AGRICO CHEMICAL COMPANY
IMPREST ACCOUNT

PHONE 813-428-1431
P.O. BOX 1110
MULBERRY, FLORIDA 33860

4457

63-526 / 631 185

July 18 19 89

PAY TO THE ORDER OF Florida Department of Environmental Regulation $ 200.00

----------------Two Hundred and no/100-- DOLLARS

Sun First National Bank
of Polk County
Mulberry Office 185
400 North Church Ave., Mulberry, FL 33860

AGRICO CHEMICAL COMPANY IMPREST ACCOUNT

⑈0004457⑈ ⑆063105269⑆0185000100013⑈

2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Molten Sulfur Storage and Handling Facility -
Construction Permit Application For South Pierce

Dear Pradeep:

Enclosed is a construction permit application with the appropriate processing fee for the above-referenced sources, which consist of a tank receiving pit, a rail receiving pit, and two storage tanks.

Should you have any questions following your receipt and review of the enclosed application and attachments, please do not hesitate to call.

Thank you.

Sincerely,

Phillip A. Steadham
Environmental Chemist

PAS:sm
7/18/89

RECEIVED
DER-MAIL ROOM
1989 JUL 21 AM 10:48

1031

xc: S. Presnell
D. Chamberlain
W. W. Forman

#200 pd.
7-21-89
Rcpt. # 117648

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

AC 53-167779

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Molten Sulfur Storage and Handling Facility [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Agrico Chemical Company - South Pierce 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 Attachment 7

SOURCE LOCATION: Street Highway 630, Box 1110 City Mulberry

UTM: East 7407900 North 307100

Latitude 27 ° 46 ' 56 "N Longitude 81 ° 55 ' 55 "W

APPLICANT NAME AND TITLE: Selwyn Presnell, Environmental Manager

APPLICANT ADDRESS: P.O. Box 1110, Mulberry, Florida 33860

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Agrico Chemical Company

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: Selwyn L Presnell

Selwyn Presnell, Environmental Manager
Name and Title (Please Type)

Date: 7-18-89 Telephone No. (813) 428-1431

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

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 Daniel H. Lynch

DANIEL H. LYNCH
Name (Please Type)

Agrico Chemical Company
Company Name (Please Type)

Box 1110 Mulberry, Florida 33860
Mailing Address (Please Type)

Florida Registration No. 9437 Date: July 19, 1989 Telephone No. (813) 428-1431

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.

This project consists of storage facilities for the handling of molten sulfur and includes two (2) - 1050 ton storage tanks (east and west), one (1) - 100 ton rail receiving pit, and one (1)- 600 ton truck receiving pit. The project is in full compliance with the applicable sections of F.A.C. Chapter 17.2.

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

Start of Construction 1964 Completion of Construction 1964

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.)

None

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

None

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) Not Applicable.

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

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

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

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

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

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

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

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

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   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.

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	See Attachment I		114,100	1, 2, 3, 4

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

1. Total Process Input Rate (lbs/hr): 114,100

2. Product Weight (lbs/hr): 350,000

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

Truck Receiving Pit - See Attachment 3A

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
S Particulate	0.46	2.03	N/A	N/A	4060	2.03	2
H2S	0.70	3.07	N/A	N/A	6140	3.07	2
SO2	1.19	5.22	N/A	N/A	10440	5.22	2
VOC's	0.84	3.71	N/A	N/A	7420	3.71	2
Total Reduc S	Reported as H2S		above				

[1]See Section V, Item 2.

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

[3]Calculated from operating rate and applicable standard.

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

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

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

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

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

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

2. Product Weight (lbs/hr): _____

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

Rail Receiving Pit - See Attachment 3B

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
S Particulate	0.11	0.03	N/A	N/A	60	0.03	4
H2S	0.18	0.05	N/A	N/A	100	0.05	4
SO2	0.29	0.08	N/A	N/A	160	0.08	4
VOC's	0.18	0.05	N/A	N/A	100	0.05	4
Total Reduc S	Reported sa H2S		above				

[1]See Section V, Item 2.

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

[3]Calculated from operating rate and applicable standard.

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

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

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

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

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

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

2. Product Weight (lbs/hr): _____

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

Storage Tanks (2)* - See Attachment 3C

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/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
S Particulate	0.16	0.72	N/A	N/A	1440	0.72	3
H2S	0.24	1.07	N/A	N/A	2140	1.07	3
SO2	0.42	1.82	N/A	N/A	3640	1.82	3
VOC's	0.30	1.30	N/A	N/A	2600	1.30	3
Total Reduc S	Reported as H2S		above				

[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).

