HERCULES, INC.

Hattiesburg Facility
Hattiesburg, Mississippi

Title V Operating Permit Application

May 2000

Trinity Consultants

TITLE V OPERATING PERMIT APPLICATION
HERCULES, INC. ▪ HATTIESBURG, MISSISSIPPI FACILITY

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Project 001901.0040

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1.1 FACILITY DESCRIPTION

Hercules, Incorporated (Hercules) currently operates a chemical specialties manufacturing facility in Hattiesburg, Forrest County, Mississippi. The Hattiesburg facility operates under Title V Operating Permit No. 0800-00001, which was issued on November 13, 1998. The facility is a major source of Hazardous Air Pollutants (HAPs) under Title III of the 1990 Clean Air Act Amendments (CAAA). National Emissions Standards for Hazardous Air Pollutants (NESHAPs) Subpart PPP – National Emission Standards for Hazardous Air Pollutants for Polyether Polyols Production (40 CFR 63.1420) which was promulgated on June 1, 1999 applies to the Rosin Amine Derivatives (RAD) process area. The purpose of this submittal is to include Subpart PPP applicability in the facility's Title V Operating Permit.

1.2 PROCESS DESCRIPTION

Rosin Amine Derivatives (RAD), including Amines and Amine Acetates, are manufactured in the RAD area. Ethylene Oxide Derivatives (EOD), including Polyrads and Surfactants, are also manufactured in the RAD area. The major use of Amine Acetates is a collector for silica and silicate minerals. Amine Acetate is used primarily in the benefication of non-metallic ores. The Polyrads are corrosion inhibitors that are used for hydrochloric acid and for petroleum refining equipment. Their detergent properties aid in loosening and dispersing scale. The facility routinely produces RAD and/or EOD finished products. Some raw materials are stored in bulk storage tanks which are not in the immediate process area. Ammonia is stored in tanks in the Metal Resinates area. Ethylene Oxide is stored in an isolated storage tank away from the immediate process area. Finished products are either packaged or stored in product storage tanks in the RAD area.

The manufacturing scheme for RAD is: 1) rosin ammoniation in the presence of a metal catalyst to produce crude Nitrile; 2) batch distillation of crude Nitrile to produce distilled Nitrile; 3) hydrogenation of distilled Nitrile in the presence of a metal catalyst to produce Amine; and 4) various blending operations to produce Amine Acetates.

The manufacturing scheme for EOD is: 1) reacting Ethylene Oxide with various feed resins; and 2) various blending operations.

Emissions associated with the RAD process area primarily include: 1) reactor losses; 2) tank losses from raw materials and product storage; 3) fugitive losses; and 4) accounting inventories and mass balances. The RAD ammoniation reactor vent is equipped with a water scrubber. The Nitrile still operates under vacuum and is equipped with a barometric condenser/hot well. The hydrogenation reactor's vent is equipped with a water scrubber bucket. The blending operations are associated with tank losses.

The EOD reactor vent is equipped with a weak Sulfuric Acid circulating media to convert Ethylene Oxide to Ethylene Glycol controlled blowdown.

A diagram of the RAD process area is found in Appendix C.

1.3 EMISSION SOURCES

The emission points for the RAD process area at the Hattiesburg facility are provided in this update to the Title V permit application. Based on the Mississippi Air Pollution Code, APC-S-6, Section VII.B, some of the emission sources at the Hattiesburg facility are insignificant sources and need to be identified in the Title V permit application. All insignificant activities are identified in Section C of the Title V permit application.

1.4 EMISSION CALCULATIONS

Detailed emission rate calculations for all sources are provided in Appendix A of the permit application. The emission rate calculations for all sources were performed using engineering estimates, design data, and SOCMI emission factors for fugitive components.

1.5 APPLICABLE REGULATIONS

All applicable state and federal regulations for the Hattiesburg facility are provided in Section N of the Title V permit application.

The Hattiesburg facility is subject to a number of federal and state air quality regulations including National Emission Standards for Hazardous Air Pollutants (NESHAPs) Subpart PPP – National Emission Standards for Hazardous Air Pollutants for Polyether Polyols Production (40 CFR 63.1420).

As noted in Section O, the Hattiesburg facility is currently in compliance with applicable state and federal regulations. The statement indicating current compliance status is provided in Section O of the Title V permit application.

1.6 CHEMICAL ACCIDENT PREVENTION REGULATION

The accidental release prevention program is mandated by section 112(r) of the Clean Air Act and is codified in 40 CFR 68. The program was finalized on June 20, 1996. The Hattiesburg facility is complying with all applicable provisions of the accidental release program.

1.7 STRATOSPHERIC OZONE PROTECTION

Title VI of the Clean Air Act Amendments requires phaseout of ozone-depleting chemicals. The stratospheric ozone protection provisions have been codified in 40 CFR 82. The Hattiesburg facility does not manufacture any ozone depleting substances as identified in 40 CFR 82.

1.8 National Ambient Air Quality Standards

The Hattiesburg facility is located in Forrest County, Mississippi, which is classified as attainment for all criteria pollutants. The Hattiesburg facility is in compliance with the state requirements in the State Implementation Plan (SIP). Therefore, it is in compliance with the state requirements designed to meet the National Ambient Air Quality Standards.

1.9 Summary

All the forms required to furnish a complete Title V permit application have been completed. In addition, detailed emission rate calculations are provided for reference in Appendix A. Confidential business information, including raw material input and product output data, is included in Appendix D. A map indicating the location of the facility is found in Appendix B, and a RAD process area diagram is provided in Appendix C.

FOR OFFICIAL USE ONLY	
APPLICATION RECEIPT DATE:	
APPLICATION NO.:	
FOR MODIFICATION: MINOR	

STATE OF MISSISSIPPI
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF POLLUTION CONTROL
AIR DIVISION
P.O. BOX 10385
JACKSON, MS. 39289-0385
PHONE NO.: (601) 961 - 5171

APPLICATION FOR TITLE V AIR POLLUTION CONTROL PERMIT TO OPERATE AIR EMISSIONS EQUIPMENT

PERMITTING ACTIVITY:

	INITIAL APPLICATION
X	MODIFICATION
	RENEWAL OF OPERATING PERMIT

NAME: Hercules, Inc.

CITY: Hattiesburg

COUNTY: Forrest

FACILITY No. (if known): 0800-00001

APPLICATION FOR TITLE V PERMIT TO OPERATE AIR EMISSIONS EQUIPMENT

CONTENTS

OPERATING PERMIT APPLICATION REQUIREMENTS

All applications must be submitted on the form supplied by the Permit Board. Trivial activities which are listed in Attachment A are presumed to emit less than 1 pound per hour of a pollutant that is not a hazardous air pollutant and less than 0.1 pound per hour of any hazardous air pollutant; these activities need not be reported in the application. Insignificant activities which are specified in Section VII.A. of Regulation APC-S-6 and listed herein also need not be included. For insignificant activities which are specified in Section VII.B. of Regulation APC-S-6, a list must be included in the application. An application may not omit information needed to determine the applicability of or to impose, any applicable requirement, or to evaluate the fee amount required under the schedule pursuant to Section VI. of Regulation APC-S-6. The forms and attachments shall include the elements specified as follows:

A. Identifying information, including company name and address (or plant name and address if different from the company name), owners name and agent, and telephone number and names of plant site manager/contact;

B. A description of the sources process and products by Standard Industrial Classification Code including any associated with any alternate scenario identified by the source;

C. Emission-related information as follows:

1. A qualitative description of all emissions units, including those not subject to applicable requirements but not those omitted under trivial or insignificant activities provisions;

2. A description of all emissions of pollutants for which the source is major and of all emissions of regulated air pollutants sufficient to determine or verify major source status, to determine or verify applicability of and compliancewith applicable requirements, and to assess and collect permit fees, if the emissions basis for fees has not been previously determined. Fugitive emissions from individual components within a facility may be determined collectively based on their relationship to the associated process unless individual emission rates are needed to determine the applicability of an applicable requirement such as NSPS, NESHAPS, a MACT standard, etc. or to determine air quality impacts. Similarly, where individual components or units with a facility may be classified into a generic group due to the commonality of applicable requirements and/or the nature of operation, stack emissions may be determined collectively for the group unless individual emission rates are needed to determine applicability of an applicable requirement or to determine air quality impacts;

3. For each pollutant and emissions unit which is regulated, emission rates in TPY and in such terms as are necessary to establish compliance consistent with the applicable standard reference test method, except that, for pollutants and units which have no applicable requirements expressed in emission rate terms, emission rate quantification may be omitted;

4. To the extent it is needed to determine or regulate emissions, the information that follows: fuels, fuel use, raw materials, production rates, and operating schedules;

5. Identification and description of air pollution control equipment and compliance monitoring devices or activities;

6. Limitations on source operation affecting emissions or any work practice standards, where applicable, for all regulated pollutants at the Title V source;

7. Other information required by any applicable requirement (including information related to stack height limitations developed pursuant to Section 123 of the Federal Act); and

8. Calculations on which the information requested in this section is based;

D. Air pollution control requirements as follows:

1. Citation and description of all applicable requirements, and

2. Description of or reference to any applicable test method for determining compliance with each applicable requirement;

E. Other specific information that may be necessary to implement and enforce other applicable requirements of the Federal Act or of these regulations or to determine the applicability of such requirements;

F. An explanation of any proposed exemptions from otherwise applicable requirements;

G. Additional information as determined to be necessary by the Permit Board to define alternative operating scenarios identified by the source pursuant to Section III.A.9. of Regulation APC-S-6 or to define permit terms and conditions implementing 40 CFR 70.4(b)(12) or Section III.A.10. of Regulation APC-S-6;

H. A compliance plan for all Title V sources that contains all of the following:

1. A description of the compliance status of the source with respect to all applicable requirements;

2. A description as follows:

a. For applicable requirements with which the source is in compliance, a statement that the source will continue to comply with such requirements;

b. For applicable requirements that will become effective during the permit term, a statement that the source will meet such requirements on a timely basis;

c. For requirements for which the source is not in compliance at the time of permit issuance, a narrative description of how the source will achieve compliance with such requirements;

3. A compliance schedule as follows:

a. For applicable requirements with which the source is in compliance, a statement that the source will continue to comply with such requirements;

b. For applicable requirements that will become effective during the permit term, a statement that the source will meet such requirements on a timely basis. A statement that the source will meet in a timely manner applicable requirements that become effective during the permit term shall satisfy this provision, unless a more detailed schedule is expressly required by the applicable requirements;

c. A schedule of compliance for sources that are not in compliance with all applicable requirements at the time of permit issuance. Such a schedule shall include a schedule or remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with any applicable requirements for which the source will be in noncompliance at the time of permit issuance. This compliance schedule shall resemble and be at least as stringent as that contained in any judicial consent decree or administrative order to which the source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based;

4. A schedule for submission of certified progress reports, to be submitted no less frequently than every 6 months for sources required to have a schedule of compliance to remedy a violation;

5. The compliance plan content requirements specified in this paragraph shall apply and be included in the acid rain portion of a compliance plan for an affected source, except as specifically superseded by regulations promulgated under Title IV of the Federal Act with regard to the schedule and method(s) the source will use to achieve compliance with the acid rain emissions limitations;

I. Requirements for compliance certification, including the following:

1. A certification of compliance with all applicable requirements by a responsible official consistent with Section II.E of Regulation APC-S-6 and Section 114(a)(3) of the Federal Act;

2. A statement of methods used for determining compliance, including a description of monitoring, recordkeeping, and reporting requirements and test methods;

3. A schedule for submission of compliance certifications during the permit term, to be submitted no less frequently than annually, or more frequently if specified by the underlying applicable requirement or by the Permit Board;

4. A statement indicating the sources compliance status with any applicable enhanced monitoring and compliance certification requirements of the Federal Act; and

J. The use of nationally-standardized forms for acid rain portions of permit applications and compliance plans, as required by regulations promulgated under Title IV of the Federal Act.

