6/10/80
Rev. 8/25/80

AC 53 -34865

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

SOURCE TYPE: DAP Storage and Shipping [X] New[1] [ ] Existing[1]

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

COMPANY NAME: Agrico Chemical Company COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2. Gas Fired) Scrubber on DAP Storage and Shipping Facility

SOURCE LOCATION: Street SR 630 City Polk County

UTM: East 407.4 km E North 3071.5 km N

Latitude 27 ° 45 ' 45 "N Longitude 81 ° 56 ' 28 "W

APPLICANT NAME AND TITLE: Agrico Chemical Company

APPLICANT ADDRESS: P.O. Box 1969 SPCW Bartow, FL 33830

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: [signature]

L. C. Lahman, Plant Manager
Name and Title (Please Type)

Date: 9/2/80 Telephone No. (813) 428-1423

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 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: [signature]

John R. Koogler, P.E.
Name (Please Type)

(Affix Seal)

SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS
Company Name (Please Type)

1213 NW 6th Street, Gainesville, FL 32601
Mailing Address (Please Type)

Florida Registration No. 12925 Date: 9/2/80 Telephone No. (904) 377-5822

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

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.

A DAP storage and shipping facility with a capacity of 600,000 TPY DAP will be constructed. Capability for shipping by rail and truck will be provided. All transfer points will be vented and ducted to a common scrubber for particulate matter control. (con't)

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

Start of Construction September, 1980 Completion of Construction July, 1982

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.)

Venturi or other wet scrubber at a cost of approximately $125,000.

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

None

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __X__ No

F. Normal equipment operating time: hrs/day 7 ; days/wk 24 ; wks/yr 50 ; if power plant, hrs/yr ____ ; if seasonal, describe: (8400 hours/year)

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

1. Is this source in a non-attainment area for a particular pollutant? No
   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. Yes
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

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

II, A (con't)

A bulk storage building will be constructed for the storage of ammonium phosphate product. Product will be received from the new granulation plant at a design rate of 100 TPH by the product conveyor and product transfer conveyor. Material is transferred to the shuttle feed conveyor which feeds the product shuttle conveyor which in turn distributes the granulated product throughout the storage building.

Product is retrieved from the bulk storage facility by a front end loader which transports it to the shipping elevator through the receiving hopper. The product discharges from the elevator through a splitter/diverter to two shipping screens. Oversize material flows to the cage mill where it is crushed and returned to the receiving hopper by gravity. Undersize from the shipping screens flows by gravity to the fines storage bin. The fines are returned to the granulation plant by front end loader. The on-size product discharges from the screens onto the shipping transfer conveyor which transfers the product to the loadout surge bin.

The loadout surge bin is equipped with loads cells which signal a weight indicator. A high weight alarm informs the operator that the system cannot accept additional product. A low weight alarm signals the operator that the system can again receive product from the front end loader. An overflow chute also provides positive indication that the bin is full and overflowing material is flows by gravity to the front of the fines storage bin.

Two loadout spouts are provided for discharge of product at 200 TPH to either rail or truck loading.

The air vented from the process is treated first, in cyclone dust collectors. Secondly, a wet venturi scrubber is used to remove the remaining dust particles. The dust removed by the cyclones flows by gravity to the fines storage bin.

The gases entering the venturi scrubber are sprayed with pond water. The gases and liquid leaving the venturi passes vertically downward through a central pipe, the gas is separated near the bottom with the gas going upward and the liquid downward. As the gases flow upward the cyclonic action disengages the entrainment from the gas stream as the gases spirals upwards to the exit nozzle near the top of the vessel. The gases then pass through a mist eliminator before entering the fan. The liquid from the scrubber flows to the scrubber seal tank from which it is pumped to the DAP effluent sump.

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		
DAP	Dust	-	400,000(max.)	1

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

1. Total Process Input Rate (lbs/hr): 400,000 lb/hr (max.)
2. Product Weight (lbs/hr): 400,000 lb/hr (max.)

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Part. Matter	3.4	14.1	BACT	3.4	34.0	141	16

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Scrubber	Dust	90%	> 2.0 micron	See V.5
(Final design not complete)				

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 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)

[5] If Applicable

E. Fuels N/A

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

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, 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 _____ Maximum _____

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

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

Stack Height: 125 ft. Stack Diameter: 3.5 ft.

Gas Flow Rate: 30,000 ACFM Gas Exit Temperature: 115 °F.

Water Vapor Content: 5 % Velocity: 52.0 FPS

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight – show derivation.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8½" 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 1

7. An 8½" 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 2

8. An 8½" 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 3

V, 1 Through-Put Weight Rate

The storage and shipping facility will be designed to store and ship the product from the proposed DAP plant; 600,000 TPY.

The maximum load-out rate will be 200 TPH

The maximum rate at which DAP will be transferred into storage is 100 TPH.

V, 2 and 3 Emission Estimates and Potential Emissions

Particulate matter will be the only pollutant emitted from this facility. The pH of DAP is approximately seven. This eliminates the possibility of fluoride emissions.

Particulate Matter

Actual emissions - A concentration in the exhaust gas stream of 0.015 grains/scf, dry was assumed.

Hourly Max. = 30,000 Acfm x (1-0.05) x 293/319 x 0.015 x 60 min/hr x 1/7000
= 3.4 lb/hr

Annual Avg. = 3.4 x 8400 x 1/2000
= 14.1 tons/year

Potential emissions - Assume a scrubber efficiency of 90%.

Hourly Max. = 3.4/(1-0.9)
= 34 lbs/hr

Annual Avg. = 14.1/(1-0.9)
= 141.0 tons/year

V, 4 Control Efficiency Estimates

Particulate Matter

E_p - Assumed to be 90%.

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[ ] Yes [X] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [X] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
Particulate Matter	0.015 grains/SCF, dry

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

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: Venturi or Impingement scrubber

b. Operating Principles: Impingement

c. Efficiency*: 90-95% (estimate) d. Capital Cost: $125,000.00

e. Useful Life: 10 years f. Operating Cost: Undetermined

g. Energy*: Undetermined h. Maintenance Cost: $10,000/year

i. Availability of construction materials and process chemicals: Good

j. Applicability to manufacturing processes: Proven within the industry

k. Ability to construct with control device, install in available space, and operate within proposed levels:
Can be designed into proposed facility.

2.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy**: h. Maintenance Costs:

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:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Life: f. Operating Cost:

g. Energy: h. Maintenance Cost:

*Explain method of determining efficiency above.

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*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected: See VI-E

1. Control Device:

2. Efficiency*:

3. Capital Cost:

4. Life:

5. Operating Cost:

6. Energy:

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

*Explain method of determining efficiency above.

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

Similar systems have been proven effective within the industry and particulate matter emissions can be controlled to an acceptable level.

*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

SEE ATTACHED AIR QUALITY REVIEW REPORT

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.

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 on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

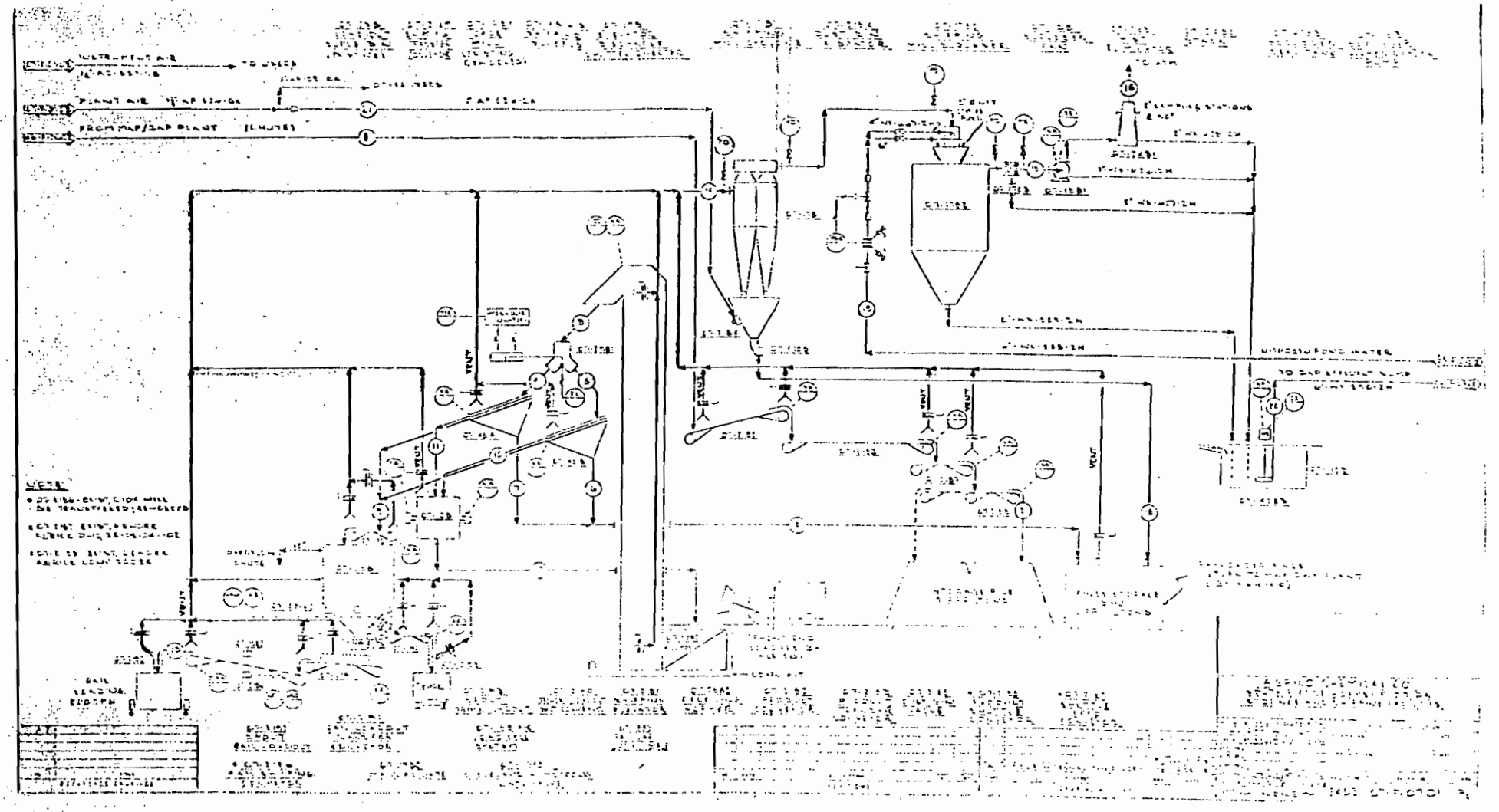
F. Attach all other information supportive to the PSD review.