* These emissions represent the total from two identical tanks.

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 N/A Maximum _____

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

Small spills of molten sulfur may occur from time to time. These solidify upon cooling, are collected in a curbed bin, and are sold to a recycling operation.

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

Stack Height: Not Applicable ft. Stack Diameter: _____ ft.

Gas Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F.

Water Vapor Content: _____ % Velocity: _____ FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

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)] (Attachment 2)

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. (Attachment 3A, 3B & 3C)

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test). (Same as Attachment 3A, 3B & 3C)

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.) Not Applicable

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). Not Applicable

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. (Attachment 4)

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). (Attachment 5)

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. (Attachment 6)

ATTACHMENT 1

MOLTEN SULFUR CONTAMINANTS

The following contaminants are present in the vapor space above molten sulfur in the concentrations shown:

	Concentration, lb/acf
Sulfur Particulate	1.757×10^{-5}
Hydrogen Sulfide	$1.719 \times 10^{-2} \times (V^{-0.938})$*
Sulfur Dioxide	5.472×10^{-6}
Volatile Organic Compounds	5.224×10^{-5}
Total Reduced Sulf. Compounds	$1.719 \times 10^{-2} \times (V^{-0.938})$*

* where V - ventilation rate (acf) to the -0.938 power

ATTACHMENT 2

SECTION V.I: DERIVATION OF TOTAL PROCESS INPUT RATE AND PRODUCTION RATE

TOTAL PROCESS INPUT RATE:

= 0.326 tons sulfur/ton sulfuric acid produced x 4200 TPD sulfuric acid x 1/24 days/hr x 2000 #/ton
= 114,100 lbs/hr.

PRODUCTION RATE:

At the calculated total process rate above, the production rate is a design rate of 4200 TPD for the two plants combined.

ATTACHMENT 3A

BASIS OF EMISSIONS ESTIMATE FOR TRUCK RECEIVING PIT

ASSUMPTIONS

1. Plant sulfur throughput is 500,525 tpy based on two sulfuric acid plants operating at 2100 tpd, 365 dpy.

   = (2 plants x 2100 tpd)(365 dpy)(0.3265 ton S/ton H_2SO_4)
   = 500,525 tpy.

2. Truck receiving pit throughput is 90% of plant throughput, or 450,473 tpy.

3. Rail receiving pit throughput is 10% of plant throughput, or 50,052 tpy.

4. Truck pit has forced ventilation rate of 2700 cfm, by two fans, 1350 cfm each and a capacity of 600 tons.

5. The head space over the molten sulfur is 3000 cu ft, based on dimensions of the pit and freeboard.

6. Sulfur particle concentration in vent gas when pit is being filled is 0.2 grains/dscf (based on data obtained from Koogler and Enviroplan).

7. Sulfur vapor concentration in the truck pit at a 300 minute/turnover ventilation rate is at equilibrium with an equilibrium concentration of 0.2 grains/cu ft. At a 0 minute/turnover ventilation rate(infinite dilution), the sulfur vapor concentration would be 0 grains/cu ft. The sulfur vapor concentration was approximated with a first order equation(see attached curve), which uses the above boundary conditions and forces the concentration to 10% of the equilibrium value at a one minute/turnover ventilation rate.

EMISSIONS

Sulfur Particulate

= (2 vents x 1350 cfm) x 60 min/hr x 0.2 grains/cu ft x 0.1 1/7000 lb/grain x 1/2000 ton/lb x 8760 hr/yr

= 2.03 tpy

= 2.03 tpy x 2000 lb/ton x 1/8760 yr/hr

= 0.46 lb/hr

Hydrogen Sulfide, Sulfur Dioxide, and Volatile Organics

Equilibrium concentrations:

H2S = 0.303 grains/cu ft
SO2 = 0.515 grains/cu ft
VOC = 5.224×10^{-5} lb/cu ft

Total ventilation = 2700 cu ft/min

H2S Emissions = 2700 cu ft/min x 60 min/hr x 0.303 grains/ cu ft
x 0.1 x 1/7000 lb/grain x 1/2000 ton/lb x 8760 hr/yr
= 3.07 tpy, or