INSIGNIFICANT ACTIVITIES AND EMISSIONS

I. The following activities/emissions sources are not required to be included in a Title V permit application:

A. New or modified pilot plants, subject to temporary source regulations located in Section III.E. of regulation APC-S-6.

B. Maintenance and upkeep:

1. Maintenance, structural changes, or repairs which do not change the capacity of such process, fuel-burning, refuse-burning, or control equipment, and do not involve any change in quality, nature, or quantity of potential emissions of any regulated air pollutants; and

2. Housekeeping activities or building maintenance procedures;

C. Air conditioning or ventilation: comfort air conditioning or comfort ventilating systems which do not transport, remove, or exhaust regulated air pollutants to the atmosphere;

D. Laboratory equipment:

1. Laboratory equipment used exclusively for chemical or physical analysis for quality control or environmental monitoring purposes; or

2. Non-production laboratory equipment used at non-profit health or non-profit educational institutions for chemical or physical analyses, bench scale experimentation or training, or instruction;

E. Hot water heaters which are used for domestic purposes only and are not used to heat process water;

F. Fuel use related to food preparation by a restaurant, cafeteria, residential cooker or barbecue grill where the products are intended for human consumption;

G. Clerical activities such as operating copy machines and document printers, except operation of such units on a commercial basis;

H. Hand held equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sanding, sawing, surface grinding, or turning of ceramic art work, precision parts, leather, metals, plastics, fiber board, masonry, carbon, glass, or wood;

I. Equipment for washing or drying fabricated glass or metal products, if no VOCs are used in the process and no oil or solid fuel is burned;

J. Water cooling towers (except at nuclear power plants); water treatment systems for process cooling water or boiler feed water; and water tanks, reservoirs, or other water containers not used in direct contact with gaseous or liquid process streams containing carbon compounds, sulfur compounds, halogens or halogen compounds, cyanide compounds, inorganic acids, or acid gases;

K. Domestic sewage treatment facilities (excluding combustion or incineration equipment, land farms, storage silos for dry material, or grease trap waste handling or treatment facilities);

L. Stacks or vents to prevent escape of sewer gases through plumbing traps;

M. Vacuum cleaning systems for housekeeping, except at a source with hazardous air pollutants;

N. Alkaline/phosphate washers and associated cleaners and burners;

O. Mobile sources;

P. Livestock and poultry feedlots and associated fuel burning equipment other than incinerators;

Q. Outdoor kerosene heaters;

R. Equipment used for hydraulic or hydrostatic testing;

S. Safety devices, excluding those with continuous emissions; and

T. Brazing, soldering, or welding equipment that is used intermittently or in a non-continuous mode.

II. The following activities/emissions sources must be listed in the application but emissions from these activities do not have to be quantified.

A. All gas fired, #2 oil fired, infrared, electric ovens with no emissions other than products of fuel combustion;

B. Combustion units with rated input capacity less than 10 million Btu/hr that are fueled by:

1. Liquified petroleum gas or natural gas supplied by a public utility; or

2. Commercial fuel oil #2 or lighter;

C. Equipment used for inspection of metal products;

D. Equipment used exclusively for forging, pressing, drawing, spinning, or extruding metals;

E. Equipment used exclusively to mill or grind coatings and molding compounds where all materials charged are in paste form;

F. Mixers, blenders, roll mills, or calendars for rubber or plastics for which no materials in powder form are added and in which no organic solvents, diluents, or thinners are used;

G. All storage tanks used exclusively to store fuel oils, kerosene, diesel, jet fuel, crude oil, natural gas, or liquified petroleum gas (the application must list the size of the tank, date constructed and/or modified, type tank, and material stored);

H. Space heaters utilizing natural or LPG gas and used exclusively for space heating;

I. Back-up or emergency use generators, boilers or other fuel burning equipment which is of equal or smaller capacity than normal main operating equipment, cannot be used in conjunction with normal main operating equipment, and does not emit, have or cause the potential to emit of any regulated air pollutant to increase;

J. Blast cleaning equipment using a suspension of abrasives in water;

K. Die casting machines;

L. Foundry sand mold forming equipment to which no heat is applied and from which no organics are emitted.

M. Bark and wood - waste storage and handling;

N. Log wetting areas;

P. Log flumes;

Q. Sodium hydrosulfide storage tank;

R. Smelt dissolving tank view ports;

S. Spout cooling water storage;

T. Effluent drains;

U. White water chest;

V. Repupler vents;

W. Clay storage tank;

X. Alum storage tank;

Y. Starch storage tank;

Z. Steam vents and leaks;

AA. Deaerator vents;

AB. Mill air and instrument air system;

AC. Demineralizer water storage tank;

AD. Acid storage tank;

AE. Process water tank;

AF. Air purification system vents;

AG. Effluent neutralizing tank/system;

AH. Dregs washer;

AI. Lime silo;

AJ. Lime mud mix tank;

AK. H_2O_2 storage tank;

AL. Green liquor tank; and

AM. Tall oil storage tank.

III. Notwithstanding I. and II. above, the applicant shall include all emissions sources and quantify emissions if needed to determine major source status, to determine compliance with an applicable requirement and/or the applicability of any applicable requirement such as NSPS, NESHAP, MACT standard, etc. as such term is defined in Section I. of Regulation APC-S-6 or collect any permit fee owed under the approved fee scheduled.

IV. Notwithstanding I. and II. above, the applicant shall include all emission sources with a potential to emit:

1. greater than 1 pound per hour of any regulated pollutant that is not a hazardous air pollutant;

2. greater than 0.1 pound per hour of any hazardous air pollutant.

V. The permittee does not have to report the addition of any insignificant activity listed in Section I. above unless the addition is a Title I modification or requires a permit to construct. If a Title I permit or a Permit to Construct is required, then the modification procedures outlined in Section IV.E. of Regulation APC-S-6 shall be followed.

IV. The addition of any insignificant activity listed in Section II. above, shall be handled as an administrative amendment as defined in Section IV.D. of Regulation APC-S-6 unless the addition is a Title I modification or requires a Permit to Construct. If a Title I permit or Permit to Construct is required, then the modification procedures outlined in Section IV.E. of Regulation APC-S-6 shall be followed.

REGULATED AIR POLLUTANTS

Total suspended particulate matter
PM_{10}
Sulfur dioxide
Nitrogen oxides
Carbon monoxide
Volatile organic compounds(see note 1)
Lead
Dioxin/Furan
Fluorides
Hydrogen chloride
Hydrogen sulfide
Sulfuric acid mist
Total reduced sulfur
Reduced sulfur compounds
Arsenic
Asbestos
Beryllium
Benzene
Mercury
Radionuclides
Vinyl chloride
Carbon tetrachloride
Chlorofluorocarbon-11
Chlorofluorocarbon-12
Chlorofluorocarbon-13
Chlorofluorocarbon-111
Chlorofluorocarbon-112
Chlorofluorocarbon-113
Chlorofluorocarbon-114
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Hydrochlorofluorocarbon-253
Hydrochlorofluorocarbon-261
Hydrochlorofluorocarbon-262
Hydrochlorofluorocarbon-271
Halon-1211
Halon-1301
Halon-2402
Methyl chloroform

Note 1 - Volatile organic compounds (VOC) includes any compound of carbon, excluding carbon monoxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate, which participates in atmospheric photochemical reactions. This includes any such organic compound other than the following which have been determined to have negligible photochemical reactivity: Methane; ethane; methylene chloride; 1,1,1-trichloroethane; CFC-113; CFC-11;CFC-12; CFC-22; FC-23; CFC-114; CFC-115; HCFC-123; HFC-134a; HCFC-141b; HCFC-142b; HCFC-124; HFC-125; HFC-134; HFC-143a; HFC-153a; and perfluorocarbon compounds which fall into these classes: (i) Cyclic, branched, or linear, completely fluorinated alkanes; (ii) Cyclic, benched, or linear, completely fluorinated ethers with no unsaturations; (iii) Cyclic, branched, or linear completely fluorinated tertiary amines with no unsaturations; and (iv) Sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine. **For the purposes of this application hazardous air pollutants that are volatile organic compounds should be included as VOCs for reflection of total VOCs from the facility but need to be identified separately as well.**

HAZARDOUS AIR POLLUTANTS

CAS No.	CHEMICAL NAME
75070	Acetaldehyde
60355	Acetamide
75058	Acetonitrile
98862	Acetophenone
53963	Acetylaminofluorene(2)
107028	Acrolein
79061	Acrylamide
79107	Acrylic Acid
107131	Acrylonitrile
107051	Allyl Chloride
92671	Aminodipheyl(4)
62533	Aniline
90040	Anisidine(o)
7440360	Antimony Compounds
7440382	Arsenic Compounds (inorganic including arsine)
1332214	Asbestos
71432	Benzene
92875	Benzidine
98077	Benzotrichloride
100447	Benzyl Chloride
7440417	Beryllium Compounds
192524	Biphenyl
117817	Bis(2-ethhylhexyl)phthalate(DEHP) (Dioctyl Phthalate)
542881	Bis(chloromethyl)ether
75252	Bromoform
106990	Butadiene(1,3)
7440439	Cadmium Compounds
156627	Calcium Cyanamide
105602	Caprolactam
133062	Captan
63252	Carbaryl
75150	Carbon Disulfide
56235	Carbon Tetrachloride
463581	Carbonyl Sulfide
120809	Catechol
133904	Chloramben
57749	Chlordane
7782505	Chlorine
79118	Chloroacetic Acid
532274	Chloroacetophenone(2)
108907	Chlorobenzene
510156	Chlorobenzinate
67663	Chloroform
107302	Chloromethyl methyl ether
126998	Chloroprene (Neoprene; 2-Chloro-1,3-Butadiene)
7440473	Chromium Compounds (IV)
10210681	Cobalt Carbonyl (as Co)
7440484	Cobalt Compounds (metal, dust, and fumes as Co)
16842038	Cobalt Hydrocarbonyl (as Co)

