June 12, 2001

MEMORANDUM

TO: Mark Dietrich, Administrator
Pocatello Regional Office

FROM: Marjorie MartzEmerson
State Office Air Division

SUBJECT: ***PERMIT TO CONSTRUCT TECHNICAL ANALYSIS***
Final Permit Number 077-00006, J.R. Simplot, Pocatello
300 Sulfuric Acid Plant Restoration Project (P-000318)

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.01.200 (*Rules for the Control of Air Pollution in Idaho*) for issuing Permits to Construct (PTCs).

PROJECT DESCRIPTION

The J.R. Simplot Company (Simplot) owns and operates the Don Plant near Pocatello, Idaho for the manufacture of anhydrous ammonia, phosphoric acid, and sulfuric acid along with nitrogen, phosphate, and sulfate fertilizers. High-grade sulfuric acid for use in the manufacturing process and for commercial sale is produced in the 300 (#3) and 400 (#4) sulfuric acid plants. Simplot has requested a permit to construct (PTC) for replacing aging equipment in the #3 sulfuric acid plant.

The proposed project will replace the converter, drying tower, 98% acid pump tank, number 2 superheater, two boiler-feed water pumps, scrubber packing, scrubber demister mesh pad, and scrubber mist eliminators. The proposed project will install a DynaWave Reverse Jet Scrubber in addition to the currently installed packed bed ammonia scrubber. Simplot commenced construction on the project under the 15-day pre-permit construction approval process in accordance with IDAPA 58.01.01.213.

The Don Plant is a designated facility for Prevention of Significant Deterioration (PSD) and is a major source of particulate matter (PM_{10}), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). The plant is located in a nonattainment area for PM_{10}.

The primary emissions from the project will be SO_2, sulfur trioxide (SO_3), and H_2SO_4 vapor and mist. The proposed project includes the addition of a second scrubbing system to the existing packed bed ammonia scrubber to further reduce SO_2 emissions. Ammonium sulfate particulate matter may be generated and released from the two-stage scrubbers.

SUMMARY OF EVENTS

On November 13, 2000, the Idaho Department of Environmental Quality received a PTC application and a request for 15-day pre-permit construction approval from the J.R. Simplot Company for restoration of the #3 sulfuric acid plant. The public meeting was held on November 22, 2000. Pre-permit approval for construction was granted on December 11, 2000. A proposed permit was sent to public comment on May 4, 2001. A public hearing was held on May 29, 2001 and the public comment period ended on June 11, 2001. No public comments were received.

DISCUSSION

1. Process Description

The #3 sulfuric acid plant produces sulfuric acid using a single contact process. Liquid sulfur is burned in the sulfur furnace to produce SO_2. The offgas from the furnace containing SO_2, small amounts of SO_3, and excess air is cooled through a waste-heat boiler and then reacted with oxygen in a multi-pass, four-bed catalytic converter to form SO_3. Following cooling, the SO_3 gas stream is sent to the absorber tower where the SO_3 is absorbed in a sulfuric acid solution to form sulfuric acid. The only significant source of emissions from the process is the exhaust leaving the absorbing tower. This gas contains small amounts of SO_2 and even smaller amounts of SO_3, H_2SO_4 vapor and H_2SO_4 mist.

The exhaust from the absorbing tower will be treated using a DynaWave Reverse Jet Scrubber followed by the existing packed-bed ammonia scrubber.

2. Equipment Listing

The principal equipment in the #3 sulfuric acid plant is briefly outlined below. The listing does not include a complete listing of all ancillary support equipment.

Sulfur unloading, hot pit, and storage tank. Elemental sulfur is brought in by tank car, heated to a liquid state, and stored.

Drying tower. Uses sulfuric acid to scrub moisture from the air before it enters the furnace.

Acid tanks. Two sulfuric acid storage tanks, one with a concentration of 98.5% sulfuric acid for use in the drying tower and absorbing towers, and a product tank with a concentration of 93%.

