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Folder Name: Agrico Chemical Company
Permit(s) numbered: AC 53-34861
AC 53-34865
AC 53-34868

S. Pierce Works Bartow, Polk County
AC 53-34871

Documents:
Period During Which
DOCUMENT WAS
SUBMITTED
(APPLICATION, PD & TE,
FINAL DETERMINATION,
POST PERMIT

App 11/3/80

Detailed Description

1. Phos. ACID "A" TRAIN FUME
SCRUBBER WATER AND FUME FLOW
SCHEMATIC (BLUE PRINT)

AIR QUALITY REVIEW
FOR PROPOSED PHOSPHATE FERTILIZER COMPLEX EXPANSION

AGRICO CHEMICAL COMPANY
SOUTH PIERCE CHEMICAL WORKS

AUGUST 29, 1980

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1.0 EXISTING AIR QUALITY DATA

1.1 Existing Data

Pollutants for which monitoring data might be required are sulfur dioxide, particulate matter and nitrogen oxides. Various factors, including air quality modeling and existing monitoring data justify eliminating the necessity for Agrico to enter into a preconstruction ambient air monitoring program.

Particulate matter monitoring data have been collected in Polk County for several years by the Florida Department of Environmental Regulation and other organizations. The data collected by the Department of Environmental Regulation at the Union Hall monitoring site (approximately one kilometer south of SR 60 on Bonnie Mine Road) is probably most representative of air quality in areas of phosphate industry activity.

This monitoring site was located in an area with much greater phosphate industry related activity than the area in which the Agrico South Pierce Chemical Works is located. Data from the Union Hall site for the period January 1978 through October 1979 were analyzed to establish some reference to the impact of phosphate industry activity on ambient total suspended particulate matter levels. Those monitoring data are presented in Table 1-1. The data show a long-term (20-month) geometric mean TSP level of 53.6 micrograms per cubic meter and a second-high 24-hour TSP level of 119 micrograms per cubic meter. The TSP levels near Agrico are expected to be lower than these levels because the density of phosphate fertilizer related activities is lower.

The existing sulfur dioxide monitoring data available for Polk County is submitted under separate cover with this permit package. These data were collected at monitors located 8-16 km north of the Agrico site in an area with a much heavier sulfur dioxide emission burden. Since the monitoring data indicated that there was no threat to sulfur dioxide ambient air quality standards in this area, it followed that there would be even less of a threat to exceeding the standards near the Agrico plant site. The detailed modeling of sulfur dioxide emissions included in Section 2.0 of this application confirms the preliminary modeling data and further supports the preliminary decision that preconstruction sulfur dioxide monitoring is not necessary to determine whether emissions will cause or contribute to a violation of an ambient air quality standard.

Other pollutants potentially emitted from the proposed sources for which ambient air quality standards exist are carbon monoxide and nitrogen oxides. The potential emission rate of both of these pollutants is less than 100 tons per year. Because of this neither preconstruction nor post-construction air quality monitoring is required for these pollutants.

1.2 Background Concentrations

Background levels for particulate matter, sulfur dioxide and nitrogen oxides have been estimated. For nitrogen oxides and sulfur dioxide the background was assumed to be zero. This assumption was made since all of the sulfur dioxide and nitrogen oxides emitted within several miles of

the proposed Agrico chemical complex are emitted from permitted air pollution sources. Emission data for these sources are on file with the Florida Department of Environmental Regulation office in Tampa, Florida and were taken into consideration in developing emission inventories which were used for air quality modeling.

The background concentrations of particulate matter for the annual average period and the 24-hour average period were derived from two reports: A Comparison of Total Suspended Particulate Matter Levels in The Ambient Air Measured at Two Monitoring Sites in Mulberry, Florida, Sholtes & Koogler Environmental Consultants, April 1977; and Environmental Impact Statement-Draft, Estech General Chemicals Corporation, Duette Mine, Manatee County, Florida, US EPA Region IV, October 1979. In the first report an annual average particulate matter background concentration of 35 micrograms per cubic meter is reported. In the second report an annual average background concentration of 25 micrograms per cubic meter is reported. Since the Agrico site is approximately mid-way between the areas included in the two referenced studies, the annual total suspended particulate matter background for the Agrico SPCW area was assumed to be 30 micrograms per cubic meter.

For the 24-hour background, the Estech EIS reports a concentration of 55 micrograms per cubic meter. A 24-hour background level was not reported in the Sholtes & Koogler report. Since the annual average particulate matter background level assumed for the Agrico site was five micrograms per cubic meter higher than that reported in the Estech EIS, a 24-hour background level of 60 micrograms per cubic meter, which is five micrograms per cubic meter higher than the 24-hour background reported in the Estech EIS, was assumed for the Agrico site.

TABLE 1-1
FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
TOTAL SUSPENDED PARTICULATE MATTER MONITORING DATA

UNION HALL SITE
JANUARY, 1978 TO OCTOBER, 1979

POLK COUNTY, FLORIDA

DATE	TSP ($\mu\text{g}/\text{m}^3$)	DATE	TSP ($\mu\text{g}/\text{m}^3$)	DATE	TSP ($\mu\text{g}/\text{m}^3$)	DATE	TSP ($\mu\text{g}/\text{m}^3$)
1/6/78	58	7/5	50	1/1/79	67	7/6	50
1/12	68	7/11	48	1/7	67	7/12	44
1/18	56	7/17	46	1/13	63	7/18	43
1/24	42	7/23	32	1/19	60	7/24	--
1/30	85	7/29	53	1/25	36	7/30	50
2/5	72	8/4	36	1/31	64	8/5	40
2/11	85	8/10	57	2/6	54	8/11	44
2/17	61	8/16	27	2/12	64	8/17	42
2/23	75	8/22	65	2/18	85	8/23	33
3/1	53	8/28	45	2/24	48	8/29	25
3/7	50	9/3	52	3/2	48	9/6	55
3/13	64	9/9	76	3/8	60	9/12	--
3/19	126	9/15	119*	3/14	43	9/18	--
3/25	53	9/21	47	3/20	38	9/24	29
3/31	65	9/27	82	3/26	40	9/30	35
4/6	--	10/3	99	4/1	48	10/6	38
4/12	--	10/9	67	4/7	--	10/12	88
4/18	54	10/15	59	4/13	49	10/18	44
4/24	33	10/21	89	4/19	89	10/24	51
4/30	80	10/27	51	4/25	26	10/30/79	40
5/6	44	11/2	111	5/1	32		
5/12	44	11/10	56	5/7	14		
5/18	64	11/16	51	5/13	--	n =	99
5/24	62	11/22	86	5/19	64	$\bar{x}_g =$	53.6
5/30	--	11/26	49	5/25	--		
6/5	51	12/2	31	5/31	--		
6/11	56	12/8	52	6/6	67		
6/17	46	12/14	114	6/12	78		
6/23	35	12/20	62	6/18	64		
6/30	63	12/26/78	--	6/24	81		
				6/30	61		

* Second-high 24-hour SO_2 concentration.

2.0 AIR QUALITY IMPACT ANALYSIS

2.1 Introduction

Air quality modeling has been conducted to evaluate the impact of sulfur dioxide and particulate matter emissions from the expanded Agrico facility. The baseline concentration for these pollutants and the impact of new or modified sources (all major sources constructed since January 6, 1975 and all sources since August 7, 1977) have been established by air quality modeling. The impact of new or modified sources within the area of the Agrico chemical complex have been included in the air quality impact analysis.

The air quality modeling for both long-term and short-term impacts was conducted in accordance with guidelines established by EPA (Guideline for Air Quality Models, March 1978).

For sulfur dioxide the annual, the 24-hour and the 3-hour time periods were investigated. With particulate matter the annual period and the 24-hour period were evaluated.

The annual period was evaluated by using the Air Quality Display Model (AQDM). Meteorological data from Tampa for the period 1970-1974 were used.

For the 24-hour and 3-hour periods, the CRSTER and PTNTPW models were used. The CRSTER was used to establish the area of significant impact and the meteorological conditions resulting in the highest second-high impacts in various directions from the fertilizer complex. Once the meteorological conditions were established, these data plus emission

data from various sources were input into the PTMTPW model and the maximum impacts were determined. Receptor spacing of 0.1 km were used in determining the point of maximum impact.

The results of the modeling are summarized in Table 2-1 and various Figures. The computer print-outs for all of the air quality modeling are bound as a separate document.

2.2 Impact Analysis

The short-term impact is defined as the 3-hour and 24-hour impact of pollutants emitted from sources in the study area. The short-term impact analysis was conducted with the CRSTER and PTMTPW air quality models.

The CRSTER model was run first using as input the emission data from the proposed sources and meteorological data for the period 1970-1974 from Tampa, Florida. The receptor distances in the CRSTER model were set to predict the point of maximum impact and also the boundary of the area of significant impact of the proposed sources. Significant, as it is used in this context, is defined in Table 2-2. The areas of significant impact for sulfur dioxide and particulate matter are shown in Figures 2-1 and 2-2 respectively.