HAZARDOUS AIR POLLUTANTS

CAS No.	CHEMICAL NAME
65996818A	Coke Oven Emissions
1319773	Cresols/Cresylic acid
108394	Cresol(m)
95487	Cresol(o)
106445	Cresol(p)
98828	Cumene (Isopropylbenzene)
---	Cyanide Compounds (NOTE # 1)
3547044	DDE
334883	Diazomethane
132649	Dibenzofurans
96128	Dibromo-3-chloropropane(1,2)
84742	Dibutylphthalate
106467	Dichlorobenzene(1,4)(p)
91941	Dichlorobenzidene(3,3)
111444	Dichloroethyl ether (Bis(2-chloroehtyl)ether)
542756	Dichloropropene(1,3)
62737	Dichlorvos
111422	Diethanolamine
121697	Diethyl aniline (N,N) (dimethylaniline (N,N))
64675	Diethyl Sulfate
119904	Dimethoxybenzidine(3,3')
60117	4 - Dimethyl aminoazobenzene
119937	Dimethyl benzidine (3,3')
79447	Dimethyl carbamoyl chloride
68122	Dimethyl formamide
57147	Dimethyl hydrazine(1,1)
131113	Dimethyl phthalate
77781	Dimethyl sulfate
534521	Dinitro-o-cresol(4,6), and salts
51285	Dinitrophenol(2,4)
121142	Dinitrotoluene(2,4)
123911	Dioxane(1,4) (1,4-diethyleneoxide)
122667	Diphenylhydrazine(1,2)
94757	d(2,4), salts and esters
106898	Epichlorohydrin (Chloro-2,3-epoxypropane(1))
106887	Epoxybutane(1,2) (1,2-Butylene oxide)
140885	Ethyl acrylate
100414	Ethyl benzene
51796	Ethyl carbamate (Urethane)
75003	Ethyl chloride (Chloroethane)
106934	Ethylene dibromide (1,2-Dibromoethane)
107062	Ethylene dichloride (1,2-Dichloroethane)
107211	Ethylene glycol
151564	Ethylene imine (Azridine)
75218	Ethylene oxide
96457	Ethylene thiourea
75343	Ethylidene dichloride (1,1-Dichloroethane)
50000	Formaldehyde
---	Glycol ethers (NOTE #2)
76448	Heptachlor

HAZARDOUS AIR POLLUTANTS

CAS No.	CHEMICAL NAME
118741	Hexachlorobenzene
87683	Hexachlorocyclopentadiene
67721	Hexachloroethane
822060	Hexamethylene-1,6-diisocyanate
680319	Hexamethylphosphoramide
110543	Hexane
302012	Hydrazine
7647010	Hydrochloric acid
7664393	Hydrogen Fluoride (Hydrofluoric acid)
123319	Hydroquinone
78591	Isophorone
7439921	Lead Compounds
58899	Lindane (all isomers)
108316	Maleic anhydride
7439965	Manganese Compounds
7439976	Mercury Compounds
67561	Methanol
72435	Methoxychlor
74839	Methyl bromide (Bromomethane)
74873	Methyl chloride (Chloromethane)
71556	Methyl chloroform (1,1,1-Trichloroethane)
78933	Methyl ehtyl ketone (2-Butanone) (MEK)
60344	Methyl hydrazine
74884	Methyl iodide (Iodomethane)
108101	Methyl isobutyl ketone (Hexone)
624839	Methyl isocyanate
80626	Methyl methacrylate
1634044	Methyl tert butyl ether
101144	Methylene bis(2-chloroaniline)(4,4) (MOCA)
75092	Methylene chloride (Dichloromethane)
101688	Methylene diphenyl diisocynate (MDI)
101779	Methylenedianiline(4,4')
—	Mineral fibers (NOTE #3)
91203	Naphthalene
7440020	Nickel Compounds
7440020	Nickel, refinery dust
12035722	Nickel, subsulfide
98953	Nitrobenzene
92933	Nitrodiphenyl(4)
100027	Nitrophenol(4)
79469	Nitropropane(2)
62759	Nitrosodimethylamine(N) (Dimethylnitrosoamine)
59892	Nitrosomorpholine(N)
684935	Nitroso-N-methylurea(N)
56382	Parathion
82688	Pentachloronitrobenzene (Quintobenzene)
87865	Pentachlorophenol
108952	Phenol
106503	Phenylenediamine(p)
75445	Phosgene

HAZARDOUS AIR POLLUTANTS

CAS No.	CHEMICAL NAME
7803512	Phosphine
7723140	Phosphorus
85449	Phthalic anhydride
1336363	Polychlorinated biphenyls (Arochlors)
---	Polycylic Organic Matter (NOTE #5)
1120714	Propane sultone(1,3)
57578	Propiolactone(beta)
123386	Propionaldehyde
114261	Propoxur (Baygon)
78875	Propylene dichloride (1,2 dichloropropane)
75558	Propylene imine(1,2) (2-methyl aziridine)
75569	Propylene oxide
91225	Quinoline
106514	Quinone (1,4-Cyclohexadienedione)
---	Radionuclides (including radon) (NOTE #4)
7782492	Selenium Compounds
100425	Styrene
96093	Styrene oxide
1746016	Tetrachlorodibenzo-p-dioxin(2,3,7,8) (TCDD) (Dioxin)
79345	Tetrachloroethane(1,1,2,2)
127184	Tetrachloroethylene (Perchloroethylene)
7550450	Titanium Tetrachloride
108883	Toluene
95807	Toluene diamine(2,4) (2,4-diaminotoluene)
584849	Toluene diisocyanate(2,4)
95534	Toluidine(o)
8001352	Toxaphene (Chlorinated camphene)
120821	Trichlorobenzene(1,2,4)
79005	Trichloroethane(1,1,2)
79016	Trichloroethylene
95954	Trichlorophenol(2,4,5)
88062	Trichlorophenol(2,4,6)
121448	Triethylamine
1582098	Trifluralin
540841	Trimethylpentane(2,2,4)
75014	Vinyl Chloride
108054	Vinyl Acetate
593602	Vinyl Bromide
75354	Vinylidene chloride (1,1-Dichloroethylene)
1330207	Xylenes (mixed)
108383	Xylene(m)
95476	Xylene(o)
106423	Xylene(p)

NOTE # 1: X'CN where X = H' or any other group where a formal dissociation may occur, for example: KCN or $Ca(CN)_2$.

NOTE # 2: Includes mono- and di- ethers of ethylene glycol, dietheylene glycol and triethylene glycol R-(OCH_2CH_2)n-OR' where:

n = 1,2,3

R = alkyl or arl groups

R' = R,H, or group which, when removed, yield glycols ethers with the structure: R-(OCH_2CH_2)n-OH. Polymers are excluded from the glycol category

NOTE # 3: Includes glass microfibers, glass wool fibers, rock wool fibers, and slag wool fibers, each characterized as "respirable" (fiber diameter less then 3.5 micrometers) and possessing an aspect ratio (fiber length divided by fiber diameter) greater than 3.

NOTE # 4: A type of atom which spontaneously undergoes radioactive decay.

NOTE # 5: Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100 Celsius.

Owners Information — Section B

1. Name, Address & Contact for the Owner/Applicant

   A. Company Name: Hercules, Incorporated

   B. Mailing Address:

      1. Street Address or P. O. Box: 613 W. 7th Street
      2. City: Hattiesburg 3. State: MS
      4. Zip Code: 39401
      5. Telephone No.: (601) 545-3450

   C. Contact:

      1. Name: Charles Jordan
      2. Title: Environmental Coordinator

2. Name, Address, Location and Contact for the Facility:

   A. Name: Hercules, Incorporated

   B. Mailing Address:

      1. Street Address or P.O. Box: 613 W. 7th Street
      2. City: Hattiesburg 3. State: MS
      4. Zip Code: 39401
      5. Telephone No.: (601) 545-3450

   C. Site Location:

      1. Street: 613 West 7th Street
      2. City: Hattiesburg 3. State: MS
      4. County: Forrest 5. Zip Code: 39401
      6. Telephone No.: (601) 545-3450

   Note: If the facility is located outside of the City limits, please attach a sketch or description to this application showing the approximate location of the site.

   D. Contact:

      1. Name: Charles Jordan
      2. Title: Environmental Coordinator

3. SIC Code(s)(including any associated with alternate operating scenarios):
   2861, 2821, 2869, 2899

4. Number of Employees: 125

5. Principal Product(s): Rosin Derivatives and Paper Chemicals

6. Principal Raw Materials: Rosin and Paper Chemicals

7. Principal Process(es): Rosin Derivatives and Paper Chemicals Manufacturing

8. Maximum amount of principal product produced or raw material consumed per day: 3,103,720 lbs/day

9. Facility Operating Schedule:

   A. Specify maximum hours per day the operation will occur: 24

   B. Specify maximum days per week the operation will occur: 7

   C. Specify maximum weeks per year the operation will occur: 52

   D. Specify the months the operation will occur: January-December

10. Is this facility a small business as defined by the Small Business Act? No

11. **EACH APPLICATION MUST BE SIGNED BY THE APPLICANT.**

The application must be signed by a responsible official as defined in Regulation APC-S-6, Section I.A.26.

I certify that to the best of my knowledge and belief formed after reasonable inquiry, the statements and information in this application are true, complete, and accurate, and that, as a responsible official, my signature shall constitute an agreement that the applicant assumes the responsibility for any alteration, additions, or changes in operation that may be necessary to achieve and maintain compliance with all applicable Rules and Regulations.

Walter Langhans	**Plant Manager**
Printed Name of Responsible Official	**Title**
5/31/00	
Date Application Signed	**Signature of Applicants Responsible Official**

EMISSIONS SUMMARY for the ENTIRE FACILITY

List below the total emissions for each pollutant from the entire facility in accordance with Operating Permit Application Requirements, pp. 3-5. For stack emissions, use the maximum annual allowable (potential) emissions. For fugitive emissions, use the annual emissions calculated using the maximum operating conditions.

POLLUTANT Footnote 1	ANNUAL EMISSION RATE	
	lb/hr	tons/yr
Particulate matter (PM/PM_{10}) (Footnote 2)	358.08	1,568.39
Sulfur dioxide (SO_2)	479.21	2,098.93
Nitrogen oxides (NOx)	127.58	558.79
Carbon monoxide (CO)	10.25	44.88
Volatile Organic Compounds (VOC)	253.77	1,111.48
Total Hazardous Air Pollutants (HAP)	83.29	364.83
Epichlorohydrin	1.70	7.46
Toluene	78.49	343.80
Xylene	0.12	0.51
Ethylbenzene	0.03	0.14
Ethylene oxide	2.32	10.17
Biphenyl	0.63	2.76

1. All regulated air pollutants,including hazardous air pollutants emitted from the entire facility should be listed. A list of regulated air pollutants has been provided in Section A.

2. All PM assumed to be PM_{10} for the purposes of this application as no data is available for PM_{10}.

With the exception of the emissions resulting from insignificant activities and emissions as defined in Regulation APC-S-6, Section VII, the pollutants listed above are all regulated air pollutants reasonably expected to be emitted from the facility.

SIGNATURE (must match signature on page 17)

For the sections listed below indicate the number that have been completed for each section as part of this application.

Section B	1	Section L1	0	Section M1	0
Section C	1	Section L2	0	Section M2	0
Section D	1	Section L3	0	Section M3	1
Section E	1	Section L4	0	Section M4	0
Section F	0	Section L5	1	Section M5	0
Section G	0	Section L6	0	Section M6	0
Section H	1	Section L7	0	Section M7	0
Section I	0			Section M8	0
Section J	0			Section N	1
Section K	0			Section O	3

As a minimum, sections B, C, M, N and O must be completed for the application to be considered complete.

Please list below all insignificant activities required by APC-S-6, Section VII.B that apply to your facility.

Effluent treatment (per Section VII.B.19 and 32)

Shops (Painting, Welding, Sandblasting, Maintenance, etc…) (per Section VII.A.2)

Portable, Fuel-powered, Air Compressors (per mobile source exemption)

The following activities are requested as insignificant based on their emissions which are less than 1 lb/hr of any criteria pollutant and less than 0.1 lb/hr of any HAP:

Nitrogen generation

Firehouses – including generators and pumps

Tanks (see attached list) (per Section VII.B.7) (Please note that this submittal only contains the insignificant tanks in the RAD process area. Insignificant tanks in other process areas are found in the Title V permit application which was submitted in November 1995 with an amended submittal in February 1998.)