Sulfur furnace. Molten sulfur is pumped to the burner where it is oxidized to SO_2 using the dry combustion air.

Waste heat boiler. Removes heat for the furnace offgas before it is transferred to the converter.

Converter with internal steam superheater and heat exchanger. A multi-pass, four-bed, catalytic converter for converting SO_2 to SO_3. Waste heat is removed through the superheaters and heat exchangers.

Economizers and cold reheat exchanger. Waste heat removal and reheat as needed.

Intermediate and final absorbing towers. SO_3 is absorbed in 98.5% sulfuric acid.

Ammonia scrubbers. Ammonia is used as the scrubbing agent in a process that absorbs SO_2 from the stack gas to form ammonium sulfate. The DynaWave reverse jet scrubber will be followed by a packed-bed scrubber. The absorbing liquid is fed counter current to the flow of gas.

Stack. The exhaust will be released through a 4.5 ft diameter, 202 ft high stack at approximately 102,000 acfm at 85°F.

The proposed project will replace the converter, drying tower, 98% acid pump tank, number 2 superheater, two boiler-feed water pumps, scrubber packing, scrubber demister mesh pad, and scrubber mist eliminators.

3. Emission Estimates

Simplot has requested a permit to replace major portions of the process equipment and the addition of pollution control equipment for the #3 sulfuric acid plant to ensure future safety and extend the useful life of the plant. Simplot has proposed that the potential to emit for SO_2 be limited to below current emission rates based on the effectiveness of a two-stage ammonia scrubbing system. The emission estimates are, therefore, based on controlled emissions through the two-stage scrubbers. The controlled emission limits will apply at all times the plant is operating.

Pollutant	Emission Factor or Limit	Throughput	Emission Rate	Annual Emission Limit	Average Actual Emissions
SO_2	4 lbs/ton	1750 tons/day	170 lbs/hr	750 tons/yr	900 tons/yr
SO_3	Included as H_2SO_4 because SO_3 rapidly reacts with water vapor to form H_2SO_4 mist				
H_2SO_4 vapor/mist	0.041 lbs/ton		72 lbs/day	13 tons/yr	6.4 tons/yr
NH_3			2.5 lbs/hr	11 tons/yr	11 tons/yr
NO_x	0.2 lbs/ton		350 lbs/day	64 tons/yr	27 tons/yr
PM_{10}	The total PM_{10} emissions have not been measured, see discussion below				
CO_2	8.1 lbs/ton		7.1 tons/day		
Estimates based on the PTC application prepared by MFG, Inc, dated November 10, 2000, except for CO_2 which is taken from AP-42.					

Sulfur dioxide. Simplot is proposing to reduce SO_2 emissions through a second stage ammonia scrubber that will limit the SO_2 emissions to 170 lbs/hr averaged over a 3-hour period. These emissions estimates are projected based on 10 years of source tests and the projected enhanced removal of SO_2 by the two-stage ammonia scrubbing system.

Sulfur trioxide. The SO_3 emissions from the plant are best controlled by plant operational controls. The SO_3 in the stack gas is absorbed in a highly efficient absorbing tower. The SO_3 leaving a properly operating tower (without controls) will normally be < 0.1 mg/scf (Muller Sulfuric Acid Process Description) or < 3.6 lbs/hr. Because SO_3 rapidly reacts with moisture in the atmosphere to form H_2SO_4 mist, it is included in the H_2SO_4 emission evaluation.

Sulfuric acid vapor and/or mist. Simplot is proposing to limit (with controls) the total emissions of H_2SO_4 equivalent to 2.99 lbs/hr (averaged over 24 hours) through optimal plant operation and effective pollution control technology. Total H_2SO_4 will include acid mist, acid vapor, SO_3, and ammonium sulfate particulate generated in the scrubbers. An increase in either SO_3 or H_2SO_4 mist is usually first seen as increased stack opacity.

Ammonia. Simplot estimates that the NH_3 releases from the scrubbers will be less than 2.5 lbs/hr which was the highest emission rate observed in previous years source tests.

Nitrogen oxides. Simplot is proposing a NO_x emission limit of 0.2 lbs/ton or a potential to emit of 350 lbs/day and 64 T/yr. Current actual NO_x emissions are 27 T/yr.

Particulate matter less than or equal to 10 microns. Baseline data for PM_{10} is not available in the permit application, the Tier 1 permit application, or the SIP Tier 2 for the #3 sulfuric acid plant. The PM_{10} emissions from this source may include ammonium sulfate and condensible particulate matter. Neither of these types of particulate material have been well characterized. Simplot estimated the increase of ammonium sulfate particulate matter to be less than 9 T/yr but provided no information on current emissions of ammonium sulfate or condensible particulate matter as PM_{10}.

Carbon dioxide. The AP-42 emission factor for carbon dioxide emissions from sulfuric acid plants is 8.1 lbs/ton of product produced. Carbon dioxide is not a regulated pollutant.

4. Modeling

Through the modeling conducted by MFG, Simplot demonstrated compliance with applicable regulatory standards (*Modeling Review of the 300 Sulfuric Acid Plant Restoration Project Permit to Construct Application* Memorandum attached).

5. Facility Classification

The Don Plant manufactures fertilizer and other inorganic chemical products, including the manufacture of sulfuric acid. SIC Code 2874. The facility is a major facility as defined in IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10.

6. Area Classification

The Don Plant is located in an area that is designated moderate nonattainment for PM_{10}. The region is unclassifiable for the other criteria pollutants.

7. Regulatory Review

The #3 sulfuric acid plant is subject to the following requirements:

- IDAPA 58.01.01.122, Information Orders by the Department

  The Department may issue information orders for the purpose of developing any implementation plan, and standard of performance, any emission standard or rule; determining whether any person is in violation of a standard; or carrying out any air quality provisions.

- IDAPA 58.01.01.123, Certification of Documents

  All documents, including but not limited to, application forms for permits to construct, application forms for operating permits, progress reports, records, monitoring data, supporting information, requests for confidential treatment, testing reports, or compliance certifications submitted to the Department shall contain a certification by a responsible official. The certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

- IDAPA 58.01.01.124 and 125, Truth, Accuracy, and Completeness of Documents

  All documents submitted shall be truthful, accurate and complete. No person shall knowingly make any false statement, representation, or certification in any form, notice, or report required by any permit, or any applicable rule or order in force pursuant thereto.

- IDAPA 58.01.01.126, Tampering

  No person shall knowingly render inaccurate any monitoring device or method required under any permit, or any applicable rule or order in force pursuant thereto.

- IDAPA 58.01.01.130 through 136, Excess Emissions

  The rules outline the procedures and requirements to be implemented in all excess emissions events, including procedures for minimizing, correcting, reporting, and recording any event.

- IDAPA 58.01.01.155, Circumvention

  No person shall willfully conceal the emission of regulated pollutants which would otherwise cause a violation.

- IDAPA 58.01.01.157, Test Methods and Procedures

  Outlines test methods and procedures for conducting performance tests and reporting results.

- IDAPA 58.01.01.161, Toxic Substances

  Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.

- IDAPA 58.01.01.201, Permit to Construct Required

  No owner or operator may commence construction or modification of any stationary source, facility, major facility, or major modification without first obtaining a permit to construct from the Department unless the source is exempted or complies with Section 213. This permit to construct is recommended for construction and operation of the minor modification proposed for the 3# sulfuric acid plant.

- IDAPA 58.01.01.210, Demonstration of Preconstruction Compliance with Toxic Standards

  The modeling evaluation demonstrates compliance with the applicable ambient air concentration standard for ammonia and sulfuric acid.

- IDAPA 58.01.01.213, Pre-Permit Construction

  Simplot demonstrated eligibility for pre-permit construction approval to be granted.

- IDAPA 58.01.01.577, Ambient Air Quality Standards for Specific Air Pollutants

  The modeling evaluation demonstrates that the projected increase of nitrogen oxides will not significantly contribute to violation of the NAAQS. Sulfur dioxide emissions will decrease as a result of the proposed project. The modeling evaluation of the projected increase in ammonium sulfate as PM_{10} will not significantly contribute to violation of the NAAQS. The condensible fraction of PM_{10} was not evaluated, a source test to establish emissions will be required.

- IDAPA 58.01.01.590, New Source Performance Standards

  Compliance with 40 CFR 60 is required for affected sulfuric acid plants.

- IDAPA 58.01.01.625, Visible Emissions

  A person shall not discharge any air pollutant for a period or periods aggregating more than three minutes in any 60-minute period which is greater than 20% opacity.

- IDAPA 58.01.01.650 and 651, Rules for Control of Fugitive Dust

  Requires that all reasonable precautions be taken to prevent the generation of fugitive dust.

- IDAPA 58.01.01.845, Control of Sulfur Oxide Emissions from Sulfuric Acid Plants

  Restricts SO_2 emissions to 28 lbs/ton of acid produced (averaged over a complete cycle of operation or three hours whichever is greater) and requires that EPA Method 8 be used for testing. The emission limit recommended by Simplot for SO_2 averages 2.3 lbs/ton.

- 40 CFR 60, New Source Performance Standards

  The NSPS general provisions (40 CFR Subpart A) and the NSPS for sulfuric acid plants (40 CFR Subpart H) apply to sulfuric acid plants that commence construction or modification after August 17, 1971. A modification is defined as

  > "any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted." (40 CFR 60.2).

  The #3 sulfuric acid plant restoration project is a physical change that may increase the emissions of acid mist from 6.4 T/yr to 13.1 T/yr. The applicability determination is made by the Environmental Protection Agency (EPA). Simplot has indicated in their application, and DEQ concurs, that NSPS requirements are applicable to the #3 sulfuric acid plant based on this modification. The NSPS requirements, including but not limited to, shall be met:

  - Standards of Performance for New Stationary Sources General Provisions (40 CFR 60, Subpart A)
  - Notification and recordkeeping (40 CFR 60.7). Outlines specific EPA notification and recordkeeping requirements for NSPS-affected facilities or units, including:

"(b) Any owner or operator subject to the provisions of this part shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; and malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.

(c) Each owner or operator required to install a continuous monitoring device shall submit excess emissions and monitoring systems performance report ... to the Administrator semi-annually ...

(1) The magnitude of excess emissions ...

(2) Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventive measures adopted. ..."

- Performance tests (40 CFR 60.8). Outlines the requirements for performance tests and data reduction.
- Compliance with standards and maintenance requirements (40 CFR 60.11). Describes compliance standards.

  (c) The opacity standards set forth in this part shall apply at all times except during periods of startup, shutdown, malfunction ...

  (d) At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. ...
- Circumvention (40 CFR 60.12). Prohibits concealment of an emission which would otherwise constitute a violation of an applicable standard.
- Monitoring requirements (40 CFR 60.13). Outlines the monitoring requirements, including the operation and calibration requirements for continuous emission monitoring systems.
- Modification (40 CFR 60.14). Definition of modification.
- Reconstruction (40 CFR 60.15). Definition of reconstruction.
- Standards of Performance for Sulfuric Acid Plants (40 CFR 60, Subpart H). Outlines applicability and provides definitions.
- Standard for sulfur dioxide (40 CFR 60.82). Prohibits sulfur dioxide releases in excess of 4 pounds per ton.
- Standard for acid mist (40 CFR 60.83). Prohibits acid mist releases, expressed as H_2SO_4, in excess of 0.15 pounds per ton of production being expressed as 100% H_2SO_4. Prohibits the exhibition of greater than 10% opacity.
- Emission monitoring (40 CFR 60.84). Requires the installation of a continuous monitoring system for sulfur dioxide measurement. Requires that the data be converted into units of the applicable standard.
- Test methods and procedures (40 CFR 60.85). Specifies methods and procedures.

8. Permit Requirements

8.1 Emission Limits

Emission limits have been established for the significant pollutants based on the evaluation and modeling analysis demonstrating compliance with ambient standards, NSPS requirements, and on the limits proposed by Simplot to maintain emissions below significant emission rates. No emission limit has been established in this PTC for PM_{10}. Performance testing for PM_{10} is required. Based on analysis of the source test data, an emission limit may be established.

Pollutant	Performance Standard	Throughput	Hourly Emission Limit	Annual Emission Limit
SO_2	4 lbs/ton	1750 tons/day	170 lbs/hr (3-hour average)	750 tons/yr
H_2SO_4 mist	0.041 lbs/ton		3 lbs/hr (24-hour average)	13 tons/yr
NH_3			2.5 lbs/hr	11 tons/yr
NO_x	0.2 lbs/ton			64 tons/yr
PM_{10}				
Opacity	10%			

8.2 Operating Requirements

The #3 sulfuric acid plant is limited to the currently permitted throughput of 1,750 tons per day. The emission estimates and evaluation are based on the plant operating 24 hours per day, 365 days per year (8,760 hours) with the two-stage scrubber system operating at all times.

FEES

The J.R. Simplot Don Plant is a major facility as defined in IDAPA 58.01.01.008.10 and is, therefore, subject to registration and registration fees in accordance with IDAPA 58.01.01.527. According to the Air Emissions Data Base Master List for 2001, the J.R. Simplot Don Plant, Pocatello registered 4,399 tons of pollutants by paying $70,000 in fees. This modification will decrease annual emissions of sulfur dioxide by approximately 150 tons. The emissions of other regulated pollutants may increase by approximately 50 tons.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommend the J.R. Simplot Don Plant, Pocatello PTC No.077-00006 for the 300 sulfuric acid plant be issued.

AIRS INFORMATION

AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

Air Program Description	SIP	PSD	NESHAP	NSPS	MACT	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2		A		A		A	U
NOx		B				B	U
CO		B				B	U
PM_{10}							N
PM (Particulate)							
VOC							
THAP (Total HAPs)							
Other (specify below:)							
(Add additional lines if necessary.)							
VE/FE/FD *	ND	ND	ND	ND	ND	ND	

* VE/FE/FD (VISIBLE EMISSIONS, FUGITIVE EMISSIONS, AND FUGITIVE DUST) ARE ENTERED FOR COMPLIANCE PURPOSES ONLY AND DO NOT REQUIRE EVALUATION BY THE PERMIT ENGINEER.

AIRS/AFS CLASSIFICATION CODES:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
B = Actual and potential emissions below all applicable major source thresholds.
C = Class is unknown.
ND = Major source thresholds are not defined (e.g., radionuclides).

MME/tk:ms P-000318 G:\enw\martzem\JRSPTCtm

cc: Marilyn Seymore, DEQ Air Quality Division
Marjorie MartzEmerson, DEQ Air Quality Division
Tiffany Floyd, Pocatello Regional Office
Laurie Kral, EPA Region 10
Source File (077-00006)
Pat Rayne, AFS
Source File (077-00006)

MEMORANDUM

TO: Marjorie Martzemerson, Air Quality Permit Program Manager, State Air Quality Division

FROM: Mary Anderson, Air Quality Modeler, Technical Services Office

SUBJECT: Modeling Review of the 300 Sulfuric Acid Plant Restoration Project Permit to Construct Application

DATE: February 6, 2001

1. SUMMARY:

In November of 2000, Simplot Agribusiness Don Plant submitted a 15-day permit to construct application for the 300 sulfuric acid plant (#3) restoration project. Simplot Agribusiness (Simplot) manufactures nitrogen, phosphate, and sulfate commercial products at its Don Plant facility located near Pocatello, ID. This project would not increase the plant's design capacity of 1,750 tons of sulfuric acid per day. The actual emissions are not expected to increase. However, to allow for uncertainties after the modification, Simplot has proposed allowable emissions that represent increased potential emissions. The Don Plant is a designated facility with respect to Prevention of Significant Deterioration (PSD) regulations. The plant is a major source of particulate matter (PM10), sulfur dioxide (SO2), and nitrogen dioxide (NO2). Through modeling provided by MFG, Simplot has demonstrated compliance with all applicable regulatory standards.

2. DISCUSSION:

2.1 Project Description

The scope of the project is the replacement of aging process equipment. At #3, Simplot proposes to replace the following equipment in 2001: the converter, drying tower, 98% pump tank, #2 Superheater, two boiler feed water pumps, scrubber packing, scrubber demister mesh pad and scrubber mist eliminators. A second scrubber stage will be added to the existing packed bed ammonia scrubber to further reduce SO2 emissions. This modeling analysis, performed by MFG, Inc., evaluated emission increases of the following pollutants: PM10, NO2, ammonia (NH3), and sulfuric acid mist (H2SO4)

2.2 Applicable Air Quality Impact Limits

This facility is located in Bannock County which is designated as nonattainment for PM10 and attainment or unclassifiable for NO2. Therefore PM10 ambient concentrations must be compared to the Significant Contribution Levels (see IDAPA 58.01.01.006.93). NO2 ambient impacts due to the incremental increase is also compared to the Significant Contribution Levels (see IDAPA 58.01.01.006.93). If the ambient concentrations exceed these levels then the

appropriate background concentration would be added to determine compliance to the National Ambient Air Quality Standards (NAAQS). The ambient impacts for the toxic pollutants listed above must be compared to the Acceptable Ambient Concentration (AAC). The applicable regulatory limits for this Project are listed in Table 1.

Table 1. Applicable Regulatory Standards.

Pollutant	Averaging Period	Regulatory Standard ($\mu g/m^3$)	
		Significant Contribution Level[a]	NAAQS or AAC[b]
NO2	Annual	1.0	100
NH3	24-hour	N/A	900
H2SO4	24-hour	N/A	50
PM_{10}	24-hour	5.0	150
	Annual	1.0	50

a. IDAPA 58.01.01.006.93
b. IDAPA 58.01.01.577 for criteria pollutants and IDAPA 58.01.01.585 for toxic pollutants

2.3 Background Concentrations

Background concentrations were not needed because the ambient concentrations for all criteria pollutants were estimated to be below the Significant Contribution Level. Background concentrations are not available for toxic pollutants.

2.4 Co-contributing Sources

Co-contributing sources are not included in this analysis.

2.5 Modeling Impact Assessment

On November 13, 2000 IDEQ received a 15-day permit to construct application for the Simplot Don Siding Plant 300 Sulfuric Acid Plant Restoration Project. In this application, MFG used 3 years of on-site meteorological data (1997 – 1999). It was determined that this meteorological data had not been previously approved for modeling use by IDEQ. Simplot was requested to supply IDEQ with the necessary information to enable IDEQ staff to thoroughly review the quality of data. Simplot then submitted the following information to IDEQ:

1. Standard Operating Procedures (SOP),
2. "Meteorological and Air Quality Monitoring and Quality Assurance Plan for J. R. Simplot's Don Plant",
3. Copies of the site log books,
4. Quality Control (QC) performance audits.

Bruce Louks, Air Quality Monitoring Analyst for IDEQ, reviewed the documents for compliance. His findings are included in attachment I. Mr. Louks determined that the 1997 and 1998 data were not acceptable. However, the 1999 data was acceptable. Therefore, Simplot resubmitted the modeling analysis using only the on-site 1999 meteorological data. One year of meteorological data is acceptable according to the *Guideline on Air Quality Models.*