Air pollutant emissions from all major sources within and well beyond the boundary of the area of significant impact of the SPCW were included in the impact studies.

The emission inventory for sulfur dioxide and particulate matter in the area of influence was developed from data on file at the Florida Department of Environmental Regulation District Office in Tampa, Florida. These files were reviewed source by source to develop an emission inventory which is as realistic as possible.

Meteorological data for evaluating the 3-hour and 24-hour pollutant levels in the ambient air were selected from the CRSTER model output. Meteorological data resulting in the highest second-high 24-hour pollutant concentrations in several directions from the SPCW were selected for evaluating particulate matter and sulfur dioxide impacts. Meteorological conditions resulting in the highest second-high 3-hour sulfur dioxide impacts in several directions from the chemical complex were also selected for further investigation.

The long-term impact is defined as the annual average impact of pollutants emitted from sources within the study area. The long-term impact analysis was conducted with the AQDM. The input data to the AQDM included emission data for sulfur dioxide and particulate matter resulting from all sources within approximately 50 km of the SPCW. This includes sources outside the area of significant impact of the proposed Agrico sources.

The meteorological data input to the AQDM were for the 1970-1974 period from Tampa, Florida. These data were in the STAR format with five stability classes. Receptor spacing used in the AQDM was 1.0 km.

2.2.1 Particulate Matter Impact Analysis

2.2.1.1 Short-Term Particulate Matter Impact

The CRSTER was run twice with particulate matter data from the Agrico sources and meteorological data for the period 1970-1974 from Tampa, Florida. From the first run it was found that the maximum 24-hour impact from proposed sources was significant (> 5 micrograms per cubic meter) and occurred at a direction of 90° from north from the proposed chemical complex at a distance of approximately 1.0 km. The meteorological data resulting in this impact was day 173, 1972. With the same set of CRSTER runs, the area of significant impact of the proposed sources was determined. The results of this preliminary analysis indicated that the average annual impact of the particulate matter emitted from the proposed sources was not significant at any distance and that the 24-hour impact dropped to an insignificant level at 2.0 km. These data are summarized in Figure 2-2. It can be seen from Figure 2-2 that the particulate matter emitted from the proposed sources will not significantly impact either the particulate matter non-attainment area in Hillsborough County or any Class I areas.

With the second set of CRSTER runs, particulate matter emissions from all Agrico sources were input with 1970-1974 Tampa meteorological data. From this series of runs the meteorology resulting in the highest second-high impact was determined. Other directions were also investigated to account for the combined influence of the Agrico sources and other sources which would be aligned during the occurrence of certain wind directions. The directions evaluated and the meteorological conditions resulting in the highest second-high impact for each are presented in Figure 2-3.

The particulate matter emission inventory used for the air quality impact analysis included all major sources within approximately 50 km radius of the Agrico plant site. This includes sources well outside the area of influence of the proposed sources.

With critical meteorological conditions established and an emission inventory developed, the air quality model PTMTPW was utilized. Meteorological data were input to the PTMTPW with emission data from the Agrico sources and sources upwind of Agrico. The model was run for each of the conditions depicted in Figure 2-3. From these runs the baseline particulate matter levels, the new source impact and the combined impact of existing and new sources were determined. These data are summarized in Figure 2-4 and Table 2-3.

These data show that the maximum 24-hour particulate matter impact from the proposed sources is 6.5 micrograms per cubic meter at a location 1.5 kilometers east of the chemical complex. This impact occurred with meteorology representative of day 173, 1972. The maximum 24-hour point source particulate matter impact occurring near the South Pierce Chemical Complex was calculated to be 49 micrograms per cubic meter. This occurred with a westerly wind and was a result of the impact of Agrico sources only. When combined with the 24-hour particulate matter background of 60 micrograms per cubic meter the resulting maximum expected 24-hour particulate matter level is 109 micrograms per cubic meter. This is below the Florida 24-hour particulate matter standard of 150 micrograms per cubic meter.

In establishing the point of maximum impact, receptor spacings of 0.1 km were used.

2.2.1.2 Long-Term Particulate Matter Impact

The CRSTER model showed that the annual impact of the proposed sources would not be significant at any location. Because of this, no further annual average modeling was done for particulate matter emissions.

2.2.2 Sulfur Dioxide Impact Analysis

2.2.2.1 Short-Term Sulfur Dioxide Impact

The short-term impact analysis for sulfur dioxide involved a 24-hour impact analysis and a 3-hour impact analysis. These time periods correspond to applicable ambient air quality standards.

As with the particulate matter analysis, the CRSTER model was run multiple times with sulfur dioxide emission data for the proposed Agrico sources and meteorological data for the period 1970-1974 for Tampa, Florida. On the first set of runs the receptors were set to determine the maximum air quality impact of the proposed sources. From this run the meteorological conditions resulting in the highest second-high 24-hour and 3-hour impacts at several locations were selected. The locations selected represented the direction to the maximum highest second-high concentration for both the 24-hour and 3-hour periods and directions that would allow investigation of the combined impacts of Agrico sources and other sources which would be aligned with Agrico during the occurrence of various wind directions. The direction selected for evaluation and the meteorological conditions resulting in the highest second-high impact for each direction are presented in Figure 2-5 for the 24-hour sulfur dioxide impact analysis and in Figure 2-6 for the 3-hour sulfur dioxide impact analysis.

The second series of runs with the CRSTER model were made to determine the area of significant impact of the proposed sources. The distance to the boundary of the area of annual significant impact was determined to be 14 km; distance to the boundary for the 24-hour period was 26 km and for the 3-hour period 27 km. The areas of significant influence are shown in Figure 2-3 along with the Pinellas County sulfur dioxide non-attainment area and the Class I PSD area nearest the Agrico plant site.

It can be seen that the proposed sources do not impact significantly on either the non-attainment area or the Class I area.

The sulfur dioxide emission inventory used for the air quality impact analysis included all major sources within approximately 50 km of the Agrico site.

The critical meteorological conditions established with the CRSTER model and the emission inventory were input to the PTMTPW model to determine the maximum impact for each condition investigated. The receptor spacing used for determining the point of maximum impact was 0.1 km. The results of these runs are summarized in Table 2-4 and Figures 2-7 and 2-8.

2.2.2.2 Long-Term Sulfur Dioxide Impact

The AQDM was run once to determine baseline sulfur dioxide levels and a second time to determine the impact of new and proposed sources. The impact of existing and new sources was determined by summing the impacts of the existing and new sources.

The annual average sulfur dioxide levels for all sources, baseline sources, and new and proposed sources are summarized in Figures 2-9 through 2-11 respectively.

2.2.3 Other Pollutant Impact Analyses

The sources proposed by Agrico which are subject to a Tier II review are the sulfuric acid plant and the DAP plant for sulfur dioxide, the DAP plant, the MAP/DAP plant and the DAP storage and shipping for particulate matter and the sulfuric acid plant for acid mist. No other source is subject to a Tier II review for any other pollutant, and hence, the impact of no other pollutant must be investigated.

Since there are no short-term or long-term ambient air quality standards for acid mist, no air quality impact analyses were conducted for this pollutant.

2.3 Impact of Fluoride Emissions

Fluorides in ambient air have been defined by EPA to be a welfare related pollutant as opposed to a health related pollutant⁽¹⁾. This is to say that fluoride levels as observed in the ambient air in the U.S. have not caused any health related effects. Effects on non-human receptors have been noted however.

When fluorides are emitted into the atmosphere in large volumes they have a tendency to accumulate in various types of vegetation and in some cases cause damage to the vegetation. A secondary effect of the accumulation of fluorides in vegetation occurs when vegetation is consumed by foraging animals. If the animals consume sufficient quantities of the fluoride, damage to teeth and bones, known as fluorosis, can occur.

In the phosphate fertilizer industry all point sources of fluorides have been controlled for quite some time. As a result of this, welfare related effects have virtually been non-existent. In 1978 an Environmental Impact Statement was prepared to describe the environmental effects of a proposed phosphate fertilizer plant expansion⁽²⁾. One phase of the EIS involved investigating the effects of fluorides on the environment surrounding the existing plant. The study concluded that no adverse economic effects resulted from fluoride emissions from the fertilizer complex. The complex included phosphoric acid plants, granular fertilizer product plants and a cooling pond and gypsum stack.

At the time this study was conducted, the existing fertilizer plant which was the subject of the study, had a capacity of 550,000 tons per year of P_2O_5 . The proposed Agrico SPCW will have a capacity of approximately 625,000 tons per year of P_2O_5 .

Furthermore, Agrico has received no complaints of damage to cattle, citrus or other crops as a result of fluoride emissions from their existing facility. This is significant since the point source fluoride emissions from the entire chemical complex was approximately 60 tons per year through mid-1977. Under conditions of the proposed expansion the allowable emissions will decrease to approximately 40 tons per year and emissions from the pond will increase about five tons per year. The net result will be a significant reduction in fluoride emissions from the SPCW.

Since Agrico has received no complaints and noted no fluoride damage in the past, it is doubtful that environmental problems will result from future operations of the SPCW since fluoride emissions are being reduced.

2.4 Conclusion

The results of all air quality modeling have been summarized in Table 2-1. These data show that the expansion proposed by Agrico will not threaten particulate matter or sulfur dioxide air quality standards. Neither will the expansion threaten Class II PSD increments, significantly impact non-attainment areas for sulfur dioxide or particulate matter nor significantly impact Class I areas.

TABLE 2-1

SUMMARY OF AIR QUALITY ANALYSIS(1)
 AGRICO CHEMICAL COMPANY
 POLK COUNTY, FLORIDA

Pollutant/ Time	Air Quality			PSD			Non-Attainment Impact Area
	Fla. AADS (ug/m ³)	Baseline (ug/m ³)	With New & Existing Sources (ug/m ³)	Class II Increment (ug/m ³)	Calculated Increment (ug/m ³)	Fraction Increment Consumed	Calculated Impact (ug/m ³)
15 SF Annual (2)	60						
24-Hour (3)	150	107	109	37	6	17.6%	< 1
SO ₂ Annual	60	15	19	20	4	20.0%	< 1
24-Hour	260	101	143	91	42	46.1%	< 1
3-Hour	1300	285	390	512	105	20.5%	< 1

(1) Only the maximum impacts or pollutants levels are summarized in this Table. See Figures and Table following for more detailed information.

(2) Not calculated since annual impact is not significant.

(3) Calculated concentrations include 60 ug/m³ background.

TABLE 2-2

DEFINITION OF SIGNIFICANT AIR QUALITY IMPACT

<u>Pollutant/ Time</u>	<u>Significant Impacts are Impacts Exceeding: (ug/m³)</u>
Particulate Matter	
Annual	1
24-Hour	5
SO ₂	
Annual	1
24-Hour	5
3-Hour	25

TABLE 2-3

AIR QUALITY IMPACT ANALYSIS
OF PARTICULATE MATTER EMISSIONS
AGRICO CHEMICAL COMPANY
POLK COUNTY, FLORIDA

Case	Max. Conc. (ug/m ³)	Receptor		Model Run Number
		UTM East (km)	UTM North (km)	
24-Hr TSP	(Total Concentrations[t] include 60 ug/m ³ TSP background. New Source [ns] impact is incremental impact only)			
1t	109	408.9	3071.4	10
1ns	6	408.9	3071.6	11
2t	104	408.3	3070.8	12
2ns	5	408.3	3070.8	12
3t	103	407.5	3069.8	13
3ns	3	407.5	3069.8	13

TABLE 2-4

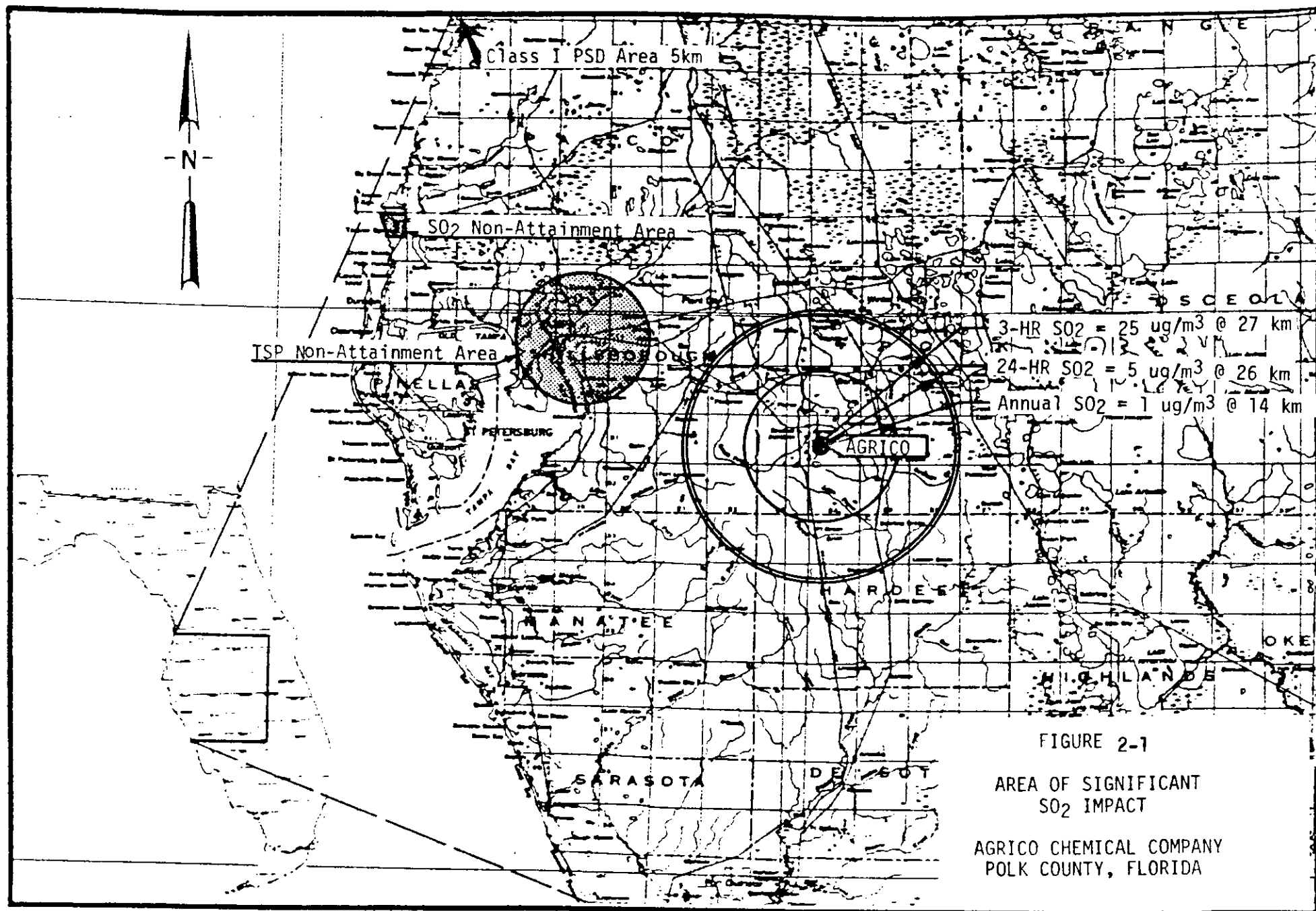
AIR QUALITY IMPACT ANALYSIS
OF SULFUR DIOXIDE EMISSIONS
AGRICOLA CHEMICAL COMPANY
POLK COUNTY, FLORIDA

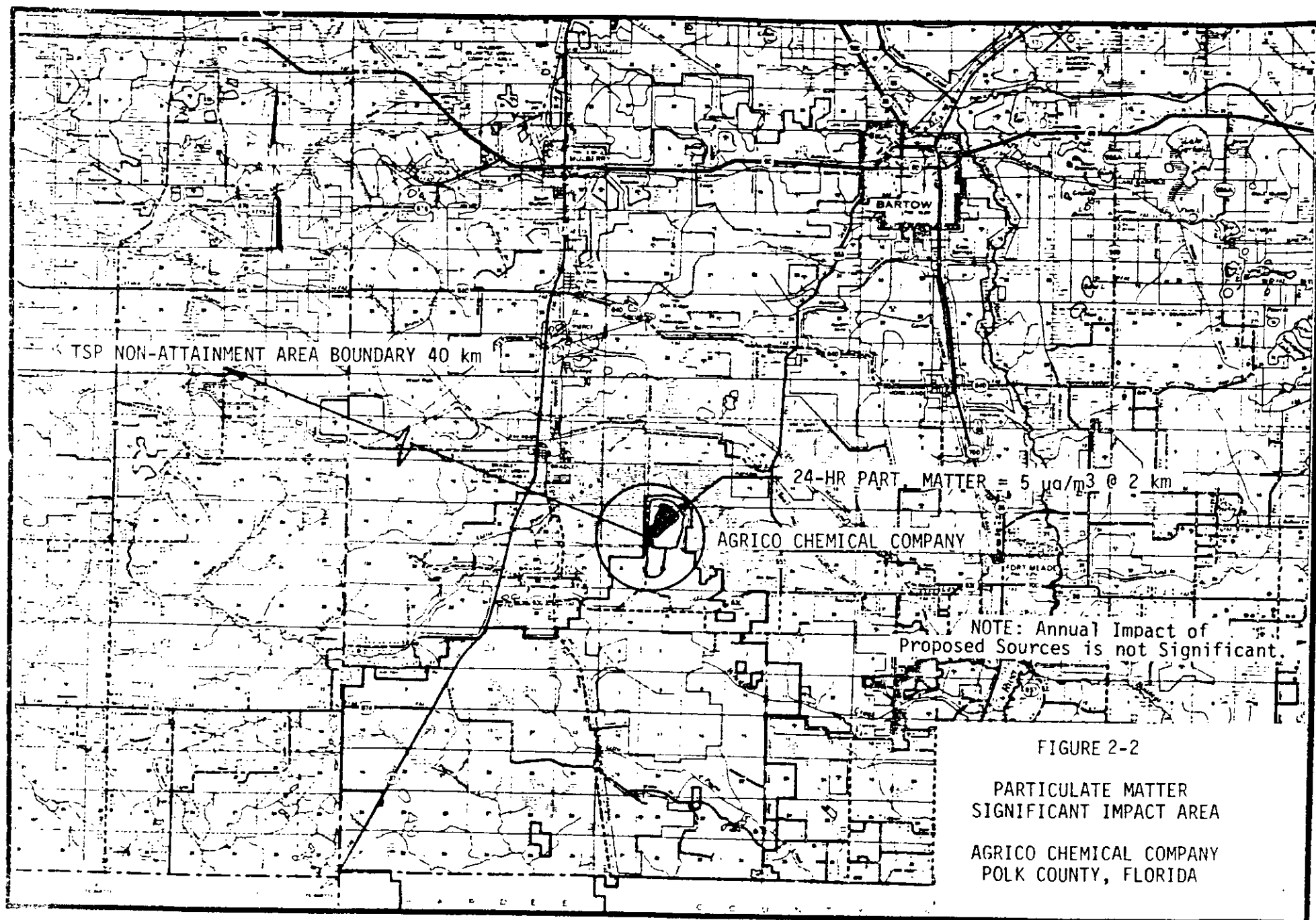
Case	Max. Conc. (ug/m ³)	Receptor		Model Run Number
		UTM East (km)	UTM North (km)	
<hr/>				
24-Hr <u>SO₂</u>	(Background = 0)			
1t	153	409.3	3071.3	20
1ns	42	409.4	3071.4	21
2t	98	408.6	3070.6	22
2ns	29	408.6	3070.7	23
3t	117	407.6	3069.4	24
3ns	25	407.6	3068.8	25
3-Hr <u>SO₂</u>	(Background = 0)			
1t	390	408.4	3071.4	30
1ns	105	408.6	3071.4	31
2t	274	408.5	3070.7	32
2ns	80	408.5	3070.8	33
3t	256	407.5	3070.2	34
3ns	72	407.6	3070.3	35
Annual <u>SO₂</u>	(Background = 0)			
1t	19	406.0	3071.0	100+101
1b1	15	406.0	3071.0	100
1ns	4	406.0	3071.0	101

t = Ground level concentration resulting from existing, new and proposed sources.

bl = Ground level concentrations resulting from existing sources (Pre 1/6/75).

ns = Impact of new and proposed sources.





AGRICO — AGRICO CHEMICAL CO.
 BORDEN — BORDEN, INC.
 B.P. — BREWSTER PHOSPHATES
 C.F.I. — C.F. INDUSTRIES
 CONSERV — CONSERV
 E.P.C. — ELECTRO-PHOS CORP.
 F.L.I. — FARMLAND INDUSTRIES, INC.
 GARDINIER — GARDINIER, INC.
 GRACE — W.R. GRACE & CO.
 IMC — INTERNATIONAL MINERALS
 & CHEMICAL CORP.

MOBIL — MOBIL CHEMICAL CO.
 ROYSTER — ROYSTER CO.
 SWIFT — SWIFT AGRICULTURAL CHEMICAL CORP.
 T/A M. — T/A MINERALS CORP.
 U.R.C. — URANIUM RECOVERY CORP.
 USS — USS AGRI-CHEMICALS

■ — MINERALS PROCESSING PLANT
 ● — CHEMICAL PLANT
 ▲ — MARINE LOADING TERMINAL

SCALE IN MILES
0 1 2 3 4 5 6 7 8 9 10

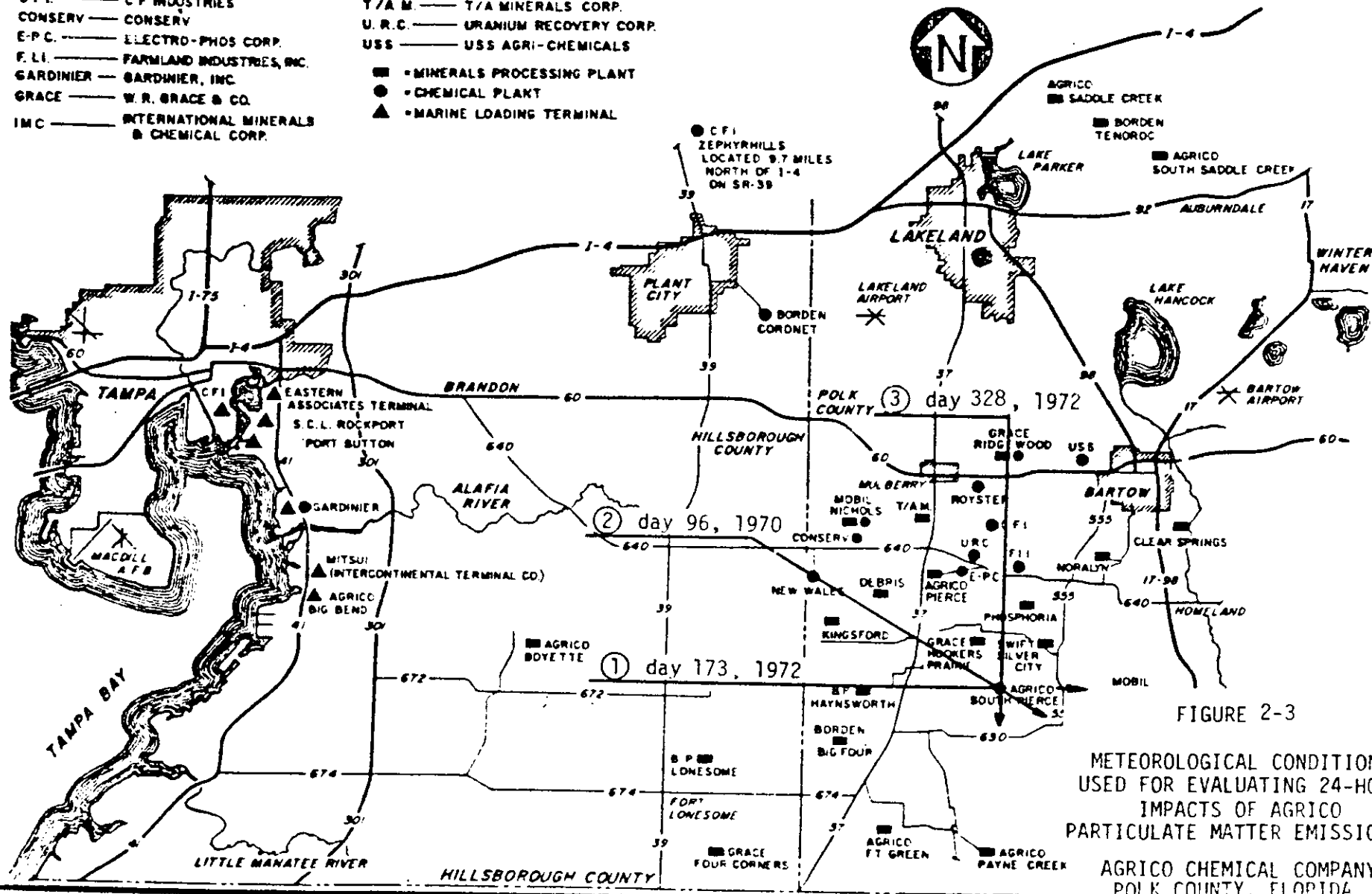
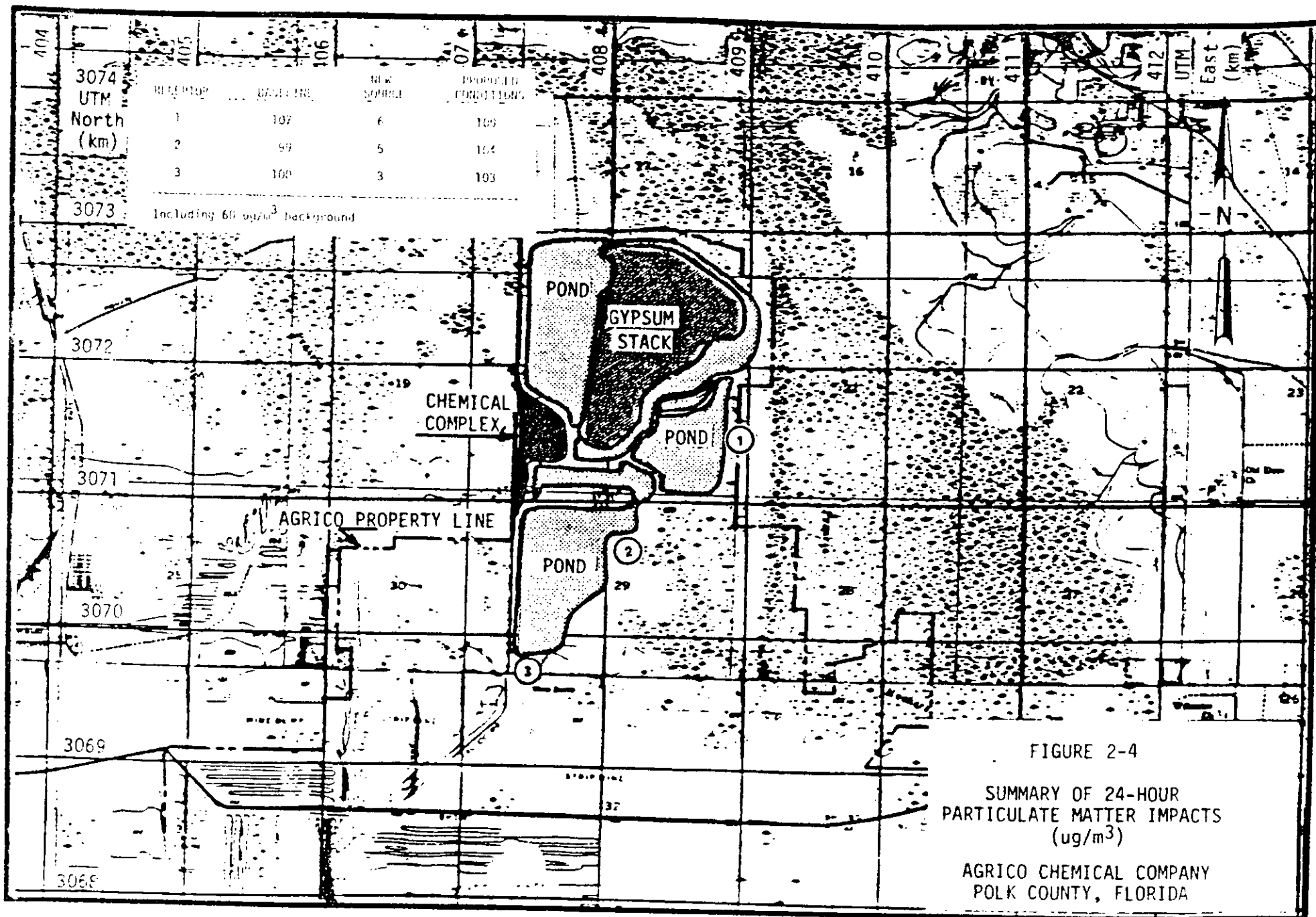


FIGURE 2-3

METEOROLOGICAL CONDITIONS
 USED FOR EVALUATING 24-HOUR
 IMPACTS OF AGRICO
 PARTICULATE MATTER EMISSIONS

AGRICO CHEMICAL COMPANY
 POLK COUNTY, FLORIDA



AGRICO — AGRICO CHEMICAL CO.
 BORDEN — BORDEN, INC.
 B.P. — BREWSTER PHOSPHATES
 C.F.I. — C.F. INDUSTRIES
 CONSERV — CONSERV
 E.P.C. — ELECTRO-PHOS CORP.
 F.L.I. — FARMLAND INDUSTRIES, INC.
 GARDINIER — GARDINIER, INC.
 GRACE — W.R. GRACE & CO.
 IMC — INTERNATIONAL MINERALS
 & CHEMICAL CORP.

MOBIL — MOBIL CHEMICAL CO.
 ROYSTER — ROYSTER CO.
 SWIFT — SWIFT AGRICULTURAL CHEMICAL CORP.
 T/A M. — T/A MINERALS CORP.
 U.R.C. — URANIUM RECOVERY CORP.
 USS — USS AGRI-CHEMICALS

■ — MINERALS PROCESSING PLANT
 ● — CHEMICAL PLANT
 ▲ — MARINE LOADING TERMINAL

SCALE IN MILES
0 1 2 3 4 5 6 7 8 9 10

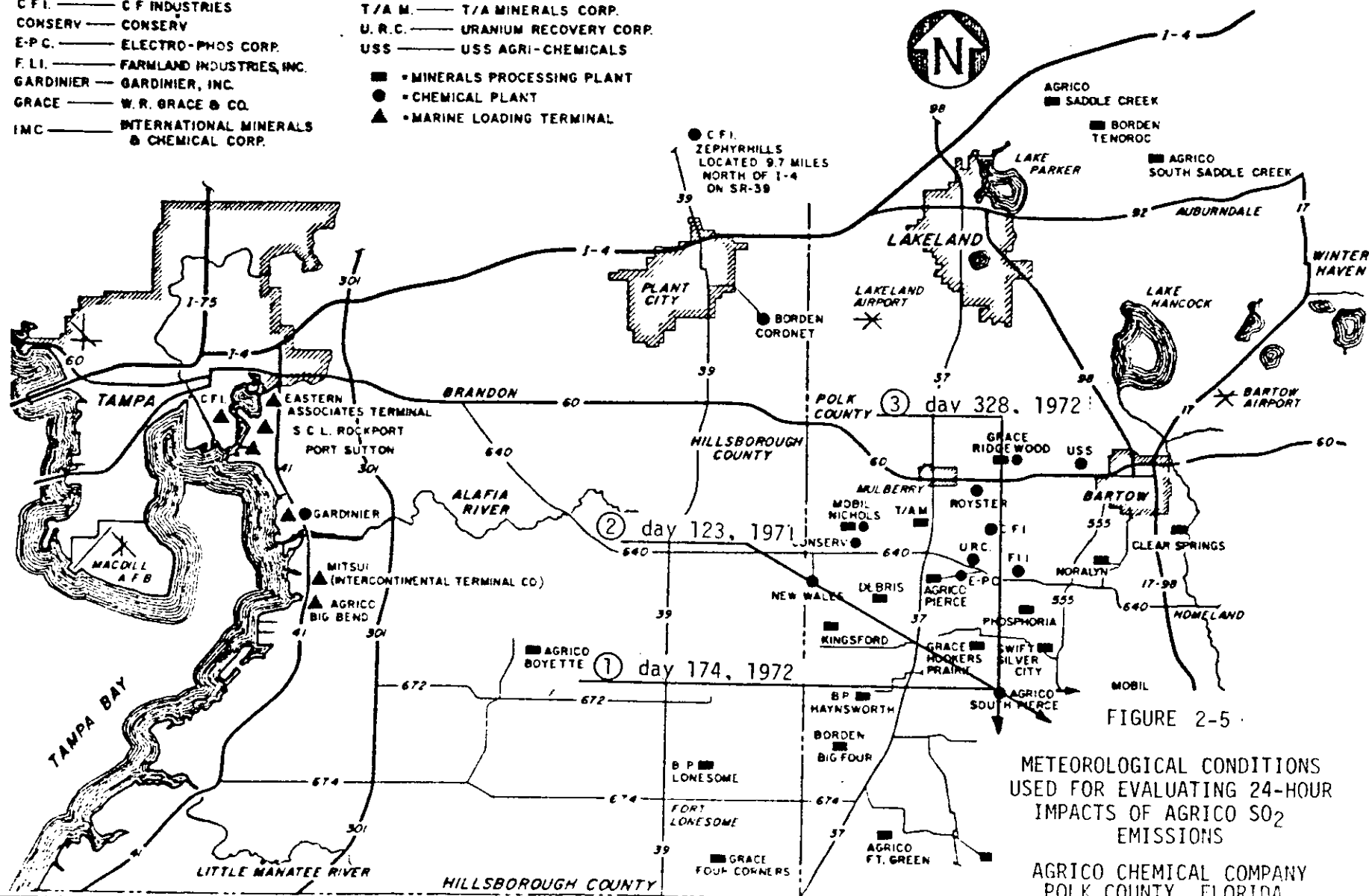


FIGURE 2-5

METEOROLOGICAL CONDITIONS
 USED FOR EVALUATING 24-HOUR
 IMPACTS OF AGRICO SO₂
 EMISSIONS

AGRICO CHEMICAL COMPANY
 POLK COUNTY, FLORIDA

AGRICO — AGRICO CHEMICAL CO.
 BORDEN — BORDEN, INC.
 B.P. — BREWSTER PHOSPHATES
 C.F.I. — C F INDUSTRIES
 CONSERV — CONSERV
 E-P.C. — ELECTRO-PHOS CORP.
 F.I.I. — FARMLAND INDUSTRIES, INC.
 GARDINIER — GARDINIER, INC.
 GRACE — W.R. GRACE & CO.
 IMC — INTERNATIONAL MINERALS
 & CHEMICAL CORP.