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

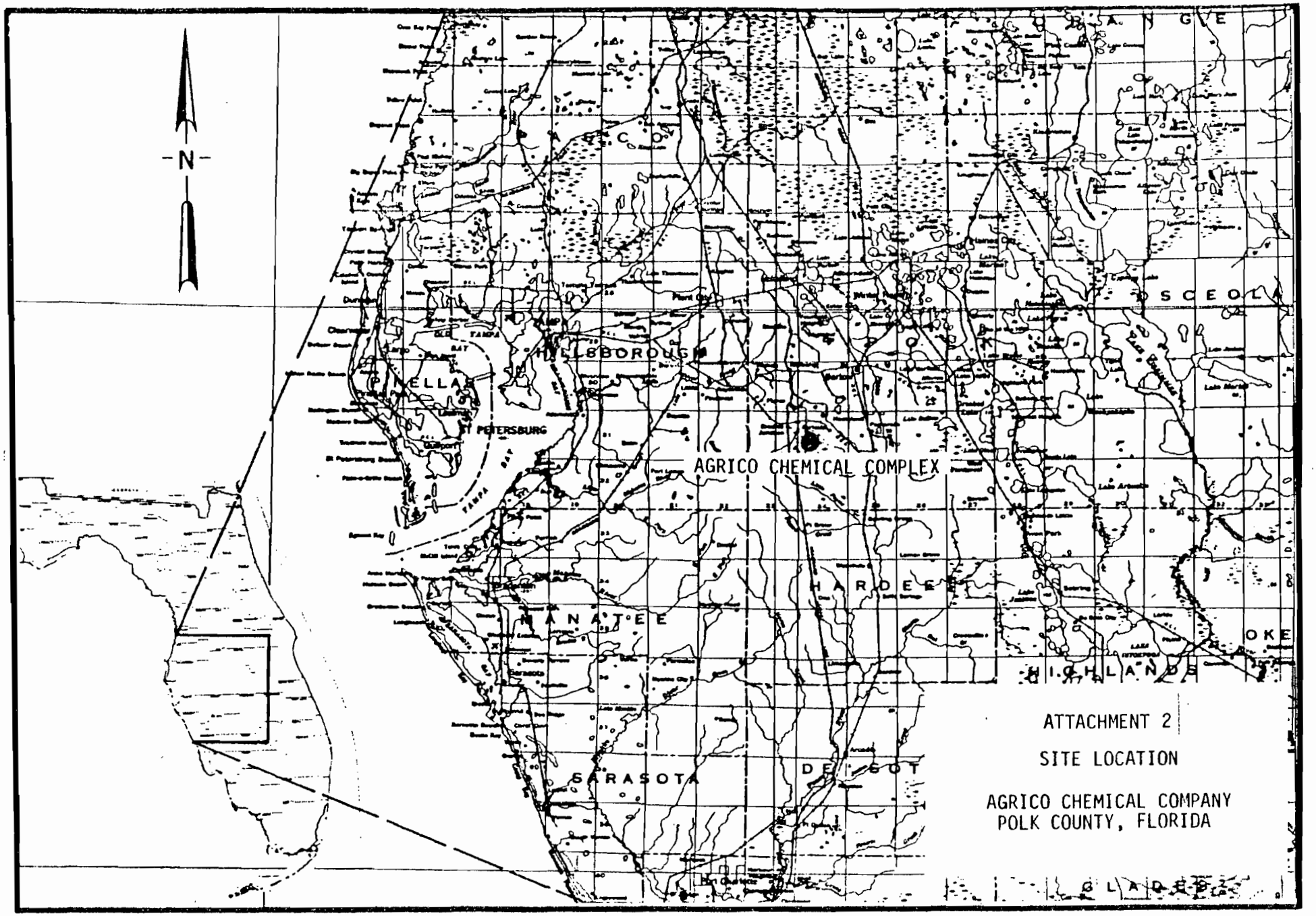
G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

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.

BEST AVAILABLE COPY



ATTACHMENT 1

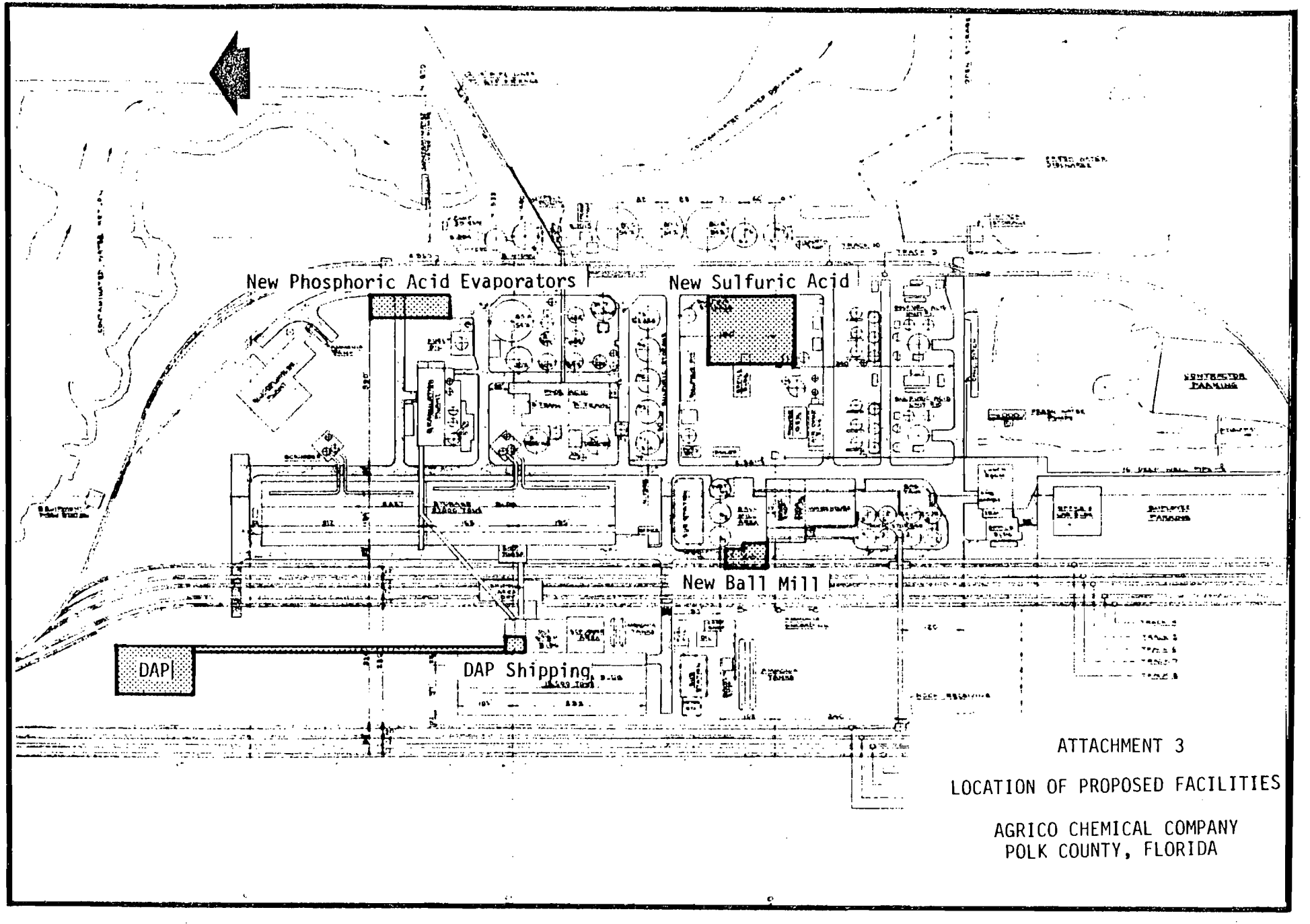


ATTACHMENT 2

SITE LOCATION

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

SHOLTES & KOOGLER



ATTACHMENT 3

LOCATION OF PROPOSED FACILITIES

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

SHOLTES & KOOGLER

6/10/80

Rev. 8/25/80

AC 53 - 34861

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

SOURCE TYPE: DAP Plant [X] New[1] [ ] Existing[1]

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

COMPANY NAME: Agrico Chemical Company COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) Packed tail gas scrubber on DAP plant

SOURCE LOCATION: Street SR 630 City Polk County

UTM: East 407.4 km E North 3071.7 km N

Latitude 27 ° 45 ' 45 "N Longitude 81 ° 56 ' 28 "W

APPLICANT NAME AND TITLE: Agrico Chemical Company

APPLICANT ADDRESS: P. O. Box 1969, South Pierce Chemical Works, Bartow, FL 33830

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: _____

L. C. Lahman, Plant Manager
Name and Title (Please Type)

Date: 9/2/80 Telephone No. (813)428-1423

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 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: _____

John B. Koogler, P.E.
Name (Please Type)

(Affix Seal)

SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS
Company Name (Please Type)

1213 NW 6th Street, Gainesville, FL 32601
Mailing Address (Please Type)

Florida Registration No. 12925 Date: 9/2/80 Telephone No. (904) 377-5822

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

SECTION II: GENERAL PROJECT INFORMATION

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

A new plant will be constructed to produce 600,000 TPY of diammonium phosphate (DAP). The plant will meet Federal NSPS for fluoride emissions & BACT for particulate matter, NO_x and SO_2 emissions. Scrubber water will recirculate through a new retention pond which will not require discharge except during periods of excessive rainfall.