Compressed Gas Cylinders

ROSIN AMINE DERIVATIVES PROCESS AREA

I.D.	PRODUCT STORED	TYPE OF TANK	CAPACITY (GALLONS)	DATE OF CONSTRUCTION
RA-1	Amine D	Steel	8,218	Pre-1977
RA-2	Amine D	Steel	4,512	Pre-1977
RA-3	Amine D	Steel	4,512	Pre-1977
RA-4	Ammonia Water (oil layer)	Steel	5,702	Pre-1977
RA-6	Amine D	Steel	5,207	Pre-1977
RA-7	Crude Nitrile	Steel	11,844	Pre-1977
RA-8	Empty	Steel	150	Pre-1977
RA-9	Distilled Nitrile	Steel	8,215	Pre-1977
RA-10	Distilled Nitrile	Steel	8,215	Pre-1977
RA-11	Crude Nitrile	Steel	14,100	Pre-1977
RA-12	Empty	Steel	25,380	Pre-1977
RA-13	Empty	Steel	4,464	Pre-1977
RA-15	Surfactant	Steel	10,400	Pre-1977
RA-16	Polyrad/Surfactant	Steel	2,406	Pre-1977
RA-17	Polyrad/Surfactant	Steel	3,065	Pre-1977
RA-18	Polyrad/Surfactant	Steel	3,065	Pre-1977
RA-19	Polyrad/Surfactant	Steel	488	Pre-1977
RA-20	Polyrad/Surfactant	Steel	488	Pre-1977
RA-23	Resin	Steel	4,510	Pre-1977
RA-24	Sodium Hydroxide (5%)	Steel	40	Pre-1977
RA-25	Pexoil (Nitrile)	Steel	4,464	Pre-1977
RA-26	Nitrile	Steel	2,840	Pre-1977
RA-27	Lime/Nitrile	Steel	225	Pre-1977
RA-28	Amine D Acetate	Steel	2,812	Pre-1977
RA-29	Empty	Steel	2,924	Pre-1977
RA-37	Rosin	Steel	1,990	Pre-1977
RA-40	Waste Water	Steel	25,350	Pre-1977
RA-41	Waste Water	Steel	25,350	Pre-1977
RA-44	Empty	Steel	9,877	Pre-1977
RA-49	Waste Oils	Steel	17,230	Pre-1977
RA-51	Isopropyl Alcohol	Steel	17,550	Pre-1977
RA-52	Acetic Acid	Steel	11,280	Pre-1977
RA-53	Dowtherm	Steel	1,176	Pre-1977
RA-54	Ammonia	Steel	12,113	Pre-1977
RA-55	Ammonia	Steel	12,113	Pre-1977

I.D.	PRODUCT STORED	TYPE OF TANK	CAPACITY (GALLONS)	DATE OF CONSTRUCTION
RA-56	Waste Water	Steel	12,750	Pre-1977
RA-57	Waste Water	Steel	12,750	Pre-1977
RA-58	Empty	Steel	10,570	Pre-1977
RA-63	Ammonia	Steel	25	1987
RA-101TC*	Material Unloading/Loading	Steel	20,000	Pre-1977

*TC-Railroad Tank Car (Mobile Source), TT – Tank Truck (Mobil Source)

RISK MANAGEMENT PLANS

If the source is required to develop and register a risk management plan pursuant to Section 112(r) of the Title III of the Clean Air Act, the permittee need only specify that it will comply with the requirement to register such a plan. The content of the risk management plan need not itself be incorporated as a permit term.

Please answer the following questions:

I. Are you required to develop and register a risk management plan pursuant to Section 112(r)?

X Yes _____ No

Only if "yes", answer questions II., III., and/or IV.

II. Have you submitted the risk management plan to the appropriate agency (i.e. Mississippi Emergency Management Agency (MEMA), Federal Emergency Management Agency (FEMA), etc.)?

X Yes _____ No

III. If yes, give agency name and date submitted. June 17, 1999
RMP Reporting Center – Merrifield, VA
EPA Facility I.D – 1000 0011 7018
FBI Notification – Washington D.C.

IV. If no, provide a schedule for developing and submitting the risk management plan to the appropriate agency and providing our agency with certification that this submittal was made.

FUEL BURNING EQUIPMENT (page 1 of 2) SECTION D

1. Emission Point No. / Name: AF-001 (181)/ Dowtherm Boiler

2. Equipment Description: Struthers Wells (Dowtherm Boiler)

3. Was this unit constructed or modified after August 7, 1977? ____ Yes X No
If yes please give date and explain.

4. Rated Capacity: 8.3 MMBTU/hr 5. Type of burner: Multiple Port Gas

6. Usage Type (i.e. Space Heat, Process, etc.) : Process Heat

7. Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage.

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	ACTUAL YEARLY USAGE
Natural Gas	1,000 Btu/cf	-	-	8,300 cf	18,737 mcf

8. Please list any fuel components that are hazardous air pollutants and the percentage in the fuel.

9. Operating Schedule: 24 hours/day 7 days/week 52 weeks/year

10. Stack Data:
A. Height: 55 ft
B. Inside diameter: 1.5 ft
C. Exit gas velocity: 14.3 fps
D. Exit gas temperature: 1,000 deg F

11. UTM Coordinates:
A. Zone 16 B. North 3,469,600 m C. East 280,700 m

FUEL BURNING EQUIPMENT (page 2 of 2) SECTION D

12. POLLUTANT EMISSIONS:

Example emission rate calculations, monitoring data, or stack test data must be attached in accordance with Operating Permit Application Requirements, pp. 3-5.

EMISSION POINT NO.	POLLUTANT (note 1)	CONTROL EQUIPMENT		ACTUAL EMISSION RATE (in accordance with Operating Permit Application Requirements, pp. 3-5)			PROPOSED ALLOWABLE EMISSION RATE (Optional)		
		yes/no*	effic.	note 2	lb/hr	tn/yr	Note 2	lb/hr	tn/yr
AF-001	PM	NO		0.004 lb/MMBtu	0.037	0.042	0.6 lb/MMBtu	None requested	
	PM_{10}	NO		N/A	0.062	0.070	N/A	None requested	
	SO_2	NO		0.0006 lb/MMBtu	0.005	0.006	4.8 MMBtu/hr	None requested	
	NOx	NO		N/A	0.830	0.937	N/A	None requested	
	CO	NO		N/A	0.174	0.197	N/A	None requested	
	VOC	NO		N/A	0.044	0.049	N/A	None requested	
	All Other Criteria Pollutants	NO		N/A	< 1	N/A	N/A	None requested	
	All Other HAPs	NO		N/A	< 0.1	N/A	N/A	None requested	

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed. A list of regulated air pollutants has been provided in Section A.

2. Provide emission rate in units of applicable emission standard, e.g. lb/MMbtu, gr/dscf, etc. This may not apply to every emission point or every pollutant from emission point.

* If yes, attach appropriate Air Pollution Control Data Sheet from Section L or manufacturers specifications of other.

MANUFACTURING PROCESSES (page 1 of 2) SECTION E

1. Emission Point No./ Name: AF-000 (180 & 190)/Rosin Amine Derivatives Process Area

2. Process Description: See attached process description found in Section 1.2 of the introduction.

3. Was this unit constructed or modified after August 7, 1977? _____ yes X no
If yes please give date and explain. _____

4. Capacity (tons/hr): See attached Appendix D, Confidential Business Information

5. Raw Material Input:

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR
See attached Appendix D, Confidential Business Information			

6. Product Output:

PRODUCT or BY-PRODUCT	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR
See attached Appendix D, Confidential Business Information			

7. Stack Data:

AF-002 (182)/Ammoniation Vent

A.	Height:	17.5 ft	C.	Exit gas velocity:	0-1 fps
B.	Inside diameter:	4 in	D.	Exit gas temperature:	Ambient

AF-003 (183)/Amine Reactor Vent

A.	Height:	1 ft	C.	Exit gas velocity:	0-1 fps
B.	Inside diameter:	2 ft	D.	Exit gas temperature:	Ambient

AF-004 (190)/Packed Bed Scrubber with Sulfuric Acid

A.	Height:	32 ft	C.	Exit gas velocity:	0-1 fps
B.	Inside diameter:	2 in	D.	Exit gas temperature:	Ambient

8. UTM Coordinates:

A. Zone 16 B. North 3,469,600 m C. East 280,700 m

13. POLLUTANT EMISSIONS:

Example emission rate calculations, monitoring data, or stack test data must be attached in accordance with Operating Permit Application Requirements, pp. 3-5.

EMISSION POINT NO	POLLUTANT (note 1)	CONTROL EQUIPMENT		ACTUAL EMISSION RATE (in accordance with Operating Permit Application Requirements, pp. 3-5)			PROPOSED ALLOWABLE EMISSION RATE (Optional)		
		Yes/no*	effic.	note 2	lb/hr	tn/yr	note 2	lb/hr	tn/yr
AF-000 (180 &190)	VOC (fugitive)	NO	N/A		0.37	1.62		None requested	
	HAP (fugitive)	NO	N/A		0.37	1.62		None requested	
AF-004 (190)	VOC	YES	98 %		0.06	0.27		None requested	
	HAP	YES	98 %		0.06	0.27		None requested	
AF-002 (182)	All Other Criteria Pollutants	NO	N/A		< 1	N/A		None requested	
	All Other HAPs	NO	N/A		< 0.1	N/A		None requested	
AF-003 (183)	All Other Criteria Pollutants	NO	N/A		< 1	N/A		None requested	
	All Other HAPs	NO	N/A		< 0.1	N/A		None requested	

1. All regulated air pollutants including hazardous air pollutants emitted from this source should be listed in accordance with Operating Permit Application Requirements, pp. 3-5. A list of regulated air pollutants has been provided in Section A.

2. Provide emission rate in units of applicable emission standard, e.g. lb/MMbtu, gr/dscf, etc. This may not apply to every emission point or every pollutant from an emission point.

*
If yes, attach appropriate Air Pollution Control Data Sheet from Section L or manufacturers specifications if other.

TANK SUMMARY (page 1 of 2) SECTION H

1. Emission Point No./Name: RA-50 Ethylene Oxide Storage Tank (M0741)

2. Was this tank constructed or modified after August 7, 1977? _____ Yes X no
   If yes please give date and explain. _____

3. Product Stored: Ethylene oxide
   If more than one product is stored, provide the information in 4.A-E for each product.

4. Tank Data:

A.	True Vapor Pressure at storage temperature:	21/68	psia/°F
B.	Reid Vapor Pressure at storage temperature:	_____	psia/°F
C.	Density of product at storage temperature:	7.4	lb/gal
D.	Molecular Weight of product vapor at storage temperature:	44	lb/lbmol
E.	Throughput for most recent calendar year:	33,318	gal/yr
F.	Tank Capacity:	18,550	gal
G.	Tank Diameter:	9	feet
H.	Tank Height / Length:	36	feet
I.	Average Vapor Space Height:	4.5	feet
J.	Tank Orientation:	Horizontal	Vertical or Horizontal
K.	Type of Roof:	Dome	Dome or Cone
L.	Is the Tank Equipped with a Vapor Recovery System?	_____	yes X no

   If Yes, describe on separate sheet of paper and attach. Indicate efficiency.