MOBIL — MOBIL CHEMICAL CO.
 ROYSTER — ROYSTER CO
 SWIFT — SWIFT AGRICULTURAL CHEMICAL CORP.
 T/A M. — T/A MINERALS CORP.
 U.R.C. — URANIUM RECOVERY CORP.
 USS — USS AGRI-CHEMICALS

■ — MINERALS PROCESSING PLANT
 ● — CHEMICAL PLANT
 ▲ — MARINE LOADING TERMINAL

SCALE IN MILES
0 1 2 3 4 5 6 7 8 9 10

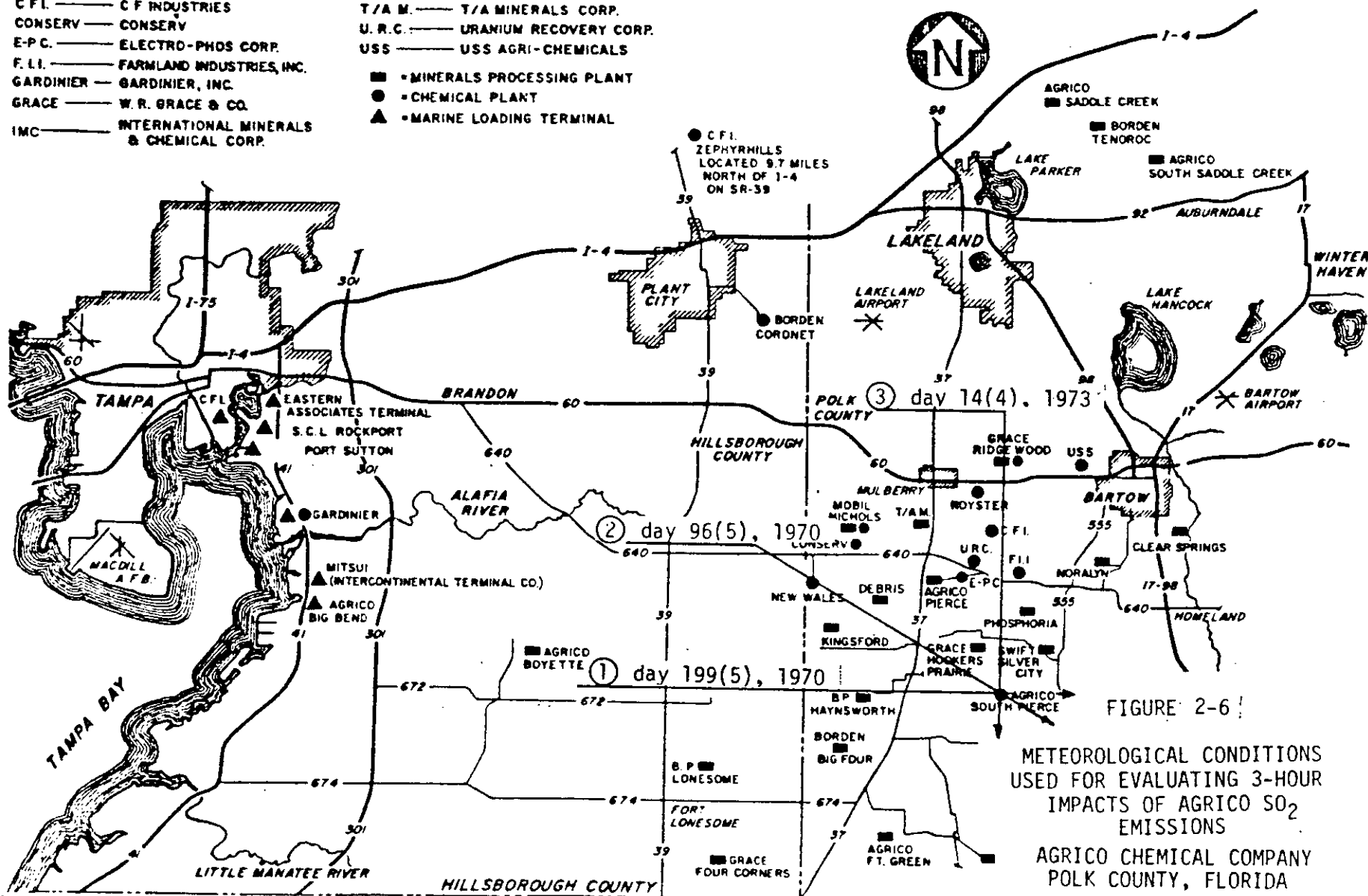
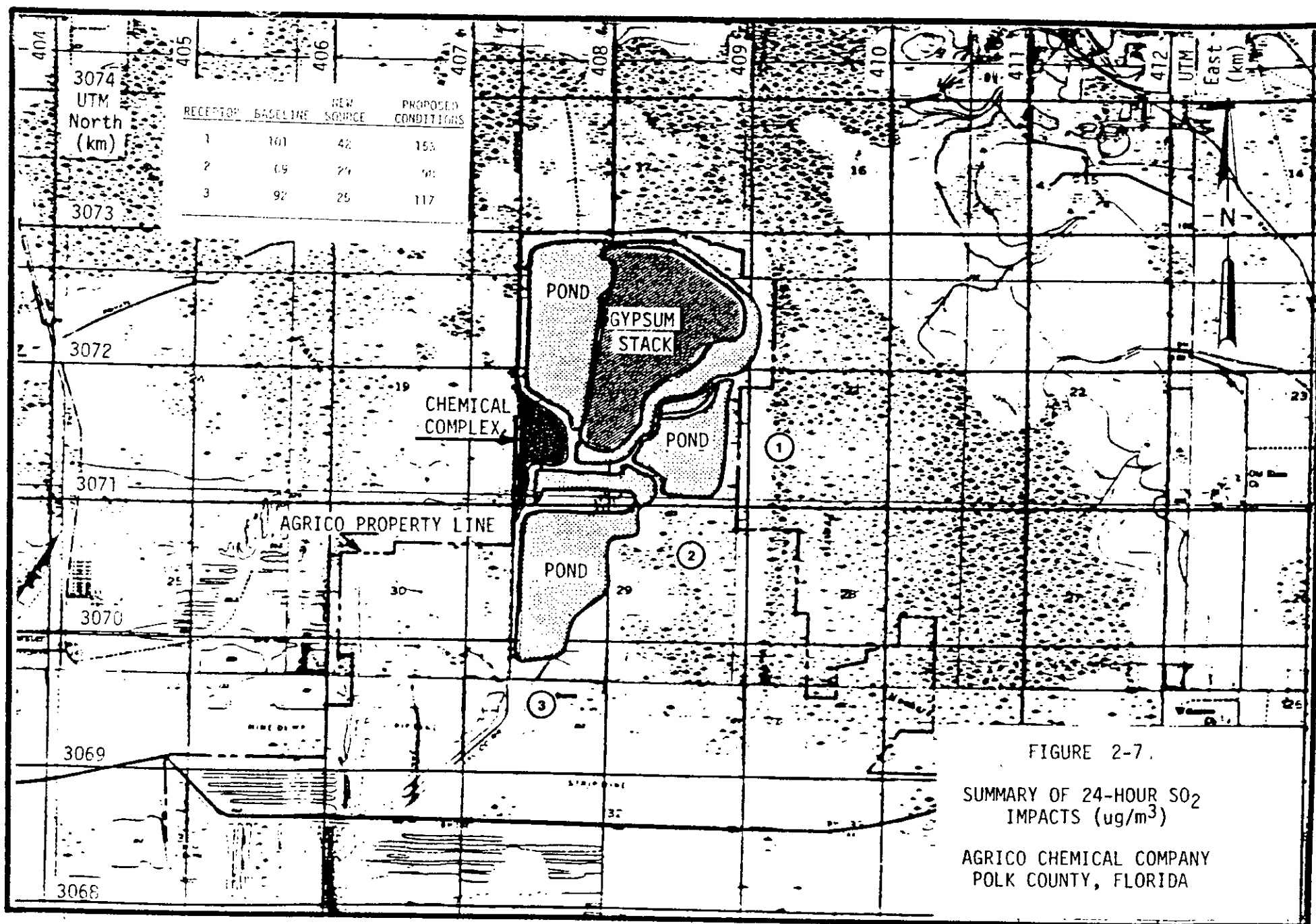


FIGURE 2-6

METEOROLOGICAL CONDITIONS
 USED FOR EVALUATING 3-HOUR
 IMPACTS OF AGRICO SO₂
 EMISSIONS
 AGRICO CHEMICAL COMPANY
 POLK COUNTY, FLORIDA



