17TA Concentrator	N/A	N/A	0.1 lb/hr	0.1 lb/hr
0044	Pilot Plant KMN04 Storage Bin with Dust Collector	DC-13	Baghouse	$2.83 \times 10^{-6}$ lb PM-10/ (Tech - Pilot) lb	$2.83 \times 10^{-6}$ lb Mn/ (Tech - Pilot) lb
	Zeosyl		Cyclone and Baghouse	0.14 lb/day	N/A
0026	Was: #6 Fuel Oil Tank (1) Now: Potassium Carbonate	N/A	N/A	N/A	N/A
-	3 Oxidizer Marley Cooling Tower	---	N/A	0.864 lb/day for Each	N/A
<u>USP Plant</u>					
0009	USP Vacuum Dryer	0009	Condenser	0.0021 lb/ PM-10/lb USP Produced	0.0021 lb Mn/lb USP Produced
0040 & 0041	USP Sievers & Nugget Siever	0021	USP Wet Dust Collector 14DC	0.000037 lb PM-10/lb USP Produced	0.000037 lb Mn/lb USP Produced
<u>Carulite Plant</u>					
0020	Carulite Reactors (RE214, RE250, RE547)	0015	Cyclone (Centrifuge)	0.0001 lb/hr	0.0001 lb/hr
0021	Carulite Sizing, Packaging, Sifters	0017	Semco Baghouse	0.0045 lb/hr	0.0045 lb/hr
0032	Carulite Mixer, Calciner	0018	Scrubber Newcombe	0.00092 lb PM-10/lb Carulite Produced	0.00092 lb Mn/lb Carulite Produced
0042 & 0043	Carulite Mixer & Carulite Calcinator	0022	Cyclone & Scrubber	0.00092 lb PM-10/lb Carulite Produced	0.00092 lb Mn/lb Carulite Produced

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ATTACHMENT C

Fuel Combustion Emissions

Combustion Sources:      Boiler #3 - 93 mmBtu/hour  
                                  Boiler #4 - 135 mmBtu/hour  
                                  Oxidizer Burners #1 and 2 - 8 mmBtu/hour  
                                  Oxidizer Burner #3 - 10 mmBtu/hour  
                                  Jeffry Dryer - 1.8 mmBtu/hour  
                                  Space Heaters - 1 M Btu/hour (each)

FESOP Limits:              1,000 MM cubic feet of natural gas per year  
                                  150,000 gallons per year of #2 oil  
                                  0.28% weight percent sulfur in oil

sources > 0.3 to < 100 mmBtu/hour

[Emission Factors (lb/MM cu ft)]

Emissions (TPY)

<u>SOURCE</u>	<u>FUEL</u>	<u>SCF/YR</u>	<u>NO<sub>x</sub></u> [100]	<u>SO<sub>x</sub></u> [0.6]	<u>PM/PM-10</u> [7.6]	<u>CO</u> [84]	<u>VOM</u> [5.5]
ant mbustion	Natural Gas	100,000,000	50.00	0.30	3.80	42.00	1.75

stillate Oil Combustion

[Emission Factors (lb/1000 gal)]

Emissions (TPY)

<u>SOURCE</u>	<u>FUEL</u>	<u>GALLONS/YR</u>	<u>NO<sub>x</sub></u> [20]	<u>SO<sub>x</sub></u> [142(s)]	<u>PM/PM-10</u> [2]	<u>CO</u> [5]	<u>VOM</u> [0.34]
iler 3	#2 Oil	150,000	1.50	2.98	0.15	0.38	0.02
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Totals (tons/year)			51.50	3.28	3.95	42.38	2.78