= 3.07 tpy x 2000 lb/ton x 1/8760 yr/hr

= 0.70 lb/hr

SO2 Emissions = 2700 cu ft/min x 60 min/hr x 0.515 grains/ cu ft
x 0.1 x 1/7000 lb/grain x 1/2000 ton/lb x 8760 hr/yr
= 5.22 tpy, or

= 5.22 tpy x 2000 lb/ton x 1/8760 yr/hr

= 1.19 lb/hr

VOC Emissions = 2700 cu ft/min x 60 min/hr x 5.224×10^{-5} lb/cu ft
x 0.1 x 1/2000 ton/lb x 8760 hr/yr
= 3.71 tpy, or

= 3.71 tpy x 2000 lb/ton x 1/8760 yr/hr

= 0.84 lb/hr

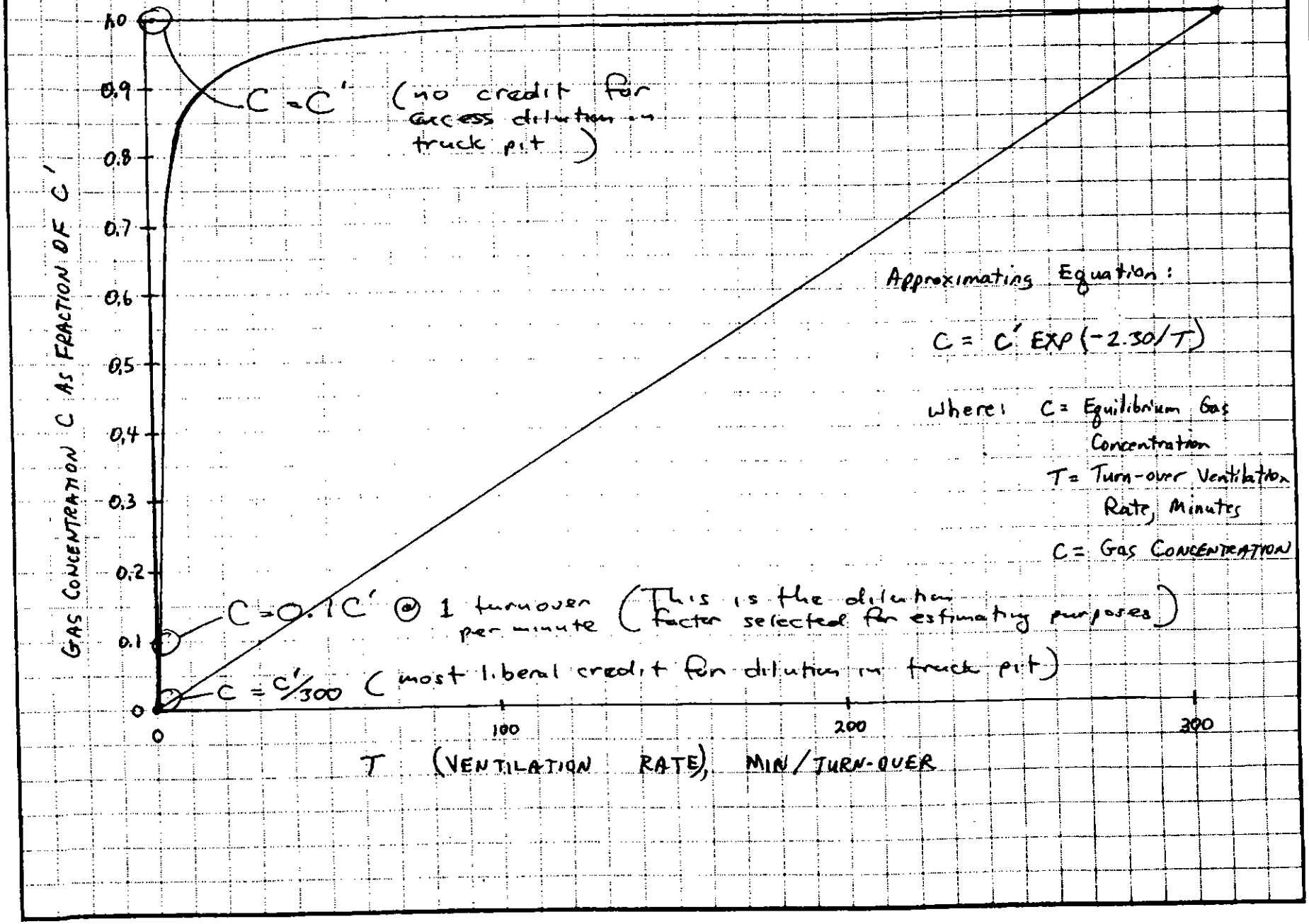
REFERENCES FOR EMISSION ESTIMATES

1. SULFUR PARTICULATE ---- prepared by Dr. John B. Koogler, Koogler & Associates, Gainesville, Florida for Agrico Chemical Company using actual measurements of a similar system and data obtained from Enviroplan, Inc.