M. Check the Type of Tank:

_____	Fixed Roof	_____	External Floating Roof
X	Pressure	_____	Internal Floating Roof
_____	Variable Vapor Space	_____	Other, describe: _____

N. Check the Closest City:

X	Jackson, MS	_____	Birmingham, AL
_____	Memphis, TN	_____	Montgomery, AL
_____	New Orleans, LA	_____	Baton Rouge, LA

O. Check the Tank Paint Color:

_____	Aluminum Specular	_____	Gray Light
X	Aluminum Diffuse	_____	Gray Medium
_____	Red	_____	White
_____	Other, describe		

P. Tank Paint Condition: Good Good or Poor

Q. Check Type of Tank Loading

1. Trucks and Rail Cars
   - _____ Submerged Loading of clean cargo tank
   - X Submerged Loading : Dedicated Normal Service
   - _____ Submerged Loading : Dedicated Vapor Balance Service
   - _____ Splash Loading of clean cargo tank
   - _____ Splash Loading : Dedicated Normal Service
   - _____ Splash Loading : Dedicated Vapor Balance Service

2. Marine Vessels
   - _____ Submerged Loading: Ships
   - _____ Submerged Loading: Barges

R. For External Floating Roof Tanks

1. Check the Type of Tank Seal:

Mechanical Shoe

_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal

Liquid Mounted Resilient Seal

_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal

Vapor Mounted Resilient Seal

_____ Primary Seal Only
_____ With Shoe-Mounted Secondary Seal
_____ With Rim-Mounted Secondary Seal

2. Type of External Floating Roof: _____ Pontoon
_____ Double-Deck

S. For Internal Floating Roof Tanks

1. Check the Type of Tank Seal:

Liquid Mounted Resilient Seal

_____ Primary Seal Only
_____ With Rim-Mounted Secondary Seal

Vapor Mounted Resilient Seal

_____ Primary Seal Only
_____ With Rim-Mounted Secondary Seal

2. Number of Roof Columns: _____
3. Length of Deck Seam _____ feet
4. Area of Deck: _____ feet^2
5. Effective Column Diameter: _____ feet
6. Check the Type of Tank:

_____ Bolted with Column Supported Roof
_____ Welded with Column Supported Roof
_____ Bolted with Self-Supported Roof
_____ Welded with Self-Supported Roof

5. Emissions Summary

1.	Breathing Loss:	0	lb/hr	0	TPY
2.	Working Loss::	0	lb/hr	0	TPY
3.	Total Emissions:	0	lb/hr	0	TPY

6. UTM Coordinates:

A. Zone 16 B. North 6939 C. East 8062

* Tank is a pressurized storage vessel which is equipped with a pressure relief valve thart vents to the scrubber when loading. This results in negligible emissions to the atmosphere.

AIR POLLUTION CONTROL DEVICES SECTION L

1. If the air pollution control device is different from the attached forms, then submit drawings, specifications, manufacturers data, etc.

2. Fill out one form for each air pollution control device and attach to the appropriate emission point description form.

SCRUBBERS (Page 1 of 2) SECTION L5

1. Emission Point No. / Name: AF-004

2. Manufacturers Name and Model No.: Anderson 2000 Inc. Serial No. S-4733-832

3. Date of construction for existing sources or date of anticipated start-up for new sources:
1988

4. Scrubber Data:

a) Scrubber type:

	Venturi		Orifice
X	Packed Tower		Gravity Tower
	Cyclonic		Condenser
	Mist Eliminator		Impingement Plate
	Other:		

b) Liquid injection rate:
1) Design maximum: 11.4 gpm @ 104.7 psia
2) Expected average: 11.4 gpm @ 104.7 psia

c) Pressure drop: 3 Inches H_2O

d) Scrubbing liquid:
1) Once-through _____ Recycled X
2) If recycled: _____ gpm make - up rate
3) If water, describe settling basin: N/A
4) Solution / Reactant systems:
a) Chemical make up: Weak Sulfuric Acid
b) How is discharge handled, treated? Effluent Treatment Plant

e) Gas flow: X Counter current _____ Concurrent
1) Flow rate: 107.6 acfm
2) Inlet Temperature: 392 °F

f) Venturi Data:
1) Inlet Area: _____ ft^2
2) Throat Area: _____ ft^2
3) Throat velocity: _____ ft / sec
4) _____ Fixed throat _____ Variable throat

g) Packed or Plate Tower Data:
1) Surface Area: _____ ft2
2) Packing depth: 10 ft
3) Type of packing: _____ Rings 5/8" Polypropylene Saddles
_____ Other:
4) No. of plates: _____
5) Type of plates: _____

h) Demisting Data:
1) Mist eliminator filter area: _____ ft^2
2) Type: _____ Cyclone _____ Vanes _____ Pad
Other:

SCRUBBERS (Page 2 of 2) SECTION L5

i) Efficiency: 98 %

j) Are extra nozzles readily available? _____ Yes X No

How many? _____

k) Pressure measurement devices installed? _____ Yes X No

5. Which process(es) does the scrubber control emissions from? Rosin Amine Derivatives Process (Ethylene Oxide)

COMPLIANCE DEMONSTRATION (page 1 of 2) SECTION M

Completion of Section M is not required for a complete application. It is presented to merely reflect what may be required by the Enhanced Monitoring and/or the Periodic Monitoring Regulations. Upon promulgation of those regulations, this section will be revised to reflect the actual requirements. Until then, the information in this section should be utilized for planning purposes.

Choose the type of monitoring that is suggested for your source in the "Enhanced Monitoring Guideline". Fill out the appropriate form and attach to the corresponding emission point description pages.

A. Compliance Demonstration by Continuous Emissions Monitoring (CEM).

Sulfur Dioxide(SO_2)	Nitrogen Oxides (NO_x)	Oxygen (O_2)
Carbon Dioxide (CO_2)	Total Reduced Sulfur (TRS)	Opacity
Hydrogen Chloride (Hcl)	Carbon Monoxide (CO)	Flow
Hydrogen Sulfide (H_2S)	Volatile Organic Compound (VOC)	

B. Compliance Demonstration by Periodic Emission Monitoring using Portable Monitors.

SO_2 NO_x O_2 CO_2 CO HCl H_2S VOC Flow Moisture
Combustibles Combustion Efficiency

C. Compliance Demonstration by Monitoring Control System Parameters or Operating Parameters of a Process.

Baghouse	Pressure drop across baghouse, Broken bag detector, Opacity.
Mechanical Collectors	Pressure drop across collector, Hopper full detector, Opacity.
Electrostatic Precipitators	Primary and secondary voltage,Primary and secondary currents, Spark Rate, Broken wire detector, Rap cycle frequency, Resistivity measurement, Inlet water flow, Total solids, Opacity.
Thermal Incinerator	Firebox temperature.
Catalytic Incinerator	Catalyst bed temperature.
Flare	Pilot light detector, Temperature after flame zone.
Particulate Scrubber	Pressure drop across scrubber and demister, Scrubber fluid recirculation rate, Pump discharge pressure, Pump motor current.
Absorber for Gases	pH of fluid, Fluid recirculation rate, Air flow, Pressure drop across absorber and demister, Fluid temperature.
Carbon Absorber	Steam mass flow rate per regeneration cycle, Carbon bed temperature.
Condenser	Condenser exit temperature, Amount of solvent recovered daily.Charging rate, Production rate, Hours of operation, Secondary chamber temperature, Kiln or dryer exit temperature, Burner combustion efficiency, Power consumption, Static pressure, Fuel usage rate, Water injection rate.

D. Compliance Demonstration by Monitoring Maintenance Procedures.

Water quality testing
Sludge solids testing
Electrostatic precipitator cleaning frequency
Blacklight inspection of baghouses
Sludge mercury testing
Periodic inspection of process operating parameters
VOC leak testing
Soot blowing frequency
Fugitive dust control measures
Control equipment inspection frequency
Reid vapor pressure testing

E. Compliance Demonstration by Stack Testing.

EPA Method 1 & 2 :	Flow (S-type pilot tubes, Hot-wire anemometer)
EPA Method 3 :	CO_2, O_2, CO (Orsat, Fyrite)
EPA Method 3A :	CO_2, O_2, (Analyzers)
EPA Method 4 :	Moisture (Wet bulb-Dry bulb, Impingers)
EPA Method 5 :	PM
EPA Method 6 :	SO_2 (Impingers)
EPA Method 6B :	SO_2 (24 hour average)
EPA Method 6C :	SO_2 (Analyzer)
EPA Method 7E :	NO_x (Analyzer)
EPA Method 9 :	Opacity (Visible emissions reader)
EPA Method 10 :	CO (Analyzer)
EPA Method 16 :	TRS (Gas Chromatograph)
EPA Method 16A :	TRS (Impingers)
EPA Method 16B:	TRS (Gas Chromatograph)
EPA Method 18 :	VOC (Gas Chromatograph)
EPA Method 21 :	VOC Leaks (Analyzer)
EPA Method 25A:	VOC (Analyzer with FID)
EPA Method 25B :	VOC (NDIR Analyzer)

F. Compliance Demonstration by Fuel Sampling and Analysis (FSA).

Coal Sampling
Waste oil sampling
Refuse derived fuel sampling
Coke sampling
Sewage sludge sampling
Landfill gas sampling
Tire derived fuel sampling
Paper sludge sampling

G. Compliance Demonstration by Recordkeeping.

Testing and monitoring records
Compliance schedule records
Process hours of operation records
Fuel usage records
As-applied coating & ink composition records
Records of malfunction
As-applied coating & ink records,
Transfer efficiency records
Production records

COMPLIANCE DEMONSTRATION BY MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS SECTION M3

The monitoring of a control system parameter or a process parameter may be acceptable provided that a correlation between the parameter value and the emission rate of a particular pollutant is established in the form of a curve of emission rate versus parameter values. At least three sets of stack test data, that bracket the emission limit if possible, shall be used to define the emission curve. This data shall constitute the certification of the system and must be attached for approval. If it is not attached, it shall be submitted within 60 days from the date of startup of the system or the date of application, which ever is later.

1. Emission Point No./Name : AF-004 (190) Packed Bed Scrubber with Sulfuric Acid

2. Method of monitoring description: Monitor the scrubbing liquid flow rate or pressure.
Monitor the pH of the scrubber effluent with a continuous recorder.

Facility shall certify monitoring control system parameters as specified in Subpart PPP. Shall follow performance test requirements and/or design design evaluation requirements as outlined in 40 CFR 63.1426.

Attach separate sheets if needed.

3. Backup system (attach other compliance demonstration forms if needed):

4. The monitoring system shall be subject to appropriate performance specifications, calibration requirements, and quality assurance procedures.

5. If a quality assurance / quality control plan is not attached with the application for approval, it shall be submitted within 60 days from the date of startup of the monitoring program or the date of application, which ever is later.

