P 938 762 832

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Mr. C. M. Farris, Farmland Ind	
Street and No. P. O. Box 960	
P.O., State and ZIP Code Bartow, FL 33830	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 2-9-90 Permit: AC 53-169874	

PS Form 3800, June 1985

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. C. M. Farris
Farmland Industries, Inc.
P. O. Box 960
Bartow, FL 33830

4. Article Number
P 938 762 832

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Address
X Linda Thompson

6. Signature — Agent
X

7. Date of Delivery
2-12-90

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Mar 1988 * U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

UNITED STATES POSTAL SERVICE

OFFICIAL BUSINESS

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Print your name, address and ZIP Code in the space below.

- Complete items 1, 2, 3, and 4 on the reverse.
- Attach to front of article if space permits, otherwise affix to back of article.
- Endorse article "Return Receipt Requested" adjacent to number.

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FEB 14 1990

DER - BAQM

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Print Sender's name, address, and ZIP Code in the space below.

Dept. of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400
Attn: Patty ~~Adams~~

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

Mr. C. M. Farris
Farmland Industries, Inc.- Green Bay
P. O. Box 960
Bartow, Florida 33830

February 8, 1990

Enclosed is construction permit No. AC 53-169874 to Farmland for the existing molten sulfur system at the Green Bay facility in Polk County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copy furnished to:

B. Thomas, SW District
R. Tedder, P.E.

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 2-9-90.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk

2-9-90
Date

Final Determination

Farmland Industries, Inc.
Green Bay Complex
Bartow, Polk County, Florida

Molten Sulfur Storage and Handling System

Permit Number: AC 53-169874

Florida Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

February 7, 1990

Final Determination

Farmland Industries, Inc.'s application for the permitting of their existing molten sulfur system in Bartow, Polk County, Florida, has been reviewed by the Bureau of Air Regulation.

Public Notice of the Department's Intent to Issue the permit was published in The Ledger on November 22, 1989.

Copies of the Preliminary Determination have been available for inspection at the Department's Southwest District office in Tampa and the Department's Bureau of Air Regulation office in Tallahassee.

No comments were received during the public notice period. The final action of the Department is to issue the permit as proposed in the Preliminary Determination.

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

PERMITTEE:
Farmland Industries, Inc.
Post Office Box 960
Bartow, FL 33830

Permit Number: AC 53-169874
Expiration Date: Jan. 1, 1991
County: Polk
Latitude/Longitude: 27°50'37"N
81°56'05"W
Project: Molten Sulfur Storage and Handling System

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. 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:

For the permitting of the molten sulfur storage and handling system consisting of a rail and truck unloading system; one 91 short ton (ST) rail pit; one 72 ST truck pit; a 31 ST No. 1 supply pit; a 28 ST No. 3/4 supply pit; one 6000 ST molten sulfur storage tank; two 2500 ST storage tanks; and the associated transfer pumps and piping. The molten sulfur system is located at Farmland's Green Bay Complex in Bartow, Polk County, Florida.

The UTM coordinates of this facility are Zone 17, 409.5 km East and 3079.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Farmland's application received September 9, 1989.
2. DER's Preliminary Determination dated November 16, 1989.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-169874
Expiration Date: Jan. 1, 1991

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefor caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

GENERAL CONDITIONS:

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

GENERAL CONDITIONS:

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Farmland's molten sulfur storage and handling system shall be allowed to operate continuously (i.e. 8760 hours/year).

2. The maximum molten sulfur throughput rate shall neither exceed 1310 tons per day (TPD), nor 480,000 tons per year (TPY), based on the combined maximum rated sulfuric acid production rate of 4000 TPD 100% sulfuric acid for the three plants.

3. Visible emissions (VE) shall not exceed 20% opacity from any source in the molten sulfur system.

4. The permittee shall employ procedures to minimize emissions, from the molten sulfur system pursuant to the applicable requirements of F.A.C. Rule 17-2.600(11)(a) [Molten Sulfur Storage and Handling Facilities]. The permittee shall also comply with other applicable provisions of F.A.C. Chapters 17-2 and 17-4.

5. No objectionable odors shall be allowed, in accordance with F.A.C. Rule 17-2.620(2) [Objectionable Odor Prohibited].

SPECIFIC CONDITIONS:

6. Initial compliance tests shall be conducted in accordance with the July 1, 1988, version of 40 CFR 60 Appendix A, using EPA Method 9, for visible emissions. For the storage tank vents and the sulfur pits' vents the tests shall be conducted while the tank and pits are being filled. VE tests shall be required again at the time of renewing the operation permits.

7. Any change in the method of operation, equipment or operating hours shall be submitted to DER's Southwest District office for approval.

8. For emission inventory and PSD purposes, the estimated maximum emissions from the sources in the molten sulfur storage and handling system are:

Source		Expected Emissions				
		PM/PM_{10}	SP	SO_2	TRS/H_2S	VOC
Tank 1	lb/hr	0.9	0.5	1.2	0.6	0.9
6000 ST	TPY	2.4	1.2	3.1	1.1	2.2
Tanks 2&3	lb/hr	0.9	0.5	1.2	0.6	0.8
2500 ST ea.	TPY	2.7	1.4	3.5	1.6	2.5
Truck Pit	lb/hr	0.1	0.1	0.1	0.1	0.1
	TPY	0.3	0.1	0.4	0.2	0.3
Rail Pit	lb/hr	0.5	0.3	0.7	0.4	0.5
	TPY	2.5	1.2	3.2	1.5	2.3
Supply Pit	lb/hr	0.1	0.1	0.1	0.1	0.1
No. 1, 3/4 ea.	TPY	0.3	0.1	0.4	0.2	0.3

9. A minimum of 15 days prior written notification of the compliance tests shall be given to DER's Southwest District office. The compliance test results shall be submitted to the Southwest District office within 45 days of test completion.

10. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation (BAR) prior to 60 days before the expiration of the permit (F.A.C. 17-4.090).

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-169874
Expiration Date: Jan. 1, 1991

SPECIFIC CONDITIONS:

11. An application for an operation permit must be submitted to DER's Southwest District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. 17-4.220).

Issued this 8 day
of February, 1990

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

Attachment 1 Available Upon Request

Florida Department of Environmental Regulation
Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347 • 813-623-5561
Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary
Dr. Richard Garrity, Deputy Assistant Secretary

September 24, 1990

Mr. C. M. Farris
General Manager
Farmland Industries, Inc.
Post Office Box 960
Bartow, FL 33830

Dear Mr. Farris:

Re: Polk County - AP
AO53-185584

On August 27, 1990, the Department received your air pollution application to operate a molten sulfur storage and handling system at your Green Bay facility near Bartow. In order to continue processing the application, the Department will need the following additional information pursuant to Rule 17-4.070(1), F.A.C.:

1. Submit an additional processing fee of $500.00, since the applicable similar source fee pursuant to Rules 17-4.050(4)2.b. and 17-4.050(4)3., F.A.C. is $750.00.

2. For each visible emission test report submitted with the application, state what the transfer rate in tons/hour was during testing. If the rates are not available either retest the source(s) or explain why the information is not applicable. Be sure each rate submitted is accompanied by a description such as truck to pit, railcar to pit, pit to tank etc.

3. Explain how the transfer rates supplied in No. 2 above correlate to the 8500 ton value shown on the application. Note - These rates will also be compared to the maximum rates stated in the application dated August 30, 1989.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)	Initial / Date
Mirza Baig	
2. DARM - BAR	Initial / Date
3. DER - Tallahassee	Initial / Date
4. Twin Towers	Initial / Date

REMARKS:

RECEIVED
FEB 19 1991
DER - BAQM

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM:
Jim McDonald

DATE 2-14-91

PHONE

4. Explain how compliance with the 1310 tons/day and 480,000 tons/year limitations of Specific Condition No. 2 in permit AC53-169874 are demonstrated. Additionally, submit documentation and/or records for August 31, 1990 that demonstrate compliance with these limitations.

5. Specific Condition No. 4 of permit AC53-169874 states procedures to minimize emissions shall be employed. Submit a written copy of the procedures that are employed.

"NOTICE: Pursuant to the provisions of Section 120.600, F.S. and Chapter 17-12.070(5), F.A.C., if the Department does not receive a response to this request for information within 90 days of the date of this letter, the Department will issue a final order denying your application. You need to respond within 30 days after you receive this letter, responding to as many of the information requests as possible and indicating when a response to any unanswered question will be submitted. If the response will require longer than 90 days to develop, an application for new construction should be withdrawn and resubmitted when completed information is available. Or for operating permits, you should develop a specific time table for the submission of the requested information for Department review and consideration. Failure to comply with a time table accepted by the Department will be grounds for the Department to issue a Final Order of Denial for lack of timely response. A denial for lack of information or response will be unbiased as to the merits of the application. The applicant can reapply as soon as the requested information is available."

If you have any questions, please call Mr. Jim McDonald of my staff at (813) 623-5561 extension 421.

Sincerely,

J. Harry Kerns

J. Harry Kerns, P.E.
District Air Engineer

JHK/jmq

Farmland

Farmland Industries, Inc.
Fertilizer Phosphate Manufacturing
County Road 640
Post Office Box 960
Bartow, Florida 33830-0960
Telephone: 813 533-1141
Facsimile: 813 533-8793

Charles W. Jenkins
Environmental Coordinator

Mr. J. Harry Kerns, P.E.
District Air Engineer
Florida Department of Environmental Regulation
4520 Oak Fair Boulevard
Tampa, FL 33610-7347

October 18, 1990

Re: Sulfur Handling Air Permit AO53-185584

Dear Mr. Kerns:

Your letter of September 24, 1990, to Mr. Farris was forwarded to me and I have organized the responses in the order that they were requests.

In answer to Item 1:

The Permit Fee Schedule of October 3, 1988, F.A.C. 17-4.050 (4)(a)(2.c.) states that an operating permit for any source not required to measure actual emission is $250.00. Specific condition #6 of the present construction permit states that a visible emission test shall be required only when the permit is renewed. We do not feel that the additional $500.00 requested is within the present fee guidelines. If this is in error please explain.

In answer to Item 2:

I have included a copy of the original V.E. sighting conducted on the sulfur system in July of this year. I have numbered the pages at the bottom for easy reference when explaining transfer rates.

Page 1:

A nine car cut of rail cars was being unloaded at the time of this siting (July 24, 1990). Two rail cars are dumped at one time (please refer to Figure 1) and the normal length of time to empty a car is 30 minutes. These sulfur cars average 98 tons of sulfur each giving a pit flow rate of 392 TPH (tons per hour). The rail car pit is equipped with level control and operates in the following manner. The plant transfer pump operates first and can pump about 120 TPH to the two 2,500 ton storage tanks near Sulfuric Acid Plant No. 2. Increased level causes the second pump to transfer sulfur to the west terminal 6,000 ton storage tank.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO 04-421

ACTION DUE DATE

	Initial	Date
1. TO: (NAME, OFFICE, LOCATION) MIRZA Mr. John Reynolds		
2. DARM - BAR RECEIVED		
3. DER - Tallahassee JAN 11 1991		
4. Twin Towers DER - BAQM		

REMARKS: FYI - FARMLAND AC53-190667

By this response when I was processing their application to operate shows

1. They didn't keep proper records until recently
2. They failed to notify us when they didn't meet the daily limits of the construction permit - that's why this modification.
3. Page 4 of response - I don't feel the truck unloading area meets Rule 17-2.600(11)(a) 2., F.A.C. (the within 20 feet criteria)

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM: Jim McDonald

DATE 1-8-91

PHONE

Therefore, the page 1 siting was made at a rate of about 392 TPH rail car to pit. Exhibit A is a copy of the Sulfur Unloading Report for July 24. This report is submitted each day by the Transportation Department.

Page 2:

During the V.E. siting of the truck unloading pit there was one truck that delivered 47,000 pounds of sulfur and entered our scales at 8:51 AM. The weigh-out was 9:10 AM giving an unload time of about 15 minutes, allowing 8 minutes total to drive to the pit from the main gate, connect the unload spout, disconnect at completion and drive back to the scale. This gives a dump rate of 201 TPH truck to pit. This pit is also level controlled and the transfer pump will automatically pump the sulfur to the two 2,500 ton storage tanks. See Figure 1 and also a copy of the Farmland weigh ticket, Exhibit B. This rate is slightly lower than the 290 TPH estimate given in the Process Description page 2a.

Page 3:

The No. 2 transfer pit is located in the No. 2 Sulfuric Acid Plant area, but since this plant is permanently shut down, this pit supplies Plant No. 1 only. Exhibit C is a copy of a portion of the No. 1 plant Daily Operating Sheet showing the sulfuric acid production for the day of the pit V.E. siting (July 24, 1990). The plant produced 244 tons of H_2SO_4 for a sulfur rate of nearly 10 TPH pit to Plant No. 1. The Process Description lists the maximum rate of 12 TPH on page 2a.

Page 4:

Shown on Exhibit D, a portion of the Sulfuric Acid Plants No. 3 & 4 operating sheet, the production from 6 AM to 2 PM was 559 and 589 tons of H_2SO_4. The resulting rate for the pump pit was then about 47 TPH of sulfur from pit 3/4 to the plants. Process Description rate given was 42 TPH.

Pages 5 - 14:

The three tank vents A, B and C were sited on July 19, 1990 and the remaining vents on July 18. Table I shows the tank inventories for these two days and also see Exhibits D, E, F & G which are copies of a portion of the log sheets for Sulfuric Acid Plants 1, 3 & 4. From this information we can determine that during the day of July 18, 420 tons of sulfur were used equally from tanks 05-911 and 05-912. These tanks are also referred to as No. 1 and No. 2 respectively or West and East tanks. Since about one half of the total tons or 210 came from tank No. 1 while it gained 124.7 tons (see Table I), then 334.7 tons of sulfur were fed to the tank.

The rate for the siting on July 18 was then 334.8/8 or 41.8 TPH of sulfur from the unloading system to the tank. The rate for July 19 was 27.7 TPH.

Pages 15 - 24:

The V.E. sitings on the East tank were taken over a three day span from July 17 through 19. The rates for these days are derived by the same process used on the West tank and are:

Date	Rate
July 17	18.8 TPH
" 18	34.5 TPH
" 19	36.0 TPH

All these rates represent the rate of sulfur from the unloading system into the tank averaged over the 8 hour day shift.

Pages 25 - 33:

As was shown in the Page 1 discussion, the rail car pit receives 392 TPH when two cars are dumping and the transfer pump can only remove a constant 120 TPH from the pit leaving 272 TPH that must be pumped to the storage tank. Exhibits A & H are copies of the Sulfur Unloading Report for the two days this tank's vents were sited July 23 and 24. Eight cars were unloaded on the first day and nine on the second. The sulfur rate during these V.E.'s should be 272 TPH of sulfur from the pit to the tank.

In answer to Item 3:

The Technical Evaluation and Preliminary Determination dated November 16, 1989, described the 6,000 ton tank labeled 04-901 and the two 2,500 ton tanks 05-911 and 05-912. The 6,000 ton tank is only a surge tank to hold the excess sulfur that is unloaded by rail long enough to be pumped to the plant tanks 05-911 and 912. The level in this tank will fluctuate a great deal even during a single 8 hour shift. The two process tanks Nos. 1 & 2 are constantly emptying into the plant pump pits and are therefore constantly being emptied at a rate equal to the plant production rates.

I don't know what you mean by the 8,500 ton value. The plants require a total of about 1,310 tons per day and our total tank storage capacity is 11,000 tons. From Table I it can be seen that the average day shift sulfur usage for these three days was 442 tons and for a 24 hour operation that would equal 1,326 tons which agrees closely with the 1,310 tons daily usage referred to in the above evaluation.