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

Start of Construction September 1980 Completion of Construction July 1982

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.)

Scrubber & stack	$1,557,000
Fans, motors, pumps	645,200
Duct work & piping	834,000
Site preparation, concrete, structural	446,000
Indirect & engineering	2,064,500
TOTAL	$5,566,700

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

None

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes X No

F. Normal equipment operating time: hrs/day 22 ; days/wk 7 ; wks/yr 46.4 ; if power plant, hrs/yr ____ ; if seasonal, describe: 7,143 hours per year

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

1. Is this source in a non-attainment area for a particular pollutant? NO
   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. YES
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. YES
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? YES
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

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		
Phos. Acid(52%P_2O_5)	F	1.50	154,806	1, 2, 3
Ammonia	None		30,856	4, 5, 6
H_2SO_4 (93%)	None		0-3,360	8

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

1. Total Process Input Rate (lbs/hr): 675,092 TPY = 189,022 lb/hr (225,675 max. hourly rate)
2. Product Weight (lbs/hr): 600,000 TPY = 167,997 lb/hr (200,000 max. hourly rate)

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Part. Matter	24.0	71.9	BACT	24.0	758	2707	30
Fluoride	2.9	8.6	NSPS	2.9	2764	8293	30
SO_2	33.5	100.6	BACT	33.5	146	352	30
NO_x	8.1	19.4	BACT	8.1	8	19	30
CO	2.0	4.8	BACT	2.0	2.0	4.8	30

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Scrubber (1)	Part	96.8%		(See V,
	Fluoride	99.9%		4)
	SO_2	77.0% (2)		
	NO_x & CO	0		
(1) Includes coaxial venturi scrubbers and tail gas scrubber in series.				
(2) Efficiency includes sorption in dryer.				

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 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)

[5]If Applicable

E. Fuels

Type (Be Specific)	Consumption* (lb/hr)		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
No. 6 oil	2188	3240	60.42

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, lbs/hr

Fuel Analysis:

Percent Sulfur: 2.25 Percent Ash: 0.07

Density: 8.044 lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: 18,647 BTU/lb 150,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): Not Applicable

F. If applicable, indicate the percent of fuel used for space heating. Annual Average _____ Maximum _____

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

No solid waste. Liquid wastes recirculated through a retention pond. Negative water balance results in no discharge from pond except possibly during periods of excessive rainfall.

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

Stack Height: 125 ft. Stack Diameter: 10 ft.

Gas Flow Rate: 225,000* ACFM Gas Exit Temperature: 130 °F.

Water Vapor Content: 12 % Velocity: 47.8 FPS

* 176,872 scfm, dry

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight — show derivation.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8½" 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 1)
7. An 8½" 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 2)
8. An 8½" 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 3)

V, 1 Process Input and Product Weight

Phosphoric acid with a 52% P_2O_5 content is reacted with anhydrous ammonia. Sulfuric acid is used for pH adjustment to obtain optimum ammonia absorption and for adjusting product analysis.

Input (Average)*

Phosphoric Acid	154,806 lb/hr
(P_2O_5)	(80,499)
Anhydrous ammonia	30,856
Sulfuric Acid	3,360 (max)
TOTAL	189,022

$$189{,}022 \text{ lb/hr} \times \frac{7143 \text{ hr/yr}}{2000 \text{ lb/ton}} = 675{,}092 \text{ TPY}$$

Product (Average)*

Input less moisture and losses (11.1%) = 600,000 TPY

= 167,997 lb/hr

= 84 TPH*

*Maximum production rate will be 100 TPH; input and product weight rates will increase proportionately.

Average P_2O_5 input = 40.25 tons per hour

Maximum P_2O_5 input = 100/84 x 40.25

= 47.92 tons per hour.

V, 2 and 3 Emission Estimates and Potential Emissions

Particulate Matter (Maximum & Average Rate)

Actual Emissions (@ 0.5 lb/ton P_2O_5 input)

= 0.5 x 47.92 (max. P_2O_5 input rate)
= 24.0 lb/hour (hourly maximum)
= 0.5 x 40.25 (avg. P_2O_5 input) x 7143 hr/yr x 1/2000
= 71.9 tons/year (annual average)

Potential Emissions

= 0.5 grains/SCF, dry[1] x 176,872 x 60 x 1/7000
= 758.0 lb/hour x 7143 x 1/2000
= 2707 tons/year

Sulfur Dioxide

Potential Emissions - Fuel consumption (max.) is 3240 lb/hr @ 2.25% sulfur

Max. hourly = 3240 x 0.0225 x 2 lb SO_2/lb S
= 145.8 lb/hr

Annual avg. = 2188 lb/hr (avg) x 0.0225 x 2 x 7143 x 1/2000
= 351.6 tons/yr.

Actual Emissions (@ 0.7 lb/ton P_2O_5 input)

= 0.7 x 47.92
= 33.5 lb/hr (hrly. max.)
= 0.7 x 40.25 x 7143 x 1/2000
= 100.6 tons/year (annual average)

Nitrogen Oxides

Potential and Actual Emissions (AP-42)

Assume 20 lb NO_X/1000 gal fuel as emission factor.

Max. hourly = 3240 lb fuel/hr x 1/8.044 gal/lb x 1/1000 x 20
= 8.1 lb NO_X/hr

Annual avg. = 2188 lb/hr (avg) x 1/8.044 x 1/1000 x 20 x 7143/2000
= 19.4 tons/year

[1] Evaluation of Control Technology for the Phosphate Fertilizer Industry, EPA 600/2-79-169, August, 1979.

V, 2 and 3 Emission Estimates and Potential Emissions (continued)

Fluorides

Potential Emissions

154,806 x 100/84 lb/hr 52% P_2O_5 phos. acid w/1.5% fluoride
= 154,806 x 0.015 x 100/ 84
= 2764 lb/hr max.
154,806 x 0.015 x 7143 x 1/2000
= 8293 tons/year. Avg.

Actual Emissions (@ 0.06 lb F/ton P_2O_5 Input)

= 0.06 x 47.92
= 2.9 lb/hr (hourly max.)
= 0.06 x 40.25 x 7143 x 1/2000
= 8.6 tons/year (annual average)

Carbon Monoxide

Potential and Actual Emissions

Assume an emission factor of 5 lb CO/1000 gal of fuel burned (AP-42)

Max. hourly = 3240 lb fuel/hr x 1/8.044 gal/lb x 1/1000 x 5
= 2.0 lb CO/hr.

Annual avg. = 2188 lb fuel/hr x 1/8.044 x 1/1000 x 5 x 7143 hr/yr x 1/2000
= 4.8 tons/year

V, 4 Control Efficiency Estimates (Reference Emission Estimates in previous Section)

Particulate Matter

E_p = (758.0 - 24.0)/758.0 = 96.8%

Sulfur Dioxide

E_s = (146 - 33.5)/146 = 77.0%

Nitrogen Oxides

E_n - Assumed to be 0

Fluoride

E_f = (2239 - 2.9)/2239 = 99.9%

Carbon Monoxide

E_c - Assumed to be 0

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[X] Yes [ ] No

Contaminant	Rate or Concentration
Fluorides	0.06 lb/ton P_2O_5 input

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [X] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
Fluorides	0.06 lb/ton P_2O_5 input
Particulate Matter	0.5 lb/ton P_2O_5 input
Sulfur Dioxide	0.7 lb/ton P_2O_5 input

D. Describe the existing control and treatment technology (if any). Proposed plant, no control presently exists at Agrico.

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

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: Venturi scrubber/separators on reactor-granulator, dryer and cooler system followed by common cross-flow packed scrubber.

b. Operating Principles: Condensation, absorption, impaction

c. Efficiency*: 99.9%F, 96% P.M., 70% SO_2 d. Capital Cost: $5.5 x 10^6

e. Useful Life: 10 years f. Operating Cost: } 10-15% of raw material cost

g. Energy*: ~ 8 x 10^6 KWH/yr. h. Maintenance Cost: }

i. Availability of construction materials and process chemicals: Good

j. Applicability to manufacturing processes: Proven within the industry

k. Ability to construct with control device, install in available space, and operate within proposed levels: Can be designed into proposed plant; performance proven in the industry.