2. HYDROGEN SULFIDE, SULFUR DIOXIDE, and VOLATILE ORGANICS ---- prepared by Dr. John B. Koogler for Agrico Chemical Company using data collected at Sulfur Terminals(Tampa) in November, 1983 and other data collected by Enviroplan, Inc.

3. VOLATILE ORGANIC COMPOUNDS ---- prepared by Dr. John B. Koogler for Agrico Chemical Company using concentration data obtained from Enviroplan, Inc.

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

ENVIRONMENTAL SERVICES

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

JOB _____

CALCULATED BY _____ DATE _____

SHEET NO. 8a OF 8

ATTACHMENT 3B

BASIS OF EMISSION ESTIMATES FOR RAIL RECEIVING PIT

ASSUMPTIONS

Applicable assumptions incorporated by reference from Attachment 3A.

In addition, the following assumptions are noted:

1. Rail receiving pit capacity is 100 tons.

2. The pit has two vents with a ventilation rate of 18 cu ft/min/vent plus the volume of air displaced during filling of the pit.

3. Sulfur is transferred from a 90 ton rail car at a rate of one car/hr. Sulfur is pumped to the west storage tank at a rate of 90 tph.

4. The rail pit is empty when sulfur transfer is not occuring.

5. The ventilation rate during filling is 3767 cu ft/hr. This is based on the following:

   = (2 vents x 18 cu ft/min/vent x 60 min/hr) + volume displaced by the sulfur during filling of the pit

   = 2160 + 1607 = 3767 cu ft/hr

6. The sulfur particulate concentration = 0.2 grains/cu ft.

7. Annual use of the pit is about 50052 tons/yr / 90 tph, or about 556 hr/yr.

EMISSIONS

Sulfur Particulate

= 3767 cu ft /hr x 556 hr/yr x 0.2 grains/cu ft x 1/7000 lb/grain x 1/2000 ton/lb

= 0.03 tpy

= 0.03 tpy x 2000 lb/ton x 1/556 yr/hr

= 0.11 lb/hr

Hydrogen Sulfide, Sulfur Dioxide, and Volatile Organics

Equilibrium concentrations:

H2S = 0.303 grains/cu ft
SO2 = 0.515 grains/cu ft
VOC = 5.224×10^{-5} lb/cu ft

Total ventilation = 3767 cu ft/hr
Transfer Time = 556 hr/yr

H2S Emissions = 3767 cu ft/hr x 556 hr/yr x 0.303 grains/cu ft x 1/7000 lb/grain x 1/2000 ton/lb
= 0.05 tpy, or

= 0.05 tpy x 2000lb/ton x 1/556 yr/hr

= 0.18 lb/hr

SO2 Emissions = 3767 cu ft/hr x 556 hr/yr x 0.515 grains/cu ft x 1/7000 lb/grain x 1/2000 ton/lb
= 0.08 tpy, or

= 0.08 tpy x 2000lb/ton x 1/556 yr/hr

= 0.29 lb/hr

VOC Emissions = 3767 cu ft/hr x 556 hr/yr x 5.224 x 10^{-5} lb/cu ft x 1/2000 ton/lb
= 0.05 tpy, or

= 0.05 tpy x 2000lb/ton x 1/556 yr/hr

= 0.18 lb/hr

REFERENCES

See Attachment 3A.

ATTACHMENT 3C

BASIS OF EMISSION ESTIMATE FOR STORAGE TANKS

ASSUMPTIONS

Applicable assumptions incorporated by reference from Attachment 3A.