Note: All emission factors from AP-42 for natural gas and fuel oil combustion

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ATTACHMENT D

PERMANGANATE PLANT EMISSIONS

E M I S S I O N S

IEPA Source No.	Source Name	Control No.	Control Name	Maximum (Hour/Yr)	PM-10 (Lb/Hr)	PM-10 (Ton/Yr)	Manganese (Ton/Yr)
DC-1	Surge Hopper #1 DC	DC-1	Dust Collector	8,760	0.0210	0.0920	0.0920
DC-10	Cycle Bin DC	DC-10	Dust Collector	8,760	0.0230	0.1007	0.1007
DC-11	Bulk Bin DC	DC-11	Dust Collector	8,760	0.0190	0.0832	0.0832
DC-12	Packaging Bin DC	DC-12	Dust Collector	8,760	0.0250	0.1095	0.1095
DC-2	Surge Hopper #2 DC	DC-2	Dust Collector	8,760	0.0210	0.0920	0.0920
DC-3	Weigh Hopper DC	DC-3	Dust Collector	8,760	0.0060	0.0263	0.0263
DC-4	Blender Transporter DC	DC-4	Dust Collector	8,760	0.0290	0.1270	0.1270
DC-5	S. Silo (Recycle-P.P.)DC	DC-5	Dust Collector	8,760	0.0560	0.2453	0.2453
DC-6	SC Silo (Tech) DC	DC-6	Dust Collector	8,760	0.0560	0.2453	0.2453
DC-7	NC Silo (S.7.7.) DC	DC-7	Dust Collector	8,760	0.0400	0.1752	0.1752
DC-8	N Silo (N.7.7.) DC	DC-8	Dust Collector	8,760	0.0230	0.1007	0.1007
DC-9	Recycle Tk DC	DC-9	Dust Collector	8,760	0.0340	0.1489	0.1489
0037	New Cell Construction Equipment	N/A	N/A	300	----	0.0000	N/A
----	2 Evaporator Marley Cooling Towers	N/A	N/A	8,760	0.0280	0.1226	N/A
0002	Calrox Ore Use Bin 49TA, Sta 109	0002	Semco DC310 Baghouse 10DC	3,000	0.0021	0.0032	0.0037
0004	North Ore Storage Bin, 148TA, Sta 001	0004	Semco DC310 Baghouse, DC10- 148TA	3,000	0.0021	0.0032	0.0037
0005	South Ore Storage Bin, 149TA, Sta 001	0005	Semco DC310 Baghouse, DC10-149TA	3,000	0.0021	0.0032	0.0037
0001	Ore Conveying System Sta 001	0001	Semco VPS-100 Baghouse	6,000	0.0021	0.0063	0.0075
0007	Calrox Ore Use Bin, 23TA, Sta 108	0007	Semco DC310 Baghouse, 10DC-23TA	3,000	0.0021	0.0032	0.0037

## E M I S S I O N S

IEPA Source No.	Source Name	Control No.	Control Name	Maximum (Hour/Yr)	PM-10 (Lb/Hr)	PM-10 (Ton/Yr)	Manganese (Ton/Yr)
0008	Calrox Ore Use Bin-41TA, Sta 109 MN Ore Process	0008	Baghouse, 10DC-41TA	3,000	0.0025	0.0038	0.0050
0010	Reactor Heater-Gas Burner-1 BU46TA Sta 111	N/A	N/A	8,760	0.0960	0.4205	N/A
0011	Cooling Towers TA171 Sta 129 & TA31 Sta 129 Old/New	N/A	N/A	8,760	0.0360	0.3154	N/A
0012	1 Burner, Jeffry Dryer	0010 & 0011	Schneible Wet Collector & Cyclone	8,760	0.0270	0.1183	0.1183
0013	TA101 Concentrator	N/A	N/A	8,760	0.1000	0.4380	0.4380
0014	Calrox Packaging & Blending Sta 131 Dust Pickups	D	Scrubber (131- 5DC-2) & Cyclone (Pack-Cyc-001)	8,760	0.3058	1.3392	1.3392
0015	Calrox Storage Tk & Bulk Loading 129 TA Sta 131	0012 & 0013	0012 Semco Baghouse (10DC 129TA) & 0013 Scrubber	1,200	0.0532	0.0319	0.0319
0027	Cooling Tower TA 31 Sta 135 (No Process Emission)	N/A	N/A	8,760	0.0360	0.1577	N/A
0029	Burner 4BU Sta 110, Gas Fired Mode	N/A	N/A	8,760	0.0010	0.0044	N/A
0034	Pneumatic Trans of Lime to Storage Bin from Tank Truck	0020	Bag Filter Semco Model DCU 310	150	0.0060	0.0005	N/A
0035	Lime Slaker	N/A	N/A	8,760	----	0.0000	N/A
0036	Screw Conveyor & Weigh Hopper for Lime Stacker	N/A	N/A	1,700	----	0.0000	N/A
0038	Oxidizer Burner	N/A	N/A	8,760	0.0960	0.4205	N/A
0039	Concentrator	N/A	N/A	8,760	0.1000	0.4380	0.4380
0044	Pilot Plant KMN04 Storage Bin with Dust Collector  Zeosyl	N/A	N/A  Cyclone and Baghouse	8,760  5,825	0.0025  0.0001	0.0110  0.0002	0.0110  N/A

