

W. HANKS
7/1/80

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



BOB GRAHAM
GOVERNOR
JACOB D. VARN
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

July 1, 1980

(REPLACED BY DAVID S. SHARP, GEN. MGR.)

Mr. J. R. Terry, Vice President
W. R. Grace and Company
P. O. Box 471
Bartow, Florida

Dear Mr. Terry:

Enclosed is Permit Number AC 53-24460, dated July 1, 1980
to construct a 130 TPH Diammonium Phosphate Plant issued pursuant
to Section Chapter 403, Florida Statutes.

Acceptance of the permit constitutes notice and agreement
that the Department will periodically review this permit for com-
pliance, including site inspections where applicable, and may
initiate enforcement actions for violation of the conditions
and requirements thereof.

Sincerely,

Steve Smallwood, Chief
Bureau of Air Quality Management

cc: Mr. William Hennessey

Final Determination

W. R. Grace and Company

Polk County, Florida

Construction Permit

AC 53-24460

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

July 1, 1980

W. R. Grace and Company

Final Determination

W. R. Grace and Company's application for a permit to construct a diammonium phosphate plant in Polk County has been reviewed by the Bureau Of Air Quality Management. Public notice of the Department Intent to Issue was published in the Tampa Tribune on April 1, 1980 and, because of modifications to the proposed plant requested by the company that were incorporated into the proposed permit, again in the Lakeland Ledger on May 3, 1980. Copies of the preliminary determination have been available for public inspection at the Southwest District office in Tampa and at the Bureau Of Air Quality Management office in Tallahassee.

No comment from the public were received on either proposed permit. W. R. Grace requested the limit on maximum production rate to be increased and the limit on operation hours be eliminated. In response to their request, the permitted maximum production rate was increased from 115 to 130 TPH DAP and the limit on operation hours was replaced with a limit on annual DAP production. (800,000) DAP

As originally proposed in the permit to construct, hourly production and annual operation hours were limited. At the Company's request, these limits were modified to provide more operating flexibility. An annual production cap was added to limit overall emissions (permitted emissions are pounds of pollutant per ton of production) to the previously proposed values. Thus, the allowable emissions with these permit modifications are unchanged.



STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

CONSTRUCTION
PERMIT

NO. AC 53-24460

W. R. GRACE AND COMPANY
DIAMMONIUM PHOSPHATE PLANT
BARTOW, POLK COUNTY

DATE OF ISSUANCE

✓ 3 JULY 1980

DATE OF EXPIRATION

DECEMBER 31, 1982

Jacob D. Varn

JACOB D. VARN
SECRETARY

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



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STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: W. R. Grace & Company
P. O. Box 471
Bartow, Florida 33830

PERMIT/CERTIFICATION
NO. AC 58-24460

COUNTY: Polk County

PROJECT: DAP/Fertilizer Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2 and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction of a diammonium phosphate plant to be located at the permittee's phosphate fertilizer complex north of State Road 60 west, Bartow, Florida. The latitude, longitude and UTM coordinates of the proposed plant are 27°54'13"N by 81°55'17"W and 409.290E, 3,086.960N respectively.

Construction shall be in accordance with the attached permit application, plans, documents and drawings except as otherwise noted in the following list of "Specific Conditions".

Attachments* are as follows:

1. Application to Construct Air Pollution Sources, DER form 17-1.122(16) dated April 16, 1980.
2. Figure, Stack Test Facilities.

*Distributed March 27, 1980 with Technical Evaluation and Preliminary Determination.

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 Section 403.161(1), Florida Statutes. Permittee is hereby placed

PERMIT NO.: AC 53-24460
APPLICANT: W. R. Grace & Co.
Bartow, Florida

on notice that the department will review this permit periodically and may initiate court 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 indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

3. 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 non-compliance, 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.

4. As provided in subsection 403.087(6), 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.

5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.

6. 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 Section 403.111, F.S.

7. In the case of an operation permit, 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.

8. 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 therefore 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, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.

9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation 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.

13. This permit also constitutes:

- Determination of Best Available Control Technology (BACT)
- Determination of Prevention of Significant Deterioration (PSD)
- Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

SPECIFIC CONDITIONS:

PERMIT NO.: AC 53-24460
APPLICANT: W. R. Grace & Company

Specific Conditions

1. The maximum production rate of the plant will be 130 TPH DAP (18-46-0) and the plant shall have a maximum production of 800,000 tons DAP per calendar year.
2. The allowable emissions from the 7 foot diameter, 132.5 foot high stack for the DAP plant will be:

Pollutant	Emission Rate lbs./TP ₂ O ₅ input	Maximum Emissions lbs/hr T/yr.	
Particulate	0.5 (BAET)	29.9	98.0 ✓
Sulfur Dioxide	0.7 (-"-)	41.9	122.5
Fluoride	0.06 (-"-)	3.6	11.8 ✓

3. Fugitive particulate and fluoride emissions from the process, conveying and storage equipment will be controlled by sealing and/or venting all fumes from the equipment to pollution abatement devices.
4. No. 5 fuel oil used by the dryer shall not contain more than 2.4% sulfur.
5. Construction shall commence and be completed within a reasonable time based on the schedule given the application. Construction will reasonably conform to the plans submitted.
6. Reasonable precautions to prevent fugitive emissions during construction, such as coating or spraying roads and construction sites used by contractors with a liquid to prevent dust, will be taken by the permittee.
7. Semi-annual progress reports showing approximate percent completion of modifications and construction of new and affected existing facilities will be submitted to the Department until construction permit AC 53-24460 expires or

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APPLICANT: W. R. Grace and Company

is replaced by a permit to operate.

8. The permittee will install, calibrate, maintain, operate and record data from flow monitoring devices that can be used to determine total P_2O_5 input to the plant.
9. The permittee will measure and record the pressure drop of the gas stream across each scrubber system. Pressure drop across the venturi scrubber must be at least 12 inches water during plant operations. The records will be maintained for 2 years and available for inspection by regulatory agency personnel on request.
10. Permittee shall submit a test plan for approval and notify the Bureau of Air Quality Management prior to any compliance testing of the facility. Upon demonstration of compliance with the operational limits of this permit the permittee shall submit a complete application for an operating permit to the Southwest District office. The application must be submitted at least 90 days before expiration of the construction permit. Permittee may continue to operate in compliance with all terms of this permit until expiration of this permit or issuance of an operating permit.
11. DER will be notified 30 days in advance of the compliance test. The test procedures will be EPA reference methods 1, 2, 3, 4, 5, 6 and 13A or 13B as described in 40 CFR 60, Appendix A or any approved alternate test method. The test will be conducted with the plant operating at 130 TPH DAP (+10%) with the dryer burning fuel oil containing 2.4% sulfur (+10%).
12. Periodic emissions tests or tests by the request of the Department at the sources expense will be a condition to any permit to operate. If the source can furnish a study on this source showing a high correlation (.95+) between the emission of any pollutant and plant operation parameters, the periodic emission test for that pollutant may be waived by the Department.
13. Stack sampling facilities will include the eyebolt and angle described in the attached sketch.

PERMIT NO.: AC 53-24460
APPLICANT: W. R. Grace and Company

- ④ 14. The fertilizer plant 300-x(AO 53-25191) will be shut down before No. 3 DAP plant starts up. Fertilizer plant 300-y (AO 53-13210) will cease operations within 6 months after the no. 3 DAP plant start-up. Operation permits will be returned to DER within 10 days of the shut down of each plant.

(G.T.S.P.!) *Handwritten in red ink, with a line pointing to the word "Fertilizer" in the paragraph above.*

④ NUMERICAL CREDIT FOR THIS WAS NOT TAKEN IN GRACE'S APPLICATION, NOR IN EPA'S CALCULATIONS OF PSD LIMITS; OR IN RACI. DR. J. KOOLGER'S STUDY OF "IMPACT of W.R. GRACE PARTICULATE MATTER EMISSIONS on HILLSBOROUGH COUNTY NON-ATTAINMENT AREA" DATED JUNE 16, 1982 (COPY to Steve SMALLWOOD, 6/18) SHOWS BOTH GTSP TRAINS IN OPERATION, TOGETHER WITH THE No. 3 (NEW) PLANT.

Jacob D. Varn

Jacob D. Varn
Secretary

Expiration Date: December 31, 1982

Issued this 3RD day of JULY, 1980

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

As copy
W. HANKS



SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS
1213 N.W. 6th Street Gainesville, Florida 32601 (904) 377-5822

SKEC 124-79-01

March 3, 1980

Mr. Walter Starnes
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Dear Walt:

On behalf of myself and Jerry Girardin, we would like to express our appreciation for the opportunity of meeting with you and your staff on February 28th to discuss Best Available Control Technology (BACT) for particulate matter emissions from diammonium phosphate fertilizer plants. I would like to provide a written record of the information we relayed to you during this meeting and an answer, to the best of my ability, to some of the questions that were raised.

I think the most important point that Jerry and I tried to get across was the fact that the particulate matter which we all are concerned about in the tail gas from a DAP plant is not particulate matter generated during the production of DAP, but particulate matter formed in the tail gas scrubber during the removal of gaseous fluoride. If the problem were as straightforward as scrubbing inert particulate matter with relatively clean scrubber water, don't think New Wales or any of the other companies presently proposing new DAP plants would have any reservation about agreeing to a particulate matter emission rate in the range of 0.01 grams/scf, dry for BACT.

With DAP plants; however, the particulate matter of concern is formed in the air pollution control system and is the result of many variables. These variables not only effect the quantity of particulate matter generated but also the size of the particles and the chemical composition of the particles. With this in mind it should be apparent why the industry is hesitant to commit to an emission standard that will control emissions generated through a process they cannot adequately control.

In general the particles are formed as the result of pH changes in the scrubbing system and the effect of these changes on the chemical equilibrium of the pond water used for scrubbing. The changes in pH are generally brought about by variations in the amount of ammonia breaking through the primary scrubber and reaching the tail gas scrubber. Under conditions of extremely low scrubber water pH there is evidence that the particle formed is an ammonium bi-fluoride particle. When greater amounts of ammonia enter the tail gas scrubber and the scrubbing water pH increases there is evidence that the particle formed is silicon dioxide. The latter is the result of the decreased solubility of silicon compounds in scrubber water resulting from an increase in pH.

The amount of ammonia reaching the tail gas scrubber is a function of plant operating conditions. Slight upsets in plant operating procedures and even normal fluctuation in plant operation procedures will effect the amount of ammonia passing through the primary scrubber and reaching the tail gas scrubber. Coupled with this variable is the effect that pond water (scrubber water) has on the formation of particles. The chemistry of the pond water systems and the effect of pH changes on these systems is quite complex. I personally do not profess to understand the subtleties of the system and doubt that there are many people, if any, who do. Nonetheless, these subtleties are a fact of life in the phosphate fertilizer industry and the characteristics of individual pond waters are something individual plant operators have to live with day in and day out.

With one DAP plant we discussed it is our understanding that essentially fresh water is used on a once-through basis for tail gas scrubbing. In this particulate case one of the major factors effecting particle generation in the tail gas scrubbing system is eliminated. More than likely this is the reason for the low particulate matter emission rate recorded in this particular case.

From strictly an air pollution point of view, it would be ideal if all companies could use clean water on a once-through basis in their scrubbing systems. In reality; however, this is not possible both because of limitations imposed by wastewater discharge permits and the extra demand it would place on the water resources in the area.

One of the questions raised during our discussion was the pressure drop across the tail gas scrubbers at the plants for which we submitted particulate matter emission data. I was able to determine that the tail gas pressure drop usually runs from 8 to 10 inches. This appears to be normal throughout the industry. I would like to point out; however, that the pressure drop across the tail gas scrubber is almost irrelevant in this case however since tail gas scrubbers were not designed to remove particulate matter. The tail gas scrubbers are designed to remove gaseous fluorides and the design criteria used in designing these scrubbers is the number of transfer units; not the scrubber pressure drop.

March 3, 1980

Another matter which was discussed was the size of the particles generated in the tail gas scrubber. I was not able to obtain any specific information on this matter. The particles; however, are fumes and fumes are generally defined to be in the size range of 0.01 to 1.0 microns. I feel this size range is probably a reasonable estimate of particles generated in DAP plants based on the experience I had with one particular plant and related to you during our meeting.

Regarding the measurement of the size of these particles, I feel this would be quite difficult. I feel this way because the tail gases from the DAP plant are generally saturated and some of the particles or fumes in question are quite hydroscopic. If an attempt is made to sample these particles with a cascade impactor in the stack, even if the impactor is heated, the particles and the associated moisture will impact on a stage which will indicate a larger than actual particle size. ✓ Sampling the particles and then sizing outside the stack I feel would be virtually impossible because of problems that would be encountered with particle agglomeration.

For the record, I have attached hereto a copy of the particulate matter emission data for the four DAP plants that we provided during our meeting on February 28th. As I stated during our meeting, these data represent particulate matter emission rates from DAP plants constructed within the past five years. Plants A, C and D employ vertical tail gas scrubbers similar to the one proposed by New Wales. Plant B, the existing New Wales DAP plant, employs a cross flow packed tail gas scrubber.

Again, I would like to thank you and your staff for the opportunity to meet with you and we hope the information provided will be considered in your determination of Best Available Control Technology for particulate matter emissions from DAP plants. If you have any questions regarding the information we have submitted or if we can provide any additional information for you, please feel free to contact either of us.

Very truly yours,

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS



John B. Koogler, Ph.D., P.E.