Current Applicable Requirements and Status (page 1 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-000	APC-S-1 Sect. 3.1 (STATE ONLY)	Smoke - general			≤ 40% opacity			IN
AF-000	APC-S-1 Sect. 3.1 (STATE ONLY)	Smoke - startup			≤ 40% opacity, ≤ 15 min/startup, 3 startups/hrs			IN
AF-000	APC-S-1 Sect. 3.2 (STATE ONLY)	Opacity			≤ 40% opacity			IN
AF-000	APC-S-1 Sect. 3.3 (STATE ONLY)	Gen. nuisance			As specified in the regulations			IN
AF-000	APC-S-1 Sect. 9.2 (STATE ONLY)	Stack heights			As specified in the reguations			IN
AF-004	APC-S-1 Section 3.1 (STATE ONLY)	Smoke - general			≤ 40% opacity			IN

Current Applicable Requirements and Status (page 2 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	APC-S-1 Section 3.1 (STATE ONLY)	Smoke – startup			≤ 40% opacity, ≤ 15 min/startup, 3 startups/hrs			IN
AF-004	APC-S-1 Sect. 3.2 (STATE ONLY)	Opacity			≤ 40% opacity			IN
AF-004	APC-S-1 Sect. 3.3 (STATE ONLY)	Gen. Nuisance			As specified in the regulations			IN
AF-004	APC-S-1 Sect. 9.2 (STATE ONLY)	Stack heights			As specified in the reguations			IN
AF-004	40 CFR 63 Subpart PPP (63.1425(a))	Applicability of process vent control requirements	EO			The facility must comply with the requirements for epoxide emissions.	June 1, 2002	

Current Applicable Requirements and Status (page 3 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1425(b)(2)(ii))	Aggregated 98% reduction of total epoxide emissions	EO		98% total epoxide reduction	Conduct performance test to certify compliance	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1426(c))	Determination of epoxide reduction efficiency	EO			Performance test	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1426(c)(1))	Sampling site location	EO			Sampling sites located at the inlet and outlet of the combustion, recovery, or recapture device as specified in 40 CFR 63.1426(c)(1)(I)(B)(1).	Within 150 days after the compliance date	

Current Applicable Requirements and Status (page 4 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1426(c)(3))	Testing conditions	EO			Testing of process vents as specified in 40 CFR 63.1426(c)(3)(i)(B)(1-5), 40 CFR 63.1426(c)(3)(ii), and 63.1426(c)(3)(iii).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1426(c)(4)(i))	Test methods – sample and velocity traverses	EO	EPA Method 1 or 1A		Methods used for sample and velocity traverses shall be as specified in 40 CFR 63.1426(c)(4)(i).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1426(c)(4)(ii))	Test methods – velocity and gas volumetric flow rate	EO	EPA Method 2, 2A, 2C, or 2 D		Methods used for velocity and gas volumetric flow rate shall be as specified in 40 CFR 63.1426(c)(4)(ii).	Within 150 days after the compliance date	

Current Applicable Requirements and Status (page 5 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1426(c)(4)(iii))	Test methods – concentration mesurements	EO	EPA Method 18		Methods used for determining concentration shall be as specified in 40 CFR 63.1426(c)(4)(iii).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1426(c)(4)(iv))	Test methods – alternative methods	EO			Alternative methods must be validated as specified in 40 CFR 63.1426(c)(4)(iv).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1426(c)(5))	Calculation of percent reduction efficiency	EO			Percent reduction efficiency shall be calculated as specified in 40 CFR 63.1426(c)(5) (i-iv).	Within 150 days after the compliance date	

Current Applicable Requirements and Status (page 6 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1426(e)(1))	Determination of organic HAP emission reduction	EO			Organic HAP reduction shall be calculated as specified in 40 CFR 63.1426(e)(1).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1426(e)(2))	Determination of control efficiency	EO			Control efficiency for organic HAP reduction shall be calculated as specified in 40 CFR 63.1426(e)(2)(ii).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1429(a))	Monitoring equipment requirements	EO			Monitor the scrubbing liquid flow rate or pressure. Monitor the pH as specified in 40 CFR 63.1429(a)(4).	June 1, 2002	

Current Applicable Requirements and Status (page 7 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1429(d))	Establishing parameter monitoring levels	EO			Parameter monitoring levels shall be established as per 40 CFR 63.1429(d)(1-3).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1430(b))	Records to demonstrate compliance	EO			Keep records of percent of organic HAP reduction as per 40 CFR 63.1430(b)(2)(i).	Ongoing after NCS submittal	
AF-004	40 CFR 63 Subpart PPP (63.1430(c))	Records establishing parameter monitoring levels	EO			Keep records which establish the parameter monitoring levels as per 40 CFR 63.1430(c).	Ongoing after NCS submittal	

Current Applicable Requirements and Status (page 8 of 17)

SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1430(d)(1))	Records to demonstrate continuous compliance	EO			Keep continuous records of operating equipment parameters as specified in 40 CFR 63.1430(d)(1).	Ongoing after NCS submittal	
AF-004	40 CFR 63 Subpart PPP (63.1430(d)(2))	Records of daily average parameters	EO			Keep records of daily average parameters as specified in 40 CFR 63.1430(d)(2) (i-ii).	Ongoing after NCS submittal	

Current Applicable Requirements and Status (page 9 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1430(d)(5))	Records specifying monitoring system breakdowns, repairs, calibration checks, and zero and high level adjustments	EO			Keep records of monitoring system breakdowns, repairs, calibration checks, and level adjustments as specified in 40 CFR 63.1430(d)(5).	Ongoing after NCS submittal	
AF-004	40 CFR 63 Subpart PPP (63.1430(g))	Notification of Compliance Status	EO			Submit information as specified in 40 CFR 63.1430(g)(1).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1430(h))	Periodic reports	EO			Submit information as specified in 40 CFR 63.1430(h)(1&2).	Due 8 months after NCS; covers a 6 month period	

Current Applicable Requirements and Status (page 10 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1437(a))	Performance tests – Conducting the performance test	EO			Performance test shall be conducted as specified in 40 CFR 63.1437(a)(1-4).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1437(b))	Performance tests – Data reduction	EO			Data shall be reduced as specified in 40 CFR 63.1437(b).	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1438(a-d))	Establishing parameter monitoring levels	EO			Shall establish parameter monitoring levels as specified in 40 CFR 63.1438 (a-d).	Within 150 days after the compliance date	

Current Applicable Requirements and Status (page 11 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
AF-004	40 CFR 63 Subpart PPP (63.1438(a-d))	Establishing parameter monitoring levels	EO			Establish parameter monitoring levels based on performance test and/or engineering documents	Within 150 days after the compliance date	
AF-004	40 CFR 63 Subpart PPP (63.1438(f))	Parameter monitoring excursions – Process vents	EO			Record parameter monitoring excursions for process vents as specified in 40 CFR 63.1438(f)(3).	1st periodic report	
AF-004	40 CFR 63 Subpart PPP (63.1438(g))	Excused excursions – Process vents	EO			Record excused excursions for process vents as specified in 40 CFR 63.1438(g).	1st periodic report	

Current Applicable Requirements and Status (page 12 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
RA-50	40 CFR 63 Subpart PPP (63.1432(a))	Compliance with the HON storage vessel provisions	EO			Shall comply with the HON storage vessel requirements as specified in 40 CFR 63.1432(a).	June 1, 2002	
RA-50	40 CFR 63 Subpart PPP (63.1432(q))	Additional recordkeeping requirements	EO			Shall keep records of the times when the storage vessel is being filled as specified in 40 CFR 63.1432(q).	June 1, 2002	
RA-50	40 CFR 63 Subpart PPP (63.1438(f))	Parameter monitoring excursions – Storage vessels	EO			Record parameter monitoring excursions for storage vessels as specified in 40 CFR 63.1438(f)(1or 2).	June 1, 2002	

Current Applicable Requirements and Status (page 13 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
Wastewater	40 CFR 63 Subpart PPP (63.1433)	Wastewater provisions				Shall comply with the wastewater provisions as specified in 40 CFR 63.1433.	June 1, 2002	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(a))	General recordkeeping requirements – Data retention				Shall keep data as specified in 40 CFR 63.1439(a).	June 1, 2002	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(b)(1))	Startup, shutdown, malfunction plan				Shall develop and implement a SSM plan as specified in 40 CFR 63.1439(b)(1).	June 1, 2002	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(d))	Recordkeeping and documentation requirements				Shall keep records as specified in 40 CFR 63.1439(d)(1-8).	June 1, 2002	

Current Applicable Requirements and Status (page 14 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(e)(1))	Violation of reporting requirements				Failing to submit information as specified in 40 CFR 63.1439(e)(1) shall not constitute a violation of the reporting requirements if some conditions are met.	Ongoing after NCS submittal	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(e)(2))	Submittal of reports				Submit all reports as specified in 40 CFR 63.1439(e)(2).	Ongoing after NCS submittal	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(e)(3))	Initial notification				Submit initial notification as specified in 40 CFR 63.1439(e)(3) by June 1, 2000.	June 1, 2000	IN

Current Applicable Requirements and Status (page 15 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(e)(4))	Precompliance report				Shall submit a precompliance report as specified in 40 CFR 63.1439(e)(4), if needed.	June 1, 2001	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(e)(5))	Notification of Compliance Status				Shall submit an NCS as specified in 40 CFR 63.1439(e)(5).	Within 150 days after compliance date	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(e)(6))	Periodic reports				Shall submit periodic reports as specified in 40 CFR 63.1439(e)(6).	Due 8 months after NCS; covers a 6 month period	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(e)(8))	Operating permit application requirements				Update operating permit application as specified in 40 CFR 63.1439(e)(8).	June 1, 2000	IN

Current Applicable Requirements and Status (page 16 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(f))	Alternative monitoring parameters				Report alternative monitoring parameters as specified in 40 CFR 63.1439(f).	Ongoing after NCS submittal	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(g))	Alternative continuous monitoring and recordkeeping				Request alternative continuous monitoring and recordkeeping as specified in 40 CFR 63.1439(g).	June 1, 2001	
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(g))	Reduced recordkeeping program				Request a reduced recordkeeping program as per 40 CFR 63.1439(h).	As part of NCS submittal	

Current Applicable Requirements and Status (page 17 of 17) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Description of Regulation	Pollutant	Test Method	Limits	Action Required to Satisfy Regulation	Completion Date	Compliance Status IN / OUT
RAD Process Area	40 CFR 63 Subpart PPP (63.1434(a))	Compliance with the HON equipment leak provisions				Comply with the HON equipment leak provisions as specified in 40 CFR 63.1434(a).	December 1,1999	IN
RAD Process Area	40 CFR 63 Subpart PPP (63.1434(h))	Compliance with the HON equipment leak provisions				Comply with the HON equipment leak provisions as specified in 40 CFR 63.1434(h).	December 1,1999	IN
RAD Process Area	40 CFR 63 Subpart PPP (63.1439(b))	Compliance with 40 CFR 63 Subpart A general requirements				Comply with Subpart A requirements as specified in 40 CFR 63.1439(b).	June 1, 2002	

Future Applicable Requirements and Status (page 1 of 1) SECTION N

List applicable state and federal regulations and applicable test methods for determining compliance with each applicable requirement. Clearly identify federal regulations from state requirements. Provide the compliance status as of the day the application is signed.

Emission Point No.	Applicable Requirement	Pollutant	Test Method	Limits	Compliance Status IN / OUT

COMPLIANCE CERTIFICATION SECTION O

1. Emission Point No./Name : AF-000 (180 & 190) Rosin Amine Derivatives Process Area

2. Indicate the source compliance status:

A. _____ Where this source is currently in compliance, we will continue to operate and maintain this source to assure compliance for the duration of the permit.

B. X The Current Emissions Requirements and Status form (previous page) includes new requirements that apply or will apply to this source during the term of the permit. We will meet such requirements on a timely basis.

C. _____ This source is not in compliance. The following statement of corrective action is. submitted to describe action which we will take to achieve compliance.

1. _____ Attached is a brief description of the problem and the proposed solution.

2. _____ We will achieve compliance according to the following schedule.

Progress reports will be submitted:
Starting date: _____ and every six (6) months thereafter

Problem	Action	Deadline

COMPLIANCE CERTIFICATION SECTION O

1. Emission Point No./Name : AF-004 (190) Packed Bed Scrubber with Sulfuric Acid

2. Indicate the source compliance status:

A. _____ Where this source is currently in compliance, we will continue to operate and maintain this source to assure compliance for the duration of the permit.