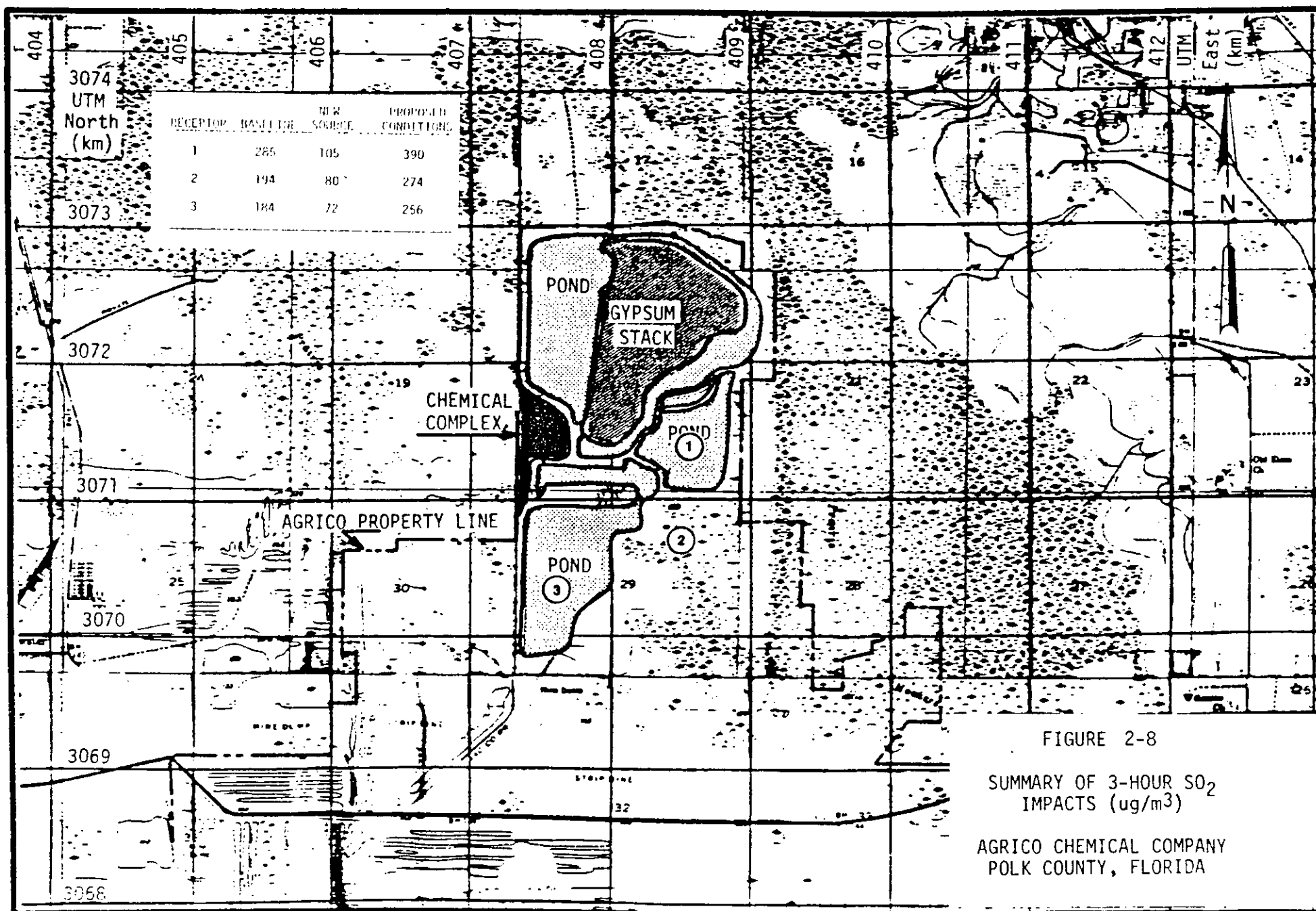


FIGURE 2-8

SUMMARY OF 3-HOUR SO₂
IMPACTS (ug/m³)