The rail car and truck unloading rates are a function of the length of time it takes to dump and are not related to production rates.

In answer to Item 4:

Exhibit 1 shows the raw material usage for the month of August and the shaded column shows the daily sulfur consumption. At the bottom of the column the average usage per day is 1,217.8 tons and for 365 days would equal 444,497 tons total. Page 2a of the Application To Construct, paragraph three lists a 12 TPH rate for Plant Pit No. 1 and 42 TPH rate for Plant Pit Nos. 3 & 4. This amounts to a total of 1,296 tons per day which is 78 tons higher than the average for August. The exact day to day production rate is not easy to control or determine and I think we need to make a change to the No. 2 Specific Condition to allow a daily maximum of 1,510 tons and 480,000 tons per year.

It should be noted that shortly we will have our new Sulfuric Acid Plant No. 5 running and with the shut down of Acid Plant No. 1 our requirements will be for a maximum of 2,210 tons per day and 672,000 tons per year. We need to incorporate these changes as soon as possible.

In answer to Item 5:

It has been the practice at Farmland Industries to promptly clean up any sulfur spills outside of concrete surfaced areas. We have initiated a record book to record spills in the future and also we have discussed with the Production Superintendents the need to clean the vents monthly. It had been our practice to do so only as needed.

The truck unloading area is equipped with a concrete curb at least six inches high around the truck unloading area with approximate dimensions of 31 feet wide by 15 feet front to back. The approach to the truck dump pit is concrete paved with approximate dimensions of 130 feet by 95 feet. At the rail car unloading stations, our practice is to attach a tail pipe to the bottom valve of the car that extends straight down into the opening of the concrete and stainless steel lined molten sulfur trough under the tracks. Some sulfur can spill around this opening at times and therefore we will construct a small containment pan around these openings.

If there are any further questions or need for clarifications please write or call me at (813) 533-1141.

Sincerely,

Charles W. Jenkins

Charles W. Jenkins
Environmental Coordinator

CWJ:dr/cwj4690

Enclosures

cc: Merle Farris w/o attachments

Farmland Fertilizer/Ag Chemical

Farmland Industries, Inc.
Fertilizer Phosphate Manufacturing
County Road 640
Post Office Box 960
Bartow, Florida 33830-0960
Telephone: 813 533-1141
Facsimile: 813 533-8793

November 30, 1990

Mr. C. H. Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: AC53-169874

Dear Mr. Fancy:

Farmland applied for and received a construction permit for our molten sulfur storage and handling system (AC53-169874). This past August we applied for an operating permit for this same system. The application was sent to the Southwest District Office and they have advised us that the permit only allows 1310 ton of sulfur per day to be unloaded thru this system. At the suggestion of Mr. Bill Thomas, could you make an editorial change to the existing construction permit that would allow the daily average of 1310 per day to be based on a yearly maximum. Our current unloading rate is not constant on a daily basis and it is very difficult to unload to an exact tonnage each day.

Farmland is in the process of starting up our new #5 Cogeneration Sulfuric Acid Plant. Although we are shutting down our old #1 Plant we will need to unload additional sulfur.

Farmland is also requesting that you extend the construction permit for six months in order for us to apply for a modification of this construction permit that would allow for additional sulfur unloading and storage.

Our current permit expires on January 1, 1991 so you can see our need to be expeditious.

Thank you very much and if you have any questions, please give me a call.

Very truly yours,

C. G. Meier
Administrator
Environmental Services

CGM:pm

pc: Merle Farris
John Reynolds
M. Craig
B. Thomas, SW Dist

3 Sulfuric Acid Plants not to exceed
4000 TPD 100% H_2SO_4.
Not to exceed 1310 TPD
OR 480,000 TPY.

Spoke with Charles Jenkins on 12-5-90.
Advised him to submit a construction/
modification application to CAPS ASAP,
with new higher TPD. Mugs.

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

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

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram
Molten Sulfur	None		241,000 TPY	Max. Annual Thru-put
			110 TPH from	pit to storage tanks
			130 TPH from	6,000 ton tank to 2,500 ton tanks via car pit

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

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

2. Product Weight (lbs/hr): NA

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] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/hr	Potential[4] Emission T/yr	Rate to flow Diagram
Part. Matter	0.506	1.21	17-2.600(11)	NA	0.506	1.21	
TRS (H_2S)	0.620	1.49	NA	NA	0.620	1.49	
SO_2	1.293	3.11	NA	NA	1.293	3.11	
VOC	0.921	2.21	NA	NA	0.921	2.21	

[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 standards.

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

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

Annual Average NA Maximum _____

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

None

One Center Vent/Eight Rim Vents

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

Stack Height: 40/37 ft. Stack Diameter: 2.0/0.83 ft.

Gas Flow Rate: 18 (each) ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 0.10/0.55 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

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: _____

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)] (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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.) NA
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). NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

FARMLAND INDUSTRIES INC.

JOB 6,000 Ton Storage Tank
CALCULATED BY C. W. Jenkins
DATE: 12/9/90
SHEET NO. 1 OF 3

Emissions factors are based on APPENDIX A

Transfer Volumetric Flow Rates:

Sulfur density = 112 lbs/ft^3

Loading tank flow = 448 ton/hr X 2,000 lb/ton X 1/60 hr/min X 1/112 ft^3/lb

= 133.3 ft^3/min

Unloading tank flow = 130 ton/hr X 2,000 lb/ton X 1/60 hr/min X 1/112 ft^3/lb

= 38.7 ft^3/min

Transfer Times:

Loading tank time = 46%/100 X 525,000 tons/yr X 1/448 hr/ton

= 539.1 hrs/yr

Unloading tank time = 54%/100 X 525,000 tons/yr X 1/130 hr/ton

= 2,180.8 hrs/yr

Idle time = 8,760 hr/yr - 539.1 hr - 2,180.8 hr

= 6,040.1 hr/yr

Ventilation Rates:

Natural ventilation estimated at 18 CFM/vent

Loading tank = 18 CFM/vent X 9 vents + 133.3 CFM

= 295.3 CFM

Unloading tank = 18 CFM/vent X 9 vents - 38.7 CFM

= 123.3 CFM

Idle tank = 18 CFV/vent X 9 vents

= 162 CFM

EMISSIONS

Particulate Sulfur:

Emission factors used for calculations are in APPENDIX A

Loading tank = 295.3 CFM X 60 min/hr X 0.2 grain/ft^3 X 1/7,000 lb/grain

= 0.506 lb/hr

Yearly = 0.506 lb/hr X 539.1 hr/yr X 1/2,000 ton/lb

= 0.136 TPY

Unloading tank = 123.3 CFM X 60 min/hr X 0.2 grain/ft^3 X 1/7,000 lb/grain

= 0.211 lb/hr

Yearly = 0.211 lb/hr X 2180.8 hr/yr X 1/2,000 ton/lb

= 0.230 TPY

Idle tank = 162 CFM X 60 min/hr X 0.2 grain/ft^3 X 1/7,000 lb/grain

= 0.278 lb/hr

Yearly = 0.278 lb/hr X 539.1 hr/yr X 1/2,000 ton/lb

= 0.839 TPY

Total annual emissions = 0.136 + 0.230 + 0.839 = 1.21 TPY

It can be seen from this analysis that the emissions are a function of the net amount of air exhausted from the tank since it is assumed that the tank does not gain or lose inventory from year to year; therefore, the air forced out of the tank from filling equals the air drawn into the tank from emptying and the net result is the same as an idle tank for the full 8,760 hour period.

Idle tank emissions = 0.278 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

= **1.21** TPY

FARMLAND INDUSTRIES INC.

JOB 6,000 Ton Storage Tank
CALCULATED BY C. W. Jenkins
DATE: 12/9/90
SHEET NO. 3 OF 3

TRS (as H_2S):

Loading tank = 295.3 CFM X 60 min/hr X 3.5×10^{-5}/ft^3

= 0.620 lb/hr (max. rate)

Idle tank = 162 CFM X 60 min/hr X 3.5×10^{-5}/ft^3

= 0.340 lb/hr

Total annual emissions = 0.340 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

= 1.489 TPY

SO_2:

Loading tank = 295.3 CFM X 60 min/hr X 7.3×10^{-5}/ft^3

= 1.293 lb/hr (max. rate)

Idle tank = 162 CFM X 60 min/hr X 7.3×10^{-5}/ft^3

= 0.710 lb/hr

Total annual emissions = 0.710 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

= 3.108 TPY

VOC:

Loading tank = 295.3 CFM X 60 min/hr X 5.2×10^{-5}/ft^3

= 0.921 lb/hr (max. rate)

Idle tank = 162 CFM X 60 min/hr X 5.2×10^{-5}/ft^3

= 0.505 lb/hr

Total annual emissions = 0.505 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

= 2.214 TPY

2, 500 TON STORAGE TANKS

STATE OF FLORIDA

DEPARTMENT OF EMVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex COUNTY: Polk

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) 2,500 Ton Storage Tanks

Farmland has two 2,500 ton molten sulfur storage tanks located near what was Sulfuric Acid Plant No. 2. Each tank is 45 feet in diameter and 32 feet 5 inches high at the top of the sidewall. Both tanks have two 20 inch diameter natural draft vents located near the center of the roof and eight 10 inch diameter rim roof vents.

The tanks receive approximately 502,500 TPY of molten sulfur (maximum of 525,000 tons) from the rail car pit at a rate of 130 TPH and 167,500 TPY (maximum of 175,000 tons) from the truck pit at a rate of 167 TPH. The total sulfur thru-put is distributed equally between the two tanks.

Approximately 43 % of the sulfur drains from these tanks into the Sulfuric Acid Supply pit No. 5 (formerly pit No. 1) at a maximum rate of 36.1 TPH, average rate of 32.8 TPH. The balance of the sulfur is drained into the Sulfuric Acid Plants No. 3 and No. 4 sulfur supply pit at a maximum rate of 48.1 TPH, average rate of 43.7 TPH.

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

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

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram
Molten Sulfur	None		350,000 TPY	Max. Annual Thru-put
			65 TPH from	each tank rail pit to storage
			83.5 TPH from	each tank truck pit to storage
			42.3 TPH to	each tank plants from each tank

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

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

2. Product Weight (lbs/hr): NA

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] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/hr	Potential[4] Emission T/yr	Rate to flow Diagram
Part. Matter	0.332	1.359	17-2.600(11)	NA	0.332	1.359	
TRS (H_2S)	0.406	1.665	NA	NA	0.406	1.665	
SO_2	0.848	3.473	NA	NA	0.848	3.473	
VOC	0.604	2.474	NA	NA	0.604	2.474	

[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 standards.

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

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

Annual Average NA Maximum _____

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

None

Two Center Vents/Eight Rim Vents per Tank

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

Stack Height: 40/37 ft. Stack Diameter: 1.67/0.83 ft.

Gas Flow Rate: 18 (each) ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 0.14/0.55 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incinerator

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) _____

DER Form 17-1.202(1)
Effective November 30, 1982

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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 preasure drop, etc.)
   NA
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).
   NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

FARMLAND INDUSTRIES INC.

JOB 2,500 Ton Tanks (Each)
CALCULATED BY C. W. Jenkins
DATE: 12/10/90
SHEET NO. 1 OF 3

Emissions factors are based on APPENDIX A

Transfer Volumetric Flow Rates:

Sulfur density = 112 lbs/ft^3

Loading tank from rail car pit
= 65 ton/hr X 2,000 lb/ton X 1/60 hr/min X 1/112 ft^3/lb

= 19.3 ft^3/min (per tank)

Loading tank from truck pit
= 83.5 ton/hr X 2,000 lb/ton X 1/60 hr/min X 1/112 ft^3/lb

= 24.9 ft^3/min (per tank)

Unloading tank to supply pits
= (16.4 to No. 5 + 21.9 to No. 3 & 4) ton/hr ave. X 2,000 lb/ton X 1/60 hr/min X 1/112 ft^3/lb

= 11.4 ft^3/min

Transfer Times:

Loading tank time
From rail car pit = 262,500 max. tons/yr X 1/65 hr/ton

= 4,038.5 hrs/yr

From truck pit = 87,500 max. tons/yr X 1/83.5 hr/ton

= 1,047.9 hrs/yr

Tank unloading time is considered to be equal to the plant operating factor of 95 % or in other words the tank is idle 5 % of the time.

Idle time = (5/100) X 8,760 hr/yr = 438 hr

Tank emptying only time = 8,760 hr/yr - 4,038.5 hr - 1,047.9 hr - 438 hr

= 3,235.6 hr/yr

Ventilation Rates:

Natural ventilation estimated at 18 CFM/vent

Idle tank = 18 CFM/vent X 10 vents = 180 CFM

Tank emptying = 180 CFM - 11.4 CFM = 168.6 CFM

Tank loading from rail pit while emptying
= 168.6 CFM + 19.3 CFM = 187.9 CFM

Tank loading from truck pit and emptying
= 168.6 CFM + 24.9 CFM = 193.5 CFM

Total ventilation = 180 CFM X 60 min/hr X 438 hrs
+ 168.6 CFM X 60 min/hr X 3,235.6 hrs
+ 187.9 CFM X 60 min/hr X 4,038.5 hrs
+ 193.5 CFM X 60 min/hr X 1,047.9 hrs

= 95,157,897.6 ft^3/year

Maximum ventilation = 193.5 CFM X 60 min/hr = 11,610 ft^3/hr

EMISSIONS

Particulate Sulfur:

Emission factors used for calculations are in APPENDIX A

Yearly = 95,157,897.6 ft^3/year X 0.2 grain/ft^3 X
1/7,000 lb/grain X 1/2,000 ton/lb

= 1.359 TPY (each tank)

Maximum rate = 11,610 ft^3/hr X 0.2 grain/ft^3 X
1/7,000 lb/grain

= 0.332 lb/hr

TRS (as H_2S):

Total annual emissions = 95,157,897.6 ft^3/year X $3.5x10^{-5}$ lb/ft^3 X 1/2,000 ton/lb

= 1.665 TPY (each tank)

Maximum rate = 11,610 ft^3/hr X $3.5x10^{-5}$ lb /ft^3

= 0.406 lb/hr

SO_2:

Total annual emissions = 95,157,897.6 ft^3/year X $7.3x10^{-5}$ lb/ft^3 X 1/2,000 ton/lb

= 3.473 TPY (each tank)

Maximum rate = 11,610 ft^3/hr X $7.3x10^{-5}$ lb /ft^3

= 0.848 lb/hr

VOC:

Total annual emissions = 95,157,897.6 ft^3/year X $5.2x10^{-5}$ lb/ft^3 X 1/2,000 ton/lb

= 2.474 TPY (each tank)

Maximum rate = 11,610 ft^3/hr X $5.2x10^{-5}$ lb /ft^3

= 0.604 lb/hr

SUPPLY PIT NO. 5

STATE OF FLORIDA

DEPARTMENT OF EMVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex COUNTY: Polk

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) Supply Pit No. 5

Supply Pit No. 5 has a capacity of 31 tons and transfers molten sulfur from the two 2,500 ton storage tanks to Sulfuric Acid Plant No. 5 at an average rate of 32.8 TPH, maximum rate of 36.1 TPH. An average of 287,100 tons per year of sulfur are transferred through the pit.

The pit is 8 feet long, 10 feet wide and 7 feet deep. It is covered with aluminum plate and has one 4 inch diameter natural draft vent exhausting at 10 feet above grade. There is always molten sulfur in the pit under normal conditions, and the level is maintained constant by automatic level control.