2.

a. Control Device: Same as E1 except with counter-current (vertical) packed tail gas scrubber.

b. Operating Principles: Condensation, absorption, impaction

c. Efficiency*: 99.9% F, 96% PM, 70% SO_2 d. Capital Cost: $5.5 x 10^6

e. Useful Life: 10 years f. Operating Cost: } 10-15% of raw material cost

g. Energy**: ~ 8 x 10^6 KWH/year h. Maintenance Costs: }

i. Availability of construction materials and process chemicals: Good

j. Applicability to manufacturing processes: Proven within the industry

k. Ability to construct with control device, install in available space, and operate within proposed levels: Can be designed into proposed plant; performance proven within the industry.

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Life: f. Operating Cost:

g. Energy: h. Maintenance Cost:

*Explain method of determining efficiency above.

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*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected: Coaxial venturi scrubber/separators on the reactor-granulator, dryer and cooler systems followed by either a vertical counter-current flow or a

1. Control Device: horizontal cross-flow packed tail gas scrubber
2. Efficiency*: 99.9% F, 96.8% PM, 77% SO_2
3. Capital Cost: $5,000,000
4. Life: 10 years
5. Operating Cost: $175,000/year
6. Energy: 8 x 10^6 KWH/year
7. Maintenance Cost: Unknown
8. Manufacturer: Undetermined
9. Other locations where employed on similar processes:

a. Similar to scrubbing system designed by D.M. Weatherly

(1) Company: USS Agri-Chemicals

(2) Mailing Address: Highway 60

(3) City: Bartow

(4) State: Florida

(5) Environmental Manager: Jim Carroll

(6) Telephone No.: 813/533-0471

*Explain method of determining efficiency above. (See Section V, 4)

(7) Emissions*:

Contaminant	Rate or Concentration
Fluorides	0.06 lb/ton P_2O_5
Particulate Matter	0.07 lb/ton P_2O_5
Sulfur Dioxide	Not tested

(8) Process Rate*: 60 - 90 TPH

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

The system proposed by Agrico will satisfy NSPS for fluoride and the recently determined FDER BACT limits for particulate matter and sulfur dioxide. Final design of the plant and scrubber system has not been completed and because of this Agrico has not firmly decided on a cross-flow or a counter-current flow packed tail gas scrubber. Either will provide control efficiencies necessary to meet BACT and NSPS.

Agrico has had considerable experience with cross-flow packed scrubbers at the South Pierce Chemical Works and is quite satisfied with operating and performance characteristics. The alternative of the vertical counter-current flow packed tail gas scrubber has recently been demonstrated at the USS Agri-Chemicals, Bartow plant.

*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

SEE ATTACHED AIR QUALITY REVIEW REPORT

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.

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

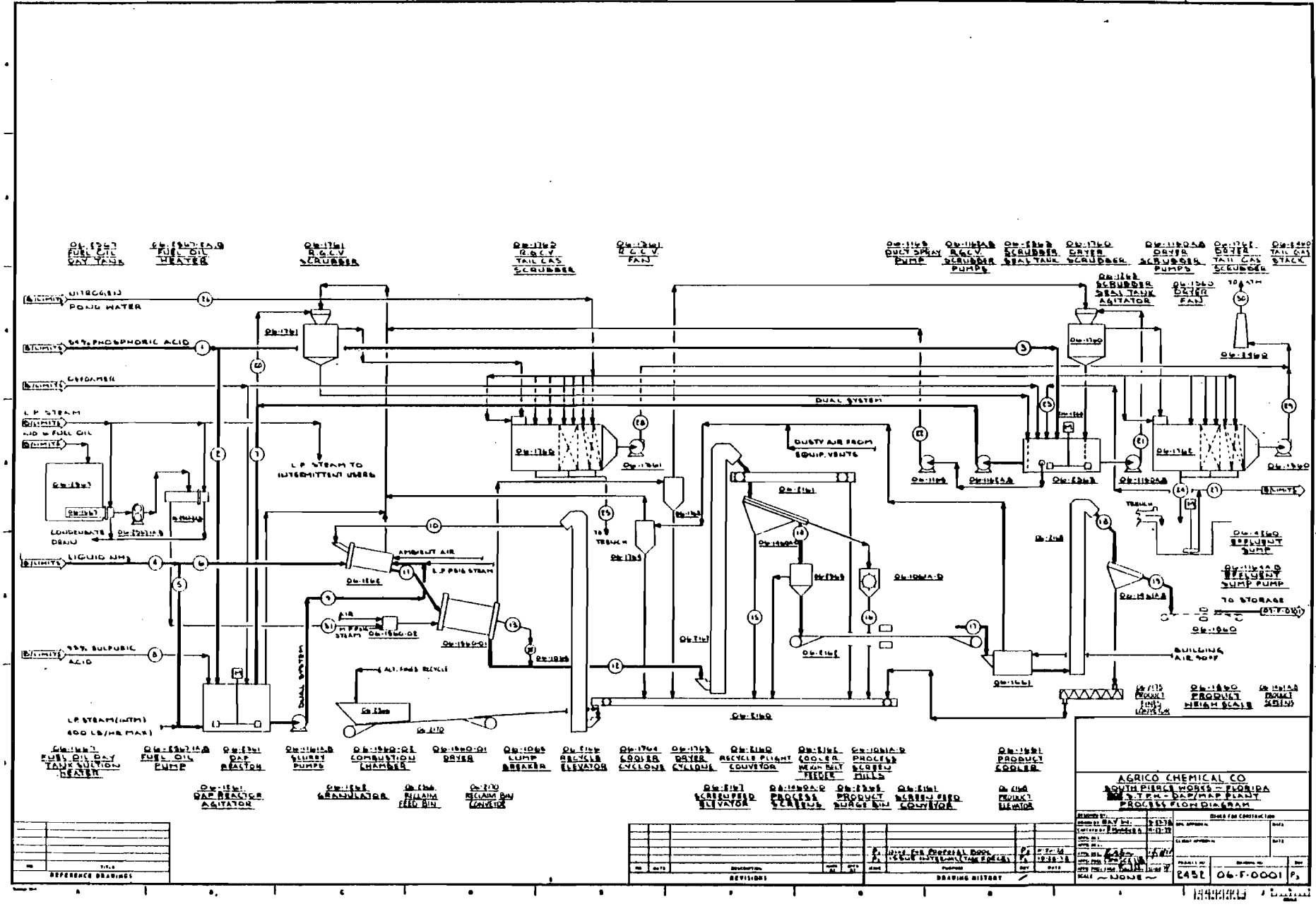
Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

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

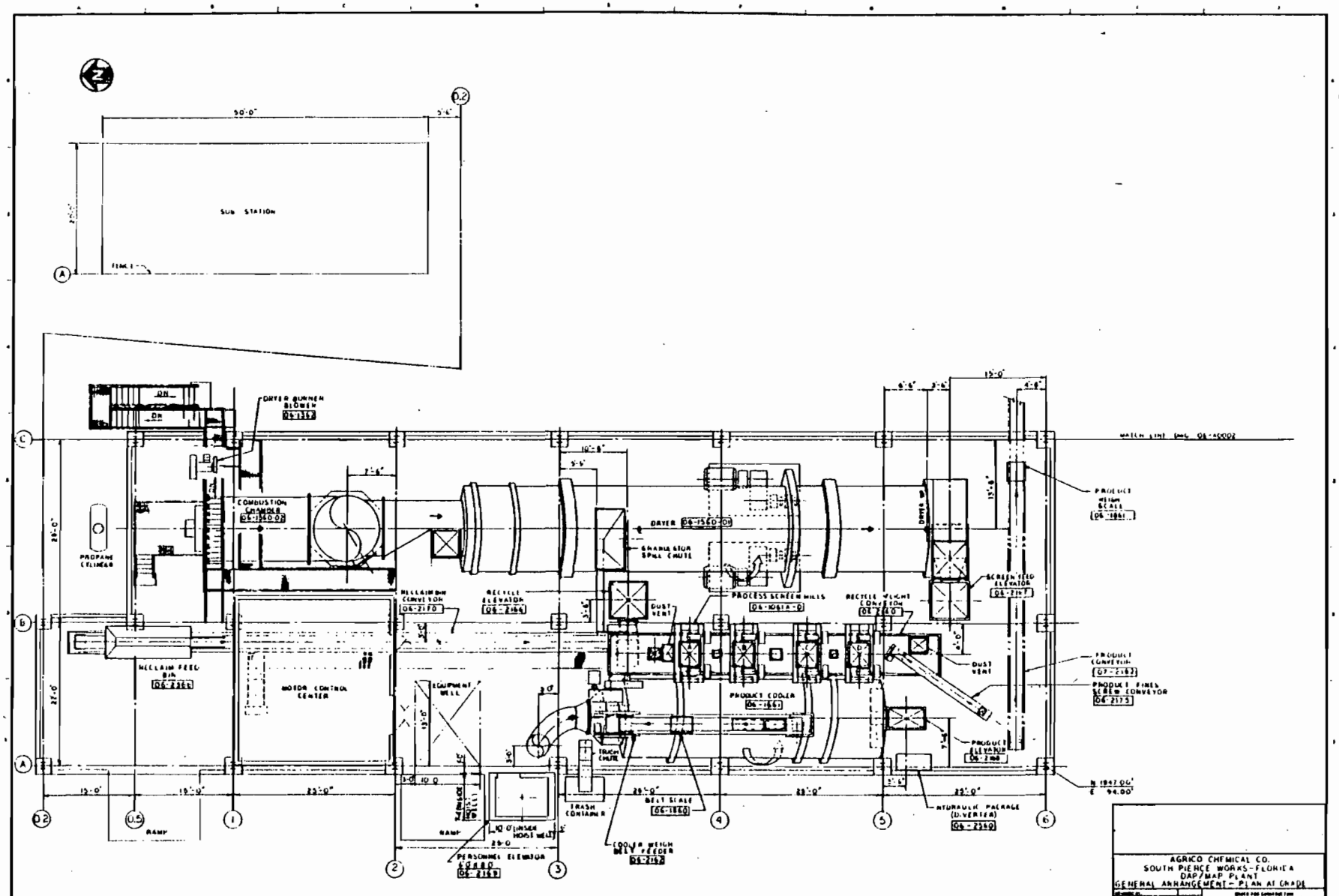
*Specify bubbler (B) or continuous (C).