In addition, the following assumptions are noted:

1. All sulfur delivered by rail and 20% delivered by truck is transferred to storage tanks. This is about 140147 tpy.

   = 50052 + (0.2 x 450473) = 140147 tpy

2. The transfer rate from truck pit to storage tanks is 425 gpm, or about 190 tph.

   = 425 gpm x 60 min/hr x 1/7.5 gal/cu ft x 112 lb sulfur/cu ft x 1/2000 ton/lb

   = 190 tph

3. Sulfur throughput is divided evenly between the two tanks.

4. Ventilation rates are:

   a) 50052 tpy from rail cars is transferred at a rate of 90 tph, which displaces 27 cu ft/min.

   b) 90095 tpy from truck pit is transferred at a rate of 190 tph, which displaces about 57 cu ft/min.

   c) Wind induced ventilation from each 5 vent tank is about 90 cu ft/min (5 vents x 18 cu ft/min/vent).

EMISSIONS

Sulfur Particulate

a) During filling from truck pit, based on 57 + 90 = 147 cu ft/min total ventilation rate and a sulfur particle concentration of 0.2 grains/cu ft:

Transfer time = 90095 tons/190 tph = 474 hr/yr

Emissions = 147 cu ft/min x 60 min/hr x 474 hr/yr x
0.2 grains/cu ft x 1/7000 lb/grain x
1/2000 ton/lb
= 0.06 tpy, for both tanks

b) During filling from rail pit, based on 27 + 90 = 117 cu ft total ventilation rate and a sulfur particle concentration of 0.2 grains/cu ft:

Transfer time = 50052 tons/90 tph = 556 hr/yr

Emissions = 117 cu ft/min x 60 min/hr x 556 hr/yr x
0.2 grains/cu ft x 1/7000 lb/grain x
1/2000 ton/lb
= 0.06 tpy, for both tanks

c) During withdrawal or when idle, based on a 90 cu ft total ventilation rate and a sulfur particle concentration of 0.2 grains/cu ft:

Time = 8760 hr/yr - (474 + 556) = 7730 hr/yr

Emissions = 90 cu ft/min x 60 min/hr x 7730 hr/yr x
0.2 grains/cu ft x 1/7000 lb/grain x
1/2000 ton/lb
= 0.60 tpy, for both tanks

Total Tank Emissions:

= 0.06 + 0.06 + 0.60 = 0.72 tpy, for both tanks

= 0.72 tpy x 2000 lb/ton x 1/8760 yr/hr = 0.16 lb/hr

Hydrogen Sulfide, Sulfur Dioxide, and Volatile Organics

Equilibrium concentrations:

H2S = 0.303 grains/cu ft
SO2 = 0.515 grains/cu ft
VOC = 5.224 x 10^{-5} lb/cu ft

a) Emissions from tank during filling from truck pit:

Total ventilation = 147 cu ft/min
Transfer Time = 474 hr/yr

VOC Emissions = 117 cu ft/min x 60 min/hr x 556 hr/yr
x 5.224 x 10^{-5} lb/cu ft) x 1/2000 ton/lb
= 0.10 tpy, or

= 0.10 tpy x 2000 lb/ton x 1/8760 yr/hr

= 0.023 lb/hr for both tanks

c) Emissions from tank when idle or sulfur is withdrawn:

Total ventilation = 90 cu ft/min
Transfer Time = 7730 hr/yr

H2S Emissions = 90 cu ft/min x 60 min/hr x 7730 hr/yr
x 0.303 grains/cu ft x 1/7000 lb/grain
x 1/2000 ton/lb
= 0.90 tpy, or

= 0.90 tpy x 2000lb ton x 1/8760 yr/hr

= 0.21 lb/hr for both tanks

On same basis, using equilibrium concentrations shown above, the emissions of SO2 and VOC's may be calculated.

SO2 Emissions = 90 cu ft/min x 60 min/hr x 7730 hr/yr
x 0.515 grains/cu ft x 1/7000 lb/grain
x 1/2000 ton/lb
= 1.53 tpy, or

= 1.53 tpy x 2000lb ton x 1/8760 yr/hr

= 0.35 lb/hr for both tanks

VOC Emissions = 90 cu ft/min x 60 min/hr x 7730 hr/yr
x 5.224 x 10^{-5} lb/cu ft) x 1/2000 ton/lb
= 1.09 tpy, or

