Rinker Materials

Rinker Materials Corporation
1501 Belvedere Road
West Palm Beach, FL 33406

P.O. Box 24635
West Palm Beach, FL 33416

Facsimile (407) 659-4361
Telephone (407) 833-5555

November 28, 1990

RECEIVED
DEC 10 1990
DER - BAQM

Mr. C. H. Fancy, P.E. Chief
Bureau of Air Regulation
Florida Dept. of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: File No. AC 13-187599-Rock Dryer Modification

Dear Mr. Fancy:

This acknowledges receipt of the Department's letter dated November 1, 1990, regarding the preliminary review of the Rinker Materials rock dryer modification. Find enclosed a resubmittal of the original construction permit application that also addresses the additional information requested. To assist in the permit review process,we have also included as an attachment a short narrative discussion on each item referenced in the November 1, 1990 letter.

Should there be any other question call me at (407)820-8348.

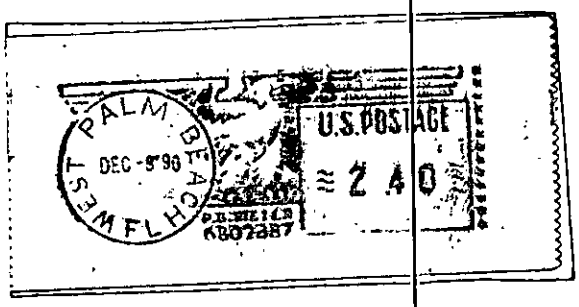
Sincerely,

RINKER MATERIALS CORPORATION

William Voshell

William E. Voshell
Environmental Manager

Attachments (2)



RINKER MATERIALS CORP

P.O. BOX 24635
WEST PALM BEACH, FLORIDA
33416-4635

TO: Mr. C. H. Fancy, P.E. Chief
Bureau of Air Regulation
Fla. Dept. of Environmental Reg.
Twin Towers Office Bld.
2600 Blair StoneRd.
Tallahassee, Fla 32399-2400

ATTACHMENT

Item 1- A copy of permit AO 13-177168 issued 5/3/90 is enclosed

Item 2- Contemporaneous emissions for criteria pollutants are 115.68 tons/yr. PM, 36.46 tons/yr. SO_2 , 9.29 tons/yr NOx , 0 tons/yr. VOC, and 43.93 tons/yr. CO. Calculations and assumptions are provided in Attachment F of the revised permit application.

Item 3- Donald A. Beers, P.E.
P.O. Box 24635
West Palm Beach, Fl 33416

Item 4- The dryer will be equipped with a by-pass stack which will allow continued use as a stone dryer. Use of the dryer as a soil treatment system is secondary to the primary function as part of the cement manufacturing process. The secondary stack will be installed between the dryer baghouse and afterburner. This stack will only be used when the dryer is processing virgin stone. This mode of operation is necessary to prevent fouling of heat exchangers and reduce pressure drop through the system when the afterburner is not required.

Item 5- The criteria pollutant emission rates for which a permit is requested are PM 1.0 lb/h (4.38 tons/yr), SO_2 17.18 lb/h (75.25 tons/yr.), NOx 6.34 lb/h (27.77 tons/yr), VOC 5.48 lb/h (24.0 tons/yr.), and CO 2.1 lb/h (9.19 tons/yr.). Calculations and assumptions for the requested rates are provided in Attachment D of the revised permit application.

Item 6- Experience has indicated that soil contaminated with residual oils at high sulfur content are not normally received for treatment. It is estimated that the average concentration of residual oil in soils will be less than 850 ppm. This would increase the emissions of SO_2 by 2.86 lb/h (12.5 tons/yr.) if these soils were received on a normal basis. It is expected that the major portion of VOC to be treated would be gasoline and other light hydrocarbons. The maximum expected to be received would be 6000 ppm which would result in a potential emission of 480 lb/h (2102.4 tons/yr.) if all soils processed were received at this level of contamination.

Item 7- It is expected that the baghouse to be installed on the dryer and used on the gallery discharge system will have an emission rate $\leq$ 5 percent opacity and $\leq$ 0.02 gr/dscf.

Item 8- Rinker Materials is a permitted facility allowed to burn "on spec" and "off spec" waste oil as fuel. Rinker wishes to retain the option to burn either waste oil type and process soils containing "on spec" and off spec" waste oils. Should further discussion be necessary, please advise.

Item 9- Fuel oil and waste oil used in the stone dryer will have a maximum sulfur content of 0.5 percent. See revised permit application for fuel specification.

Item 10- Map is enclosed showing location of dryer afterburner stack, dryer by-pass stack, and fugitive dust baghouse stack.

Item 11- The maximum expected heat input to the dryer is 27.4×10^6 Btu/h when processing light organic type contaminants in soil. This heat input is slightly higher than the expected heat input of 25.4×10^6 Btu/h which is required when preheated combustion air is provided from the afterburner. The maximum heat input to the afterburner is expected to be 15×10^6 Btu/h but may be reduced through the use of heat exchangers and when heat from VOC being oxidized is included.

Item 12- The data provided in Tables 1, 2, and 3 are heat and mass balances for four potential operating conditions for the dryer afterburner system. These four conditions were developed to define the range of heat input and gas volumes expected for control equipment sizing. Case No.1 represents conditions requiring maximum soil temperature (1500°F) and use of preheated combustion air. Case No. 2 represents conditions expected when light organics or low concentrations in soil are expected and lower soil temperature can be used (1000°F). Case No.'s 3 and 4 are identical to Case No.'s. 1 and 2 except that the assumption was made that preheat combustion air could not be used.

Item 13- The basis for calculation of afterburner residence time is provided in Attachment H of the revised permit application.

Item 14- Rinker proposes to contain treated soil from the dryer using a stacker located on the north side of the raw material gallery. This unit restricts free fall of soil and allows material to discharge to the gallery through a series of doors which reduce fugitive dust. The stacker allows fugitive dust generated by free fall into the stacker to be contained. The stacker and elevator will be vented to a baghouse and PM captured. This design has been shown to be effective in controlling fugitive dust generated from transfer of bulk materials to storage piles. All dust collected will be returned to the stacker via an air lock and discharge tube. Also the raw material gallery is enclosed on the top and two sides. The treated soil storage area is near the center of the clinker/raw material gallery and will not be exposed to ambient wind conditions.

Florida Department of Environmental Regulation

Southeast District ● 1900 S. Congress Ave., Suite A ● West Palm Beach, Florida 33406 ● 407-964-9668

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary
Scott Benyon, Deputy Assistant Secretary

PERMITTEE:
Mr. William E. Voshell, Jr.
Environmental Manager
Rinker Materials Corporation
P. O. Box 24635
West Palm Beach, Florida 33416

I.D. NUMBER: 50/DAD/13/0014
PERMIT/CERTIFICATION NUMBER: AO 13-177168 *
DATE OF ISSUE: MAY 23 1990
EXPIRATION DATE: April 15, 1995
COUNTY: Dade
LATITUDE/LONGITUDE: 25°46'48"N/80°25'10"W
UTM: Zone 17; 558.0 Km. E; 2851.5 Km. N
PROJECT: Rinker Materials Corporation
Stone Dryer

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-2, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

OPERATE: An air pollution source consisting of a 25 T/hr.stone dryer with a Model 9VGR12 Western Precipitater Multicyclone, a Norblo Model 240AMS fabric-type Dust Collector on the east bank of silos, and a similar dust collector on the west bank of silos. The stone dryer emits particulate to the atmosphere at a height 77 feet above ground level and the dust collectors emit particulate 122 feet above ground level.

IN ACCORDANCE WITH: Application for Renewal of Permit to Operate Air Pollution Sources received March 7, 1990 and Applications to Operate Air Pollution Sources dated July 11, 1975 (stone dryer), April 1, 1976 and April 3, 1976 (east and west banks of silos) (none are attached).

LOCATED AT: 1200 Northwest 137 Avenue, Miami, Dade County, Florida.

TO SERVE: A cement manufacturing plant (SIC # 3241).

SUBJECT TO: General Conditions 1-14 and Specific Conditions 1-9.

* This permit is a renewal of AO 13-127621 issued January 16, 1987.

DER Form 17-1.201 (57)
Effective November 30, 1982

PERMITTEE:
Mr. William E. Voshell, Jr.
Rinker Materials Corporation
West Palm Beach, Florida

I.D. NUMBER: 50/DAD/13/0014
PERMIT/CERTIFICATION NUMBER: AO 13-177168
DATE OF ISSUE: MAY 23 1990
EXPIRATION DATE: April 15, 1995

SPECIFIC CONDITIONS:

1. Compliance testing shall be conducted for the sources covered by this permit by February 18, 1991 and annually thereafter in accordance with the methods specified below.

2. Emission limiting standards are as follows:

   a. Rock Dryer:

      In accordance with Florida Administrative Code Rule 17-2.610(1)(a)1. - No person shall cause, let, permit, suffer or allow the discharge of any pollutants in excess of the allowables in Table 610-1 or the following formula

      $E = 3.59P^{0.62}$ where

      P is the process rate and is less than or equal to 30 tons/hour, and E is the emission rate in lb./hr.

   b. Rock Dryer and Silos

      In accordance with Florida Administrative Code Rule 17-2.610(2)(a) - No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere any air pollutants with an opacity greater than or equal to 20 percent.

3. The compliance test report shall include results of tests by the following methods:

Source/Emission Point	Pollutant	Test Method
Stone Dryer	Particulate Visible Emissions	EPA Method 5* DER Method 9
Silo Dust Collectors	Visible Emissions	EPA Method 9

*Particulate and visible emissions testing shall be performed concurrently.

The compliance test report shall be submitted to the Department in accordance with Florida Administrative Code (F.A.C.) Rule 17-2.700(7).

4. Testing of emissions should be conducted using the fuel and/or process input which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source. Otherwise the Department may require the test to be repeated or modify the permit to reflect tested rates and/or fuels.

5. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.

6. On or before March 1 of each calendar year, a completed DER Form 17-1.202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department.

7. Copies of all reports, tests, notifications or other submittals required by this permit shall be submitted to both the Department of Environmental Regulation, Southeast District Office and Dade County Environmental Resources Management.

8. Unconfined emissions of particulate shall be controlled by the following means:

   a) Paved parking and trafficked areas shall be maintained and kept free of particulate matter build-up; and

   b) Sprinkling with water shall be used as necessary on paved areas and stockpiles.

PERMITTEE:
Mr. William E. Voshell, Jr.
Rinker Materials Corporation
West Palm Beach, Florida

I.D. NUMBER: 50/DAD/13/0014
PERMIT/CERTIFICATION NUMBER: AO 13-177168
DATE OF ISSUE: MAY 23 1990
EXPIRATION DATE: April 15, 1995

SPECIFIC CONDITIONS:

9. The permittee shall be aware of and operate under the attached "General Permit Conditions #1 thru 14.". General Permit Conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

Issued this 23rd day of May, 1990

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

J. Scott Benyon
Deputy Assistant Secretary

DER Form 17-1.201(57)
Effective November 30, 1982

Florida Department of Environmental Regulation
Southeast District • 3301 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668
Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary
Scott Bennett, Deputy Assistant Secretary

SOURCE TYPE: Afterburner [ ] New[1] [x] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [x] Modification

COMPANY NAME: Rinker Materials Corporation COUNTY: Dade

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired): stone dryer

SOURCE LOCATION: Street 1200 Northwest 137th Avenue City Miami

UTM: East Zone 17;558.2 km North 2851.3 km

Latitude 25 ° 46 ' 48 "N Longitude 80 ° 25 ' 10 "W

APPLICANT NAME AND TITLE: James S. Jenkins III, Vice President Cement Operations

APPLICANT ADDRESS: P. O. Box 650679, Miami, Florida 33265-0679

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Rinker Materials Corp.

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Furthe I agree to maintain and operate the pollution control source and pollution contr facilities in such a manner as to comply with the provision of Chapter 403, Flori Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitt establishment.

*Attach letter of authorization

Signed: James S. Jenkins

James Jenkins, V.P. Cement Operations
Name and Title (Please Type)

Date: 12/3/90 Telephone No. 305-221-7645

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project ha been designed/examined by me and found to be in conformity with modern engineeri principles applicable to the treatment and disposal of pollutants characterized in t permit application. There is reasonable assurance, in my professional judgment, th

1 See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed _____

Donald A Beers
Name (Please Type)

Rinker Materials Corporation
Company Name (Please Type)

P.O. Box 24635 WPB, Fl 33416
Mailing Address (Please Type)

Florida Registration No. 32530 Date: 12/6/90 Telephone No. 407/820-8346

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

Modify existing stone dryer to process petroleum contaminated soil pursuant to Florida DER Policy Memorandum dated August 1, 1990. Project will include a baghouse and afterburner to fully comply with all rules and regulations.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction 2/1/91 Completion of Construction 10/30/91

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Baghouse $80,000

Afterburner $500,000

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

AO 13-127621, DER permit dated May 23, 1990.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr____; if seasonal, describe:_____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? Yes

   a. If yes, has "offset" been applied? No

   b. If yes, has "Lowest Achievable Emission Rate" been applied? Yes

   c. If yes, list non-attainment pollutants. VOC

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? Yes

   a. If yes, for what pollutants? VOC

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

Controlled VOC emissions less than 25 tons/yr.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Soil	Limestone, sand	100	72,000	Attachment A 4
	Petroleum	6000 ppm	480 avg.	Attachment A
	Water	10	8,000	Attachment A

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 40 tons/h (10% moisture)

2. Product Weight (lbs/hr): 36 tons/h (0% moisture)

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
PM	<1.0	4.38	Process weight eq.	31.0		5256	7
VOC	5.48	24.0	95% control	24.0		2102	7
CO	2.1	9.2		NA		9.2	7
NO_x	6.3	27.8		NA		27.8	7
SO_2	17.18	75.25				75.25	7

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

fugitive dust baghouse

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
PM	0.5	2.3	Process wt eq.	31			
	(0.02 gr/dscf)						

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Multicyclone	PM	85	>10 μm	Engr. calculation
Baghouse	PM	99.9	>1.0μm	Engr. calculation
Afterburner	VOC	99.5	NA	Design

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Waste oil	193 gal/min	193 gal/min	27.4
Dist. oil	193 gal/min	193 gal/min	27.4
Natural gas	2.5×10^4 ft^3	2.5×10^4 ft^3	27.4

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: 0.50% Distillate
0.40 Waste oil

Percent Sulfur: _____ Percent Ash: unknown

Density: 7.4 lbs/gal Typical Percent Nitrogen: unknown

Heat Capacity: _____ BTU/lb 142,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average 0 Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

Processed soil to be returned to site as clean fill per Florida DER 17-775 F.A.C. or used as substitute cement raw materials.

D. Control Devices: (See Section V, Item 4) fugitive dust baghouse

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
micropul BH	PM	99.9	>1.0 µm	design

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): Waste oil components.

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 80 ft. Stack Diameter: 4.5 ft.

Gas Flow Rate: 36,500 ACFM 9770 DSCFM Gas Exit Temperature: 800 °F.

Water Vapor Content: 28 % Velocity: 50 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated						480	
Uncontrolled (lbs/hr)						480	

Description of Waste: Petroleum products in dryer flue gases

Total Weight Incinerated (lbs/hr): 480 Design Capacity (lbs/hr): 480

Approximate Number of Hours of Operation per day: 24 day/wk: 7 wks/yr.: 52

Manufacturer: IT/McGill

Date Constructed: 10/1/91 Model No.: custom design

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel Type	Fuel BTU/hr	Temperature (°F)
Primary Chamber	746	15×10^6	N.G.	15×10^6	1600
Secondary Chamber					

Stack Height: 80 ft. Stack Diameter: 4.5 Stack Temp. 800

Gas Flow Rate: 36,500 ACFM 9770 DSCFM* Velocity: 50 FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [x] Afterburner

[ ] Other (specify)

fugitive dust baghouse

4. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 45 ft. Stack Diameter: 1.0 x 1.0 ft.

Gas Flow Rate: 5000 ACFM 3070 DSCFM Gas Exit Temperature: 400 °F.

Water Vapor Content: 0 % Velocity: 60 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

Brief description of operating characteristics of control devices: Afterburner system will consist of heat exchanger to preheat flue gases; afterburner; heat exchanger to preheat dryer combustion air and stack

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ ( ) SO_2* _____ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. ____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

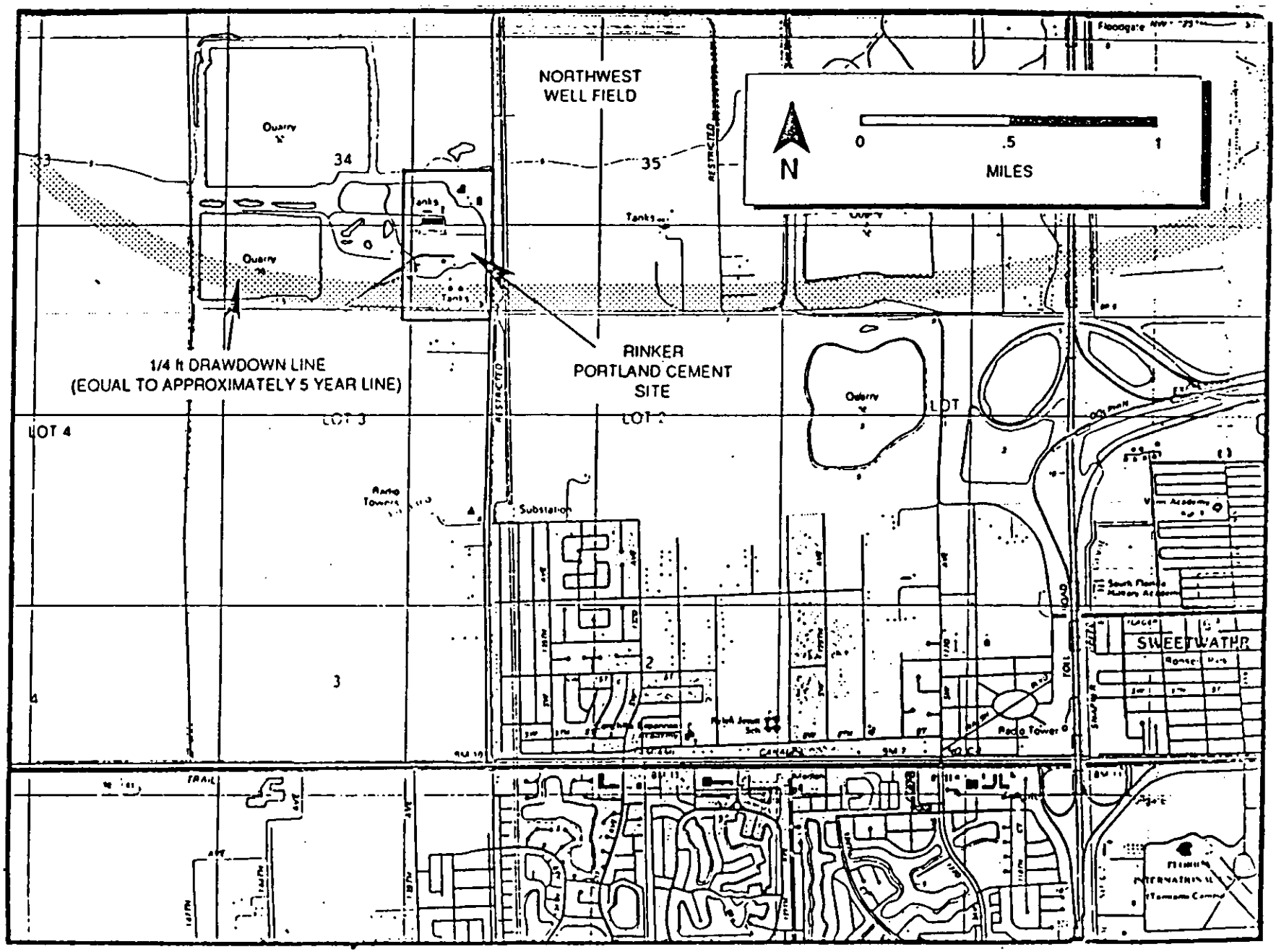
E. Emission Data Used in Modeling

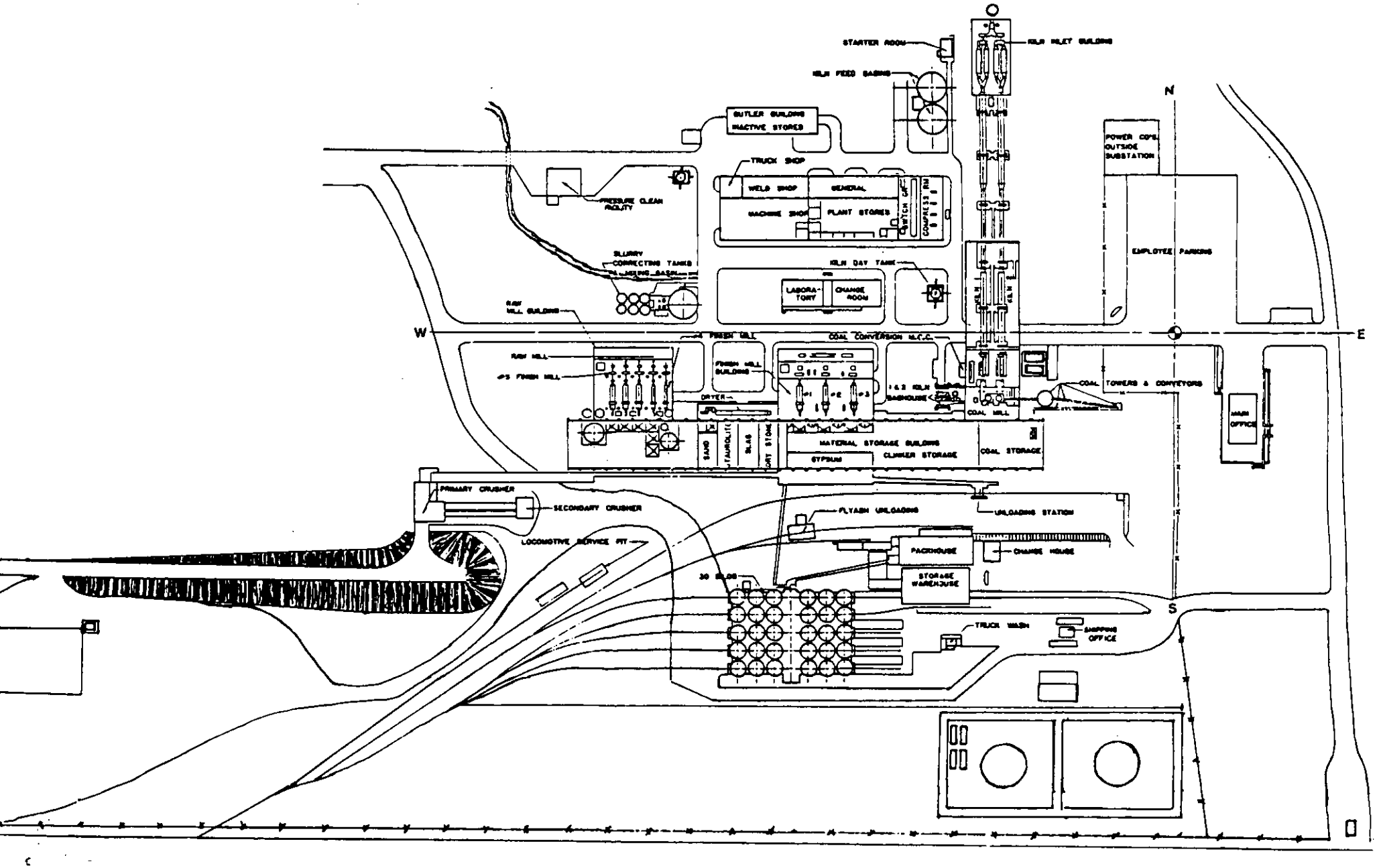
Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.


NORTHWEST
WELL FIELD
N
0
.5
1
MILES
1/4 ft DRAWDOWN LINE
(EQUAL TO APPROXIMATELY 5 YEAR LINE)
RINKER
PORTLAND CEMENT
SITE
LOT 4
LOT 3
LOT 2
LOT
34
35
3
Quarry
Tanks
Substation
Radio Tower
RESTRICTED
SWEETWATER
TRAIL


STARTER ROOM
KILN INLET BUILDING
KILN FEED BASINS
CUTLER BUILDING
INACTIVE STORES
TRUCK SHOP
WELD SHOP
GENERAL
MACHINE SHOP
PLANT STORES
SWITCH GR
COMPRESSOR RM
PRESSURE CLEAN FACILITY
SLURRY CORRECTING TANKS
MIXING BASIN
KILN DAY TANK
LABORA-TORY
CHANGE ROOM
RAW MILL BUILDING
POWER CO'S OUTSIDE SUBSTATION
EMPLOYEE PARKING
N
W
E
S
#4 FINISH MILL
COAL CONVERSION M.C.C.
RAW MILL
#3 FINISH MILL
FINISH MILL BUILDING
DRYER
#1
#2
#3
1 & 2 KILN BAGHOUSE
COAL MILL
COAL TOWERS & CONVEYORS
MAIN OFFICE
SAND
TAUROLITE
SLAG
PORT STONE
MATERIAL STORAGE BUILDING
GYPSUM
CLINKER STORAGE
COAL STORAGE
PRIMARY CRUSHER
SECONDARY CRUSHER
FLYASH UNLOADING
UNLOADING STATION
LOCOMOTIVE SERVICE PIT
PACKHOUSE
CHANGE HOUSE
STORAGE WAREHOUSE
TRUCK WASH
SHIPPING OFFICE

ATTACHMENT A

DRYER DESCRIPTION

The existing stone dryer is a 7 by 80 foot rotary dryer that was installed as part of the original plant equipment. Because of the higher temperatures required to remove petroleum products from soil, the burner and drum are to be modified to achieve a product temperature of 1500°F. The existing Todd Shipyard burner will be replaced with a Gencor ultraflame burner to provide a design heat input of 27.5×10^6 Btu/h. This burner is a low excess air design (30%) and provides maximum turn down and control stability.

To insure complete soil desorption and uniform temperature, the drum will be flighted and soil preheated in the drum as it moves countercurrent to the flame. Maximum production will be 40 tons/h with production adjusted to rates necessary to produce the required soil discharge temperatures. The soil temperature required will be determined by type of petroleum product and concentration.

The operation will reduce petroleum levels in the soil to clean fill standards (i.e., <5 ppm), which can allow the soil to be returned to the clean up site or used in the cement plant raw feed.

All particulate matter collected by the multicyclone and baghouse will be returned to the feed to ensure complete contaminate removal. The dust system will use screw conveyors and elevator.

Tables 1, 2, and 3 are heat and mass balances for the dryer at 27.5 tons/h feed rate (heavy organics) and 40 tons/h (light organics). Figure A-1 is a flow diagram for the system. Figures A-2 and A-3 are dryer mass balance outputs at 1000°F and 1500°F, respectively.

Feed System Description

Soil will be received and the required tests performed to ensure compliance with off-specification used oil limitations (i.e., arsenic, lead, halogens, etc.). The soil will be placed in the raw material gallery in separate bins for discharge to the roaster. Before placement in the roaster, the soil will be screened to remove large rocks, debris, trash, roots, etc. Oversize stone will be crushed and rescreened to insure uniform feed size to the roaster. Soil will be transferred to the roaster feed bin using an inclined belt feeder. Treated soil will be discharged from the roaster and transferred to the raw material gallery using a bucket elevator and drop leg (stacker).

TABLE 1. DRYER OPERATING CONDITIONS

	1[a]	2[b]	3[c]	4[d]
Feed rate, tons/h	27.5	40.0	27.5	40.0
Moisture, %	10	10	10	10
Product rate, tons/h	24.75	36.0	24.75	36.0
Drum speed, RPM	7.0	8.5	7.0	8.5
Flue gas weight, lb/h	28,636	33,551	30,447	35,562
CO_2, % volume	11.79	11.79	11.79	11.79
O_2, % volume	5.06	5.06	5.06	5.06
N_2, % volume	83.1	83.1	83.1	83.1
H_2O, % volume	34.3	39.6	32.98	
Temperature, °F	350	350	350	350
Volume, acfm	10,872	13,060	11,487	16,875
Combustion air weight, lb/h	21,957	24,248	23,675	26,157
Temperature, °F	400	400	90	90
Fuel Type	oil	oil	oil	oil
Fuel weight, lb/h	1,179.5	1,302.0	1,271.8	1,405.2
Heat input, 10^6 Btu	23.0	25.4	24.8	27.4
Efficiency, 10^6 Btu/ton (wet)	0.83	0.63	0.90	0.68
Efficiency, 10^6 Btu/ton (dry)	0.92	0.70	1.00	0.76
Product temperature, °F	1,500	1,000	1,500	1,000
Burner excess air, %	30	30	30	30

[a]Heavy VOC contaminants requiring high temperature using preheated combustion air.
[b]Light VOC contaminants requiring lower temperature using pre-heated combustion air.
[c]Heavy VOC contaminants requiring high temperature using ambient combustion air.
[d]Light VOC contaminants requiring lower temperature using ambient combustion air.

TABLE 2. DRYER MASS BALANCE

	1[a]	2[b]	3[c]	4[d]
Mass input				
Fuel, lb/h	1,179.5	1,302.6	1,271.8	1,405.1
Stone, lb/h	55,000.0	80,000	55,000.0	80,000.0
Combustion air, lb/h	21,956.9	24,248.1	23,675.0	26,157.4
Total, lb/h	78,136.4	105,550.7	79,947.9	107,562.5
Mass output				
Dry flue gases, lb/h	21,818.1	24,094.8	23,525.9	25,992.3
Wet gases, lb/h	6,818.3	9,455.8	6,921.2	9,570.2
Dry stone, lb/h	49,500.0	72,000.0	49,500.0	72,000.0
Total, lb/h	78,136.4	105,550.7	79,947.9	107,567.5

[a]Heavy VOC contaminants requiring high temperature using preheated combustion air.
[b]Light VOC contaminants requiring lower temperature using pre-heated combustion air.
[c]Heavy VOC contaminants requiring high temperature using ambient combustion air.
[d]Light VOC contaminants requiring lower temperature using ambient combustion air.

TABLE 3. DRYER HEAT BALANCE

	1[a]		2[b]		3[c]		4[d]	
	10^6 Btu/lb	%	10^6 Btu/lb	%	10^6 Btu/lb	%	10^6 Btu/lb	%
Heat input								
Fuel	23.00	90.62	27.40	96.52	24.80	97.06	25.40	90.19
Stone	0.273	1.07	0.397	1.40	0.273	1.07	0.397	1.42
Moisture liquid	0.154	0.606	0.224	0.79	0.154	0.60	0.224	0.79
Combustion air	1.955	7.70	0.364	1.29	0.329	1.29	2.141	7.60
Total	25.38	100.00	28.385	100.00	25.55	100.00	28.163	100.00
Heat output								
Dry stone	14.32	56.60	13.73	48.46	14.32	56.07	13.73	48.91
Dry flue gases	1.495	5.91	1.782	6.28	1.613	6.32	1.65	5.88
Moisture	8.288	32.75	11.63	41.03	8.41	32.93	11.49	40.93
Radiation	1.200	4.74	1.20	4.23	1.20	4.69	1.20	4.28
Total	25.30	100.00	28.34	100.00	25.54	100.00	28.07	100.00

[a]Heavy VOC contaminants requiring high temperature using preheated combustion air.
[b]Light VOC contaminants requiring lower temperature using pre-heated combustion air.
[c]Heavy VOC contaminants requiring high temperature using ambient combustion air.
[d]Light VOC contaminants requiring lower temperature using ambient combustion air.

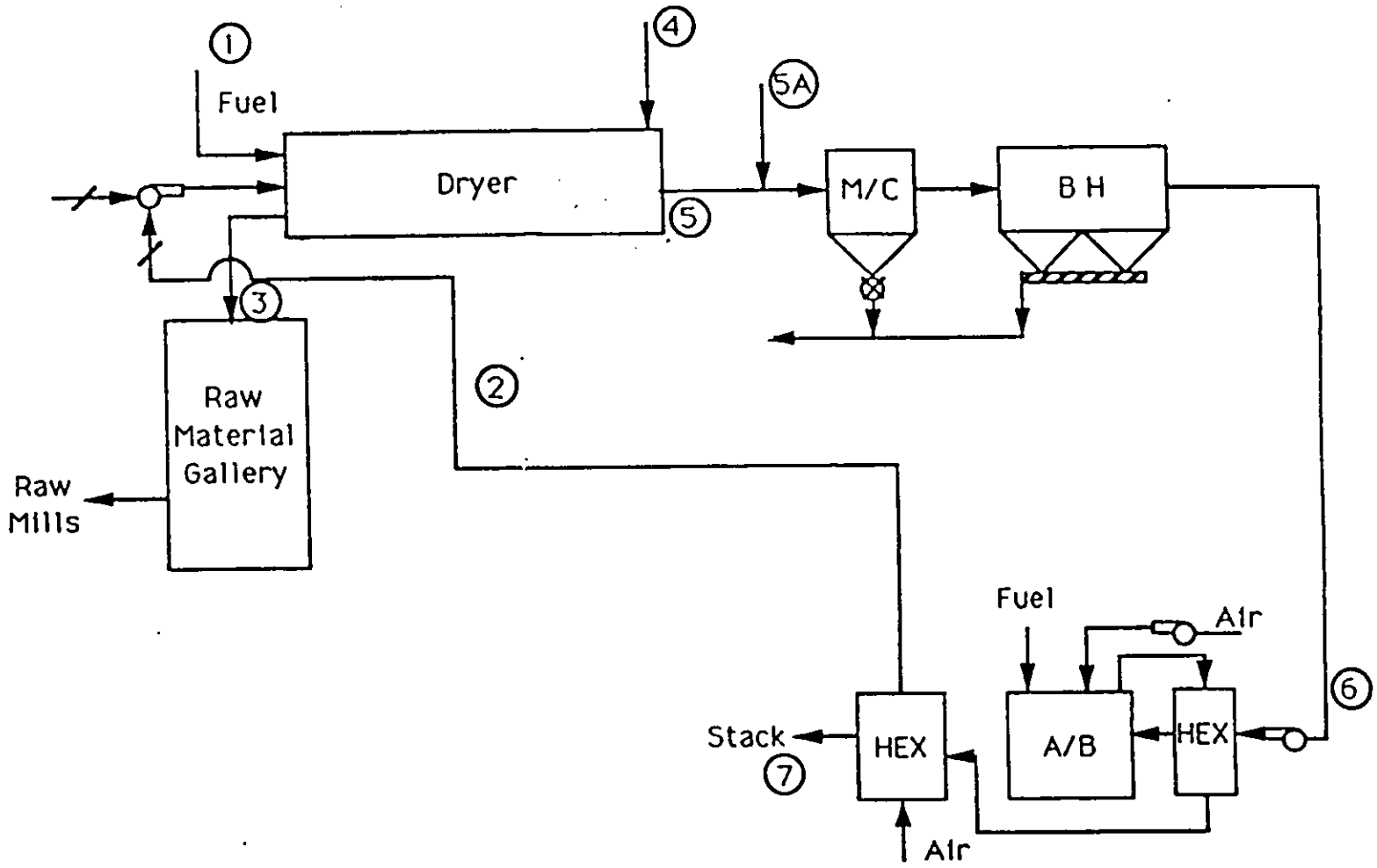


Figure A–1. Dryer flow diagram/mass balance.

STREAM NO.	MEDIA TYPE	MASS LB/HR	TEMP F	FLOW WSCFM	FLOW DSCFM	FLOW ACFM	CO2 %V/V	O2 %V/V	N2 %V/V	H2O %V/V	CO2 LB/HR	O2 LB/HR	N2 LB/HR	H2O LB/HR
1	OIL	1302.0	90	-	-	-	-	-	-	-	-	-	-	-
2	AIR	24248.0	400	5388	5388	8777	0.00	20.90	79.10	0.00	0	5626	18622	0
3	DRY STONE	72000.0	1000	-	-	-	-	-	-	-	-	-	-	-
4	WET STONE	80000.0	60	-	-	-	-	-	-	-	-	-	-	5565
5	FLUE GAS	33550.6	350	8513	5139	13060	11.79	5.06	83.13	39.60	4156	1296	18634	9456
5A	AIR	2596.0	90	578	578	600	0.00	20.90	79.10	0.00	0	602	1994	0
6	FLUE GAS	36146.6	335	9087	5716	13683	10.69	6.70	82.73	37.09	4156	1896	20628	9456

Figure A–2. Dryer mass balance at 400°F preheated combustion air/1000°F.[a]

[a]Stream number relates to drawing on page A–5 for Case No. 2

STREAM NO.	MEDIA TYPE	MASS LB/HR	TEMP F	FLOW WSCFM	FLOW DSCFM	FLOW ACFM	CO2 %V/V	O2 %V/V	N2 %V/V	H2O %V/V	CO2 LB/HR	O2 LB/HR	N2 LB/HR	H2O LB/HR
1	OIL	1179.5	90	-	-	-	-	-	-	-	-	-	-	-
2	AIR	21956.9	400	4879	4879	7947	0.00	20.90	79.10	0.00	0	5094	16863	0
3	DRY STONE	49500.0	1500	-	-	-	-	-	-	-	-	-	-	-
4	WET STONE	55000.0	60	-	-	-	-	-	-	-	-	-	-	5565
5	FLUE GAS	28636.4	350	7087	4654	10872	11.79	5.06	83.13	34.30	3764	1172	16874	6818
5A	AIR	5013.0	90	482	482	502	0.00	20.90	79.10	0.00	0	502	1731	0
6	FLUE GAS	34958.0	335	8022	5135	12079	10.69	6.50	82.77	35.99	3968	1674	18605	6945

Figure A-3. Dryer mass balance at 400°F preheated combustion air/1500°.[a]

[a]Stream number relates to drawing on page A-5 for Case No. 1.

ATTACHMENT B

DESCRIPTION OF CONTROL EQUIPMENT

A. Multicyclone

Joy-Western
35 tubes, 9" diameter (27 active)
3.5 in. H_2O pressure drop
13,680 acfm
335°F

B. Fabric Filter

Pulse-jet cleaning
Micropul
238 bags; 4.5 inches diameter; 12 ft long
3366 ft^2 cloth area
Fiberglass cloth
4.16 air-to-cloth ratio
14,000 acfm at 335°F (450°F max.)
6.0 in. H_2O expected pressure drop
0.02 gr/dscf outlet loading

C. Afterburner

Fuel: natural gas
Heat input: 15×10^6 Btu/h (max.)
30%: excess air
1600°F: combustion temperature
0.75 s: residence time
746 ft^3: primary chamber volume
98.8%: efficiency (minimum)
Manufacturer: IT/McGill, Tulsa, OK

D. Fugitive Fabric Filter

Pulse-jet cleaning
Micropul
130 bags; 4.5 inches diameter; 8 ft long
4.0 ft^2 cloth area
Nomex cloth
4.0 air-to-cloth ratio
5000 acfm at 400°F
4 in. H_2O expected pressure drop
0.02 gr/dscf outlet loading

ATTACHMENT C

AFTERBURNER SYSTEM DESCRIPTION

The afterburner used to destroy organics that are volatilized from the soil will be a direct natural gas-fired system. The dryer flue gases will be preheated to 750°F using a heat exchanger at the afterburner exhaust.

Combustion temperature in the afterburner is 1600°F at 30 percent excess air. Expected destruction efficiency is >98.8 percent on heavy hydrocarbons. The design system residence time is 0.75 seconds.

Combustion air for the dryer burner will be preheated using a second heat exchanger. A portion of the afterburner flue gases will be bypassed around the heat exchangers to maintain proper heat balance and prevent preignition of organics in the dryer exhaust.

The afterburner maximum heat input will be 15×10^6 Btu/h. This heat input would only occur during the startup period. A reduced heat input would be required during operation because of the heat release from the organics (VOC) in flue gas stream.

The system will be equipped with all flame safety and interlock controls as necessary to comply with the local codes. Combustion chamber temperature will be controlled by a feed back loop to maintain set points. A flow diagram for the system is provided in Figure C-1.

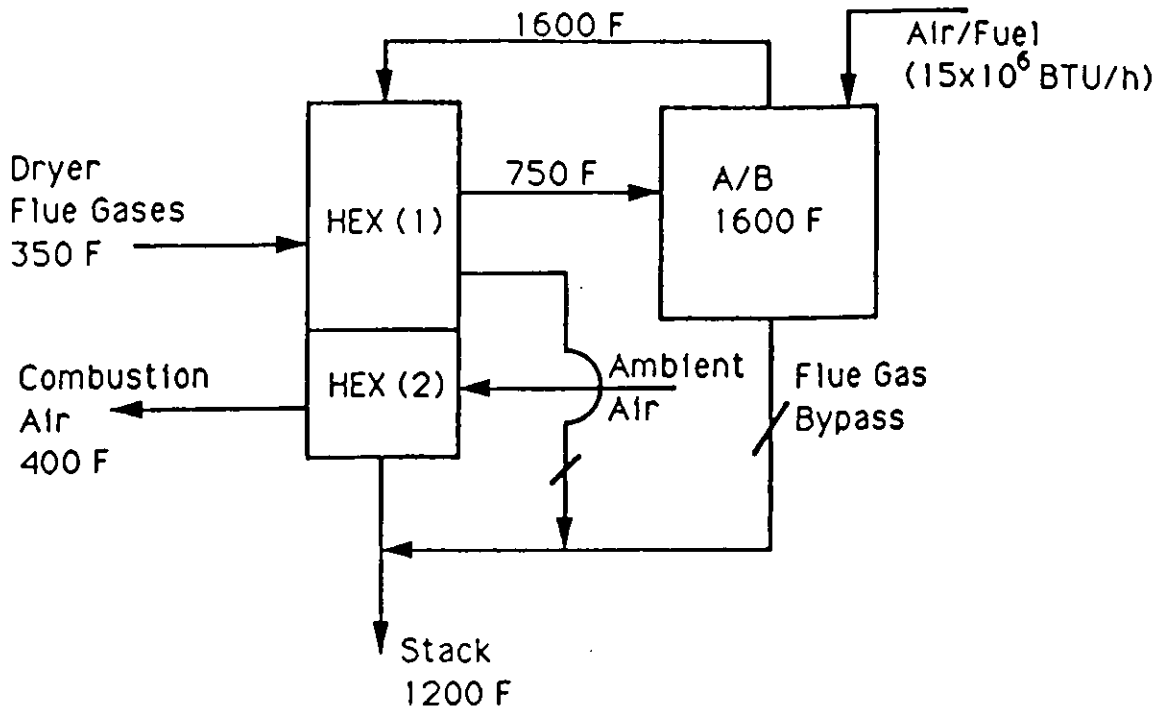


Figure C-1. Afterburner system arrangement.

ATTACHMENT D

EMISSION ESTIMATES

Pollutant emission estimates are based on expected maximum operating conditions and worst-case feed material. The highest soil contamination is assumed to be 850 ppm of residual oil. This condition is not constantly expected but represents a worst-case situation. Because of the sulfur content of residual oil this increases the potential SO_2 loss from the dryer (14.37 lb/h fuel combustion and 2.86 lb/h process loss from soil).

NO_x emissions are calculated based on NO_x generation from low excess air dryer burner and low excess air afterburner. An additional adjustment is made based on experience with the total system gas volume.

A. $\underline{NO_x}$

° Assumptions

- 150 ppm NO_x on dryer burner based on 30 percent excess air in dry flue gases
- 150 ppm NO_x on afterburner combustion based on burner dry flue gases
- 15 ppm additional NO_x in total dry gas volume
- Worst-case without organics; full burner operation

° Dryer

$$\frac{(27.5 \times 10^6\ Btu/h)(8740\ scf/10^6\ Btu)(1.3)}{60\ min/h} = 5207 dscfm$$

$$\frac{(150 \times 10^{-6}\ scf\ NO_x\ /scf)(5207 scfm)(60 min/h)}{12.8\ scf\ NO_x/lb NO_x} = 3.67\ lb/h$$

° Afterburner

° Afterburner

$$\frac{(15 \times 10^6\ Btu/h)(8740\ scf/10^6\ Btu)(1.3)}{60\ \text{min}/h} = 2841\ dscfm$$

$$\frac{(150 \times 10^{-6}\ scf\ NO_x/scf)(2841\ dscfm)(60\ \text{min}/h)}{12.8\ scf\ NO_x/lb\ NO_x} = 1.99\ lb/h$$

Total gas

$$\frac{(15 \times 10^{-6}\ scf\ NO_x/scf)(60\ \text{min}/h)(9773\ scfm)}{12.8\ scf\ NO_x/lb\ NO_x} = 0.687\ lb/h$$

Total NO_x = 6.34 lb/h

B. CO

° Assumptions

- 50 ppm CO remaining in afterburner flue gases (dry basis)
- 30 percent excess air

$$\frac{(50 \times 10^{-6}\ scf\ CO/scf)(9773\ scfm)(60\ \text{min}/h)}{13.76\ scf\ CO/lb\ CO} = 2.1\ lb/h$$

C. SO_2

° Assumptions

- Distillate oil used in dryer with sulfur content of 0.50 percent
- Fuel oil heat content 142,000 Btu/gal
- Dryer heat input 27.5 x 10^6 Btu/h
- Natural gas used on afterburner
- Maximum 850 ppm residual oil in soil at 2.1 percent S

$$\frac{27.5 \times 10^6\ Btu/h}{142{,}000\ Btu/gal} = 193.7\ gal/h$$

$$\left[193.7\ \frac{gal}{h}\right]\left[7.4\ \frac{lb}{gal}\right] = 1433\ lb/h$$

$$100 \qquad (1433\ lb/h) = 14.32$$

° Afterburner

$$(15 \times 10^6\ \frac{Btu}{h}) \rightarrow neg.\ sulfur$$

° Fuel in Soil

(2)(40 ton/h)(2000 lb/ton)(850 x 10^{-6})(2.1/100 %S) = 2.68 lb/h

Total SO_2 = 17.18 lb/h

D. VOC

° Potential (40 tons/h)(2000 lb/ton)(6000 x 10^{-6}) = 480 lb/h

° Controlled (1 - 0.988)(480 lb/h) = 5.48 lb/h

E. PM

° Assumptions

- 0.02 gr/acf at baghouse exit

$$\frac{(5716\ dscfm)(0.02\ gr/dscf)(60\ min/h)}{7000\ gr/lb} = 0.97\ lb/h$$

Afterburner firing rate

$$\frac{15 \times 10^6 \ Btu/h}{1100 \ Btu/cf \ (10^6)} = 0.0136 \ mm \ cf/h$$

$$(0.0136 \ mm \ \frac{cf}{h})(1.0 \ \frac{lb}{mm \ cf} = 0.0136 \ lb/h \ (neg)$$

Total PM < 1.0 lb/h

EXPECTED ANNUAL POTENTIAL EMISSIONS

	lb/h	lb/yr	tons/yr
PM	1200	10,512,000	5256
SO_2	17.18	150,497	75.25
CO	2.1	18,396	9.19
VOC	480	4,204,800	2102.4
NO_x	6.34	55,538	27.77

ANNUAL ACTUAL CONTROLLED EMISSIONS

	lb/h	lb/yr	tons/yr
PM	1.0	8,760	4.38
SO_2	17.18	150,497	75.25
CO	2.1	18,396	9.19
VOC	5.48	48,000	24.0
NO_x	6.34	55,538	27.77

ATTACHMENT E

FUGITIVE DUST CONTROL

A material stacker will be used to place treated soil in the raw-material gallery. The stacker and elevator will be vented to a baghouse to control fugitive dust. Ambient air will be mixed with vent gases to maintain baghouse temperature below 400°F (Figure E-1).

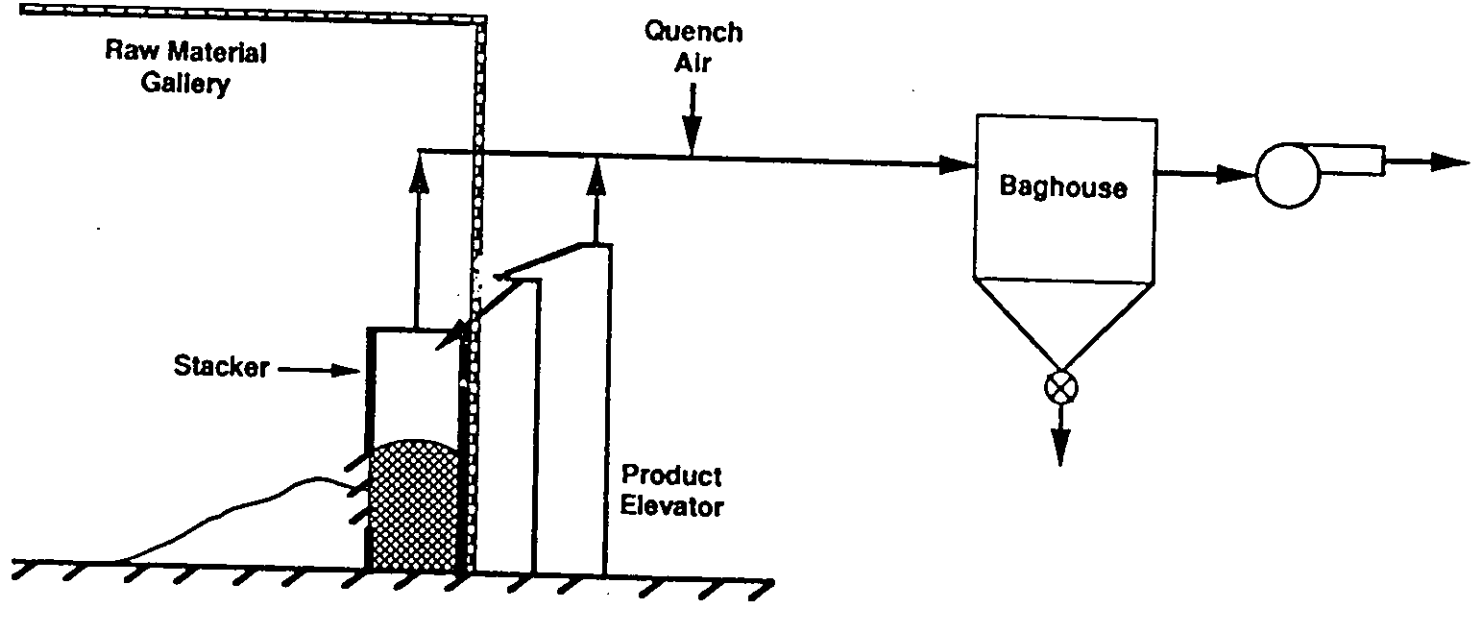


Figure E-1. Stacker fugitive dust control system.

ATTACHMENT F

HISTORIC EMISSION ESTIMATES

A. NO_x

° Assumptions

- Emission rate 0.133 lb/10^6 Btu
- Existing burner without NO_x control or excess air control

Heat input = (25 ton/h)(4.5 gal/ton)(142,000 Btu/gal) = 15.97 x 10^6 Btu/h

NO_x = (0.133 lb/10^6 Btu)(15.97 x 10^6 Btu/h) = 2.12 lb/h

NO_x = (2.12 lb/h)(8960 h/yr) (1 ton/2000 lb) = 9.29 tons/yr

B. CO

° Assumptions

- Dryer excess air at stack 134%
- Stack flow rate approximately 5750 dscfm
- Stack CO concentration approximately 400 ppm (v/v) dry

$$CO = \frac{(400 \times 10^{-6} \text{ scf CO/scf})(5750 \text{ scfm})(60 \text{ min/h})}{(13.76 \text{ scf CO/lb CO})} = 10.03 \text{ lb/h}$$

CO = (10.03 lb/h)(8760 h/yr)(1 ton/2000 lb) = 43.93 tons/yr

C. SO_2

° Assumptions

- Distillate oil used in dryer with sulfur content of 0.50 percent
- Fuel oil heat content 142,000 Btu/gal
- Dryer production rate 25 tons/h
- Fuel efficiency 4.5 gal/ton stone
- 8760 h/yr operation

Production = (8760 h/yr)(25 tons/h) = 219,000 tons/yr

Fuel usage = (219,000 tons/yr) (4.5 gal/ton) = 985,500 gal/yr

SO_2 = (1 ton/2000 lb)(985,000 gal/yr)(2)(0.5 %S/100)(7.4 lb/gal) = 36.46 tons/yr

D. VOC

Contaminated soils have not historically been processed in the drier.

E. PM

° Assumptions

- Emissions have been consistent with permit allowables (i.e., 26.41 lb/h)
- Production rate 25 tons/h

PM = (26.41 lb/h)(8760 h/yr)(1 ton/2000 lb) = 115.67 tons/yr

HISTORIC ANNUAL POTENTIAL EMISSIONS

	lb/h	lb/yr	tons/yr
PM	750	6,570,000	3285
SO_2	8.32	72,883	36.44
CO	10.03	87,863	43.93
VOC	0	0	0
NO_x	2.12	18,571	9.28

HISTORIC CONTROLLED EMISSIONS

	lb/h	lb/yr	tons/yr
PM	26.41	231,352	115.67
SO_2	8.32	72,883	36.44
CO	10.03	87,863	43.93
VOC	0	0	0
NO_x	2.12	18,571	9.28

ATTACHMENT G

NET CHANGE IN EMISSIONS

	Actual historic		Actual proposed		Change	
	lb/h	tons/yr	lb/h	tons/yr	lb/h	tons/yr
PM	26.41	115.67	1.0	4.38	-25.41	-111.29
SO_2	8.32	36.44	17.18	75.25	8.86	38.80
CO	10.03	43.93	2.1	9.19	-7.93	-34.73
VOC	0	0	5.48	24.0	5.48	24.00
NO_x	2.12	9.28	6.34	27.77	4.22	18.48

ATTACHMENT H

CALCULATION OF AFTERBURNER RESIDENCE TIME

° Assumptions

- Chamber volume 746 ft^3
- Afterburner gas volume 15,300 wscfm
- Afterburner average temperature 1600°F

$$1/t = (1 \text{ min}/60 \text{ s})(15{,}300 \text{ ft}^3/\text{min})(1/746 \text{ ft}^3)(1600°F + 460/68°F + 460) = 1.33/s$$

$t \approx 0.75$ seconds