MFG used the latest version of AERMOD to model the ambient impacts of the project. AERMOD was chosen because of the proximity of nearby complex terrain. The EPA proposed AERMOD as a replacement to ISCST3 during the *7th Conference on Air Quality Modeling.* EPA allows the application of AERMOD on a case-by-case basis until the model is formally included in the *Guideline on Air Quality Models* (Appendix W of 40 CFR 51). MFG provided a lengthy discussion on the difference between AERMOD and ISCST3. MFG stated that they are currently conducting a model evaluation study to investigate modeling techniques for revision of the SO2 SIP for the Eastern Idaho Intrastate Air Quality Control Region (40 CFR Part 52.675). A Model Evaluation Protocol was submitted for review to IDEQ and EPA on April 11, 2000 and EPA approved the *Protocol* on April 18, 2000. The study includes a comparison of AERMOD and ISCST3 model performance using SO2 data collected near the Don Plant. MFG states that the analysis indicates AERMOD outperforms ISCST3, especially in complex terrain based on the monitoring data from Site 7. MFG presented these results to EPA and Mahbubul Islam of Region 10 agreed with their evaluation of model performance and verbally approved the application of AERMOD for the SO2 SIP. Therefore, MFG determined that AERMOD was the best regulatory model available to simulate potential impacts of the project.

Based on the information presented by MFG and after contacting Mahbubul Islam of Region 10, DEQ staff agreed with MFG's determination.

MFG modeled a unit emission rate of 1 g/s. Table 2 presents the emission rates that were applied to the resulting ambient concentrations.

Table 2. Emission rates.

Pollutant	Emission Rate Increase (lb/hr)
NO2	14.6
H2SO4	3[a]
PM10	4[b]
NH3	2.5

a. Assumes all sulfate is emitted as acid mist.
b. Assumes all sulfate is emitted as ammonia sulfate particulate. This results in a double counting, but is conservative for both cases.

Table 3 presents the stack parameters used by MFG in the modeling analysis.

Table 3. #3 Stack Parameters.	
Parameter	**Existing and Future Design Value**
Stack Height (ft)	202
Flow Rate (acfm)	102,000
Diameter (ft)	4.5
Temperature (°F)	85

3. RESULTS:

Table 4 presents the results of the ambient impact analysis.

Table 4. Ambient concentrations.				
		Ambient Concentration ($\mu g/m^3$)		
Pollutant	**Averaging Period**	**Based on unit emission rate (1 g/s)**	**Based on actual emissions**	**Compliant?**
NO2	Annual	0.205	0.38	Y
H2SO4	24-hour	4.04	1.53	Y
PM10	24-hour	4.04	2.04	Y
	Annual	0.205	0.10	Y
NH3	24-hour	4.04	1.27	Y

Electronic copies are kept on file.

Attachment 1

Review of Meteorological Data

From: BRUCE LOUKS
To: MARY ANDERSON
Date: Tue, Nov 21, 2000 3:50 PM
Subject: Simplot Meteorological Data

Hello Mary,

I reviewed the package of QA/QC documents for the JR Simplot DON Plant, 1997-1999 meteorological data. Three items on which I focused included the Standard Operating Procedures (SOP), the Site Log Books, and the QC Performance Audits.

The Site Log Books were well maintained, and I find the documentation contained in them to be appropriate.

The "Meteorological and Air Quality Monitoring and Quality Assurance Plan for J.R. Simplot's DON Plant" (August, 2000) prepared by the consultant, Meteorological Solutions, Inc. (MSI), is a thorough and acceptable document. The references cited, and protocols prescribed within provide the levels of quality assurance and quality control necessary for PSD data quality requirements.

The QC audits performed by MSI for calendar year 1999 were within the scope of the SOP, and the documentation provided is acceptable.

The audit work performed by CH2MHill for CY's 1997 and 1998, however, were not performed within the scope of the SOP provided. There are instances where the starting torque check for wind speed sensors are performed by hand, checking for bearing smoothness and bearing noise. The appropriate test is to use a torque disc. Also, the wind direction sensor shaft directional torque is checked by hand and not with a torque watch, as would be appropriate.

These "torque" parameters are critical measurements for challenging a wind sensor responses at low wind speeds, and with minor changes in wind direction. On this basis, I do not consider the 1997-1998 data acceptable PSD data. If JR Simplot has additional documentation for this data, SOP's which cover the period during which this data was collected, I would need to review them to alter my determination.