B. X The Current Emissions Requirements and Status form (previous page) includes new requirements that apply or will apply to this source during the term of the permit. We will meet such requirements on a timely basis.

C. _____ This source is not in compliance. The following statement of corrective action is. submitted to describe action which we will take to achieve compliance.

1. _____ Attached is a brief description of the problem and the proposed solution.

2. _____ We will achieve compliance according to the following schedule.

Progress reports will be submitted:
Starting date: _____ and every six (6) months thereafter

Problem	Action	Deadline

COMPLIANCE CERTIFICATION SECTION O

1. Emission Point No./Name : RA-50 Ethylene Oxide Storage Tank

2. Indicate the source compliance status:

A. _____ Where this source is currently in compliance, we will continue to operate and maintain this source to assure compliance for the duration of the permit.

B. X The Current Emissions Requirements and Status form (previous page) includes new requirements that apply or will apply to this source during the term of the permit. We will meet such requirements on a timely basis.

C. _____ This source is not in compliance. The following statement of corrective action is. submitted to describe action which we will take to achieve compliance.

1. _____ Attached is a brief description of the problem and the proposed solution.

2. _____ We will achieve compliance according to the following schedule.

Progress reports will be submitted:
Starting date: _____ and every six (6) months thereafter

Problem	Action	Deadline

Attachment A

LIST OF ACTIVITIES THAT MAY BE TREATED AS "TRIVIAL"

The following types of activities and emissions units may be presumptively omitted from part 70 permit applications. Certain of these listed activities include qualifying statements intended to exclude many similar activities.

Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.

Air-conditioning units used for human comfort that do not have applicable requirements under title VI of the Act.

Ventilating units used for human comfort that do not exhaust air pollutants into the ambient air from any manufacturing/industrial or commercial process.

Non-commercial food preparation.

Consumer use of office equipment and products, not including printers or businesses primarily involved in photographic reproduction.

Janitorial services and consumer use of janitorial products.

Internal combustion engines used for landscaping purposes.

Laundry activities, except for dry-cleaning and steam boilers.

Bathroom/toilet vent emissions.

Emergency (backup) electrical generators at residential locations.

Tobacco smoking rooms and areas.

Blacksmith forges.

Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification.[1]

Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
Portable electrical generators that can be moved by hand from one location to another.[2]

Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.

Brazing, soldering and welding equipment, and cutting torches related to manufacturing and construction activities that do not result in emission of HAP metals.[3]

Air compressors and pneumatically operated equipment, including hand tools.

Batteries and battery charging stations, except at battery manufacturing plants.

Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP.[4]

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[1]Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise required.

[2]"Moved by hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.

[3]Brazing, soldering and welding equipment, and cutting torches related to manufacturing and construction activities that emit HAP metals are more appropriate for treatment as insignificant activities based on size or production level thresholds. Brazing, soldering, welding and cutting torches directly related to plant maintenance and upkeep and repair or maintenance shop activities that emit HAP metals are treated as trivial and listed separately in this appendix.

[4]Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.

Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.

Equipment used to mix and package, soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.

Drop hammers or hydraulic presses for forging or metalworking.

Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.

Vents from continuous emissions monitors and other analyzers.

Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.

Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.

Equipment used for surface coating, painting, dipping or spraying operations, except those that will emit VOC or HAP.

CO_2 lasers, used only on metals and other materials which do not emit HAP in the process.

Consumer use of paper trimmers/binders.

Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.

Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants.

Laser trimmers using dust collection to prevent fugitive emissions.

Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents.[5]

Routine calibration and maintenance of laboratory equipment or other analytical instruments.

Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.

Hydraulic and hydrostatic testing equipment.

Environmental chambers not using hazardous air pollutant (HAP) gasses.

Shock chambers.

Humidity chambers.

Solar simulators.

Fugitive emission related to movement of passenger vehicles, provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.

Process water filtration systems and demineralizes.

Demineralized water tanks and demineralizer vents.

Boiler water treatment operations, not including cooling towers.

Oxygen scavenging (de-aeration) of water.

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[5]Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.

Ozone generators.

Fire suppression systems.

Emergency road flares.

Steam vents and safety relief valves.

Steam leaks.

Steam cleaning operations.

Steam sterilizers.

APPENDIX A

EMISSION CALCULATIONS

Ethylene Oxide

Input	
Calendar Year	1994
E.O. Usage in POLYDAD	141,330 lbs
E.O. Usage in E.O.D.	115,701 lbs
Total E.O. Usage (Calc)	257,031 lbs
POLYRAD 0515	31,020 lbs
POLYRAD 0515A	43,000 lbs
POLYRAD 1110	79,900 lbs
POLYRAD 1110A	164,733 lbs
SURFACTANT AR150	46,240 lbs
SURFACTANT AR160	100,110 lbs
# Days operation (can use NA)	NA days
Output	
E.O. Losses (Usage theory)	30,138 lbs
Fugitive emissions	3,235 lbs
Point source emissions	538 lbs
E.O. to Ethylene Glycol	26,365 lbs
Ethylene Glycol produced	37,151 lbs

For Polyrads: Assume

Rosin Amine Mol. Wt.	285
Rosin Amine Purity	94 %
Adjusted Mol. Wt.	303

POLYRAD 0515	31,020 * 0.85 =	26,367
POLYRAD 0515A	43,000 * 0.7* 0.85 =	25,585
POLYRAD 0500 =		51,952
POLYRAD 1110	79,900 * 0.90 =	71,910
POLYRAD 1110A	164,733 * 0.7* 0.90 =	103,782
POLYRAD 1100 =		175,692

For 0500: 1 mol amine + 5 mol E.O. = 0500
303 + 5(44) = 523
E.O. = 5(44)/523 * lbs of 0500 = 21,854 lbs
E.O. = 5(44)/523 * 51,952 = 21,854 lbs

For 1100: 1 mol amine +11 mol E.O. = 1100
303 + 11(44) = 787
E.O. = 11(44)/787 * lbs of 1100 = 108,049 lbs
E.O. = 11(44)/787 * 175,692 = 108,049 lbs

For Surfactants: Assume

Wood Rosin Mol. Wt.	302
Wood Rosin Acid No.	160
Theoretical Acid No.	186
Wood Rosin Purity	86 %
Adjusted Mol. Wt.	351

SURFACTANT AR150	46,240 * 1.0 =	46,240
SURFACTANT AR160	100,110 * 1.0 =	100,110

For AR150: 1 mol rosin + 15 mol E.O. = AR150
351 + 15(44) = 1011
E.O. = 15(44)/1101 * lbs of AR150 = 30,186 lbs
E.O. = 15(44)/1101 * 46,240 = 30,186 lbs

For AR160: 1 mol rosin + 16 mol E.O. = AR160
351 + 16(44) = 1055
E.O. = 16(44)/1055 * lbs of AR160 = 66,803 lbs
E.O. = 16(44)/1055 * 100,110 = 66,803 lbs

Theoretical E.O.	226,892	lbs
E.O. "Losses" (Usage Theory)	30,138	lbs
E.O. Usage = Lbs of E.O./(8.34*0.85)	36,258	gallons
Days of operation, from log sheets	NA	days
Total E.O. Adducts	373,994	days
Typical Production = lbs % days		lbs/day
Base YR 1993 TYP Prod	5,470	lbs/day
Days Operation	68	days

	Component Count	Emission Factor	Emissions	
For P,V,F				
Pumps/liq. =	3	0.026	0.078	lbs/hr
Valves/liq. =	73	0.0038	0.2774	lbs/hr
Valves/vap. =	21	0.0011	0.0231	lbs/hr
Flg&con/liq. =	231	0.00013	0.03003	lbs/hr
Flg&con/vap. =	44	0.00013	0.00572	lbs/hr
Relief =	16	0.098	1.568	lbs/hr

Emission Factor Reference: Estimating Releases and Waste Treatment Efficiencies
for the Toxic Chemical Release Inventory Form
EPA 560/4-88-002 December 1987

	1.98225	lbs/hr
On a continuous basis =	17,365	lbs/yr
Since we blow the lines we only have E.O. in the P,V,F service		
the actual days of operation =	68	days
Therefore P,V,F Fugitive Emissions	3,235	lbs/yr
	1.62	tpy
	0.37	lb/hr
Therefore E.O. to scrubber	26,903	lbs/yr
For scrubber assume 98% efficiency		
E.O. to Ethylene Glycol =	26,365	lbs/yr
E.O. vented from scrubber stack =	538	lbs/yr
	0.27	tpy
	0.06	lb/hr
Ethylene glycol produced		
lbs E.O. * 62/44 =	37,151	lbs/yr

Ethylene Oxide

Note: Capacity calculations based on 1994 product ratio/distribution
The 1994 production was for 68 days of operation
Capacity ratio will be 365 days % 68 days =

Input	
Calendar Year	Capacity
E.O. Usage in POLYDAD	758,610 lbs
E.O. Usage in E.O.D.	621,042 lbs
Total E.O. Usage (Calc)	1,379,652 lbs
POLYRAD 0515	166,504 lbs
POLYRAD 0515A	230,809 lbs
POLYRAD 1110	428,875 lbs
POLYRAD 1110A	884,229 lbs
SURFACTANT AR150	248,200 lbs
SURFACTANT AR160	537,355 lbs
# Days operation (can use NA)	NA days

Output	
E.O. Losses (Usage theory)	161,773 lbs
Fugitive emissions	17,460 lbs
Point source emissions	2,886 lbs
E.O. to Ethylene Glycol	141,427 lbs
Ethylene Glycol produced	199,284 lbs

For Polyrads: Assume

Rosin Amine Mol. Wt.	285
Rosin Amine Purity	94 %
Adjusted Mol. Wt.	303

POLYRAD 0515	166,504 * 0.85 =	141,528
POLYRAD 0515A	230,809 * 0.7* 0.85 =	137,331
POLYRAD 0500 =		278,860
POLYRAD 1110	428,875 * 0.90 =	385,988
POLYRAD 1110A	884,229 * 0.7* 0.90 =	557,064
POLYRAD 1100 =		943,052

For 0500: 1 mol amine + 5 mol E.O. = 0500
303 + 5(44) = 523
E.O. = 5(44)/523 * lbs of 0500 = 21,854 lbs
E.O. = 5(44)/523 * 278,860 = 117,302 lbs

For 1100: 1 mol amine +11 mol E.O. = 1100
303 + 11(44) = 787
E.O. = 11(44)/787 * lbs of 1100 = 108,049 lbs
E.O. = 11(44)/787 * 943,052 = 579,971 lbs

For Surfactants: Assume

Wood Rosin Mol. Wt.	302
Wood Rosin Acid No.	160
Theoretical Acid No.	186
Wood Rosin Purity	86 %
Adjusted Mol. Wt.	351

SURFACTANT AR150	248,200 * 1.0 =	248,200
SURFACTANT AR160	537,355 * 1.0 =	537,355

For AR150: 1 mol rosin + 15 mol E.O. = AR150
351 + 15(44) = 1011
E.O. = 15(44)/1101 * lbs of AR150 = 30,186 lbs
E.O. = 15(44)/1101 * 248,200 = 162,030 lbs

For AR160: 1 mol rosin + 16 mol E.O. = AR160
351 + 16(44) = 1055
E.O. = 16(44)/1055 * lbs of AR160 = 66,803 lbs
E.O. = 16(44)/1055 * 537,355 = 358,576 lbs