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		
Molten Sulfur	None		300,000 TPY	Max. Annual Thru-put
			36.1 TPH from	pit to Acid Plant No. 5
				maximum

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

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

2. Product Weight (lbs/hr): NA

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		Rate to flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Part. Matter	0.031	0.14	17-2.600(11)	NA	0.031	0.14	
TRS (H_2S)	0.038	0.17	NA	NA	0.038	0.17	
SO_2	0.079	0.35	NA	NA	0.079	0.35	
VOC	0.056	0.25	NA	NA	0.056	0.25	

[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 standards.

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

_____

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

Annual Average NA Maximum _____

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

None

_____

_____

_____

1 Vent

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

Stack Height: 10 ft. Stack Diameter: 0.33 ft.

Gas Flow Rate: 18 ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 3.4 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

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: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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.)
   NA
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).
   NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

FARMLAND INDUSTRIES INC.

JOB Supply Pit No. 5
CALCULATED BY C. W. Jenkins
DATE: 12/11/90
SHEET NO. 1 OF 1

The supply pit has one vent with no forced draft. Sulfur is always in the pit. Emission factors are based on the data presented in Appendix A.

Ventilation Rate = (approx.) 18 ft^3/min/vent (natural)

Transfer time = 8,760 hr/yr

EMISSIONS

1. Sulfur Particulate = 18 CFM/vent X 1 vent X 60 min/hr X 0.2 grain/ft^3 X 1/7,000 lb/grain

   = 0.031 lb/hr

   Yearly = 0.031 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

   = 0.14 TPY

2. TRS (as H_2S) = 18 CFM/vent X 1 vent X 60 min/hr X 3.5×10^{-5} lbs/ft^3

   = 0.038 lb/hr

   Yearly = 0.038 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

   = 0.17 TPY

3. SO_2 = 18 CFM/vent X 1 vent X 60 min/hr X 7.3×10^{-5} lbs/ft^3

   = 0.079 lb/hr

   Yearly = 0.079 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

   = 0.35 TPY

4. VOC = 18 CFM/vent X 1 vent X 60 min/hr X 5.2×10^{-5} lbs/ft^3

   = 0.056 lb/hr

   Yearly = 0.056 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

   = 0.25 TPY

SUPPLY PIT NO. 3 / NO. 4

STATE OF FLORIDA

DEPARTMENT OF EMVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex COUNTY: Polk

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) Supply Pit No. 3/ No. 4

Supply Pit No. 3 / No. 4 has a capacity of 28 tons and transfers molten sulfur from the 2,500 ton storage tanks to Sulfuric Acid Plants No. 3 and No. 4 at a combined rate of approximately 43.7 tons per hour and a maximum of 48.1 tons per hour. About 382,900 tons per year of sulfur are transferred through this pit.

The pit is 8 feet 8 inches long, 8 feet 2 inches wide and 7 feet deep. It is covered with aluminum plate and has one 6 inch diameter natural draft vent at 10 feet above grade. There is always molten sulfur in the pit under normal conditions, and the level is maintained constant by an automatic level controller.

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		
Molten Sulfur	None		400,000 TPY	Max. Annual Thru-put
			48.1 TPH from	pit to Acid Plants No. 3
				and No. 4 maximum

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

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

2. Product Weight (lbs/hr): NA

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		Rate to flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Part. Matter	0.031	0.14	17-2.600(11)	NA	0.031	0.14	
TRS (H_2S)	0.038	0.17	NA	NA	0.038	0.17	
SO_2	0.079	0.35	NA	NA	0.079	0.35	
VOC	0.056	0.25	NA	NA	0.056	0.25	

[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 standards.

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

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

Annual Average NA Maximum _____

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

None

1 Vent

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

tack Height: 10 ft. Stack Diameter: 0.50 ft.

as Flow Rate: 18 ACFM - DSCFM Gas Exit Temperature: 200 °F.

ater Vapor Content: 2-3 % Velocity: 1.53 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

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)							

escription of Waste _____

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

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

anufacturer_____

ate Constructed _____ Model No. _____

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

tack Height: _____ ft. Stack Diameter: _____ Stack Temp._____

as 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.

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

[ ] Other (specify)_____

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
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   (See Section IIA)
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.
   (See Section IIA)

FARMLAND INDUSTRIES INC.

JOB Supply Pit No. 3 & 4
CALCULATED BY C. W. Jenkins
DATE: 12/11/90
SHEET NO. 1 OF 1

The supply pit has one vent with no forced draft. Sulfur is always in the pit. Emission factors are based on the data presented in Appendix A.

Ventilation Rate = (approx.) 18 ft^3/min/vent (natural)

Transfer time = 8,760 hr/yr

EMISSIONS

1. Sulfur Particulate = 18 CFM/vent X 1 vent X 60 min/hr X 0.2 grain/ft^3 X 1/7,000 lb/grain

= 0.031 lb/hr

Yearly = 0.031 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

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= 0.038 lb/hr

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= 0.17 TPY

3. SO_2 = 18 CFM/vent X 1 vent X 60 min/hr X 7.3×10^{-5} lbs/ft^3

= 0.079 lb/hr

Yearly = 0.079 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

= 0.35 TPY

4. VOC = 18 CFM/vent X 1 vent X 60 min/hr X 5.2×10^{-5} lbs/ft^3

= 0.056 lb/hr

Yearly = 0.056 lb/hr X 8,760 hr/yr X 1/2,000 ton/lb

= 0.25 TPY

BACT AND PSD
(NEITHER REQUIRED)

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

D. 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

NOT APPLICABLE

. 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

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

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

. 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:

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:

Explain method of determining efficiency.
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

NOT APPLICABLE

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

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)_____

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.

Applicants Maximum Allowable Emisaion Data

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

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.

Attach all other information supportive to the PSD review.

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.

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.

APPENDIX A

EMISSION FACTORS FOR SULFUR PARTICLES, TRS, SO_2 AND VOC IN MOLTEN SULFUR STORAGE AND HANDLING SYSTEMS

Sulfur particle emissions have been measured by Koogler & Associates (November 1988) from molten sulfur storage tanks in the phosphate chemical fertilizer industry. The measured sulfur particle concentrations in the gases vented from the storage tanks have ranged from 0.3-0.5 grains/ft^3. The higher concentrations were measured when the tanks were being filled with molten sulfur, and the lower concentrations when the tanks were idle. The average natural ventilation rates on multi-vent tanks were measured at about 18 cfm/vent.

Measurements of sulfur particle emissions at the Pennzoil terminals in Tampa, Florida, in October 1986 by Enviroplan were measured at 0.46 grains/ft^3 (NOTE: Data was corrected by Koogler and comments were transmitted to FDER, December 30, 1986). However, later tests conducted by Enviroplan (1987) at Sulfur Storage Company, Inc. in Tampa, Florida, measured sulfur particle concentrations at 0.12 grain/ft^3. It is believed that the Pennzoil tests and the Koogler tests during tank filling could contain condensed organics. Enviroplan (1987) indicated the total particulate concentrations including condensible hydrocarbons could be 2.5 times the sulfur particulate concentration.

Therefore, a reasonable estimate of sulfur particle concentration under all conditions is:

$$(0.3 + 0.12)/2 = 0.2 \text{ grains/ft}^3$$

Air vented from molten sulfur storage tanks and pits is also expected to contain small quantities of total reduced sulfur compounds, including H_2S (TRS), sulfur dioxide and volatile organic compounds (VOCs). The volatile organic compounds result from small quantities of petroleum products contained in Frasch sulfur (approximately 0.25%) and the vaporization of these compounds at the storage temperature of molten sulfur. The reduced sulfur compounds result from the reduction of elemental sulfur in the presence of carbon supplied by the petroleum products and the SO_2 results from the oxidation of elemental sulfur.

A limited number of measurements have been made on molten sulfur storage tanks at Frasch sulfur terminals in the Tampa area to determine TRS, SO_2, and VOC concentrations in the headspace of the tanks over molten sulfur. These measurements have been made on molten sulfur storage tanks with capacities in the range of 10,000 tons which are air purged at rates between 10 and 63 cfm to prevent the accumulation of H_2S. Because of the size of the tanks, the fact that they are air purged and the fact that sulfur delivered to the Port of Tampa most probably has a higher fraction of VOCs (due to the fact that there has been less time for the volatile fraction of the petroleum products to vaporize), measurements made in Tampa will overestimate TRS, SO_2 and VOC emissions from phosphate chemical fertilizer facilities which later receive the sulfur. However, as no other

data is available, the Tampa data will be used to estimate TRS (including H_2S), SO_2 and VOC emissions factors for molten sulfur storage tanks and molten sulfur pits. It should be recognized that the application of these emission factors will overstate the actual emissions by some unknown amount.

Measurements of TRS made in November 1983 by TRC and reported in the FDER "Sulfur Report" (February 1984) show the following:

Tank Purge Rate (CFM)	TRS (as H2S) in Headspace Over Molten Sulfur (ppm, vol)
43	280
63	403

Measurements made by Enviroplan, Inc. in 1987 in the headspace over molten sulfur in a tank purged at the rate of 10 cfm showed an average TRS concentration of 638 ppm (vol).

A "typical" concentration of TRS (as H_2S) in the headspace over molten sulfur can be estimated from these data:

$$[280 + 403 + 2(638)]/4 = 490 \text{ ppm (vol)}$$

$$= 3.5 \times 10^{-5} \text{ lb/ft}^3 \text{ at } 200^{\circ}\text{F}$$

Measurements of SO_2 made by TRC (1983) in the tank headspace over molten sulfur at purge rates of 43 and 63 cfm averaged 553 ppm (vol). This converts to an SO_2 concentration of 7.3×10^{-5} lb/ft^3 at 200°F.

Measurements made by Enviroplan, Inc. (1987) in the tank headspace over molten sulfur at STI in Tampa showed VOC concentrations that averaged 5.2×10^{-5} lb/ft^3.

Table 1 summarizes the above emission factors for molten sulfur storage and handling systems.

TABLE 1
SUMMARY OF EMISSION FACTORS FOR
MOLTEN SULFUR STORAGE AND
HANDLING SYSTEMS

Air Pollutant	Emission Factor
Sulfur Particle	0.2 grains/ft^3
TRS (as H_2S)	3.5×10^{-5} lb/ft^3
SO_2	7.3×10^{-5} lb/ft^3
VOC	5.2×10^{-5} lb/ft^3

REFERENCES

1. "Preliminary Report on Emissions From Tank No. 4 at Sulfur Terminal Co.,Inc., Tampa, Florida." TRC Environmental Consultants, Inc., East Hartford, Connecticut, December 30, 1983.

2. "Sulfur Report." Bureau of Air Quality Management, Florida Department of Environmental Regulation, Tallahassee, Florida, February 1984.

3. "Sulfur Particulate Emission Measurement Project at the Pennzoil Terminals in Tampa, Florida." Enviroplan, Inc., West Orange, New Jersey, October 1986.

4. Comments in a letter dated December 30, 1986, by Dr. John Koogler, Koogler & Associates to Mr. Steve Smallwood, FDER, on Enviroplan's Pennzoil Sulfur Company emission measurement report.

5. "Technical Report Supporting Application to the Florida DER For An Alternate Sulfur Particulate Emissions Sampling Procedure." Enviroplan, Inc., West Orange, New Jersey, October 30, 1987.

6. "Particulate Matter Emission Measurements From Molten Sulfur Storage Tanks at Gardinier, Inc., Tampa, Florida." Koogler & Associates, Gainesville, Florida, November 7-8, 1988.

7. Discussions with Enviroplan, Inc. at a meeting in New Orleans, Louisiana, on July 6, 1989. Enviroplan supplied measurement data on TRS and VOC concentrations in the headspace over molten sulfur storage tanks at the Sulfur Terminals Company, Inc. in Tampa, Florida, for testing which was conducted during September 1987.

Farmland Fertilizer/Ag Chemical

Farmland Industries, Inc.
Fertilizer Phosphate Manufacturing
County Road 640
Post Office Box 960
Bartow, Florida 33830-0960
Telephone: 813 533-1141
Facsimile: 813 533-8793

November 30, 1990

Mr. C. H. Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: AC53-169874

Dear Mr. Fancy:

Farmland applied for and received a construction permit for our molten sulfur storage and handling system (AC53-169874). This past August we applied for an operating permit for this same system. The application was sent to the Southwest District Office and they have advised us that the permit only allows 1310 ton of sulfur per day to be unloaded thru this system. At the suggestion of Mr. Bill Thomas, could you make an editorial change to the existing construction permit that would allow the daily average of 1310 per day to be based on a yearly maximum. Our current unloading rate is not constant on a daily basis and it is very difficult to unload to an exact tonnage each day.

Farmland is in the process of starting up our new #5 Cogeneration Sulfuric Acid Plant. Although we are shutting down our old #1 Plant we will need to unload additional sulfur.

Farmland is also requesting that you extend the construction permit for six months in order for us to apply for a modification of this construction permit that would allow for additional sulfur unloading and storage.

Our current permit expires on January 1, 1991 so you can see our need to be expeditious.

Thank you very much and if you have any questions, please give me a call.

Very truly yours,

C. G. Meier
Administrator
Environmental Services

CGM:pm

pc: Merle Farris
John Reynolds

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

Interoffice Memorandum

TO: Steve Smallwood

FROM: Clair Fancy

DATE: December 19, 1990

SUBJ: Amendment to Construction Permit No. AC 53-169874
Farmland Industries, Inc.

Attached for your approval and signature is a letter extending the expiration date for the above permit.

The Bureau recommends approval of this amendment.

CF/JR/plm

Attachment

118

OK
BA

Farmland Fertilizer/Ag Chemical

Farmland Industries, Inc.
Fertilizer Phosphate Manufacturing
County Road 640
Post Office Box 960
Bartow, Florida 33830-0960
Telephone: 813 533-1141
Facsimile: 813 533-8793

November 30, 1990

Mr. C. H. Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

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C. G. Meier
Administrator
Environmental Services

CGM:pm

pc: Merle Farris
John Reynolds
M. Baig
B. Thomas, SW Dist

Farmland Fertilizer/Ag Chemical

CERTIFIED
P 271 140 292
MAIL

BARTOW NOV 30 '90 FLA

U.S POSTAGE 2.00 METER 5112534

Farmland Industries, Inc.
Fertilizer Phosphate Manufacturing
County Road 640
Post Office Box 960
Bartow, Florida 33830-0960

Mr. C. H. Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

December 20, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert Honse, General Manager
Farmland Industries
Post Office Box 960
Bartow, Florida 33603

Dear Mr. Honse:

Re: Permit No. AC 53-169874 (Molten Sulfur Storage & Handling System)

The Department received Farmland's November 30 letter requesting an extension of the expiration date for the above permit. The request is acceptable and the following shall be changed:

Expiration Date:

FROM: January 1, 1991
TO: June 30, 1991

Attachment to be Incorporated:

Farmland's letter dated November 30, 1990.

During a telephone conversation with Charles Jenkins on December 5, Farmland agreed to re-address their other concerns regarding further modification of this permit at a later date.

This letter must be attached to the above construction permit (AC 53-169874) and shall become an attachment to the permit.

Sincerely,

STEVE SMALLWOOD, P.E.
Director
Division of Air Resources Management

SS/JR/plm

c: W. Thomas, SW District
G. Meier, Farmland

P 407 852 944

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Robert Honse	
Street and No. Garrland Ind.	
P.O. State and ZIP Code P.O. Box 960	
Postage Bartow, Fl 33603	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 12-21-90 AC53-169874	

PS Form 3800, June 1985 ☆U.S.G.P.O. 1989-234-555

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. Robert Honse, Gen. Mgr.
Garrland Industries
P.O. Box 960
Bartow, Fl 33603

4. Article Number
P 407 852 944

Type of Service:
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X Linda Thompson

6. Signature — Agent
X

7. Date of Delivery
1-2-91

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 ★U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

Check Sheet

→P 4/20

Company Name: Farmland Industries, Inc.
Permit Number: AC53-169874
PSD Number:
County: Polk
Permit Engineer:
Others involved:

operation
APD
Resp

Application:
- [x] Initial Application
- [ ] Incompleteness Letters
- [ ] Responses
- [ ] Final Application (if applicable)
- [ ] Waiver of Department Action
- [ ] Department Response
- [ ] Other

Intent:
- [x] Intent to Issue
- [x] Notice to Public
- [x] Technical Evaluation
- [ ] BACT Determination
- [x] Unsigned Permit
- [ ] Correspondence with:
  - [ ] EPA
  - [ ] Park Services
  - [ ] County
  - [ ] Other
- [x] Proof of Publication
- [ ] Petitions - (Related to extensions, hearings, etc.)
- [ ] Other

Final Determination:
- [x] Final Determination
- [x] Signed Permit
- [ ] BACT Determination
- [ ] Other

Post Permit Correspondence:
- [x] Extensions
- [ ] Amendments/Modifications
- [ ] Response from EPA
- [ ] Response from County
- [ ] Response from Park Services
- [ ] Other

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

№ 76176

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from Farmlands Industries, Inc. Date Aug. 13, 1987

Address P.O. Box 960, Bartow, FL 33830 Dollars $ 1,000.00

Applicant Name & Address Robert W. Horne, General Manager / address same as ab..

Source of Revenue ✓#69939919

Revenue Code 001031 Application Number AC 53-138041

By Maggie Jones

---

16 69 F0346 Florida Department of

CO. BR. VENDOR NO. VENDOR NAME

REMITTANCE ADVICE **1958** CHECK NUMBER 69939919

DESCRIPTION	P.O.	VOUCHER	INVOICE NO.	INV. DATE	INVOICE AMOUNT	DISCOUNT TAKEN	AMOUNT PAID
			8787	08 07 87	1,000.00		1,000.00
			TOTALS				

FARMLAND INDUSTRIES, INC.
P.O. BOX 960
BARTOW, FL. 33830

FII-6310(04/83)

CO. BR. VENDOR NO.	VENDOR NAME							
DESCRIPTION	P.O.	VOUCHER	INVOICE NO.	INV. DATE	INVOICE AMOUNT	DISCOUNT TAKEN	AMOUNT PAID
			8787	08 07 87	1,000.00		1,000.00
				TOTALS			

FARMLAND INDUSTRIES, INC.
P.O. BOX 960
BARTOW, FL. 33830

FII-6310(04/83)

COOP

FARMLAND INDUSTRIES, INC.
GREEN BAY PLANT
P.O. Box 960
Bartow, Florida 33830

1958

CHECK NO. 69939919

80-95
1012

CHECK AMOUNT
*******1,000.00

PAY EXACTLY******1,000 DOLLARS AND 00 CENTS

69 F0346 08/07/87
CO. BR. VEND. NO. CHECK DATE

UNITED MISSOURI BANK OF
CARTHAGE, MO.

FARMLAND INDUSTRIES, INC.

PAY TO THE ORDER OF
FLORIDA DEPARTMENT OF
ENVIROMNENTAL REGULATION
2600 BLAIR STONE RD
TALLAHASSEE FL 32399

[redacted]

In response to the advice received, we have made an attempt to provide complete and accurate information in order to expedite the permitting process.

The equipment and installation, while it is a relatively small operation, represents a major investment for Farmland while we are still attempting to climb out of the 6 year phosphate depression. A significant part of the initial investment can be recovered if we can produce green SPA for the Spring fertilizer season. To accomplish this would require a plant

DER
AUG 12 1987
BAQM

1031

RECEIVED
DER - MAIL ROOM
1987 AUG 11 AM 10: 04

FII-404 (09/79)

FARMLAND INDUSTRIES, INC
post office box 960 / bartow, florida 33830

January 30, 1990

Ms. Patty Adams
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Patty,

As per our phone conversation of January 29, 1990, I am enclosing a copy of our letter to Mr. Garrity at the DER branch in Tampa and the Affidavit concerning the public notice published in the Lakeland Ledger.

Any questions or further information needed, please give me a call.

Sincerely,

Charles Jenkins
Environmental Coordinator

CJ:pm

COOP

FARMLAND INDUSTRIES, INC.

post office box 960 / bartow, florida 33830

December 6, 1989

Dr. Richard D. Garrity
District Manager
Department of Environmental Regulation
4520 Oak Fair Blvd.
Tampa, Florida 33610-7347

Dear Dr. Garrity,

Pursuant to Section 403.815, Florida Statutes and DER Rule 17-103.150 Florida Administrative Code, the Notice of Intent To Issue has been published in a major, local newspaper. This newspaper is generally circulated in the County in which the project is located. A certified copy of the publication is attached.

If you have any questions, please give me a call.

Very truly yours,

C. Gene Meier
Administrator
Environmental Services

CGM:dr
Attachment

CC: Merle Farris

CGM-115-89

II-404 (09/79)

AFFIDAVIT OF PUBLICATION

THE LEDGER

Lakeland, Polk County, Florida

Case No.....

STATE OF FLORIDA)
COUNTY OF POLK)

Before the undersigned authority personally appeared Stephen DeWitt, who on oath says that he is Controller of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida; that the attached copy of advertisement, being a .....

Notice of Intent

.....

In the matter of .....

Molten Sulfur

.....

In the .....

.....

Court, was published in said newspaper in the issues of .....

November 22, 1989

.....

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signed ..... Stephen DeWitt
Controller

Sworn to and subscribed before me this 22nd

day of November A.D. 19 89

(Seal) Barbara Hudspeth
Notary Public

My Commission Expires ..... NOTARY PUBLIC, STATE OF FLORIDA.
MY COMMISSION EXPIRES NOV. 14, 1990.
BONDED THRU NOTARY PUBLIC UNDERWRITERS.

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Farmland Industries, Inc., Post Office Box 960, Bartow, FL 33830, for the existing molten sulfur storage and handling system located at Farmland's Green Bay Complex in Bartow, Polk County, Florida. A determination of the Best Available Control Technology (BACT) was not required. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petition er received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel of the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28S.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Southwest District Office
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.

K-634 — 1122: 1989

P 938 762 748

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NDT FDR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. C. M. Farris, Farmland Ind.	
Street and No. P. O. Box 960	
P.O., State and ZIP Code Bartow, FL 33830	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 11-14-89 Permit: AC 53-169874	

PS Form 3800, June 1985

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to: Mr. C. M. Farris Farmland Industries, Inc. P. O. Box 960 Bartow, FL 33830	4. Article Number P 938 762 748 Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature — Address X Jean Hucks	8. Addressee's Address *(ONLY if requested and fee paid)*
6. Signature — Agent X	
7. Date of Delivery 11/16/89	

PS Form 3811, Mar. 1988 * U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

November 16, 1989

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. C. M. Farris
Farmland Industries, Inc.- Green Bay
Post Office Box 960
Bartow, Florida 33830

Dear Mr. Farris:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Farmland's molten sulfur storage and handling system in Bartow, Polk County, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Regulation.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/pr

Attachments

cc: B. Thomas, SW District
R. Tedder, P.E.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Farmland Industries, Inc.- Green Bay DER File No. AC 53-169874
Post Office Box 960
Bartow, FL. 33830

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Farmland Industries, Inc., applied on September 5, 1989, to the Department of Environmental Regulation for a construction permit for the existing molten sulfur storage and handling system located at Farmland's facility in Bartow, Polk County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit is required for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at the address specified within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the applicant have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such

person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copies furnished to:

B. Thomas, SW District
R. Tedder, P.E.

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 11-14-89.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Lynn Deken — Clerk

11-14-89 — Date

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Farmland Industries, Inc., Post Office Box 960, Bartow, FL 33830, for the existing molten sulfur storage and handling system located at Farmland's Green Bay Complex in Bartow, Polk County, Florida. A determination of the Best Available Control Technology (BACT) was not required. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

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(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
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Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Southwest District Office
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.

Technical Evaluation
and
Preliminary Determination

Farmland Industries, Inc.
Green Bay Complex
Bartow, Polk County, Florida

Molten Sulfur Storage and Handling System

Permit Number: AC 53-169874

Florida Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

November 16, 1989

I. Application

A. Applicant

Farmland Industries, Inc.
P. O. Box 960
Bartow, Florida 33830

B. Project and Location

The applicant proposes to permit the existing molten sulfur storage and handling system at Farmland's Green Bay phosphate processing facility in Bartow, Polk County, Florida.

The UTM coordinates of this facility are Zone 17, 409.5 km East and 3079.5 km North.

C. Facility Category

Farmland's facility is major in accordance with Rule 17-2.100 of the Florida Administrative Code (F.A.C.). The molten sulfur storage and handling system consists of several existing minor sources within the facility. The Standard Industrial Classification (SIC) Code is Industry No. 2819, Sulfuric Acid/Phosphate Processing.

The NEDs Source Classification Code (SCC) is 3-01-070-02, Storage and Transfer, Industrial Inorganic Chemicals Production.

Farmland applied for a construction permit on September 5, 1989, and the application was deemed complete.

II. Project Description

Farmland's molten sulfur storage and handling system consists of a rail and truck unloading system; one 91 short ton (ST) rail pit; one 72 ST truck pit; a 31 ST No. 1 supply pit; a 28 ST No. 3/4 supply pit; one 6000 ST molten sulfur storage tank; two 2500 ST storage tanks; and the associated transfer pumps and piping. All the molten sulfur received is used in the manufacture of sulfuric acid.

The molten sulfur is delivered by 100 ton capacity railcars, and 20 ton capacity trucks. Sulfur from the railcars is gravity fed to the rail receiving pit. Sulfur from the trucks is gravity fed to the truck receiving pit. All the molten sulfur from the rail pit is transferred to the 6000 ST storage tank. As needed, this sulfur is conveyed back through the rail pit to one of the two 2500 ST storage tanks. All of the sulfur received in the truck pit is transferred to one of the two 2500 ST tanks.

The molten sulfur is then pumped from these two molten sulfur storage tanks through the supply pits to the three sulfuric acid plants. The pits and the storage tanks are steam heated to keep the sulfur molten. Sulfuric acid plant No. 1 is rated at 800 tons per day (TPD) of 100% H_2SO_4. Plant No. 3 and 4 are rated at 1600 TPD of 100% acid each. An additional 800 TPD plant has been permanently shut down. At their combined maximum rated capacity of 4000 TPD 100% acid, the total sulfur requirement would be about 1310 TPD, 480,000 tons per year (TPY).

The size and venting configuration of the sources are:

Source	Cap. (ST)	Dimensions	Vents		
Tank 1	6000	65'dia.x 32'	1	center	24"
			8	rim	10"
Tanks 2 & 3 ea.	2500	45'dia.x 32'	2	center	20"
			8	rim	10"
Rail Pit	91	18'x18'x5'	1		10"
Truck Pit	72	25'x 8'x6'	1		8"
No.1 Supply Pit	31	8'x10'x7'	1		4"
No.3/4 Supply Pit	28	8'x 8'x7'	1		6"

The vent on the rail pit has forced ventilation provided by a 1650 cfm fan. The vents on the truck pit, the supply pits, and the storage tanks, have natural ventilation.

The emissions expected from the sulfur system are emissions of particulate matter (PM), including sulfur particulate (SP), particulates less than 10 microns in size (PM_{10}), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), reduced sulfur compounds (TRS), and volatile organic compounds (VOCs).

III. Rule Applicability

The existing Farmland facility is major in accordance with F.A.C. Rule 17-2.100. The molten sulfur storage and handling system will emit particulate matter and will be permitted in accordance with F.A.C. Rules 17-2 and 17-4; and, Chapter 403 of the Florida Statutes.

The facility is located in Polk County, an area designated as attainment for all the criteria pollutants, in accordance with F.A.C. Rule 17-2.420.

The project is not subject to the new source review requirements of F.A.C. Rule 17-2.500(5), Prevention of Significant Deterioration-Preconstruction Review Requirements, because the projected emissions do not exceed significance levels in Table 500-2.

The project is subject to F.A.C. Rule 17-2.520, Sources Not Subject to PSD or Nonattainment Requirements.

The project is subject to F.A.C. Rule 17-2.600(11), Specific Emission Limiting and Performance Standards for Sulfur Storage and Handling Facilities, which lists specific operational emission reduction procedures that are to be followed. Visible emissions (VE) will be limited to 20% opacity.

The project is subject to F.A.C. Rule 17-2.620, General Pollutant Emission Limiting Standards, which prohibits objectionable odors.

The project is subject to compliance testing and reporting requirements in accordance with F.A.C. Rule 17-2.700. Compliance testing for the sources shall be conducted using EPA Method 9 for visible emissions in accordance with F.A.C. Rule 17-2.700(6)(b)9. VE tests will be required to be conducted for every emission point in the sulfur system (every vent) for the initial compliance demonstration. Several emission points may be done simultaneously if possible within the requirements of EPA Method 9. The Department will require a retest at the time of operation permit renewals.

IV. Source Impact Analysis

A. Emission Limitations

The maximum emissions from the molten sulfur system are estimated to be as follows, based on test results from other similar sources:

Source		Expected Emissions				
		PM/PM_{10}	SP	SO_2	TRS/H_2S	VOC
Tank 1	lb/hr	0.9	0.5	1.2	0.6	0.9
6000 ST	TPY	2.4	1.2	3.1	1.1	2.2
Tanks 2&3	lb/hr	0.9	0.5	1.2	0.6	0.8
2500 ST ea.	TPY	2.7	1.4	3.5	1.6	2.5
Truck Pit	lb/hr	0.1	0.1	0.1	0.1	0.1
	TPY	0.3	0.1	0.4	0.2	0.3
Rail Pit	lb/hr	0.5	0.3	0.7	0.4	0.5
	TPY	2.5	1.2	3.2	1.5	2.3
Supply Pit	lb/hr	0.1	0.1	0.1	0.1	0.1
No. 1, 3/4 ea.	TPY	0.3	0.1	0.4	0.2	0.3

Visible emissions will be limited to 20% opacity.

40 TAC 5300053

B. Air Quality Impacts

The technical evaluation of this project determined that ambient air monitoring or modeling would not be required to provide reasonable assurance that Florida'a air quality standards would not be violated.

V. Conclusion

Based on the information provided by Farmland, the Department has reasonable assurance that the existing molten sulfur storage and handling system, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

PERMITTEE:
Farmland Industries, Inc.
Post Office Box 960
Bartow, FL 33830

Permit Number: AC 53-169874
Expiration Date: Jan. 1, 1991
County: Polk
Latitude/Longitude: 27°50'37"N
81°56'05"W
Project: Molten Sulfur Storage and Handling System

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. 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:

For the permitting of the molten sulfur storage and handling system consisting of a rail and truck unloading system; one 91 short ton (ST) rail pit; one 72 ST truck pit; a 31 ST No. 1 supply pit; a 28 ST No. 3/4 supply pit; one 6000 ST molten sulfur storage tank; two 2500 ST storage tanks; and the associated transfer pumps and piping. The molten sulfur system is located at Farmland's Green Bay Complex in Bartow, Polk County, Florida.

The UTM coordinates of this facility are Zone 17, 409.5 km East and 3079.5 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Farmland's application received September 9, 1989.
2. DER's Preliminary Determination dated November 16, 1989.