JBK:sc
Attachments

cc: Mr. Steve Smallwood
Mr. Bill Thomas
Mr. Willard Hanks
Mr. Mike Harley
Mr. J. F. DeCastro
Mr. A. L. Girardin

PARTICULATE MATTER
EMISSIONS FROM DAP PLANTS

SKEC

73

Plant	Production Rate (TPH)	Part. Emissions (lb/hr)		Part. Emissions (lb/ton DAP)		Part Concentration (gr/scf, dry)	
		RUN	TEST AVG	RUN	TEST AVG	RUN	TEST AVG
		A	50	11.02 8.07 9.91	9.67	0.22 0.16 0.20	0.19
A	45	26.3 22.8 23.5	24.2	0.53 0.46 0.47	0.49	0.0346 0.0308 0.0323	0.0326
A	41	21.0 26.9 11.3	19.7	0.42 0.54 0.23	0.40	0.0276 0.0375 0.0154	0.0275
A	38	10.9 12.0 4.8	9.2	0.22 0.24 0.10	0.19	0.0154 0.0169 0.0066	0.0130
A	45	2.7 9.9 2.5	5.0	0.05 0.20 0.05	0.10	0.0035 0.0128 0.0032	0.0065
A	48	11.4 10.5 5.0	9.0	0.23 0.21 0.11	0.18	0.0164 0.0148 0.0078	0.0130
A	40	22.7 21.4 18.5	20.9	0.45 0.43 0.37	0.42	0.0304 0.0286 0.0250	0.0280
A	41	10.7 14.4 8.8	12.6	0.21 0.29 0.18	0.23	0.0161 0.0205 0.0131	0.0166
A	41	11.6 18.5 10.8	13.6	0.23 0.37 0.22	0.27	0.0171 0.0278 0.0167	0.0212
A	44	10.7 8.3 11.3	10.1	0.21 0.17 0.23	0.20	0.0138 0.0107 0.0145	0.0130

42.381 30 SHEETS 3 SQUARE
42.382 108 SHEETS 3 SQUARE
42.383 208 SHEETS 3 SQUARE
INTERNATIONAL

PARTICULATE MATTER EMISSIONS FROM DAP PLANTS

Plant	Production Rate (TPH)	Part. Emissions (lb/hr)		Part. Emissions (lb/ton DAP)		Part Concentration (gr/scf. dry)	
		RUN	TEST AVG	RUN	TEST AVG	RUN	TEST AVG
C	46		6.3		0.14		0.0082
	54		15.0		0.28		0.0207
	44		10.1		0.23		0.0145
	18		5.9		0.33		0.0094
	52		7.0		0.13		0.0107
	42		8.6		0.20		0.0109
	43		<u>8.82</u>		$n = 6$ $\bar{x} = 0.22$ $\sigma = 0.078$ $CV = 35.9\%$		$n = 6$ $\bar{x} = 0.0124$ $\sigma = 0.0046$ $CV = 37.0\%$

D <u>USSAG</u>	65	4.0		0.062		0.0045		
	68	4.2	3.6	0.070	0.058	0.0055	0.0044	
	60	2.5		0.041		0.0032		
	85	4.2	4.3	0.049	0.050	0.0047	0.0049	
	85	4.4		0.052		0.0050		
	85	7.6	5.2	0.089	0.061	0.0097	0.0066	
	85	2.8		0.033		0.0035		
	90	5.7	5.4	0.063	0.061	0.0072	0.0067	
	90	5.2		0.058		0.0062		
	70	9.2	6.9	0.132	0.099	0.0102	0.0076	
	70	4.6		0.066		0.0051		
	77.54		<u>5.08</u>		$n = 11$ $\bar{x} = 0.0661$ $\sigma = 0.027$ $CV = 41.2\%$	$n = 5$ $\bar{x} = 0.065$ $\sigma = 0.019$ $CV = 29.0\%$	$n = 11$ $\bar{x} = 0.0059$ $\sigma = 0.0023$ $CV = 39.0\%$	$n = 5$ $\bar{x} = 0.0059$ $\sigma = 0.0013$ $CV = 22.2\%$

GRACE FERT. PLT. 1978
1979
2/2/80

TPH	#/hr PARTICULATES
46	6.4 9.2 3.3 = 6.3
54	15 11.2 18.7 = 15.0
44	15.6, 7.1, 7.2 = 10.1
18	5.5 5.7 6.4 = 5.9
52	10.2 5.7 5.2 = 7.0
42	10.6 7.9 7.2 = 8.6
48	18.1 19.3 26.0 = 21.1
43.43	10.6 AVG

$\bar{x} = 0.244$ #/t DAP

42 SHEETS 8 SQUARE
42 SHEETS 100 SQUARE
42 SHEETS 200 SQUARE