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.



ATTACHMENT 1

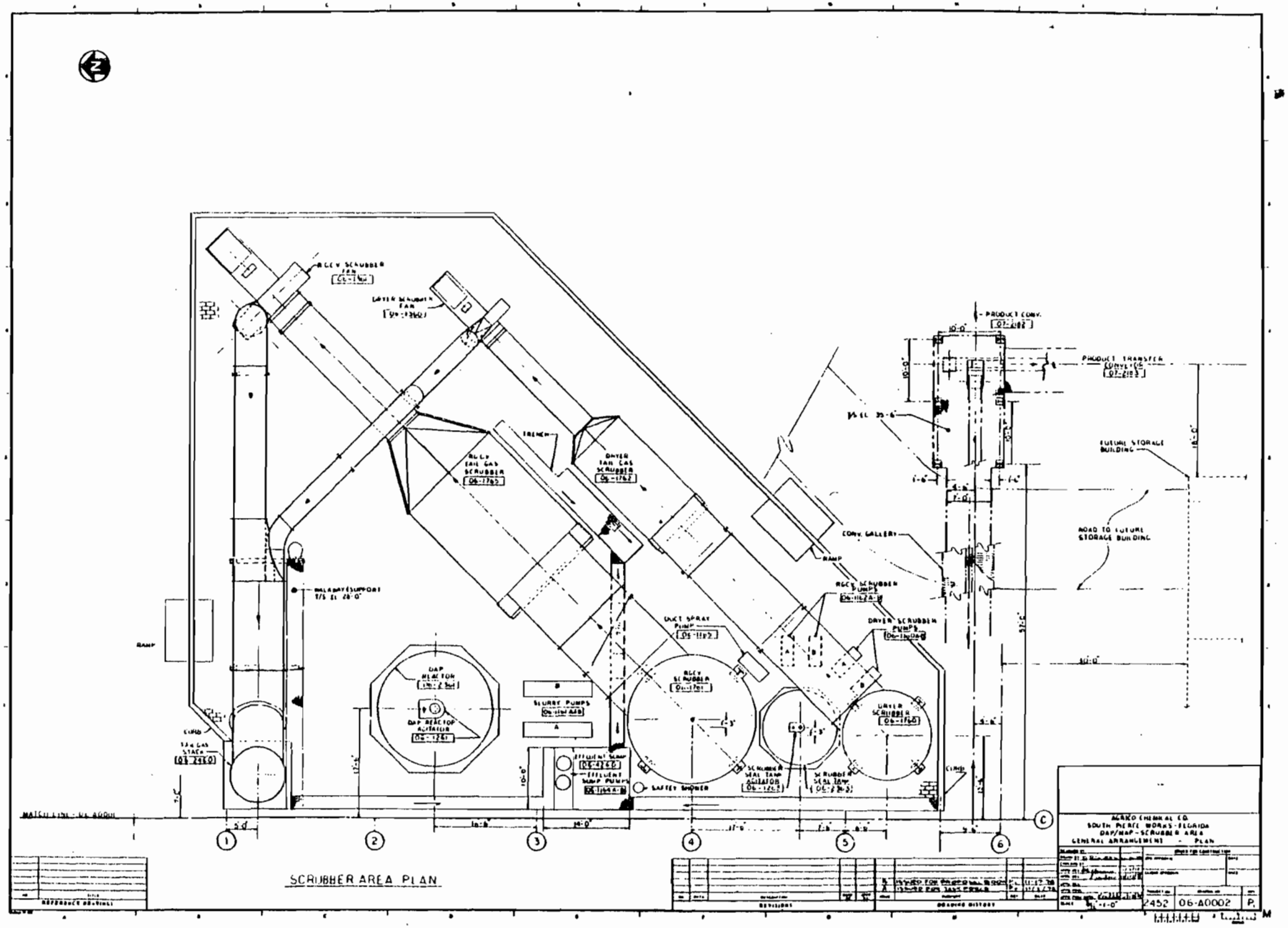


AGRICO CHEMICAL CO.
SOUTH PIERCE WORKS - FLORIDA
DAP/MAP PLANT
GENERAL ARRANGEMENT - PLAN AT GRADE

2452 | 06 - A0001

REFERENCE DRAWINGS

DRAWING HISTORY


RGCV SCRUBBER FAN
DRYER SCRUBBER FAN
PRODUCT CONV.
PRODUCT TRANSFER CONVEYOR
FUTURE STORAGE BUILDING
ROAD TO FUTURE STORAGE BUILDING
CONV. GALLERY
RAMP
TRENCH
RGCV TAIL GAS SCRUBBER
DRYER TAIL GAS SCRUBBER
MILL/DRY ESP SUPPORT
DUCT SPRAY PUMP
RGCV SCRUBBER PUMPS
DRYER SCRUBBER PUMPS
DAP REACTOR
DAP REACTOR AGITATOR
SLURRY PUMPS
RGCV SCRUBBER
DRYER SCRUBBER
SCRUBBER SEAL TANK AGITATOR
SCRUBBER SEAL TANK
EFFLUENT SUMP
EFFLUENT SUMP PUMPS
SAFETY SHOWER
TAIL GAS STACK
CURB
MATCH LINE - SEE A0001
SCRUBBER AREA PLAN
AGRICO CHEMICAL CO.
SOUTH PIERCE WORKS - FLORIDA
DAP/MAP - SCRUBBER AREA
GENERAL ARRANGEMENT - PLAN
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06-A0002
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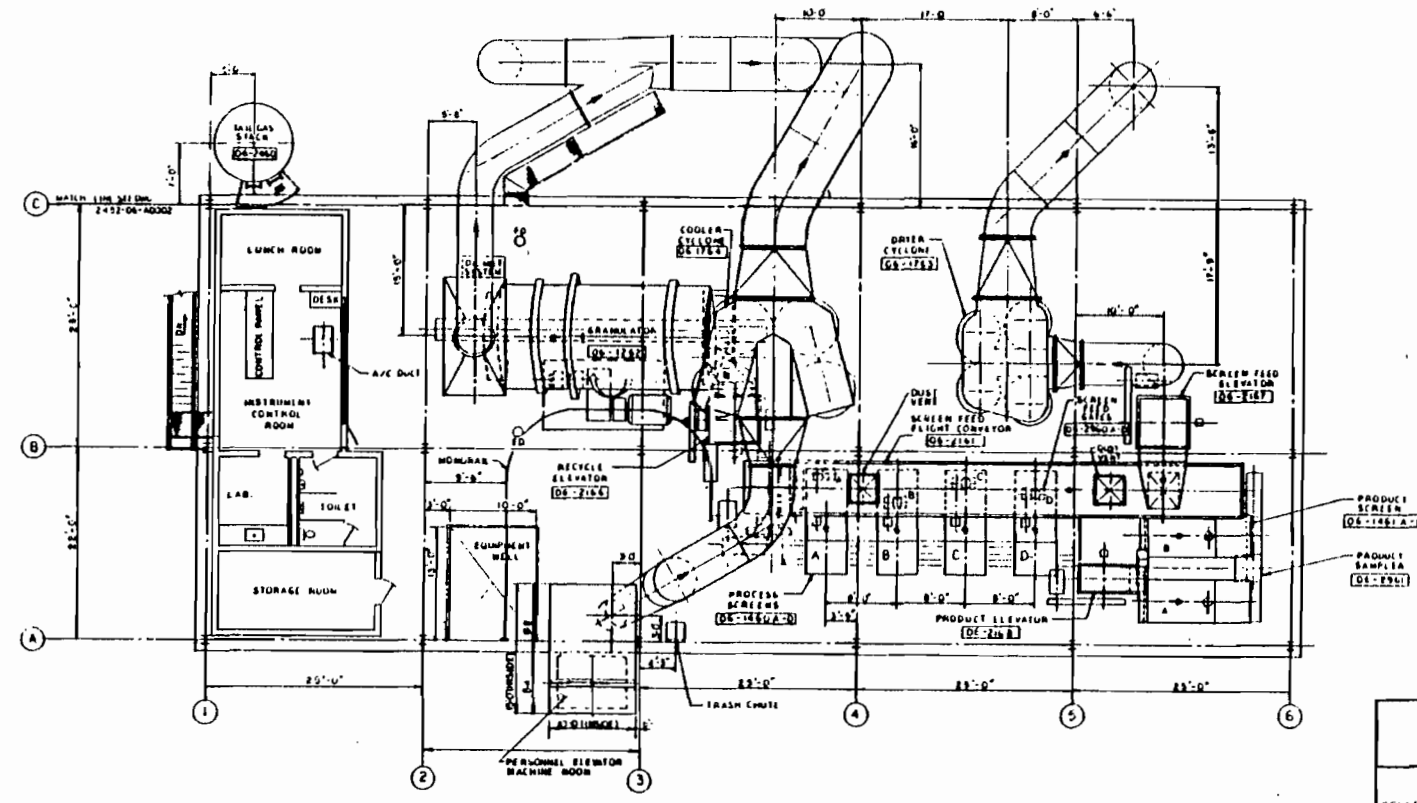
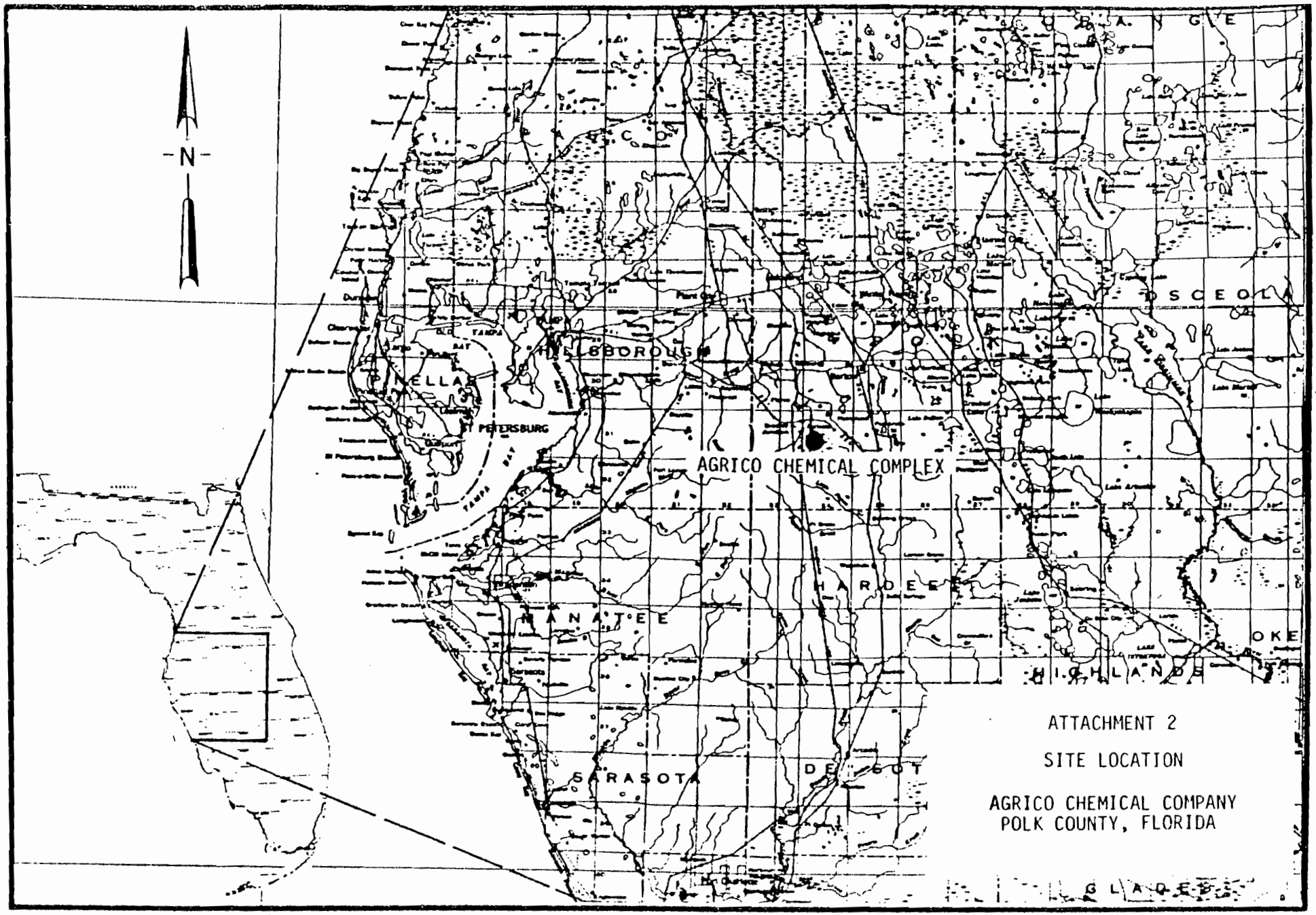
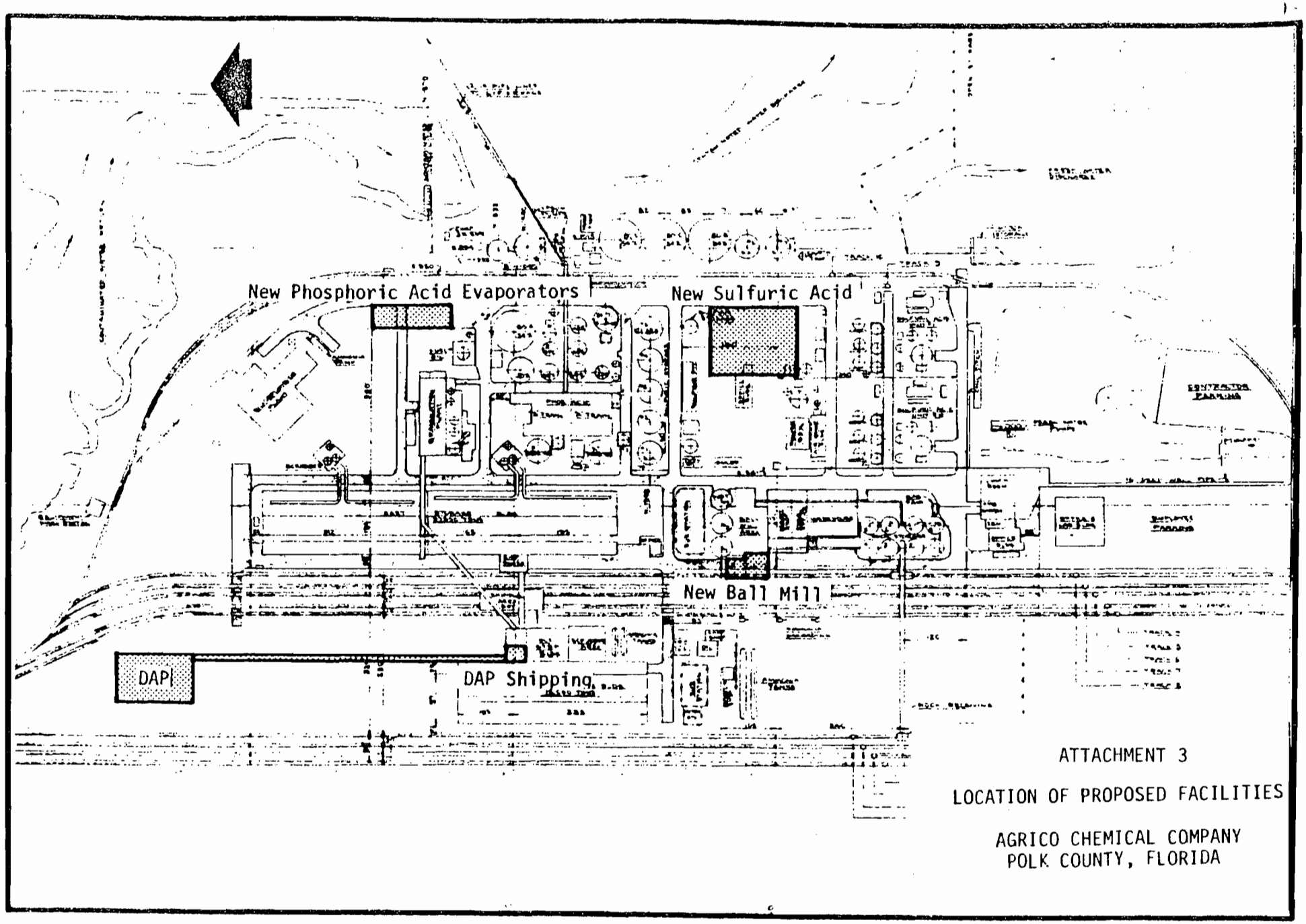


ACRICO CHEMICAL CO.
SOUTH PIERCE WORKS - FLORIDA
DAP/MAP PLANT
GENERAL ARRANGEMENT - PLAN

2452 | 06 - A0003 | P.



SHOLTES & KOOGLER



ATTACHMENT 3

LOCATION OF PROPOSED FACILITIES

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

6/10/80
Rev. 8/25/80

AC 53-34871

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Sulfuric Acid Plant [X] New[1] [ ] Existing[1]

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

COMPANY NAME: Agrico Chemical Company 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) Double Absorption Contact Sulfuric Acid Plant

SOURCE LOCATION: Street SR 630 City Polk County

UTM: East 407.6 km E North 3071.3 km N

Latitude 27 ° 45 ' 45 "N Longitude 81 ° 56 ' 28 "W

APPLICANT NAME AND TITLE: Agrico Chemical Company

APPLICANT ADDRESS: P.O. Box 1969 SPCW Bartow, Florida 33830

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: _____

L. C. Lahman, Plant Manager
Name and Title (Please Type)

Date: _____ Telephone No. (813)428-1423

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 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: _____

John B. Koogler, P.E.
Name (Please Type)

(Affix Seal)

SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS
Company Name (Please Type)

1213 NW 6th Street, Gainesville, FL 32601
Mailing Address (Please Type)

Florida Registration No. 12925 Date: 9/2/80 Telephone No. (904) 377-5822

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

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.

New double absorption contact sulfuric acid plant with a capacity of 2,000 tons per day of 100% sulfuric acid will be constructed. The plant will meet NSPS for SO_2 and acid mist and BACT for NO_x and CO.

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

Start of Construction September, 1980 Completion of Construction September, 1982

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.)