E M I S S I O N S

IEPA Source <u>No.</u>	<u>Source Name</u>	<u>Control No.</u>	<u>Control Name</u>	<u>Maximum (Hour/Yr)</u>	<u>PM-10 (Lb/Hr)</u>	<u>PM-10 (Ton/Yr)</u>	<u>Manganese (Ton/Yr)</u>
0026	Was: #6 Fuel Oil Tank (1) Now: Potassium Carbonate	N/A	N/A	8,760	0	0	N/A
	3 Oxidizer Marley Cooling Towers	N/A	N/A	8,760	0.1100	<u>0.4818</u>	<u>N/A</u>
					Total:	5.72	3.95

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ATTACHMENT E

USP PROCESS EMISSIONS

E M I S S I O N S

<u>IEPA Source No.</u>	<u>Source Name</u>	<u>Control No.</u>	<u>Control Name</u>	<u>Maximum (Hour/Yr)</u>	<u>PM-10</u>		<u>Manganese (Ton/Yr)</u>
					<u>(Lb/Hr)</u>	<u>(Ton/Yr)</u>	
0009	USP Vacuum Dryer	0009	Condenser	1,000	0.1000	0.0500	0.0500
0040	USP Sievers	0021	USP Wet Dust Collector 14DC	1,040	1.7799	0.9255	0.9255
0041	Nugget Siever	0021	USP Wet Dust Collector 14DC	160	0.8899	<u>0.0712</u>	<u>0.0712</u>
					Total:	1.047	1.047

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ATTACHMENT F

PDC PROCESS EMISSIONS

E M I S S I O N S

<u>IEPA</u> <u>Source</u> <u>No.</u>	<u>Source Name</u>	<u>Control</u> <u>No.</u>	<u>Control Name</u>	<u>Maximum</u> <u>(Hour/Yr)</u>	<u>PM-10</u>		<u>Manganese</u> <u>(Ton/Yr)</u>
					<u>(Lb/Hr)</u>	<u>(Ton/Yr)</u>	
0030	2,3 PDC Acid Process	N/A	PDC Scrubber	8,760	0.0230	0.1007	N/A
0031	Sodium Permanganate Process Cookers, Tanks and Reactors	N/A	PDC Scrubber	8,760	0.0850	<u>0.3723</u>	<u>0.4380</u>
					Total:	0.473	0.438

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ATTACHMENT G

CARULITE PROCESS EMISSIONS

				E M I S S I O N S			
IEPA Source No.	Source Name	Control No.	Control Name	Maximum (Hour/Yr)	PM-10 (Lb/Hr)	PM-10 (Ton/Yr)	Manganese (Ton/Yr)
0020	Carulite Reactors (RE214, RE250, RE547)	0015	Cyclone (Centrifuge)	8,760	0.0001	0.0004	0.0004
0021	Carulite Sizing, Packaging, Sifters	0017	Semco Baghouse	8,760	0.0420	0.1840	0.1840
0032	Carulite Sizing, Packaging, Sifters	0018	Scrubber Newcombe	8,760	0.1200	0.5256	0.5256
0042 & 0043	Carulite Mixer & Carulite Calciner	0022	Cyclone and Scrubber	8,760	0.0540	<u>0.2365</u>	<u>0.2365</u>
					Total:	0.947	0.947

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