Theoretical E.O.	1,217,879 lbs
E.O. "Losses" (Usage Theory)	161,773 lbs
E.O. Usage = Lbs of E.O./(8.34*0.85)	194,619 gallons

Days of operation, from log sheets	NA days
Total E.O. Adducts	2,007,467 days
Typical Production = lbs % days	lbs/day
Base YR 1993 TYP Prod	5,470 lbs/day
Days Operation	367 days

	Component Count	Emission Factor	Emissions
For P,V,F			
Pumps/liq. =	3	0.026	0.078 lbs/hr
Valves/liq. =	73	0.0038	0.2774 lbs/hr
Valves/vap. =	21	0.0011	0.0231 lbs/hr
Flg&con/liq. =	231	0.00013	0.03003 lbs/hr
Flg&con/vap. =	44	0.00013	0.00572 lbs/hr
Relief =	16	0.098	1.568 lbs/hr

Emission Factor Reference: Estimating Releases and Waste Treatment Efficiencies
for the Toxic Chemical Release Inventory Form
EPA 560/4-88-002 December 1987

	1.98225 lbs/hr
On a continuous basis =	17,365 lbs/yr

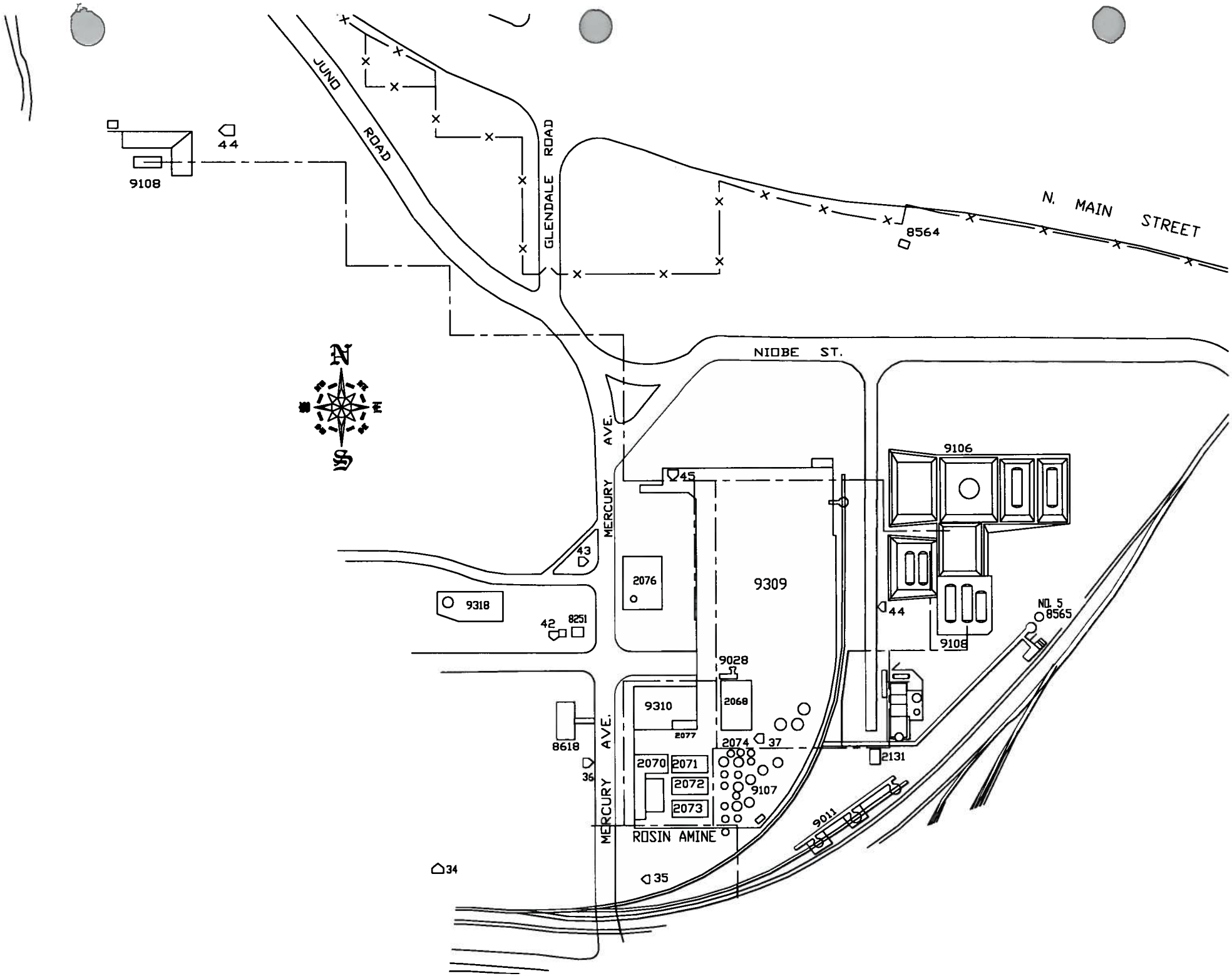
Since we blow the lines we only have E.O. in the P,V,F service	
the actual days of operation =	367 days

Therefore P,V,F Fugitive Emissions	17,460 lbs/yr
	8.73 tpy
	1.99 lb/hr

Therefore E.O. to scrubber	144,313 lbs/yr
For scrubber assume 98% efficiency	
E.O. to Ethylene Glycol =	141,427 lbs/yr
E.O. vented from scrubber stack =	2,886 lbs/yr
	1.44 tpy
	0.33 lb/hr

Ethylene glycol produced	
lbs E.O. * 62/44 =	199,284 lbs/yr

RAD PROCESS AREA DIAGRAM


JUNO ROAD
GLENDALE ROAD
N. MAIN STREET
NIOBE ST.
MERCURY AVE.
MERCURY AVE.
ROSIN AMINE
9108
44
8564
9106
45
43
2076
9309
9318
42
8251
44
NO. 5
8565
9108
9028
9310
2068
2077
8618
2074
37
2131
36
2070
2071
2072
2073
9107
9011
34
35

CONFIDENTAL PROCESS INFORMATION

MANUFACTURING PROCESSES (page 1 of 2) SECTION E

1. Emission Point No./ Name: AF-000 (180 & 190)/Rosin Amine Derivatives Process Area

2. Process Description: See attached process description

3. Was this unit constructed or modified after August 7, 1977? _____ yes X no
If yes please give date and explain. _____

4. Capacity (tons/hr): Resin Nitrile 0.54, Distilled Nitrile and Nitrile Residue 0.54, Resin Amine 0.38, Resin Amine Acetates 0.05, Resin Amine Derivatives 0.11, Ethylene Oxide Derivatives 0.05

5. Raw Material Input:

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR
Resin Nitrile			
Resin	1,342 lbs	1,342 lbs	2,198,972 lbs
Ammonia*	119 lbs	119 lbs	195,096 lbs
Distilled Nitrile and Nitrile Residue			
Resin Nitrile	1,020 lbs	1,020 lbs	1,671,442 lbs
Resin Amine			
Distilled Nitrile	793 lbs	793 lbs	1,299,952 lbs
Hydrogen Gas	11 mcf	11 mcf	17,652 mcf
Resin Amine Acetates			
Resin Amine	8 lbs	8 lbs	12,998 lbs
Acetic Acid	6 lbs	6 lbs	9,386 lbs
Isopropyl Alcohol	3 lbs	3 lbs	4,930 lbs
Resin Amine Derivatives			
Resin Amine	76 lbs	76 lbs	124,430 lbs
Ethylene Oxide**	86 lbs	86 lbs	141,330 lbs
Isopropyl Alcohol	47 lbs	47 lbs	77,455 lbs

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR
Ethylene Oxide Derivatives			
Rosin	33 lbs	33 lbs	53,384 lbs
Ethylene Oxide**	71 lbs	71 lbs	115,701 lbs
Other***			

* Annual Ammonia consumption is approximately 101,926 lbs. Annual ammonia consumption at capacity is estimated at 277,634 lbs.

** Annual Ethylene Oxide consumption is approximately 30,138 lbs (27,448 lbs converted to Ethylene Glycol).
Annual Ethylene Oxide consumption at capacity is estimated at 161,773 lbs (147,332 lbs converted to Ethylene Glycol).

*** Emissions from these materials are deemed to be insignificant (< 1 lb/hr VOC, < 0.1 lb/hr HAP) based on process knowledge. Other refers to alternate raw materials (similar to the materials listed) that may be used instead of the raw materials listed.

6. Product Output:

PRODUCT or BY-PRODUCT	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR
Resin Nitrile	1,020 lbs	1,020 lbs	1,671,442 lbs
Distilled Nitrile and Nitrile Residue	1,020 lbs	1,020 lbs	1,671,442 lbs
Resin Amine	732 lbs	732 lbs	1,119,653 lbs
Resin Amine Acetates	18 lbs	18 lbs	29,250 lbs
Resin Amine Derivatives	194 lbs	194 lbs	317,913 lbs
Ethylene Oxide Derivatives	89 lbs	89 lbs	146,350 lbs

Hercules Inc

Master AI ID: 2022

Agency Interest Type: Chemical Branch

SIC 1: 2822

County: Forrest

AI Basin: Pascagoula River Basin

Start Date: 6/11/1991

End Date:

Alternate/Historic AI Identifiers

Alt/Hist ID	Alternate/Historic Name	User Group	Start	End
2022	Hercules Incorporated	Official Site Name	6/11/1991	
03500001	Hercules Inc	Air-AIRS AFS	6/11/1991	
MSD008182081	Hercules Inc	Hazardous Waste-EPA ID	10/12/2000	
080000001	Hercules Inc	Air-Title V Operating	7/14/2000	11/12/2003
080000001	Hercules Inc	Air-Title V Operating	9/15/2000	
080000001	Hercules Inc	Air-Title V Operating	11/13/1998	11/12/2003
080000001	Hercules Inc	Air-State Operating	6/11/1991	6/1/1994
MSR110153	Hercules Inc	GP-Sara Title III	10/17/1997	
MS0001830	Hercules Inc	Water-NPDES	10/22/1991	10/21/1996
MS0001830	Hercules Inc	Water-NPDES	9/29/1986	9/28/1991
MSP091286	Hercules Inc	Water-Pretreatment	3/12/1999	2/28/2004
MS0001830	Hercules Inc	Water-NPDES	9/30/1997	9/29/2002

Regulatory Programs

Program	Sub-Program
Air	Title V - major
General Permit	
Hazardous Waste	Large Quantity Generator
Water	NPDES Major Industrial
Water	Pretreatment

AI Location and Mailing Information

Physical Address (Primary)	Mailing Address
613 West 7th Street Hattiesburg, MS 39401	613 West 7th Street Hattiesburg, MS 39401

Location Information

Section - Township - Range: - -

Telecommunications

Type	Address or Phone
Work phone number	(601) 545-3450

Staff to AI Assignments

Person Name	Assignment
Sumrall, Rick	Compliance, Management
Patton, Jan	Compliance, Staff
Patton, Jan	Enforcement
Cook, Toby	Permitting, Branch Manager
Crawford, Louis	Permitting, Permit Writer
Sharp, Loyd	Regional Office, Management

Related People

Person	Relationship	Start	End
Jordan, Charles	Is Contact For	1/1/1980	
Langhans, Walter	Is Application Signatory for	3/28/2001	
Jordan, Charles	Is Air Permit Contact For	7/18/2001	

Related Organizations

Organization	Relationship	Start	End

Last Updated: 8/27/2001 9:30:40 AM **MDEQ OPC**