= 1.09 tpy x 2000lb ton x 1/8760 yr/hr

= 0.25 lb/hr for both tanks

d) Total H2S, SO2, and VOC Emissions

H2S = 0.09 + 0.08 + 0.90 = 1.07 tpy, or 0.24 lb/hr

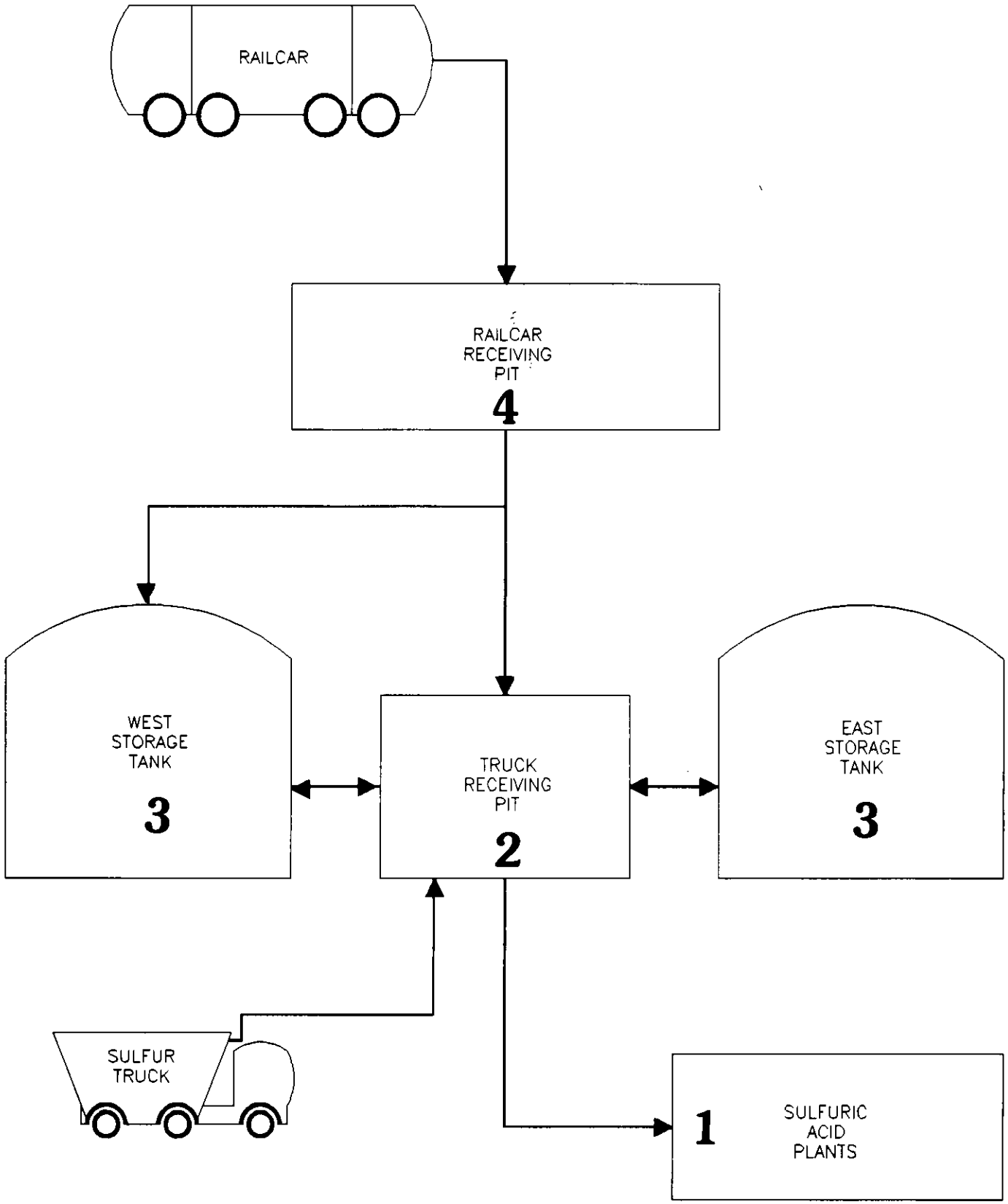
SO2 = 0.15 + 0.14 + 1.53 = 1.82 tpy, or 0.42 lb/hr

VOC = 0.11 + 0.10 + 1.09 = 1.30 tpy, or 0.30 lb/hr

REFERENCES

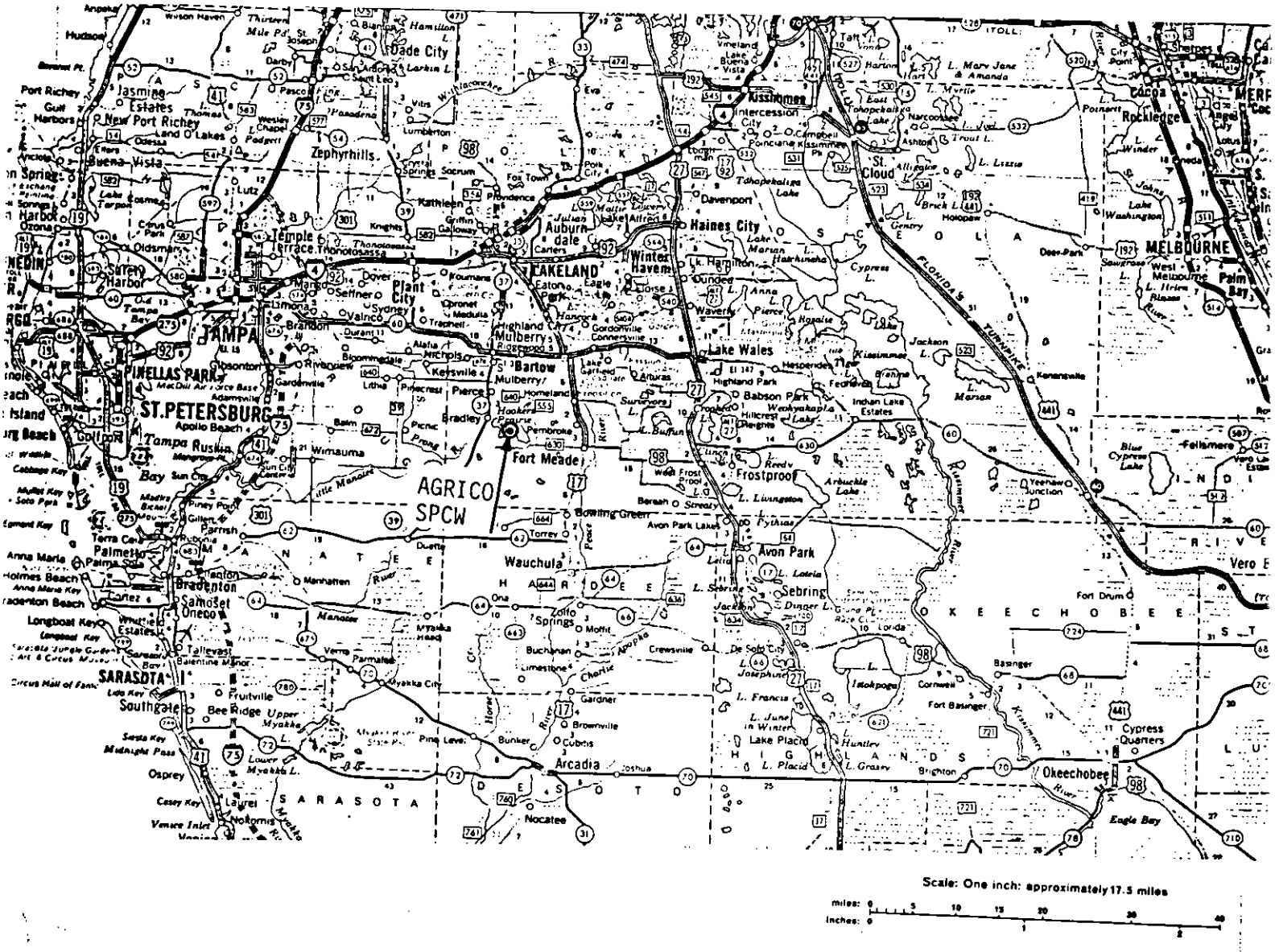
See Attachment 3A.

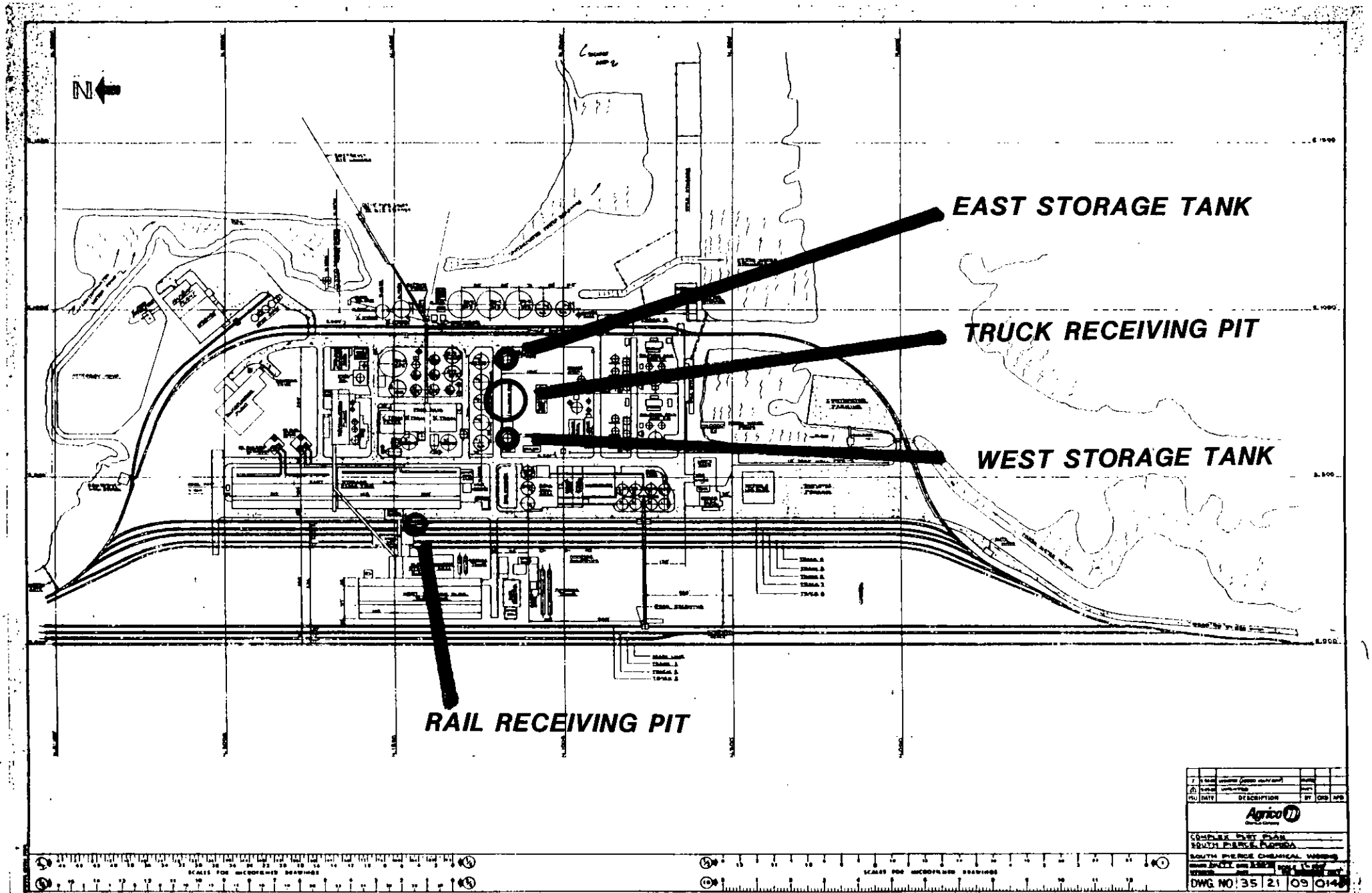
MOLTEN SULFUR STORAGE AND HANDLING FACILITY



ATTACHMENT 5

LOCATION MAP
AGRICO CHEMICAL COMPANY
SOUTH PIERCE CHEMICAL WORKS




N
EAST STORAGE TANK
TRUCK RECEIVING PIT
WEST STORAGE TANK
RAIL RECEIVING PIT
Agrico
DWG NO 35 21 09 014

PHYSICAL DESCRIPTION

The molten sulfur storage and handling facility at South Pierce consists of the following:

(1) two - 1050 ton storage tanks measuring 32 feet in diameter and 24 feet in height. Each tank has five vents with no forced ventilation - one in the center and four at the periphery at 90 degree angles. Material throughput is approximately 140,000 tons per year.

(2) one - 670 ton truck receiving pit measuring 83 feet in length and 24 feet in width. The pit has four vents, two of which have vent fans providing ventilation at a rate of 1350 cfm. Material throughput is approximately 450,000 tons per year.

(3) one - 100 ton railcar receiving pit measuring 45 feet in length and 7 feet in width. The pit has two vents with no forced ventilation. Material throughput is approximately 50,000 tons per year.

OPERATION PROCEDURES

Operation procedures for minimizing spills/fugitive emissions consist of the applicable work practice standards established by Chapter 17-2.600 (11) (a) 1-9, F.A.C.