Questions, please let me know.

Bruce Louks
Air Quality Monitoring Analyst
IDEQ
373-0294

CC: DANIEL SALGADO; MATTHEW STOLL

J.R. SIMPLOT COMPANY P.O. BOX 912 POCATELLO, IDAHO 83204

AgriBusiness

7 June, 2000

Darrin Mehr
Air Quality Engineer
Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83705-1255

Re: #3 Sulfuric Acid Plant Revamp

Dear Mr. Mehr:

Enclosed is our application package for the planned rehabilitation of our #3 Sulfuric acid plant at our Don Siding facility. When we spoke last month you suggested that a formal application would facilitate your evaluation of this project. We expect to finalize the design in August and will be placing orders for the long lead time items shortly thereafter.

If you have any questions I can still be reached at (208) 245-5673 and would be pleased to provide any answers or to locate those who can.

Sincerely

Ward Wolleson
Senior Environmental Engineer

C: with enclosures
Dan Salgado – IDEQ-Boise
Rick Elkins – IDEQ Pocatello
Norm Self – Don Plant
Klaas Hutter – AB-EMT

Without enclosure
Del Butler – Don Plant

An Application to ReVamp an Existing Air Pollution Source: #3 Sulfuric Acid Plant

Descriptive Text

Appendices:

#3 Sulfuric Capital Renovations
June 7, 2000

Summary:

Activities Included in the Proposed Revamp

There are five major pieces that will be replaced in this project. The capacity of each element will sized such as to accommodate production rates of 1850 short tons per day of 100% H2SO4 or as previously permitted, 640,000 tons per year. The purpose of the project is to allow safe and reliable operation of the plant for 10-15 more years.

The basic plant is a Monsanto designed single contact sulfuric acid plant, completed in 1966. The converter dates from that time and has been extensively repaired on an annual basis. The vessel has been in service for over three decades and we have arrived at the time that the condition of the vessel can no longer be reliably repaired. When the converter is replaced the number of and arrangements of the heat exchangers will change to suit the new equipment. The existing vessel will be disassembled in place and replaced during the June turnaround of 2001

Air for the reaction is drawn thru the drying tower where atmospheric moisture is removed in order to limit corrosion in the subsequent vessels. The drying tower was last replaced in 1981 after approximately 15 years of service. Replacement of the unit is planned during the June turnaround in 2001.

The boiler feed water pumps are original (1966) equipment to the plant and will be replaced with more efficient drives and designs. This will occur during the 2001 plant turnaround.

A central element for the plant is the internal circulation of 98% sulfuric acid to the drying tower or the dilution circuit (98% is diluted to 93%) for additional processing. The pump tank will be replaced during the 2001 plant turnaround.

The last major replacement piece will be the absorbing tower where SO3 is converted to H2SO4 and removed from the gas stream as product. This unit will be replaced during a plant turnaround in 2005.

Potential emissions of sulfur dioxide, acid mist and oxides of nitrogen are limited by the current operating permit. The will be no change in these permitted emissions.

Emissions Evaluation:

Manufacture of sulfuric acid from sulfur by the contact process is known to generate air emissions of sulfur dioxide (SO_2), acid mist (SO_3 plus H_2SO_4) and oxides of nitrogen (NO_x). There are no known emissions of any other pollutants from this process. The use of an ammonia based scrubbing system on this unit will continue. There is no reason to

expect emissions of pollutants not previously emitted. The current operating permit limits potential emissions of these pollutants. There will be no change in potential emissions. There could seem be an increase in emissions when comparing current (1999) actual emissions to theoretical (365 operating or emitting days). This difference is a result of the plant operating than 365 days and at less than permitted emission. There is no reason to expect this apparent increase to actually occur.

Permit to Construct Issues:

Section 201 of the regulations requires that no owner/operator may commence construction or modification of a stationary source without first obtaining a permit to construct from the department. Because these projects will not change the emissions nor

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