Estimated cost of installation of high efficiency mist eliminators, water recirculating facilities and required monitors is $3,300,000.

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

None

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes X No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 50 ; if power plant, hrs/yr _____ ; if seasonal, describe: (8400 hours per year)

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

1. Is this source in a non-attainment area for a particular pollutant? No
   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. Yes
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

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		
Sulfur	Carbon	0.25	55,000	1

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

1. Total Process Input Rate (lbs/hr): 55,000 lb/hr sulfur

2. Product Weight (lbs/hr): 166,667 lb/hr 100% H_2SO_4

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
SO_2	333.3	1400	NSPS	333.3	333.3	1400	2
H_2SO_4 Mist	12.5	52	NSPS	12.5	463.0	1944	2
NO_x	14.0	59	N/A	14.0	14.0	59	2
CO	0.1	0.4	N/A	0.1	0.1	0.4	2

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
High Efficiency Mist	Mist	97.3%		Estimate
Eliminators				
Double Absorption	SO_2	99.7%		Design
				Criteria

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 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)

[5] If Applicable

E. Fuels N/A

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

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, 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 _____ Maximum _____

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

_____

_____

_____

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

Stack Height: 150 ft. Stack Diameter: 9.5 ft.

Gas Flow Rate: 133,000* ACFM Gas Exit Temperature: 170 °F.

Water Vapor Content: 0 % Velocity: 31.3 FPS

* 111,466 scfm, dry

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation.

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

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

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

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

6. An 8½" 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 1

7. An 8½" 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 2

8. An 8½" 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 3

V,1 Process Input and Product Weight Rates

Input

Molten sulfur = 55,000 lbs/hr

Output

Sulfuric Acid - Assume 1.05% sulfur loss

= 55,000 x 98/32 x (1 - 0.0105)
= 166,667 lb/hr
= 83.33 tons/hr
= 2000 tons/day 100% H_2SO_4

V, 2 and 3 Emission Estimates and Potential Emissions

Sulfur Dioxide

Potential and actual emissions - based on an emission rate of 4.0 lb SO_2 per ton of 100% acid produced.

Hourly max. = 2000 TPD x 1/24 x 4.0
= 333.3 lb SO_2/hr

Annual avg. = 333.3 x 8400 hr/yr x 1/2000
= 1400 tons SO_2/year.

Acid Mist

Actual Emissions - Based on an emission rate of 0.15 lb mist per ton of 100% acid produced.

Hourly Max. = 2000 TPD x 1/24 x 0.15
= 12.5 lb/hr

Annual Avg. = 12.5 x 8400 x 1/2000
= 52.5 tons/year

Potential Emissions - Assume an efficiency of 97.3%.

Hourly Max. = 12.5/(1 - 0.973)
= 463.0 lbs/hr.

Annual Avg. = 52.5/(1 - 0. 973)
= 1944 TPY

Nitrogen Oxides

Potential and actual emissions - NO_x concentration in sulfuric acid plant tail gas stream is approximately 2.1 x 10^{-6} lb/scf.

V, 2 and 3 (continued)

= 133,000 Acfm (528/630) x 2.1 x 10^{-6} x 60 min/hr
= 14.0 lbs/hr NO_x x 8400 x 1/2000
= 58.8 tons/year

Carbon Monoxide

Potential and Actual emissions - The carbon content of "dark" sulfur is approximately 0.25%. Assuming a carbon content of fuel oil of 85% this carbon content is equivalent to a "petroleum content" of 0.29%. A carbon monoxide emission factor of 5 lb CO/1000 gal oil (AP-42) was assumed for the combustion of this material.

Hourly Max. = 55,000 lb S/hr x 0.0029 lb "oil"/lb S x 1/8 gal/lb x 1/1000 x 5 lbs CO/1000 gal
= 0.1 lb/hr CO

Annual Avg. = 0.1 x 8400 x 1/2000
= 0.4 tons/year

V, 4 Control Efficiency Estimates

Sulfur Dioxide

Sulfur in Acid

2000 lb acid x 32 lbs/98 lbs acid = 653.1 lb S/ton of acid.

Sulfur Losses in Stack

4 lb SO_2/ton acid 2 lb S/ton acid.

Absorption Efficiency

$$E_s = \frac{653.1 - 2.0}{653.1} \times 100 = 99.7\%$$

Mist

Estimated inlet concentration = 30 mg/acf
Tail gas concentration (@ 0.15 lb/ton acid) = 0.8 mg/acf

$$E_m = \frac{30 - 0.8}{30} \times 100 = 97.3\%$$

Nitrogen Oxides - E_n - Assumed to be 0

Carbon Monoxide - E_c - Assumed to be 0

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[X] Yes [ ] No

Contaminant	Rate or Concentration
Sulfur dioxide	4.0 lb/ton 100% acid produced
Acid Mist	0.15 lb/ton

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [X] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
Sulfur dioxide	4.0 lb/ton 100% acid
Acid Mist	0.15 lb/ton 100% acid

D. Describe the existing control and treatment technology (if any). NOT APPLICABLE - PLANT IS PROPOSED

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

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: Acid Mist - High efficiency mist eliminators

b. Operating Principles: Impaction

c. Efficiency*: 96-98% (See V,4) d. Capital Cost: $1,500,000

e. Useful Life: 8 years f. Operating Cost:

g. Energy**: h. Maintenance Cost: $300,000/year

i. Availability of construction materials and process chemicals: Good

j. Applicability to manufacturing processes: Proven within the industry

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

Can be designed into the proposed plant

2.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy**: h. Maintenance Costs:

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:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Life: f. Operating Cost:

g. Energy: h. Maintenance Cost:

*Explain method of determining efficiency above.

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*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device: Acid Mist - High efficiency mist eliminators
2. Efficiency*: 97.3% Mist
3. Capital Cost: $1,500,000
4. Life: 8 years
5. Operating Cost:
6. Energy:
7. Maintenance Cost: $300,000/year
8. Manufacturer: Monsanto Envirochem or equal
9. Other locations where employed on similar processes:

a.

(1) Company: Agrico Chemical Company

(2) Mailing Address: P. O. Box 1969, Bartow, FL 33830

(3) City: South Pierce (4) State: Florida

(5) Environmental Manager: Ed Mayer

(6) Telephone No.: (813) 428-1423

*Explain method of determining efficiency above. (See Section V,4)

(7) Emissions*:

Contaminant	Rate or Concentration
Sulfur dioxide	≤ 4.0 lb/ton 100% acid
Acid Mist	≤ 0.15 lb/ton 100% acid

(8) Process Rate*: 1800 TPD

b.

(1) Company:

(2) Mailing Address:

(3) City: (4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

Double absorption for the control of sulfur dioxide and high efficiency mist eliminators for the control of acid mist is the accepted NSPS and BACT for the control of these pollutants. EPA has recently reviewed NSPS for sulfuric acid plants and concluded that no better technology exists for sulfur dioxide and acid mist control.*

Agrico Chemical Company is currently operating two 1800 TPD sulfuric acid plants at the South Pierce Chemical Works with similar control equipment and operators are all well acquainted with the operation of this type plant.

* A Review of Standards of Performance for New Stationary Sources - Sulfuric Acid Plants, US EPA EPA-450/3-79-003, January 1979.

*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

SEE ATTACHED AIR QUALITY REVIEW REPORT

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.

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

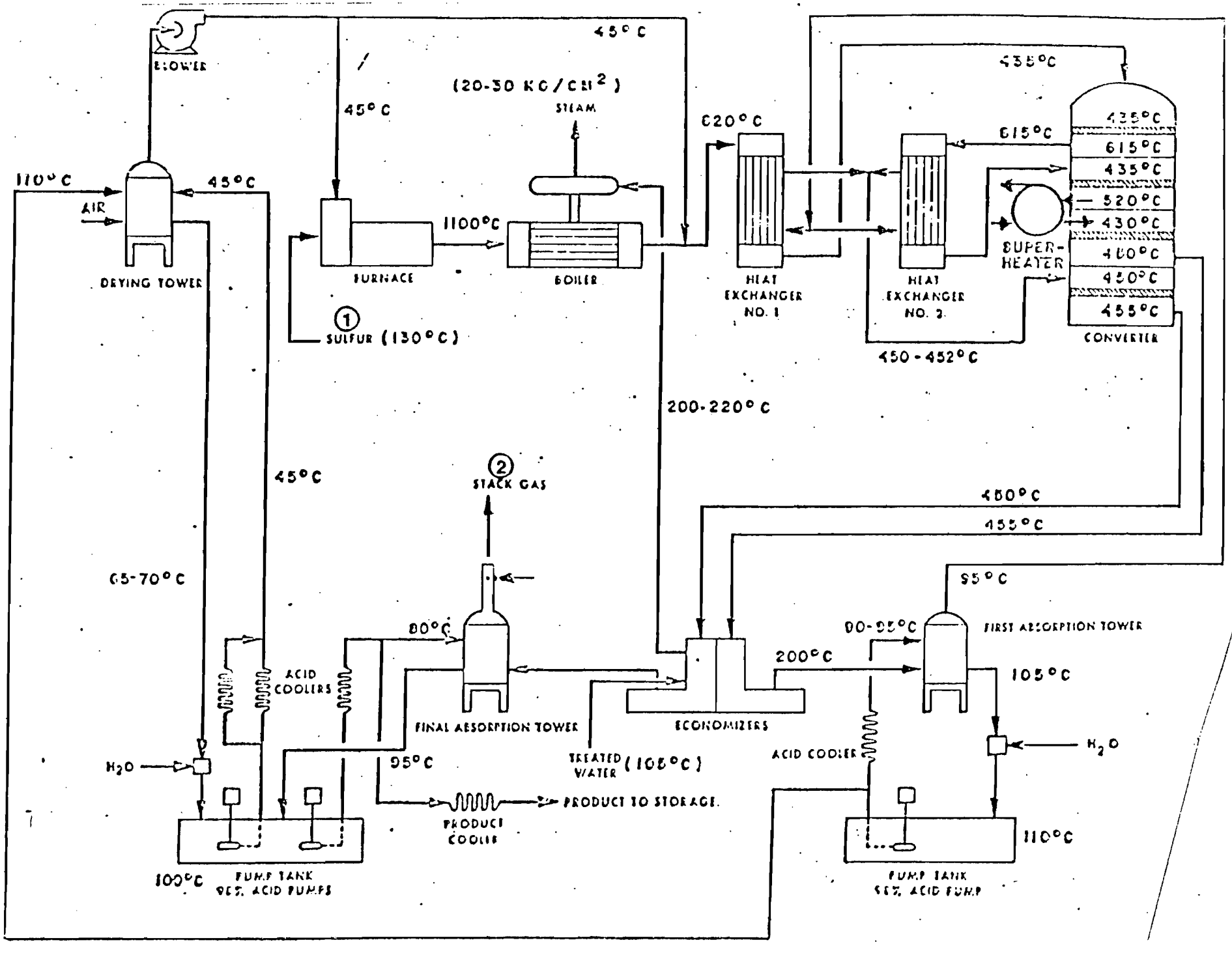
Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