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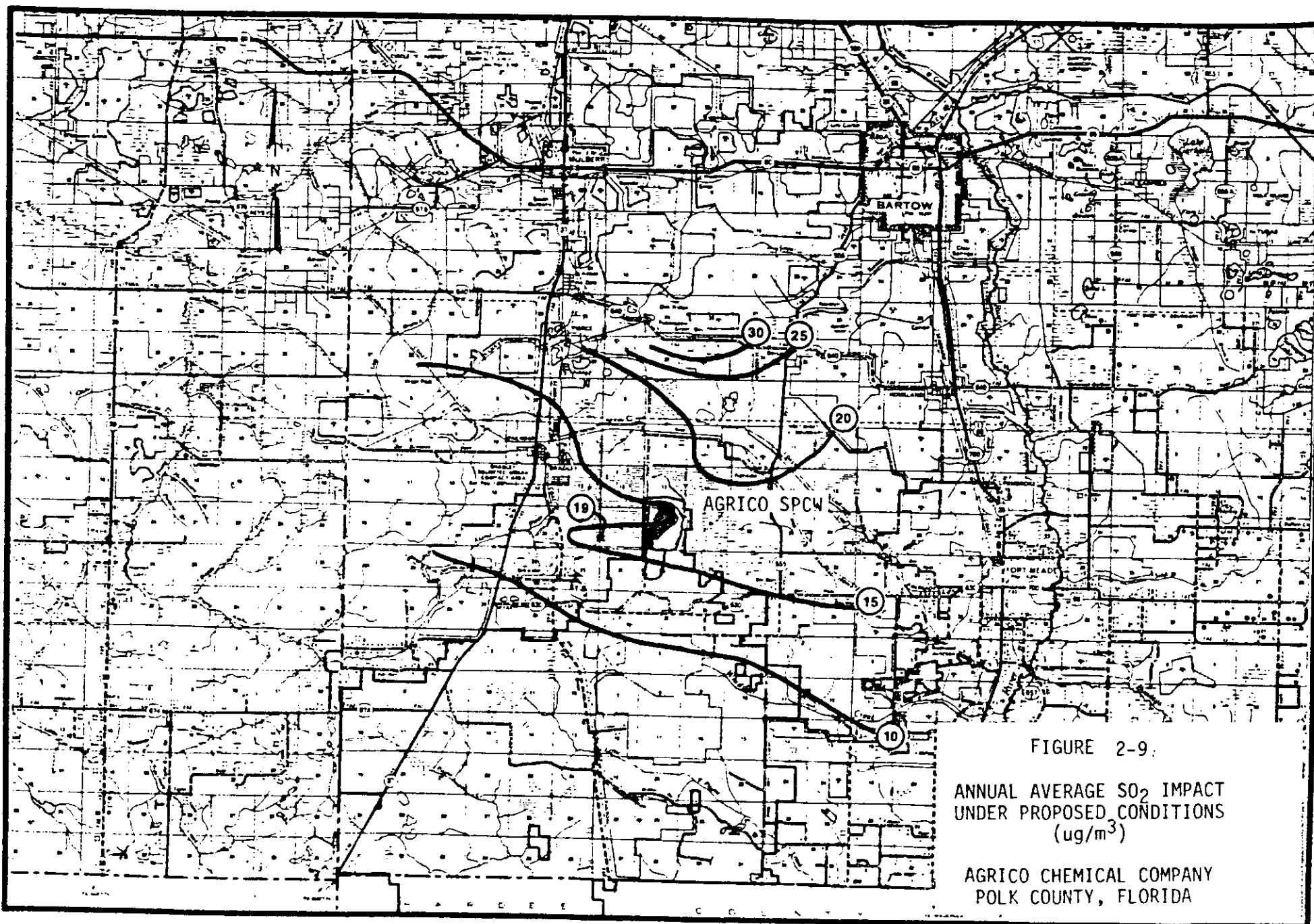
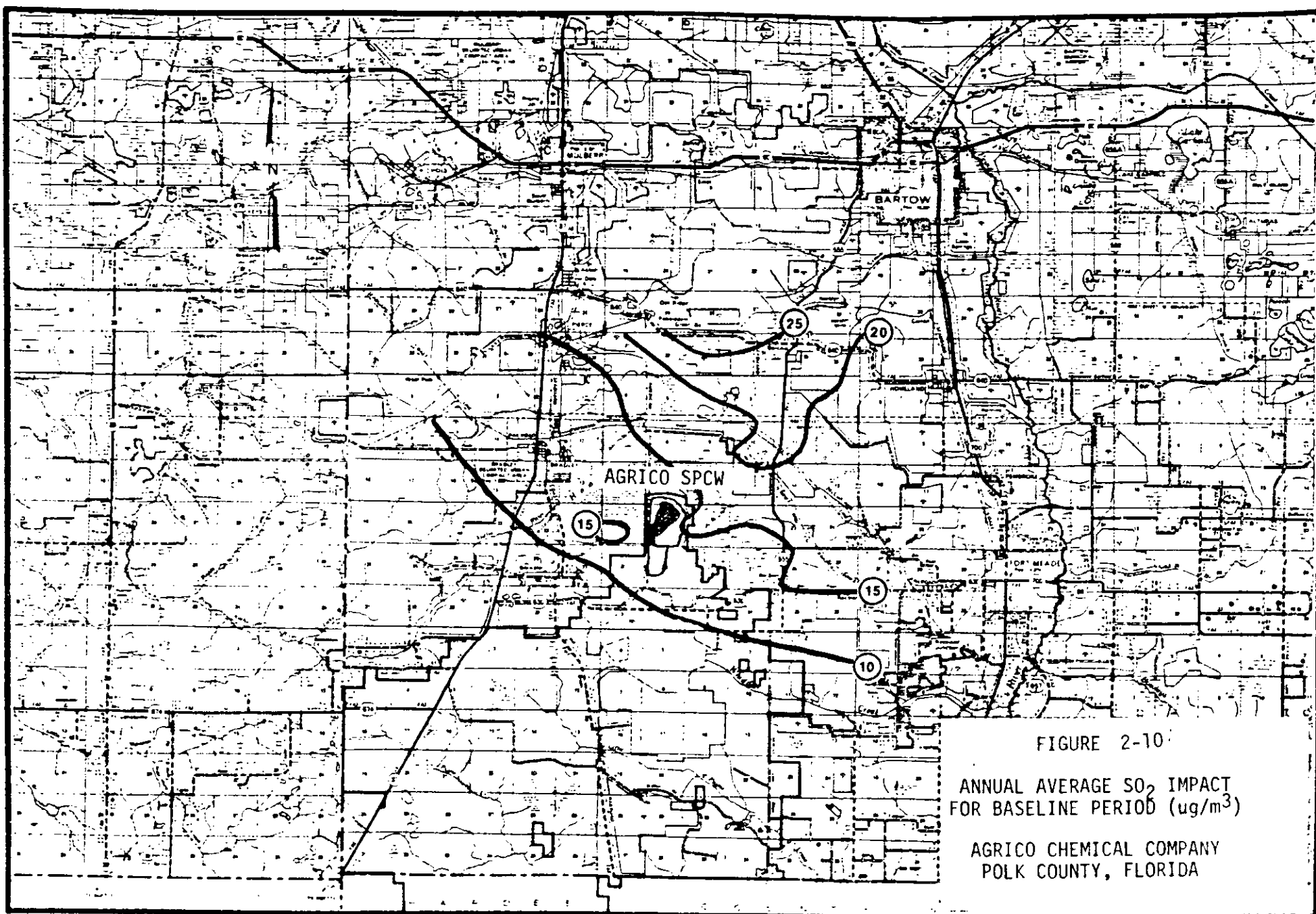
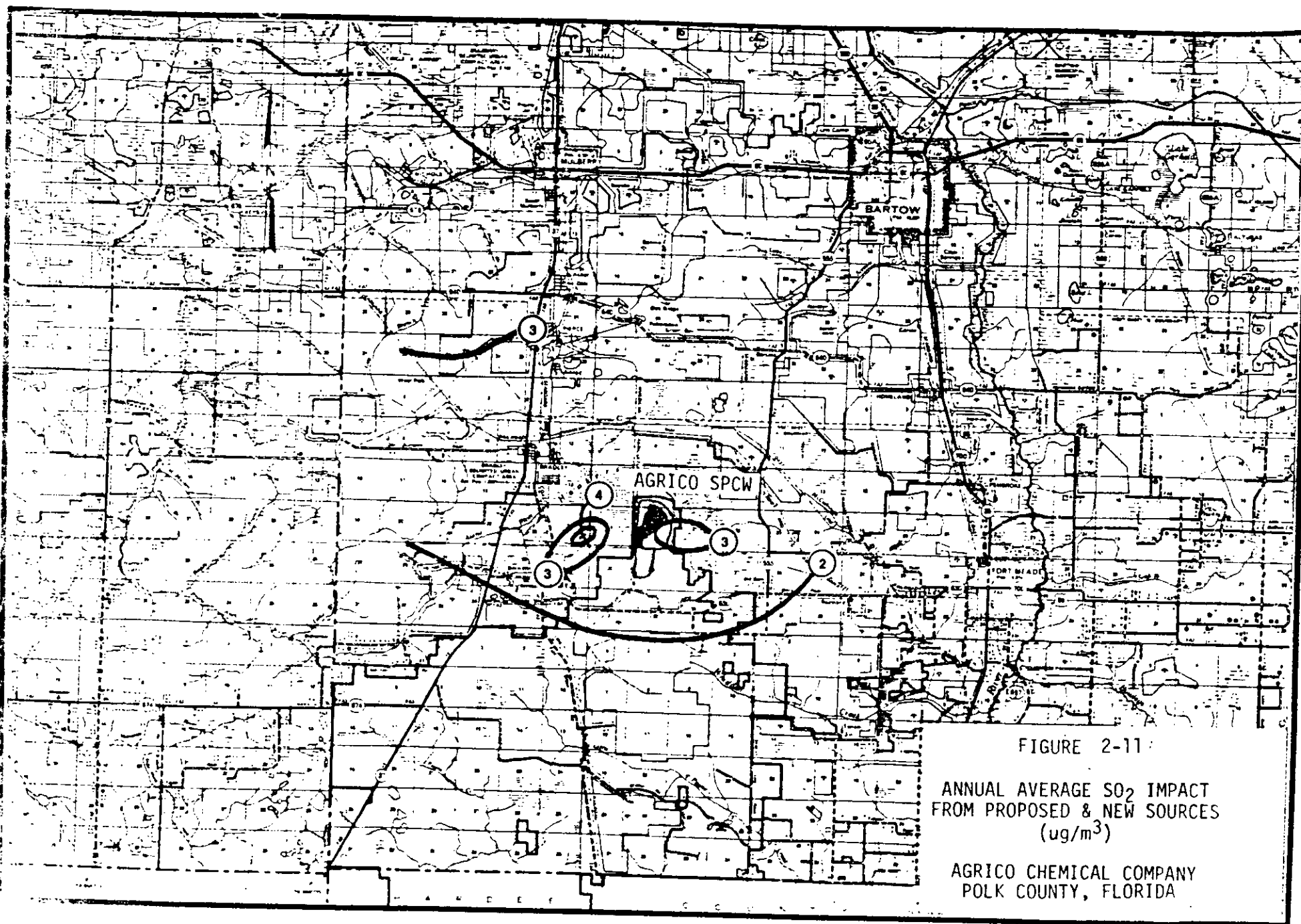


FIGURE 2-9.

ANNUAL AVERAGE SO₂ IMPACT
UNDER PROPOSED CONDITIONS
($\mu\text{g}/\text{m}^3$)

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3.0 SECONDARY IMPACTS

3.1 Introduction

A qualitative evaluation of the proposed expansion on soils, vegetation, visibility and commercial growth in the area has been prepared.

3.2 Particulate Matter and Sulfur Dioxide

Air quality modeling has demonstrated that particulate matter and sulfur dioxide levels after the proposed expansion will be well below the national secondary air quality standards. Since these standards were promulgated to protect welfare related values, it is projected that the proposed expansion will not adversely impact soils, vegetation and visibility in the surrounding area.

3.3 Nitrogen Oxides

Since nitrogen oxide emissions from the proposed sources are only five percent of the sulfur dioxide emissions and since the annual average sulfur dioxide impact of the proposed sources is only four micrograms per cubic meter, the ambient nitrogen oxides concentration resulting from emissions from the proposed sources will be approximately five percent of four micrograms per cubic meter or 0.2 micrograms per cubic meter. At this level no secondary impact is anticipated.

3.4 Fluorides

The fluoride emissions from the proposed modification are not expected to create any adverse secondary impacts. An Environmental Impact Statement recently submitted for a phosphate fertilizer complex in north Florida

(Environmental Impact Statement, Occidental Chemical Company Swift Creek Chemical Complex, Hamilton County, Florida, US EPA, Region IV, Atlanta, Georgia, July 1978) includes a section on the environmental impact of fluoride emissions. In this document it states that no significant impact to cattle, agricultural crops or timber was established

Property for several miles in all directions from Agrico is owned by phosphate interests. The closest non-phosphate company owned property on which there is a fluoride sensitive receptor; citrus, is located four kilometers southeast of Agrico. Agrico has not received any complaints from the grove owner related to emissions from the chemical complex or cooling ponds. This is significant since the point source fluoride emissions rate from the entire chemical complex prior to the program of replacing older plants with latest technology (mid-1977) was about 60 tons per year.

Under the conditions of the proposed expansion the fluoride emission rate from all point sources in the SPCW will decrease to approximately 40 tons per year. Since there will be an overall reduction in fluoride emissions from point sources and since the emissions from the ponds will increase only slightly (approximately five tons per year) it is doubtful that any fluoride related impacts will be observed in the future.