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-169874
Expiration Date: Jan. 1, 1991

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefor caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

GENERAL CONDITIONS:

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

GENERAL CONDITIONS:

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Farmland's molten sulfur storage and handling system shall be allowed to operate continuously (i.e. 8760 hours/year).

2. The maximum molten sulfur throughput rate shall neither exceed 1310 tons per day (TPD), nor 480,000 tons per year (TPY), based on the combined maximum rated sulfuric acid production rate of 4000 TPD 100% sulfuric acid for the three plants.

3. Visible emissions (VE) shall not exceed 20% opacity from any source in the molten sulfur system.

4. The permittee shall employ procedures to minimize emissions, from the molten sulfur system pursuant to the applicable requirements of F.A.C. Rule 17-2.600(11)(a) [Molten Sulfur Storage and Handling Facilities]. The permittee shall also comply with other applicable provisions of F.A.C. Rules 17-2 and 17-4.

5. No objectionable odors shall be allowed, in accordance with F.A.C. Rule 17-2.620(2) [Objectionable Odor Prohibited].

SPECIFIC CONDITIONS:

6. Initial compliance tests shall be conducted in accordance with the July 1, 1988, version of 40 CFR 60 Appendix A, using EPA Method 9, for visible emissions. For the storage tank vents and the sulfur pits' vents the tests shall be conducted while the tank and pits are being filled. VE tests shall be required again at the time of renewing the operation permits.

7. Any change in the method of operation, equipment or operating hours shall be submitted to DER's Southwest District office for approval.

8. For emission inventory and PSD purposes, the estimated maximum emissions from the sources in the molten sulfur storage and handling system are:

Source		Expected Emissions				
		PM/PM_{10}	SP	SO_2	TRS/H_2S	VOC
Tank 1	lb/hr	0.9	0.5	1.2	0.6	0.9
6000 ST	TPY	2.4	1.2	3.1	1.1	2.2
Tanks 2&3	lb/hr	0.9	0.5	1.2	0.6	0.8
2500 ST ea.	TPY	2.7	1.4	3.5	1.6	2.5
Truck Pit	lb/hr	0.1	0.1	0.1	0.1	0.1
	TPY	0.3	0.1	0.4	0.2	0.3
Rail Pit	lb/hr	0.5	0.3	0.7	0.4	0.5
	TPY	2.5	1.2	3.2	1.5	2.3
Supply Pit	lb/hr	0.1	0.1	0.1	0.1	0.1
No. 1, 3/4 ea.	TPY	0.3	0.1	0.4	0.2	0.3

9. A minimum of 15 days prior written notification of the compliance tests shall be given to DER's Southwest District office. The compliance test results shall be submitted to the Southwest District office within 45 days of test completion.

10. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation (BAR) prior to 60 days before the expiration of the permit (F.A.C. 17-4.090).

PERMITTEE:
Farmland Industries, Inc.

Permit Number: AC 53-169874
Expiration Date: Jan. 1, 1991

SPECIFIC CONDITIONS:

11. An application for an operation permit must be submitted to DER's Southwest District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. 17-4.220).

Issued this _____ day
of _____, 1989

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

_____
Dale Twachtmann, Secretary

Attachment 1 Available Upon Request

FARMLAND INDUSTRIES, INC.
post office box 960 / bartow, florida 33830

September 1, 1989

Mr. C. H. Fancy
Assistant Director
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy,

Enclosed are four (4) copies of a permit application for a molten sulfur system. Also enclosed is a check for $200.00 to cover the application fee. The potential emissions for TRS, SO2 and VOC are less than 25 tons per year therefore we are requesting a single permit for the entire molten sulfur system.

If you have any questions please give me a call.

Sincerely,

C. G. Meier

C. Gene Meier
Administrator,
Environmental Services

CGM: dr
Enclosures

cc: Pradeep Ravel - DER
Merle Farris

CGM-84-89

FARMLAND INDUSTRIES, INC.
GREEN BAY PLANT
P.O. Box 960
Bartow, Florida 33830

CHECK NO. 69956457

60-95
1012

CHECK AMOUNT
$*******200.00

16 69 F0346 08/31/89
CO. BR. VEND. NO. CHECK DATE

PAY EXACTLY $*******200 DOLLARS AND 00 CENTS

VOID AFTER 180 DAYS

UNITED MISSOURI BANK OF
CARTHAGE, MO.

FARMLAND INDUSTRIES, INC.

PAY
TO THE
ORDER
OF

FLORIDA DEPARTMENT OF
ENVIROMNENTAL REGULATION
2600 BLAIR STONE RD
TALLAHASSEE FL 32399

Carl E. Unger

$200 pd.
9-5-89
Rcpt. # 117654

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

AC 53-169874

APPLICATION TO ~~OPERATE~~/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex COUNTY: Polk

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) (See Attached Sections)

SOURCE LOCATION: Street State Road 640 West City Bartow

UTM: East 17-409.5 km North 3079.5 km

Latitude 27 ° 50 ' 37 "N Longitude 81 ° 56 ' 05 "W

APPLICANT NAME AND TITLE: C. M. Farris, General Manager, Phosphate Fertilizer Manufacturing

APPLICANT ADDRESS: P.O. Box 960, Bartow, FL 33830

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Farmland Industries, Inc.

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. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: C M Farris

C. M. Farris, General Manager
Name and Title (Please Type)

Date: 8/30/89 Telephone No. (813) 533-1141

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 have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[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 Richard B Tedder

Richard B. Tedder, P.E.

Name (Please Type)

Koogler & Associates, Environmental Services

Company Name (Please Type)

4014 N.W. 13th Street, Gainesville, Florida 32609

Mailing Address (Please Type)

Florida Registration No. 38846 Date: 8-29-89 Telephone No. (904) 377-5822

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.

See Attached Process Description

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

Start of Construction NA Completion of Construction NA

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.)

No Control

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

None

PROCESS DESCRIPTION

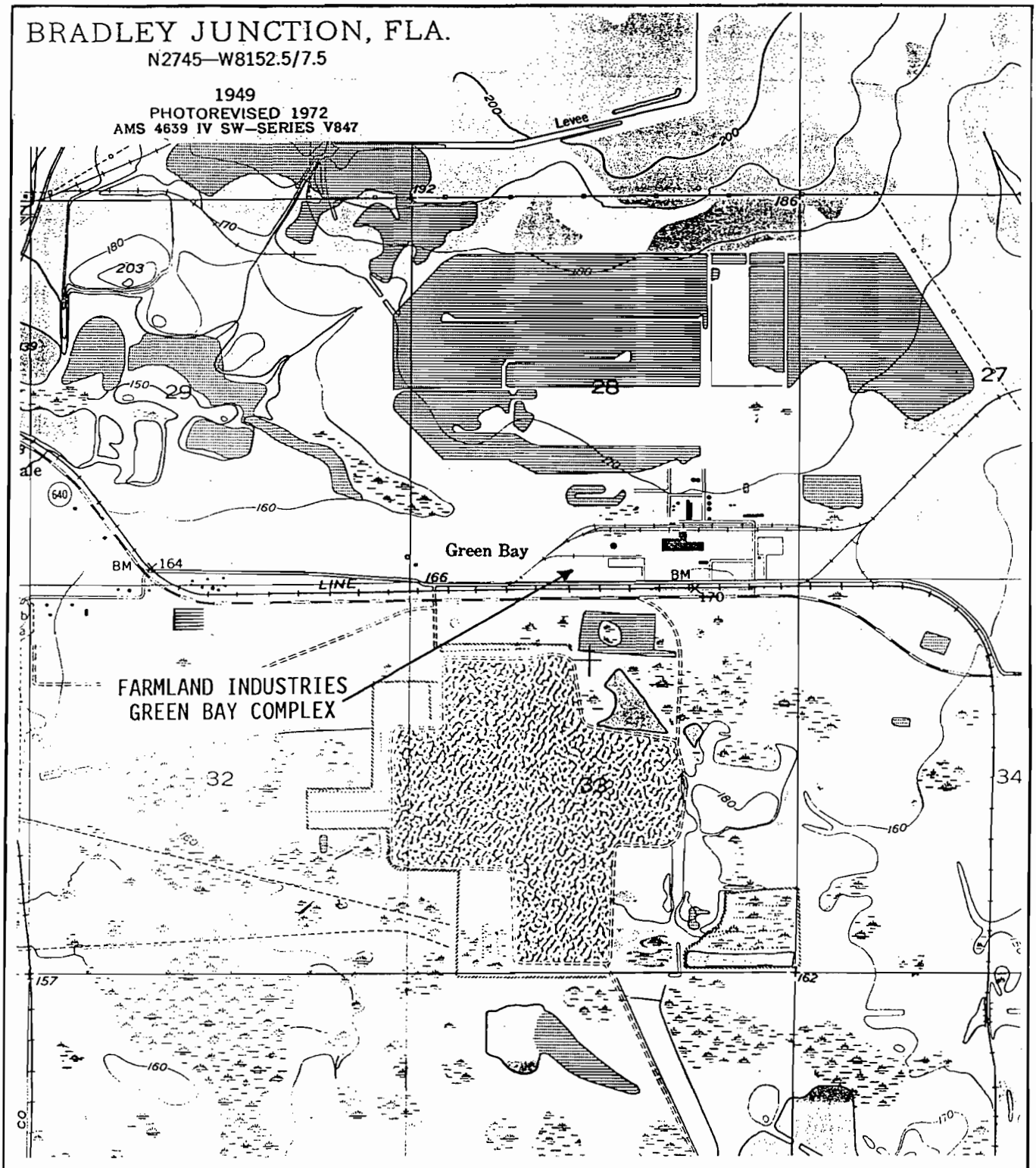
Farmland Industries, Inc. is located approximately six miles southwest of Bartow, Florida, on State Road 640 (see Figure 1). Farmland currently operates three sulfuric acid plants at the Green Bay Complex. Plants No. 3 and No. 4 are rated at 1600 short tons per day of 100 percent H_2SO_4 and Plant No. 1 is rated at 800 short tons per day. An additional 800 short tons per day plant (Plant No. 2) is on-site but has been permanently shutdown. Figure 2 shows the locations of the sulfuric acid plants and the sulfur storage tanks. The attached sulfur handling diagram (see Figure 3) is presented to clarify the operation of the sulfur system.

All of the sulfur used by Farmland is received in molten form. Approximately 67 percent (300,000 tons per year) is delivered by 100 ton rail cars to the rail car receiving pit. The balance, or 33 percent (150,000 tons per year), is delivered by truck to the truck receiving pit. All of the sulfur received at the rail car pit is transferred directly to a 6000 ton molten sulfur storage tank at a maximum rate of 400 tons per hour. As needed, this sulfur is transferred back through the rail car pit to one of the two 2500 ton storage tanks at a rate of approximately 120 tons per hour. All of the sulfur received at the truck pit is transferred to one of the two 2500 ton storage tanks at a rate of approximately 290 tons per hour.

Sulfur from the two 2500 ton storage tanks is transferred through the supply pits to the molten sulfur burners in the sulfuric acid plants. Approximately 22 percent (100,000 tons per year) of the total sulfur used is transferred to Sulfuric Acid Plant No. 1 through the No. 1 supply pit at a maximum rate of approximately 12 tons per hour. Approximately 78 percent (350,000 tons per year) of sulfur is transferred through the No. 3/No. 4 supply pit to Sulfuric Acid Plants No. 3 and No. 4 at a maximum rate of about 42 tons per hour.

During normal operations, all three sulfur pits contain molten sulfur. The approximate capacities of the rail car pit, truck pit, No. 1 supply pit, and No. 3/No. 4 supply pit are 91 tons, 72 tons, 31 tons and 28 tons, respectively. Through use of automatic level controllers, the liquid levels in all three pits are maintained fairly constant. Sulfur is pumped from the pits to the storage tanks and sulfuric acid plants. It flows by gravity from the storage tanks to the rail car pit and the supply pits. The gravity flow rate from the tanks is regulated by the pit automatic level controllers.

The sources of emissions addressed in this permit application are the only sources associated with the Farmland molten sulfur handling system.



FLORIDA

QUADRANGLE LOCATION

MN

GN

0°26'

8 MILS

0°

FIGURE 1

SITE LOCATION MAP
FARMLAND INDUSTRIES, INC.

SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

KOOGLER & ASSOCIATES

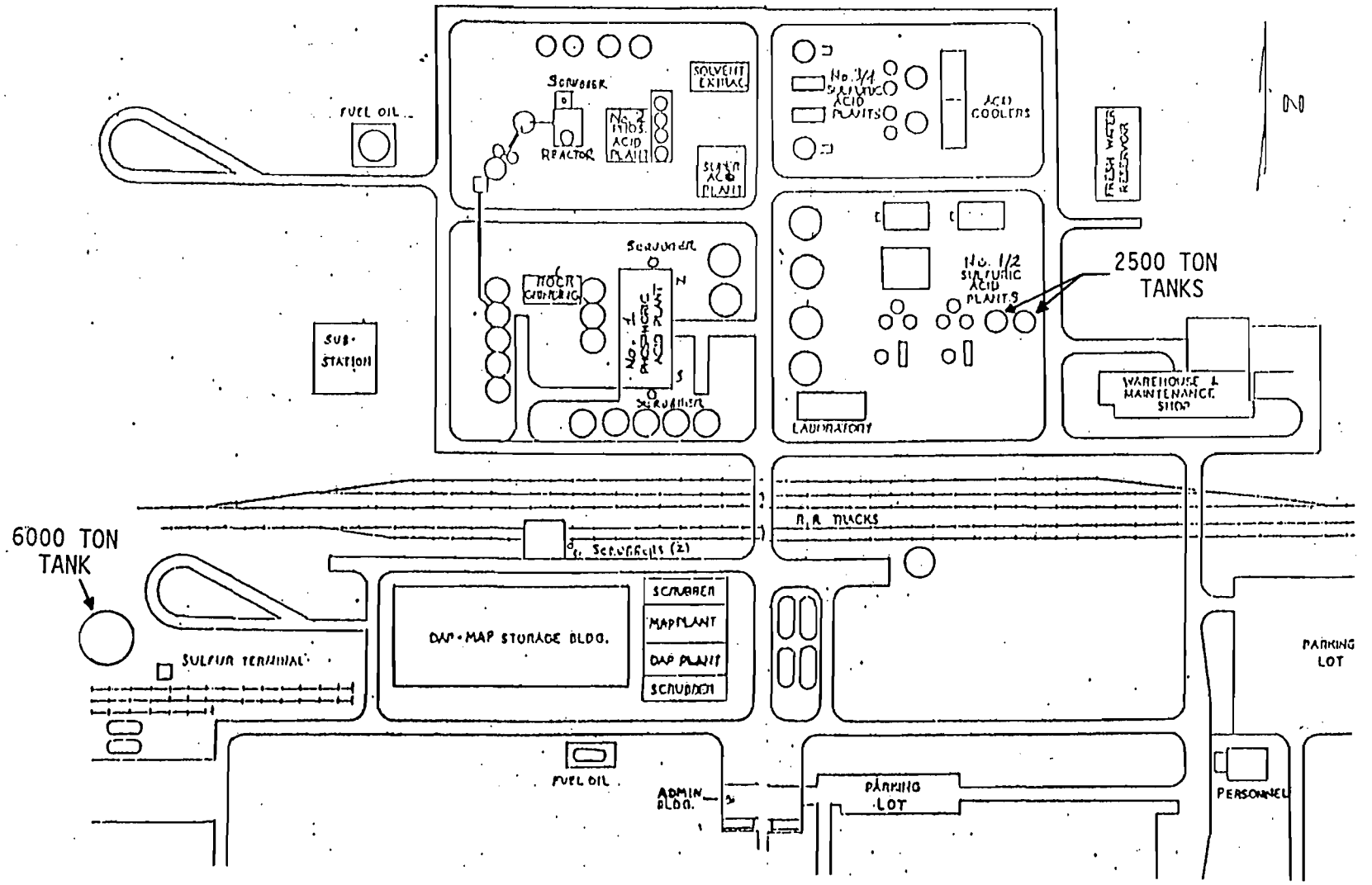


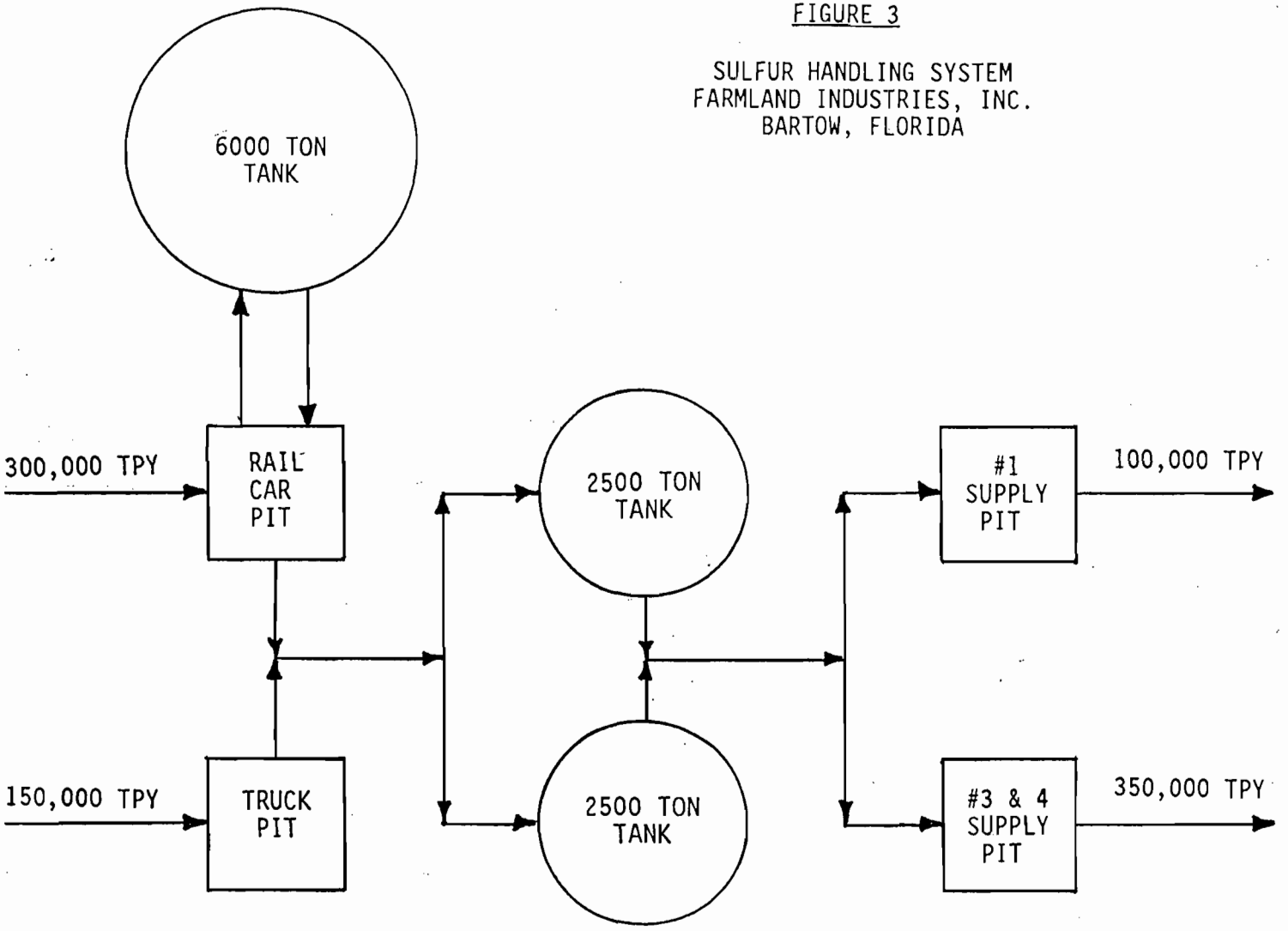
FIGURE 2

PLOT PLAN
FARMLAND INDUSTRIES, INC.

KOOGLER & ASSOCIATES

FIGURE 3

SULFUR HANDLING SYSTEM
FARMLAND INDUSTRIES, INC.
BARTOW, FLORIDA



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

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)

Existing Facility

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

   a. If yes, has "offset" been applied? NA

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

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

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. NA

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sectiona VI and VII. NA

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? NA

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NA

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

   a. If yes, for what pollutants? -

   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.

TRUCK PIT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO ~~OPERATE~~/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex COUNTY: Polk

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) Truck Pit

The truck pit is a 72 ton capacity pit used to receive molten sulfur from trucks and transfer the sulfur to either of two 2500 ton molten sulfur storage tanks. The pit receives approximately 150,000 tons per year of sulfur and transfers it to the storage tanks at a rate of 290 tons per hour. The sulfur is delivered to the pit in 25 ton (net load) trucks at a frequency of about 18 trucks per day.

The pit is 24 feet 8 inches long, 8 feet wide and 6 feet 6 inches deep. It is covered with aluminum plates and has one 8-inch diameter vent exhausting at a height of 10 feet above grade. Ventilation is natural (no forced draft). There is always molten sulfur in the pit during normal operations and the level is maintained fairly constant by an automatic level controller.

The sulfur particle emissions and the sulfur gas emissions from the delivery vehicles are accounted for in the emission estimates for the truck pit.

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

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

Deacription	Contaminants		Utilization Rate - ~~lbs/hr~~	Relate to Flow Diagram
	Type	% Wt		
Molten Sulfur	None		150,000 TPY Annual Thru-put	
			290 TPH from pit to storage tanks.	

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

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

2. Product Weight (lbs/hr): NA

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~~ hr	T/yr	
Part. Matter	0.031	0.14	17-2.600(11)	NA	0.031	0.14	-
TRS(H_2S)	0.038	0.17	NA	NA	0.038	0.17	-
SO_2	0.079	0.35	NA	NA	0.079	0.35	-
VOC	0.056	0.25	NA	NA	0.056	0.25	-

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

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

Annual Average NA Maximum _____

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

None

1 Vent

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

Stack Height: 10 ft. Stack Diameter: 0.67 ft.

Gas Flow Rate: 18 ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 0.86 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

Type of Waste	Type 0 (Plaatics)	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: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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 reaults 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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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.) NA
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). NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

JOB TRUCK PIT
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7a OF

The truck pit has one vent with no forced draft. Sulfur is always in the pit. Emission factors are based on the data presented in APPENDIX A.

Ventilation Rate $\cong$ 18 ft^3/min / vent (natural)
TRANSFER TIME = 8760 hr/yr

Emissions

1. Sulfur Particle = 18 cfm/vent x 1 vent x 60 min/hr
x 0.2 grain/ft^3 x 1/7000 lb/grain
= 0.031 lb/hr
x 8760 hr/yr x 1/2000 ton/lb
= 0.14 TPY

2. TRS (as H_2S) = 18 cfm/vent x 1 vent x 60 min/hr
x 3.5×10^{-5} lb/ft^3
= 0.038 lb/hr
x 8760 hr/yr x 1/2000 ton/lb
= 0.17 TPY

3. SO_2 = 18 cfm/vent x 1 vent x 60 min/hr
x 7.3×10^{-5} lb/ft^3
= 0.079 lb/hr
x 8760 hr/yr x 1/2000 ton/lb
= 0.35 TPY

4. VOC = 18 cfm/vent x 1 vent x 60 min/hr
x 5.2×10^{-5} lb/ft^3
= 0.056 lb/hr
x 8760 hr/yr x 1/2000 ton/lb
= 0.25 TPY

RAIL CAR PIT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO ~~OPERATE~~/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex **COUNTY:** Polk

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) Rail Car Pit

The rail car pit is a 91 ton capacity pit which receives 300,000 tons per year of molten sulfur from rail cars and transfers it to the 6000 ton storage tank. All of the sulfur recovered from the 6000 ton tank is transferred back through the rail car pit when it is pumped to the 2500 ton storage tanks. Sulfur is pumped from the pit to the 6000 ton tank at a maximum rate of 400 tons per hour and from the pit to the 2500 ton tanks at a rate of about 120 tons per hour. Sulfur is delivered to the pit in 100 ton (net load) rail cars at an average frequency of nine rail cars per day.

The pit is 18 feet long, 18 feet wide and has a sloped bottom which averages five feet in depth. The pit is covered with aluminum plates and has a single 10-inch diameter vent exhausting at 10 feet above grade. The vent has a Hartzell fan providing a ventilation rate of 1650 cubic feet per minute (at 1.5 inch WC). There is always molten sulfur in the pit during normal operations, and the level is maintained fairly constant by an automatic level controller.

Any sulfur particle emissions and sulfur gas emissions from the rail cars are accounted for in the emission estimates for the rail car pit.

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		
Molten Sulfur	None		300,000 TPY Annual Thru-put	
			400 TPH from pit to 6000 ton tank	
			120 TPH from pit to 2500 ton tanks	

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

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

2. Product Weight (lbs/hr): NA

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~~ hr	T/yr	
Part. Matter	0.28	1.24	17-2.600(11)	NA	0.28	1.24	-
TRS (H_2S)	0.35	1.52	NA	NA	0.35	1.52	-
SO_2	0.72	3.17	NA	NA	0.72	3.17	-
VOC	0.51	2.25	NA	NA	0.51	2.25	-

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

_____

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

Annual Average NA Maximum _____

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

None

_____

_____

_____

1 Vent (Forced Draft)

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

Stack Height: 10 ft. Stack Diameter: 0.83 ft.

Gas Flow Rate: 1650 ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 50.8 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

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)							

Deacription 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: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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.) NA
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).
   NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

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JOB RAIL CAR PIT
CALCULATED BY R.B. Tedder DATE
SHEET NO. 7a OF

The Rail Car Pit always has molten sulfur in the pit, stays at a fairly constant level and has one vent with a forced draft ventilation rate of 1650 ft^3/min.

TRANSFER TIME = 8760 hr/yr

The emission factors of APPENDIX A are based on measurements at molten sulfur storage tanks which based on their ventilation rates have one air turn-over in the head space every 300-400 minutes. In these tanks the sulfur particle concentration in the vented gases is estimated to be 0.2 grains/ft^3 (APPENDIX A).

In contrast the Rail Car Pit would have a head space over molten sulfur of approximately:

$$\hat{=} 18' \times 18' \times 2.5' \text{ (free board)}$$
$$= 810\ ft^3$$

$$\text{Turn-Over Rate} = 810 ft^3 / 1650\ ft^3/min$$
$$= 0.49 \text{ min per turnover.}$$

It seems reasonable to assume this large increase in turn-over rate will result in some dilution of the pollutant concentrations in the vented gases.

At a 300 min/turn-over rate, one can assume the equilibrium sulfur particle concentration is 0.2 grains/ft^3. At a 0 min/turn-over rate (i.e. infinite dilution), the sulfur particle concentration would be 0 grains/ft^3. Since fan performance will decrease as sulfur accumulates on the fan blades, assume under normal conditions the RAIL CAR PIT will achieve a 1 min/turn-over ventilation rate. The sulfur particle concentration will be approximated with a first order equation (see attached curve) which

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JOB RAIL CAR PIT
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7b OF

uses the above boundary conditions and forces the concentration to 10% of the equilibrium value at a 1 min / turn-over ventilation rate.

Using a 10% factor, the Emission Factors of APPENDIX A become:

Sulfur Particle = 0.2 x 0.1 = 0.02 grain/ft^3

TRS (as H_2S) = $3.5 \times 10^{-5} \times 0.1 = 3.5 \times 10^{-6}$ lb/ft^3

SO_2 = $7.3 \times 10^{-5} \times 0.1 = 7.3 \times 10^{-6}$ lb/ft^3

VOC = $5.2 \times 10^{-5} \times 0.1 = 5.2 \times 10^{-6}$ lb/ft^3

Emissions

1. Sulfur Particle = 1650 ft^3/min x 60 min/hr x 0.02 grain/ft^3
x 1/7000 lb/grain
= 0.28 lb/hr
x 8760 hr/yr x 1/2000 ton/lb
= 1.24 TPY

2. TRS (as H_2S) = 1650 ft^3/min x 60 min/hr x 3.5×10^{-6} lb/ft^3
= 0.35 lb/hr
x 8760 hr/yr x 1/2000 ton/lb
= 1.52 TPY

3. SO_2 = 1650 ft^3/min x 60 min/hr x 7.3×10^{-6} lb/ft^3
= 0.72 lb/hr
x 8760 hr/yr x 1/2000 ton/lb
= 3.17 TPY

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JOB RAIL CAR PIT

CALCULATED BY R.B. TEDDER DATE

SHEET NO. 7C OF

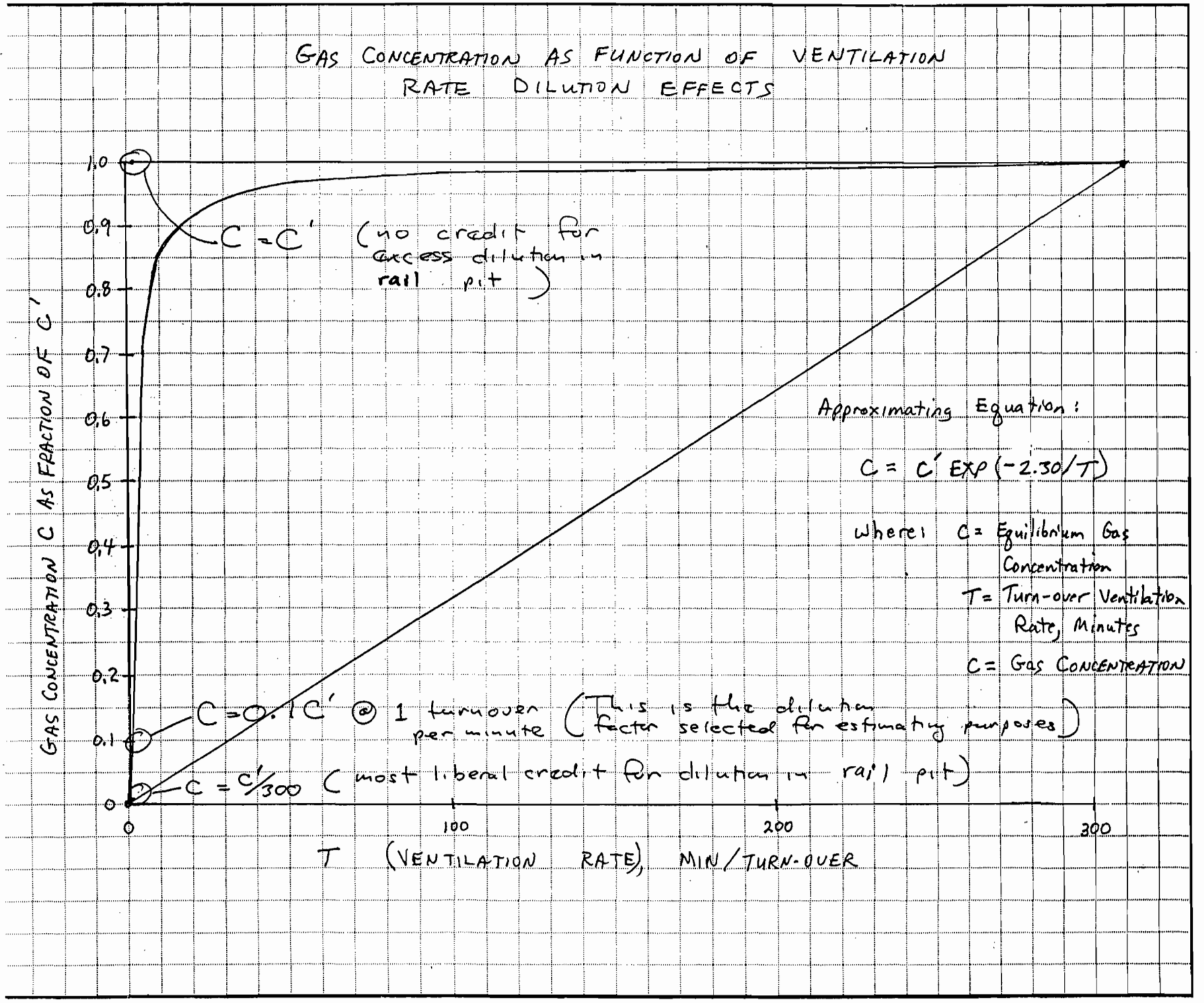
4, VOC = 1650 ft^3/min x 60 min/hr x 5.2×10^{-6} lb/ft^3

= 0.51 lb/hr

x 8760 hr/yr x 1/2000 ton/lb

= 2.25 TPY

GAS CONCENTRATION AS FUNCTION OF VENTILATION RATE DILUTION EFFECTS



Approximating Equation:

$$C = C' \exp(-2.30/T)$$

Where: C = Equilibrium Gas Concentration
T = Turn-over Ventilation Rate, Minutes
C = Gas Concentration

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JOB RAIL CAR PIT
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7d OF

6000 TON STORAGE TANK

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO ~~OPERATE~~/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System **[ ] New[1] [X] Existing[1]**

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex **COUNTY:** Polk

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) 6000 Ton Storage Tank

The rail car unloading area has a 6000 ton molten sulfur storage tank. The tank is 32 feet 5 inches high at the top of the sidewall and has a diameter of 65 feet. The tank has one 24-inch diameter center roof vent and eight 10-inch diameter rim roof vents.

The tank receives approximately 300,000 tons per year of molten sulfur from the rail car pit at a maximum rate of 400 tons per hour. The sulfur is removed from the tank and transferred to one of two 2500 ton storage tanks at a rate of approximately 120 tons per hour.

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		
Molten Sulfur	None	-	300,000 TPY Annual Thru-put	
			400 TPH from rail car pit to tank	
			120 TPH from 6000 ton tank to 2500 ton tank via rail car pit.	

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

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

2. Product Weight (lbs/hr): NA

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~~ hr	T/yr	
Part. Matter	0.48(max)	1.22	17-2.600(11)	NA	0.48(max)	1.22	-
TRS ($_2$S)	0.59(max)	1.14	NA	NA	0.59(max)	1.14	-
SO_2	1.23(max)	3.10	NA	NA	1.23(max)	3.10	-
VOC	0.88(max)	2.22	NA	NA	0.88(max)	2.22	-

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

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

Annual Average NA Maximum _____

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

None

One Center Vent/Eight Rim Vents

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

Stack Height: 40/37 **ft.** **Stack Diameter:** 2.0/0.83 **ft.**

Gas Flow Rate: 18 (each) **ACFM** - **DSCFM** **Gas Exit Temperature:** 200 **°F.**

Water Vapor Content: 2-3 **%** **Velocity:** 0.10/0.55 **FPS**

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

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: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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.) NA
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). NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

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JOB 6000 TON STORAGE TANK
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7a OF

EMISSION Factors are in APPENDIX A

TRANSFER VOLUMETRIC FLOWRATES

Sulfur density = 112 lb/ft^3 @ 280°F

Loading Tank = 400 TON/hr × 2000 lb/TON × 1/60 hr/min × 1/112 ft^3/lb
= 119 ft^3/min

Unloading tank = 120 TON/hr × 2000 lb/TON × 1/60 hr/min × 1/112 ft^3/lb
= 36 ft^3/min

TRANSFER Times

Loading Tank = 300000 TON/yr × 1/400 hr/TON
= 750 hr/yr

Unloading Tank = 300000 TON/yr × 1/120 hr/TON
= 2500 hr/yr

Tank Idle = 8760 hr/yr − (750 + 2500) hr/yr
= 5510 hr/yr

Ventilation Rates

Natural ventilation estimated at 18 cfm/vent (see APPENDIX A).
TANK has 9 roof vents.

Loading Tank = 18 cfm/vent × 9 vents + 119 cfm
= 281 ft^3/min

Unloading Tank = 18 cfm/vent × 9 vents = 36 cfm
= 126 ft^3/min

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JOB 6000 TON STORAGE TANK
CALCULATED BY R. B. Tedder DATE
SHEET NO. 76 OF

TANK Idle = 18 cfm/vent x 9 vents
= 162 ft^3/min

EMISSIONS - SULFUR PARTICLE

Emission factors used for calculations are in APPENDIX A.

Loading Tank = 281 ft^3/min x 60 min/hr
x 0.2 grain/ft^3 x 1/7000 lb/grain
= 0.48 lb/hr
x 750 hr/yr x 1/2000 ton/lb
= 0.18 TPY

Unloading Tank = 126 ft^3/min x 60 min/hr
x 0.2 grain/ft^3 x 1/7000 lb/grain
= 0.22 lb/hr
x 2500 hr/yr x 1/2000 ton/lb
= 0.27 TPY

Tank Idle = 162 ft^3/min x 60 min/hr
x 0.2 grain/ft^3 x 1/7000 lb/grain
= 0.28 lb/hr
x 5510 hr/yr x 1/2000 ton/lb
= 0.77 TPY

MAX HOURLY = 0.48 lb/hr

TOTAL Annual = (0.18 + 0.27 + 0.77) TPY
= 1.22 TPY

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JOB 6000 TON STORAGE TANK
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7C OF

Emissions – TRS (as H_2S)

Loading Tank = 281 ft^3/min × 60 min/hr × 3.5×10^{-5} lb/ft^3
= 0.59 lb/hr
× 750 hr/yr × 1/2000 ton/lb
= 0.22 TPY

Unloading Tank = 126 ft^3/min × 60 min/hr × 3.5×10^{-5} lb/ft^3
= 0.26 lb/hr
× 2500 hr/yr × 1/2000 ton/lb
= 0.33 TPY

Tank Idle = 162 ft^3/min × 60 min/hr × 3.5×10^{-5} lb/ft^3
= 0.34 lb/hr
× 5510 hr/yr × 1/2000 ton/lb
= 0.94 TPY

MAX HOURLY = 0.59 lb/hr

TOTAL Annual = (0.22 + 0.33 + 0.59) TPY
= 1.14 TPY

Emissions – SO_2

Loading Tank = 281 ft^3/min × 60 min/hr × 7.3×10^{-5} lb/ft^3
= 1.23 lb/hr
× 750 hr/yr × 1/2000 ton/lb
= 0.46 TPY

Unloading Tank = 126 ft^3/min × 60 min/hr × 7.3×10^{-5} lb/ft^3
= 0.55 lb/hr
× 2500 hr/yr × 1/2000 ton/lb
= 0.69 TPY

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JOB 6000 TON STORAGE TANK
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7d OF

TANK IDLE = 162 ft^3/min x 60 min/hr x 7.3×10^{-5} lb/ft^3
= 0.71 lb/hr
x 5510 hr/yr x 1/2000 ton/lb
= 1.95 TPY

MAX HOURLY = 1.23 lb/hr
TOTAL Annual = 3.1 TPY

EMISSIONS - VOC

Loading tank = 281 ft^3/min x 60 min/hr x 5.2×10^{-5} lb/ft^3
= 0.88 lb/hr
x 750 hr/yr x 1/2000 ton/lb
= 0.33 TPY

Unloading tank = 126 ft^3/min x 60 min/hr x 5.2×10^{-5} lb/ft^3
= 0.39 lb/hr
x 2500 hr/yr x 1/2000 ton/lb
= 0.49 TPY

TANK Idle = 162 ft^3/min x 60 min/hr x 5.2×10^{-5} lb/ft^3
= 0.51 lb/hr
x 5510 hr/yr x 1/2000 ton/lb
= 1.4

MAX Hourly = 0.88 lb/hr

TOTAL Annual = (0.33 + 0.49 + 1.4) TPY
= 2.22 TPY

2500 TON STORAGE TANKS

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO ~~OPERATE~~/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System **[ ] New[1] [X] Existing[1]**

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex **COUNTY:** Polk

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) 2500 Ton Storage Tanks

Farmland has two 2500 ton molten sulfur storage tanks located near Sulfuric Acid Plants No. 1 and No. 2. Each tank is 45 feet in diameter and 32 feet 5 inches high at the top of the sidewall. Both tanks have two 20-inch diameter vents located near the center of the roof and eight 10-inch diameter rim roof vents.

The tanks receive approximately 300,000 tons per year of molten sulfur from the rail car pit at a rate of 120 tons per hour and 150,000 tons per year molten sulfur from the truck pit at a rate of 290 tons per hour. The total sulfur thru-put is distributed equally between the two tanks.

Approximately 100,000 tons per year of molten sulfur is transferred to Sulfuric Acid Plant No. 1 through Supply Pit No. 1 at a rate of 12 tons per hour. The balance, or 350,000 tons per year, of sulfur is transferred to Sulfuric Acid Plants No. 3 and No. 4 through Supply Pit No. 3/No. 4 at a rate of 42 tons per hour.

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~~ Each Tank	Relate to Flow Diagram
	Type	% Wt		
Molten Sulfur	None	-	225,000 TPY Annual Thur-put	
			120 TPH from rail car pit	
			290 TPH from truck pit	
			14 TPH to Supply Pit No. 1	
			42 TPH to Supply Pit No. 3 / No. 4	

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

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

2. Product Weight (lbs/hr): NA

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~~ hr	T/yr	
Part. Matter	0.46(max)	1.35	17-2.600(11)	NA	0.46(max)	1.35	-
TRS (H_2S)	0.56(max)	1.64	NA	NA	0.56(max)	1.64	-
SO_2	1.17(max)	3.45	NA	NA	1.17(max)	3.45	-
VOC	0.83(max)	2.46	NA	NA	0.83(max)	2.46	-

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

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

Annual Average NA Maximum _____

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

None

Two Center Vents/Eight Rim Vents per Tank

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

Stack Height: 40/37 ft. Stack Diameter: 1.67/0.83 ft.

Gas Flow Rate: 18 (each) ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 0.14/0.55 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incinerator

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: _____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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 preasure drop, etc.)
   NA
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).
   NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

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JOB 2500 TON STORAGE TANKS
CALCULATED BY R.B. TEDDER DATE
SHEET NO. 7a OF

EMISSION FACTORS ARE IN APPENDIX A.

TRANSFER VOLUMETRIC FLOWRATES

Sulfur Density = 112 lb/ft^3 @ 280°F

Loading tank from Rail Car Pit
= 120 ton/hr x 2000 lb/ton x 1/60 hr/min
x 1/112 ft^3/lb
= 36 ft^3/min

Loading tank from TRUCK PIT
= 290 ton/hr x 2000 lb/ton x 1/60 hr/min
x 1/112 ft^3/lb
= 86 ft^3/min

Unloading tank to Supply Pit No. 1
= 12 ton/hr x 2000 lb/ton x 1/60 hr/min
x 1/112 ft^3/lb
= 3.6 ft^3/min

Unloading tank to Supply Pit No 3 & No. 4
= 42 ton/hr x 2000 lb/ton x 1/60 hr/min
x 1/112 ft^3/lb
= 13 ft^3/min

TRANSFER TIMES

Loading tank from Rail Car Pit
= 300,000 ton/year x 1/120 hr/ton x 1/2
= 1250 hr/yr/tank

Loading tank from TRUCK PIT
= 150,000 ton/yr x 1/290 hr/ton x 1/2
= 259 hr/yr/tank

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Unloading tank to Supply Pit No. 1
= 100,000 TON/yr × 1/12 hr/TON × 1/2
= 4167 hr/yr/tank

Unloading tank to Supply Pit No. 3 and No. 4
= 350,000 TON/yr × 1/12 hr/TON × 1/2
= 4167 hr/yr/tank

NOTE: Supply Pit feed rates assume 95% operating factors for Sulfuric Acid Plants No. 1, No. 3 and No. 4. Also assume Supply Pits are operated simultaneously.

TANK IDLE = 8760 hr/yr − (1250 + 259 + 4167) hr/yr
= 3084 hr/yr/tank

VENTILATION RATES

Natural ventilation estimated at 18 cfm/vent (see APPENDIX A). Each tank has 10 vents.

Loading tank from Rail Car Pit
= 18 cfm/vent × 10 vents + 36 cfm
= 216 ft^3/min

Loading tank from TRUCK PIT
= 18 cfm/vent × 10 vents + 86 cfm
= 266 ft^3/min

Unloading Tank to Supply Pits
= 18 cfm/vent × 10 vents − 3.6 − 13
= 163 ft^3/min

TANK IDLE = 18 cfm/vent × 10 vents
= 180 ft^3/min

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JOB 2500 TON STORAGE TANKS
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7C OF

EMISSIONS - SULFUR PARTICLE (Each Tank)

Loading tank from Rail Car Pit

= 216 ft³/min x 60 min/hr x 0.2 grain/ft³
x 1/7000 lb/grain
= 0.37 lb/hr
x 1250 hr/yr x 1/2000 ton/lb
= 0.23 TPY

Loading tank from Truck Pit

= 266 ft³/min x 60 min/hr x 0.2 grain/ft³
x 1/7000 lb/grain
= 0.46 lb/hr
x 259 hr/yr x 1/2000 ton/lb
= 0.06 TPY

Unloading to Supply Pits

= 163 ft³/min x 60 min/hr x 0.2 grain/ft³
x 1/7000 lb/grain
= 0.23 lb/hr
x 4667 hr/yr x 1/2000 ton/lb
= 0.58 TPY

TANK Idle = 180 ft³/min x 60 min/hr x 0.2 grain/ft³
x 1/7000 lb/grain
= 0.31 lb/hr
x 3084 hr/yr x 1/2000 ton/lb
= 0.48 TPY

MAX Hourly = 0.46 lb/hr

TOTAL Annual = (0.23 + 0.06 + 0.58 + 0.48) TPY

= 1.35 TPY

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JOB 2500 TON STORAGE TANKS
CALCULATED BY R.B. TEDDER DATE
SHEET NO. 7d OF

Emissions - TRS (as H_2S) (Each Tank)

Loading Tank from Rail Car Pit

$= 216\ ft^3/min \times 60\ min/hr \times 3.5 \times 10^{-5}\ lb/ft^3$

$= 0.45\ lb/hr$

$\times 1250\ hr/yr \times 1/2000\ ton/lb$

$= 0.28\ TPY$

Loading Tank from Truck Pit

$= 266\ ft^3/min \times 60\ min/hr \times 3.5 \times 10^{-5}\ lb/ft^3$

$= 0.56\ lb/hr$

$\times 259\ hr/yr \times 1/2000\ ton/lb$

$= 0.07\ TPY$

Unloading to Supply Pits

$= 163\ ft^3/min \times 60\ min/hr \times 3.5 \times 10^{-5}\ lb/ft^3$

$= 0.34\ lb/hr$

$\times 4167\ hr/yr \times 1/2000\ ton/lb$

$= 0.71\ TPY$

TANK Idle $= 180\ ft^3/min \times 60\ min/hr \times 3.5 \times 10^{-5}\ lb/ft^3$

$= 0.38\ lb/hr$

$\times 3084\ hr/yr \times 1/2000\ ton/lb$

$= 0.58\ TPY$

MAX Hourly $= 0.56\ lb/hr$

Total Annual $= (0.28 + 0.07 + 0.71 + 0.58)\ TPY$

$= 1.64\ TPY$

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JOB 2500 TON STORAGE TANKS
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7e OF

Emissions – SO_2 (Each Tank)

Loading Tank from Rail Car Pit
= 216 ft^3/min x 60 min/hr x 7.3×10^{-5} lb/ft^3
= 0.95 lb/hr
x 1250 hr/yr x 1/2000 ton/lb
= 0.59 TPY

Loading Tank from TRUCK PIT
= 266 ft^3/min x 60 min/hr x 7.3×10^{-5} lb/ft^3
= 1.17 lb/hr
x 259 hr/yr x 1/2000 ton/lb
= 0.15 TPY

Unloading to Supply Pits
= 163 ft^3/min x 60 min/hr x 7.3×10^{-5} lb/ft^3
= 0.71 lb/hr
x 4167 hr/yr x 1/2000 ton/lb
= 1.49 TPY

TANK Idle = 180 ft^3/min x 60 min/hr x 7.3×10^{-5} lb/ft^3
= 0.79 lb/hr
x 3084 hr/yr x 1/2000 ton/lb
= 1.22 TPY

MAX Hourly = 1.17 lb/hr

Total Annual = (0.59 + 0.15 + 1.49 + 1.22) TPY
= 3.45 TPY

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JOB 2500 TON STORAGE TANKS
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7 f. OF

Emissions — VOC (Each Tank)

Loading Tank from Rail Car Pit
= 216 ft^3/min x 60 min/hr x 5.2×10^{-5} lb/ft^3
= 0.67 lb/hr
x 1250 hr/yr x 1/2000 ton/lb
= 0.42 TPY

Loading Tank from TRUCK PIT
= 266 ft^3/min x 60 min/hr x 5.2×10^{-5} lb/ft^3
= 0.83 lb/hr
x 259 hr/yr x 1/2000 ton/lb
= 0.11 TPY

Unloading to Supply Pits
= 163 ft^3/min x 60 min/hr x 5.2×10^{-5} lb/ft^3
= 0.51 lb/hr
x 4167 hr/yr x 1/2000 ton/lb
= 1.06 TPY

TANK Idle = 180 ft^3/min x 60 min/hr x 5.2×10^{-5} lb/ft^3
= 0.56 lb/hr
x 3084 hr/yr x 1/2000 ton/lb
= 0.87 TPY

MAX Hourly = 0.83 lb/hr

Total Annual = (0.42 + 0.11 + 1.06 + 0.87) TPY
= 2.46 TPY

SUPPLY PIT NO. 1

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex **COUNTY:** Polk

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) Supply Pit No. 1

Supply Pit No. 1 has a capacity of 31 tons and transfers molten sulfur from the 2500 ton storage tanks to Sulfuric Acid Plant No. 1 at a rate of approximately 12 tons per hour. Approximately 100,000 tons per year of sulfur are transferred through the pit.

The pit is 8 feet long, 10 feet wide and 7 feet deep. It is covered with aluminum plate and has one 4-inch diameter vent exhausting at 10 feet above grade. Ventilation is natural (no forced draft). There is always molten sulfur in the pit under normal conditions, and the level is maintained constant by an automatic level controller.

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		
Molten Sulfur	None		100,000 TPY Annual Thru-put	
			12 TPH from	pit to Acid Plant No. 1

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

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

2. Product Weight (lbs/hr): NA

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/hr~~ hr	T/yr	
Part. Matter	0.031	0.14	17-2.600(11)	NA	0.031	0.14	-
TRS (H_2S)	0.038	0.17	NA	NA	0.038	0.17	-
SO_2	0.079	0.35	NA	NA	0.079	0.35	-
VOC	0.056	0.25	NA	NA	0.056	0.25	-

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

_____

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

Annual Average NA Maximum _____

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

None

_____

_____

_____

1 Vent

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

Stack Height: 10 ft. Stack Diameter: 0.33 ft.

Gas Flow Rate: 18 ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 3.4 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

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: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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.)
   NA
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).
   NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

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JOB SUPPLY PIT No. 1
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7a OF

The SUPPLY pit has one vent with no forced draft. Sulfur is always in the pit. Emission factors are based on the data presented in APPENDIX A.

Ventilation Rate $\cong$ 18 ft^3/min/vent (natural)
TRANSFER TIME = 8760 hr/yr

Emissions

1. Sulfur Particle = 18 cfm/vent × 1 vent × 60 min/hr × 0.2 grain/ft^3 × 1/7000 lb/grain
= 0.031 lb/hr × 8760 hr/yr × 1/2000 ton/lb
= 0.14 TPY

2. TRS (as H_2S) = 18 cfm/vent × 1 vent × 60 min/hr × 3.5×10^{-5} lb/ft^3
= 0.038 lb/hr × 8760 hr/yr × 1/2000 ton/lb
= 0.17 TPY

3. SO_2 = 18 cfm/vent × 1 vent × 60 min/hr × 7.3×10^{-5} lb/ft^3
= 0.079 lb/hr × 8760 hr/yr × 1/2000 ton/lb
= 0.35 TPY

4. VOC = 18 cfm/vent × 1 vent × 60 min/hr × 5.2×10^{-5} lb/ft^3
= 0.056 lb/hr × 8760 hr/yr × 1/2000 ton/lb
= 0.25 TPY

SUPPLY PIT NO. 3/NO.4

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO ~~OPERATE~~/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur System **[ ] New[1] [X] Existing[1]**

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

COMPANY NAME: Farmland Industries, Inc. - Green Bay Complex **COUNTY:** Polk

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) Supply Pit No. 3 / No. 4

Supply Pit No. 3/No. 4 has a capacity of 28 tons and transfers molten sulfur from the 2500 ton storage tanks to Sulfuric Acid Plants No. 3 and No. 4 at a combined rate of approximately 42 tons per hour. About 350,000 tons per year of sulfur are transferred through this pit.

The pit is 8 feet 8 inches long, 8 feet 2 inches wide and 7 feet deep. It is covered with aluminum plate and has one 6-inch diameter vent exhausting at 10 feet above grade. Ventilation is natural (no forced draft). There is always molten sulfur in the pit under normal conditions, and the level is maintained constant by an automatic level controller.

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		
Molten Sulfur	None		350,000 TPY Annual Thru-put	
			42 TPH from pit to Acid Plants 3 and 4	

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

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

2. Product Weight (lbs/hr): NA

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~~ lbs/hr	T/yr	
Part. Matter	0.031	0.14	17-2.600(11)	NA	0.031	0.14	-
TRS (H_2S)	0.038	0.17	NA	NA	0.038	0.17	-
SO_2	0.079	0.35	NA	NA	0.079	0.35	-
VOC	0.056	0.25	NA	NA	0.056	0.25	-

[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)
None				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
None			

*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): _____

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

Annual Average NA Maximum _____

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

None

1 Vent

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

Stack Height: 10 ft. Stack Diameter: 0.50 ft.

Gas Flow Rate: 18 ACFM - DSCFM Gas Exit Temperature: 200 °F.

Water Vapor Content: 2-3 % Velocity: 1.53 FPS

SECTION IV: INCINERATOR INFORMATION

NA - No Incineration

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: _____

_____

_____

_____

_____

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)]
   (See Sections IIA and IIIA)
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.
   (See Page 7a)
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   (See Page 7a)
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 preasure drop, etc.)
   NA
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).
   NA
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.
   (See Section IIA)
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).
   (See Section IIA)
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.
   (See Section IIA)

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
904/377-5822 ▪ FAX 377-7158

JOB Supply Pit No. 3 & No. 4
CALCULATED BY R. B. TEDDER DATE
SHEET NO. 7a OF

The Supply pit has one vent with no forced draft. Sulfur is always in the pit. Emission factors are based on the data presented in APPENDIX A.

Ventilation Rate ≅ 18 ft^3/min / vent (natural)
TRANSFER TIME = 8760 hr/yr

Emissions

1. Sulfur Particle = 18 cfm/vent × 1 vent × 60 min/hr
× 0.2 grain/ft^3 × 1/7000 lb/grain
= 0.031 lb/hr
× 8760 hr/yr × 1/2000 ton/lb
= 0.14 TPY

2. TRS (as H_2S) = 18 cfm/vent × 1 vent × 60 min/hr
× 3.5×10^{-5} lb/ft^3
= 0.038 lb/hr
× 8760 hr/yr × 1/2000 ton/lb
= 0.17 TPY

3. SO_2 = 18 cfm/vent × 1 vent × 60 min/hr
× 7.3×10^{-5} lb/ft^3
= 0.079 lb/hr
× 8760 hr/yr × 1/2000 ton/lb
= 0.35 TPY

4. VOC = 18 cfm/vent × 1 vent × 60 min/hr
× 5.2×10^{-5} lb/ft^3
= 0.056 lb/hr
× 8760 hr/yr × 1/2000 ton/lb
= 0.25 TPY

BACT AND PSD
(NEITHER REQUIRED)

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

NOT APPLICABLE

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:

. 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

NOT APPLICABLE

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.

APPENDIX A

EMISSION FACTORS FOR SULFUR PARTICLES, TRS, SO_2 AND VOC IN MOLTEN SULFUR STORAGE AND HANDLING SYSTEMS

Sulfur particle emissions have been measured by Koogler & Associates (November 1988) from molten sulfur storage tanks in the phosphate chemical fertilizer industry. The measured sulfur particle concentrations in the gases vented from the storage tanks have ranged from 0.3-0.5 grains/ft^3. The higher concentrations were measured when the tanks were being filled with molten sulfur, and the lower concentrations when the tanks were idle. The average natural ventilation rates on multi-vent tanks were measured at about 18 cfm/vent.

Measurements of sulfur particle emissions at the Pennzoil terminals in Tampa, Florida, in October 1986 by Enviroplan were measured at 0.46 grains/ft^3 (NOTE: Data was corrected by Koogler and comments were transmitted to FDER, December 30, 1986). However, later tests conducted by Enviroplan (1987) at Sulfur Storage Company, Inc. in Tampa, Florida, measured sulfur particle concentrations at 0.12 grain/ft^3. It is believed that the Pennzoil tests and the Koogler tests during tank filling could contain condensed organics. Enviroplan (1987) indicated the total particulate concentrations including condensible hydrocarbons could be 2.5 times the sulfur particulate concentration.

Therefore, a reasonable estimate of sulfur particle concentration under all conditions is:

$$(0.3 + 0.12)/2 = 0.2 \text{ grains/ft}^3$$

Air vented from molten sulfur storage tanks and pits is also expected to contain small quantities of total reduced sulfur compounds, including H_2S (TRS), sulfur dioxide and volatile organic compounds (VOCs). The volatile organic compounds result from small quantities of petroleum products contained in Frasch sulfur (approximately 0.25%) and the vaporization of these compounds at the storage temperature of molten sulfur. The reduced sulfur compounds result from the reduction of elemental sulfur in the presence of carbon supplied by the petroleum products and the SO_2 results from the oxidation of elemental sulfur.

A limited number of measurements have been made on molten sulfur storage tanks at Frasch sulfur terminals in the Tampa area to determine TRS, SO_2, and VOC concentrations in the headspace of the tanks over molten sulfur. These measurements have been made on molten sulfur storage tanks with capacities in the range of 10,000 tons which are air purged at rates between 10 and 63 cfm to prevent the accumulation of H_2S. Because of the size of the tanks, the fact that they are air purged and the fact that sulfur delivered to the Port of Tampa most probably has a higher fraction of VOCs (due to the fact that there has been less time for the volatile fraction of the petroleum products to vaporize), measurements made in Tampa will overestimate TRS, SO_2 and VOC emissions from phosphate chemical fertilizer facilities which later receive the sulfur. However, as no other

data is available, the Tampa data will be used to estimate TRS (including H_2S), SO_2 and VOC emissions factors for molten sulfur storage tanks and molten sulfur pits. It should be recognized that the application of these emission factors will overstate the actual emissions by some unknown amount.

Measurements of TRS made in November 1983 by TRC and reported in the FDER "Sulfur Report" (February 1984) show the following:

Tank Purge Rate (CFM)	TRS (as H2S) in Headspace Over Molten Sulfur (ppm, vol)
43	280
63	403

Measurements made by Enviroplan, Inc. in 1987 in the headspace over molten sulfur in a tank purged at the rate of 10 cfm showed an average TRS concentration of 638 ppm (vol).

A "typical" concentration of TRS (as H_2S) in the headspace over molten sulfur can be estimated from these data:

$$[280 + 403 + 2(638)]/4 = 490 \text{ ppm (vol)}$$

$$= 3.5 \times 10^{-5} \text{ lb/ft}^3 \text{ at } 200^{\circ}\text{F}$$

Measurements of SO_2 made by TRC (1983) in the tank headspace over molten sulfur at purge rates of 43 and 63 cfm averaged 553 ppm (vol). This converts to an SO_2 concentration of 7.3×10^{-5} lb/ft^3 at 200°F.

Measurements made by Enviroplan, Inc. (1987) in the tank headspace over molten sulfur at STI in Tampa showed VOC concentrations that averaged 5.2×10^{-5} lb/ft^3.

Table 1 summarizes the above emission factors for molten sulfur storage and handling systems.

TABLE 1
SUMMARY OF EMISSION FACTORS FOR
MOLTEN SULFUR STORAGE AND
HANDLING SYSTEMS

Air Pollutant	Emission Factor
Sulfur Particle	0.2 grains/ft^3
TRS (as H_2S)	3.5×10^{-5} lb/ft^3
SO_2	7.3×10^{-5} lb/ft^3
VOC	5.2×10^{-5} lb/ft^3

REFERENCES

1. "Preliminary Report on Emissions From Tank No. 4 at Sulfur Terminal Co.,Inc., Tampa, Florida." TRC Environmental Consultants, Inc., East Hartford, Connecticut, December 30, 1983.

2. "Sulfur Report." Bureau of Air Quality Management, Florida Department of Environmental Regulation, Tallahassee, Florida, February 1984.

3. "Sulfur Particulate Emission Measurement Project at the Pennzoil Terminals in Tampa, Florida." Enviroplan, Inc., West Orange, New Jersey, October 1986.

4. Comments in a letter dated December 30, 1986, by Dr. John Koogler, Koogler & Associates to Mr. Steve Smallwood, FDER, on Enviroplan's Pennzoil Sulfur Company emission measurement report.

5. "Technical Report Supporting Application to the Florida DER For An Alternate Sulfur Particulate Emissions Sampling Procedure." Enviroplan, Inc., West Orange, New Jersey, October 30, 1987.

6. "Particulate Matter Emission Measurements From Molten Sulfur Storage Tanks at Gardinier, Inc., Tampa, Florida." Koogler & Associates, Gainesville, Florida, November 7-8, 1988.

7. Discussions with Enviroplan, Inc. at a meeting in New Orleans, Louisiana, on July 6, 1989. Enviroplan supplied measurement data on TRS and VOC concentrations in the headspace over molten sulfur storage tanks at the Sulfur Terminals Company, Inc. in Tampa, Florida, for testing which was conducted during September 1987.