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

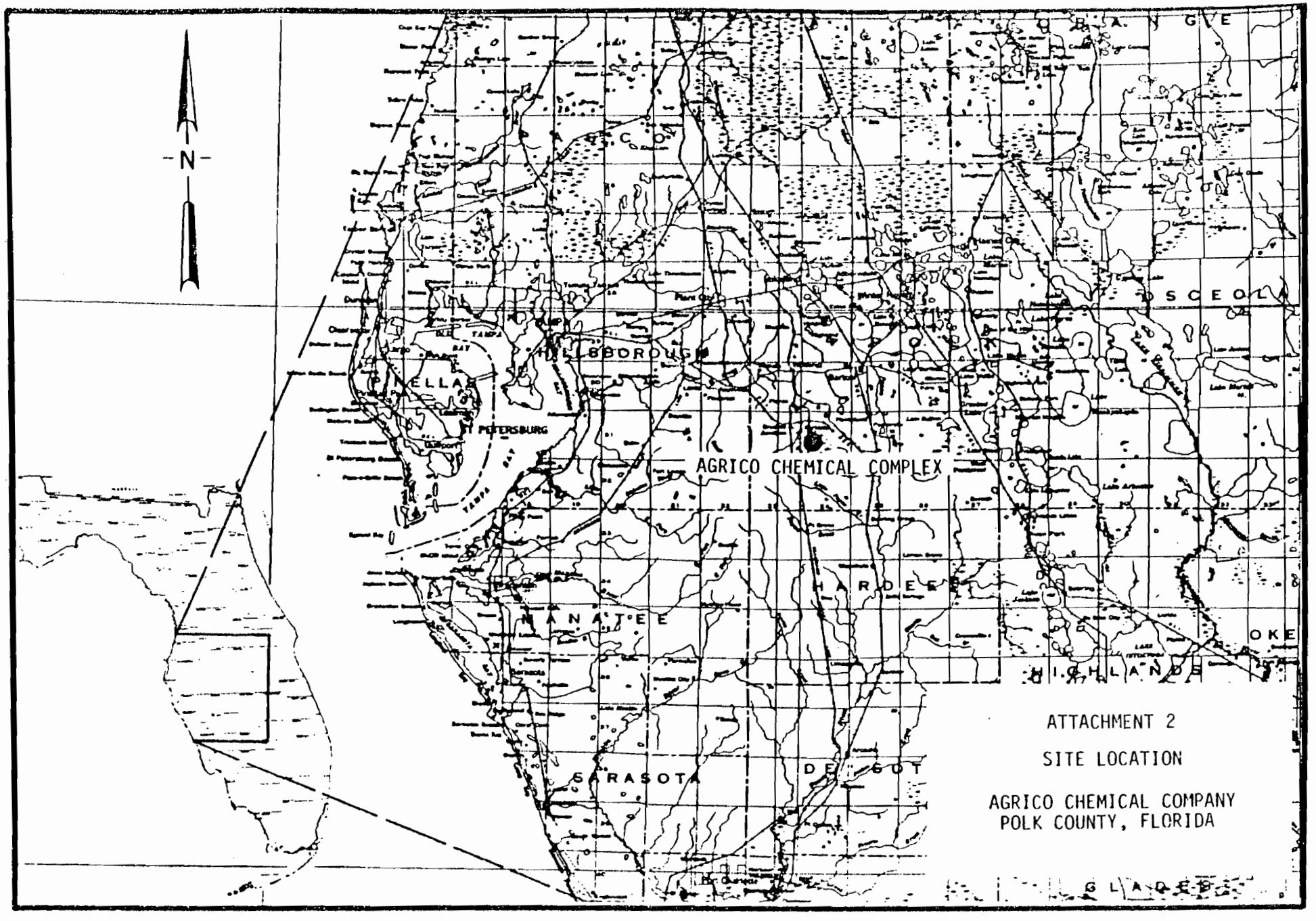
*Specify bubbler (B) or continuous (C).

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.

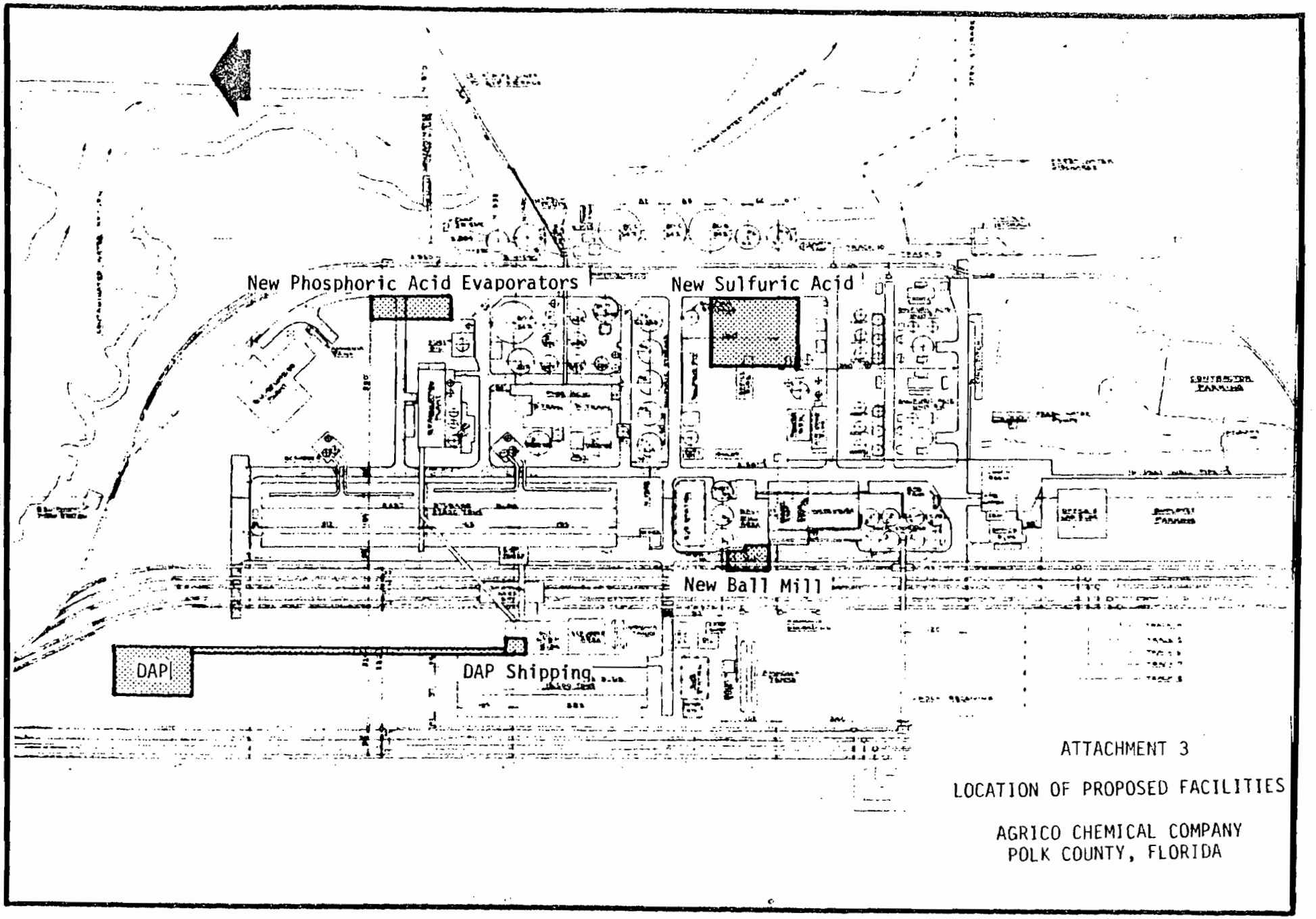
H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.



ATTACHMENT 1



SHOLTES & KOOGLER



ATTACHMENT 3

LOCATION OF PROPOSED FACILITIES

AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA