Portneuf Valley PM_{10} Nonattainment Area State Implementation Plan, Maintenance Plan, and Redesignation Request

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APPENDICIES

ACRONYMS, ABBREVATIONS, AND UNITS

AQI	Air Quality Index
BACT	Best Available Control Technology
BLM	Bureau of Land Management
BPO	Bannock Planning Organization
CAA	Clean Air Act
CALMET	Meteorological Preprocessor for CALPUFF
CALPUFF	Specific air dispersion model
CFR	Code of Federal Regulations
CMB	Chemical Mass Balance Modeling
CS	Chubbuck School
CRP	Conservation Reserve Program
DEQ	Department of Environmental Quality
EI	Emissions Inventory
EPA	Environmental Protection Agency
EPHA	Environmental Protection and Health Act
EQ	Environmental Quality Management
ERC	Emission Reduction Credit
FHNAA	Fort Hall Nonattainment Area
FHWA	Federal Highway Authority
FIP	Federal Implementation Plan
FMC	equivalent to Astaris
FR	Federal Register
FRM	Federal Reference Method
FSA	Food Security Act
FTA	Federal Transit Authority
G&G	Garrett and Gould
g/mi	grams per mile
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality

IPP	Inventory Preparation Plan
ISU	Idaho State University
ITD	Idaho Transportation Department
LAER	Lowest Achievable Emission Reduction
lb/hr	pound per hour
LRTP	Long Range Transportation Plan
MAP	Monoammonium phosphate
MD	modeling domain
MM5	Mesoscale Model
MOU	Memorandum of Understanding
mph	miles per hour
MVEB	Motor Vehicle Emissions Budget
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NCAR	National Center for Atmospheric Research
NH_3	Ammonia
NO_x	Oxides of Nitrogen
NMHC	Nonmethane Hydrocarbons
NRCS	Natural Resources Conservation Service
NSPS	New Source Performance Standards
NSR	New Source Review
PBNAA	Power Bannock Nonattainment Area
PBR	Permit by Rule
PDC	Poor Dispersion Conditions
$PM_{2.5}$	Particulate Matter under 2.5 microns in size
PM_{10}	Particulate Matter under 10 microns in size
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit

PVNAA	Portneuf Valley Nonattainment Area
QAP	Quality Assurance Plan
RACM	Reasonably Available Control Methods
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
R&P	Rupprecht & Patashnick
RWC	Residential Wood Combustion
SCS	Soil Conservation Service
SIP	State Implementation Plan
SLAMS	State and Local Monitoring Sites
SO_2	Sulfur Dioxide
STP	Sewage Treatment Plant
TAP	Technical Analysis Protocol
TEOM	Tapered Element Oscillating Microbalance
TBD	To be determined
TCM	Transportation Control Measure
TDM	Travel Demand Management
TIP	transportation improvement program
TSP	Total Suspended Particulate
TPY	Tons per Year
Tribes	Shoshone-Bannock Tribes
$\mu g/m^3$	Micrograms per cubic meter
µm	micrometer
USDA	United States Department of Agriculture
USFS	United States Forest Service
UTM	Universal Transverse Mercator
VFC	Volumetric Flow Control
VMT	Vehicle Miles Traveled

TABLES

FIGURES

1.0 EXECUTIVE SUMMARY

The Portneuf Valley is designated nonattainment for particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). This document contains the necessary evidence and analysis for the Environmental Protection Agency (EPA) to formally redesignate the Portneuf Valley Nonattainment Area (PVNAA) from nonattainment to attainment.

To redesignate an area from nonattainment to attainment EPA must determine that the following criteria are satisfied:

(i) that the area has attained the national ambient air quality standard;

(ii) that the applicable implementation plan for the area under section 7410(k) of this title is approved;

(iii) that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable federal air pollutant control regulations and other permanent and enforceable reduction;

(iv) that the maintenance plan for the area is approved and meets the requirements of section 7505(a) of this title;

(v) that the State containing such area has met all requirements applicable to the area under section 7410 of the title and part D of this subchapter.

<u>42 U.S.C. § 7407(d)(3)(E)</u>

The Portneuf Valley Nonattainment area (PVNAA) attained the PM_{10} National Ambient Air Quality Standards (NAAQS) on December 31, 1996. Since then, the area has been in compliance. This document demonstrates all Clean Air Act (CAA) requirements for attainment have been met; summarizes the progress of the area in attaining the annual and 24-hour PM_{10} standards; and includes a maintenance plan to ensure continued attainment. The document is also a formal request to the EPA to redesignate the Portneuf Valley PM_{10} Nonattainment Area to attainment of the 24-hour average and annual average PM_{10} NAAQS.

Section 189(a)(1)(B) of the 1990 CAA states that a Moderate Nonattainment Area Plan must include the following provision: "Either (i) a demonstration (including air quality modeling) that the plan will provide for attainment by the applicable attainment data; or (ii) a demonstration that attainment by such a date is impracticable." This document will address the overall demonstration that the controls in place since 1996 were adequate to demonstrate attainment. Through a combination of modeling, emission trends, and air quality data, this report will show that the area is in continued attainment.

Section 175(A)(a) of the CAA outlines the maintenance plan requirements, "…an area which has attained the NAAQS for that pollutant shall also submit a plan to provide for the maintenance of the primary ambient air quality standard for at least 10 years after the redesignation." Both the SIP and maintenance plans' requirements are met via a combination of modeling and monitoring considering existing control strategies, future control strategies, and growth.

This document provides the requisite evidence to demonstrate that the emissions control strategies included are adequate to provide for attainment and maintenance of the PM_{10} NAAQS. This demonstration has historically been done in other areas, with other SIPs, based solely on the results of dispersion modeling analysis. For the PVNAA, however, the results should not be based on a single number from the dispersion model. The model provides invaluable insight into the culpable sources, transport and fate of PM_{10}, and hot spot locations. Due to uncertainties within the modeling system (emissions, wind fields, chemistry, etc.), additional information will be used to provide this evidence. This will be called the "multi-component" hybrid approach. The multi-component hybrid approach will borrow the concepts of performing complementary analysis of measured air quality, emissions inventory, meteorological data, dispersion modeling, and other modeling (chemical mass balance (CMB), speciated rollback, etc.).

The PM_{10} NAAQS is set at 150 micrograms per cubic meter ($\mu g/m^{3)}$ for the 24-hour average, measured from midnight to midnight. It is set at 50 $\mu g/m^3$ for the annual average, based on the calendar year. The PVNAA has never exceeded or violated the annual PM_{10} standard (monitoring began in 1986). The 2001 annual average for PM_{10} was 27 $\mu g/m^3$, which is 23 $\mu g/m^3$ less than the standard. The PVNAA has not violated the 24-hour PM_{10} standard since 1993, and the area has been in attainment since December 31, 1996. Three exceedances did occur in December 1999, however this episode did not register as a violation of the standard since no other exceedance occurred prior to December 31, 2001. Additionally, EPA issued a FR notice, which stated the PVNAA attained the 24-hour PM_{10} Standard by December 31, 1996. For the winter of 2001-2002 there were no 24-hour values recorded above 70 $\mu g/m^3$ and for the winter of 2002-2003 there were no 24-hour values above 50 $\mu g/m^3$, which corresponds to approximately 80-100 $\mu g/m^3$ less than NAAQS. Based upon monitoring data, the area clearly has attained the 24-hour and annual PM_{10} NAAQS.

Emission inventories were developed for the direct emissions of PM_{10} and $PM_{2.5}$ and for PM_{10} precursors – nitrogen oxides (NO_x), sulfur dioxide (SO_2), ammonia (NH_3), carbon monoxide (CO), and volatile organic compounds (VOCs). Due to the potential regional nature of the contributing source to the nonattainment area (NAA), and the desire to characterize these regional sources in dispersion modeling that covers beyond the NAA boundaries, the inventory was based on sources located within a 50-km by 60-km modeling domain. The inventory consists of all industrial sources, area sources, non-road mobile sources, and on-road mobile sources. The temporal distribution of sources in the inventory was for two wintertime periods for 1995, a winter episodic period in 1999, a baseline data set for 2000, and future year data sets for 2005, 2010, 2015, and 2020.

Under Section 176(c) of the CAA, transportation plans, programs, and projects in NAAs must conform to the on-road motor vehicle emissions budgets (MVEB) specified in the SIP. The MVEB for PM_{10} is comprised of the fugitive dust from paved and unpaved roads, and the vehicle emissions (exhaust, tire wear, and brake wear). The budgets set for 2005, 2010, and 2020 for PM_{10}, NO_x, and VOCs apply only to the PVNAA. A 20% safety margin has been added to account for the longer time frames required by the federal transportation law in adopting Regional Transportation Plans. See Section 4 of this document for specific details regarding the MVEB.

Dispersion modeling in the PVNAA has been historically a challenging problem due to the complex meteorology, large number and variety of PM_{10} and precursor sources, and the need to consider secondary aerosol formation. The effort to demonstrate attainment and maintenance of the PM_{10} standard involved the use of dispersion, rollback, and chemical mass balance modeling. The dispersion model selected for this study was CALPUFF. This model was chosen based on the importance of the industrial sources and the need to simulate local scale dispersion and transport. The 50-km by 60-km study domain was larger than the PVNAA to include sources that might influence PM_{10} concentrations within the airshed and allow plumes from the Industrial Complex (Simplot and Astaris (FMC) facilities) to re-circulate within the region. The dispersion model simulations do not capture all aspects of observed PM_{10} and secondary aerosol concentration behavior within the airshed. The simulations are not well correlated temporally with the observations, and predictions are often too high during the early morning and nocturnal hours. The highest predictions also do not occur on the same days. It appears the MM5 simulations describe many features of the winds during such episodes, but the stochastic variability of the winds in the PVNAA during stagnant conditions is difficult to predict. The CALPUFF dispersion model simulations predict the 24-hour PM_{10} NAAQS is attained and would be maintained at the G&G monitoring sites and almost all locations within the PVNAA. Maximum 24-hour PM_{10} concentrations are above 150 $\mu g/m^3$ in several areas of the modeling domain, however, the design concentrations are about 15 percent lower than the maximum predictions and occur within the Pocatello urban area. Design PM_{10} concentrations in the PVNAA are predicted to exceed the 24-hour NAAQS southeast of the G&G monitoring site. The maximum predicted 24-hour concentration is 162 $\mu g/m^3$ in 2010, which is 8% over the NAAQS.

Comparing the dispersion modeling with CMB modeling suggests that the vehicle suspended dust component is being over-estimated and the Industrial Source group under-predicted in some of the simulations. This behavior may be related to biases in the MM5 simulations where wind speeds are under-predicted in the urban area, artificially enhancing the influence of the urban area sources. Over-prediction of the vehicle suspended dust component may also be caused by initial depletion of coarse particles that is not accounted for by the methods used to characterize this source group in the modeling.

Speciated rollback modeling was performed to enhance the demonstration that the 24-hour and annual PM_{10} concentrations will be in compliance with the NAAQS. The model disaggregates the major airborne particle components into chemically distinct groups that are contributed by different types of sources. The rollback model used chemically resolved background and ambient air PM_{10} concentrations (filter analyses), emission inventories, and chemical source profiles to asses the impacts of sources and source groups on PM_{10} concentrations. The rollback model predicted PM_{10} concentrations in the Portneuf Valley for 2020 was 25 $\mu g/m^3$ for the annual average, and 111 $\mu g/m^3$ for the maximum 24-hour average.

The control strategies in this plan consist of RACT for major industrial sources and RACM for area sources. Most of the control strategies were implemented in the 1993 SIP submittal. When the strategies were implemented, a subsequent decline in PM_{10} concentrations was seen in the PVNAA. The key control strategies include residential wood combustion (RWC) ordinances, an open burning program, RACM on agricultural sources, the Air Quality Index (AQI) program, and road sanding agreements. RACT is required by the CAA to be in place (at a minimum) for major sources within moderate NAAs. The PVNAA is a moderate NAA, and the J. R. Simplot Don Plant is the only major source located within the NAA. DEQ has determined that RACT is in place for PM_{10} and precursors (SO_x and NO_x) to secondary aerosol formation at the J. R. Simplot Don Plant. In addition to the current control strategies, DEQ has a permitting program in place to ensure that future modifications and future sources located within the PVNAA do not negatively contribute to air quality or jeopardize future maintenance.

The contingency measures listed herein are to be utilized as necessary to promptly correct any violation of the NAAQS, which may occur after redesignation of the area to attainment. The measures include a modification to the RWC ordinances, and a modification to Idaho State University (ISU's) permit. If a violation occurs in the future, DEQ will evaluate the need to implement any additional contingency measures above and beyond those listed above.

In conclusion, DEQ has provided convincing evidence that the PVNAA attained the PM_{10} NAAQS by December 31, 1996, has remained in attainment, and will continue to maintain the PM_{10} NAAQS through 2020. This document has met all of the CAA requirements, and has a clearly defined MVEB for transportation conformity purposes. This implementation and maintenance plan demonstrate that the improvement in air quality is due to permanent and enforceable reductions in emissions. The state has met all the applicable requirements under 42 U.S.C. § 7410 and part D of subchapter 1. Based on the preceding information that the area is in attainment and will maintain the NAAQS, DEQ is requesting that the PVNAA be redesignated to attainment.

2.0 INTRODUCTION

The State of Idaho Department of Environmental Quality (DEQ) is required to submit a PM_{10} State Implementation Plan (SIP) for the Portneuf Valley Nonattainment Area (PVNAA) to the U.S. Environmental Protection Agency (EPA). The purpose of the SIP is to show that the area has attained the 24-hour standard for airborne particulate matter less than or equal to 10 micrometers in aerodynamic diameter, hereafter referred to as PM_{10}, by the required attainment date of December 31, 1996. Once attainment has been demonstrated, a maintenance plan is required to show that over the next ten years, the area will continue to meet the 24-hour and also the annual PM_{10} National Ambient Air Quality Standards (NAAQS). This document includes both the SIP and the maintenance plan.

While DEQ will address both the PVNAA's issue with attainment of the 24-hour PM_{10} standard and compliance with the annual PM_{10} standard, it is important to note that the PVNAA has not had any issues regarding compliance with the annual standard.

2.1 Background

On July 1, 1987, EPA promulgated a revised NAAQS for PM_{10}. PM_{10} is about one-tenth the diameter of a human hair. The 24-hour PM_{10} standard is 150 micrograms per cubic meter ($\mu g/m^{3)}$ of air, which is not to be exceeded more than once in a year. The annual standard is 50 $\mu g/m^3$, which is expressed as an annual arithmetic mean over a 3-year period. The State of Idaho adopted these two standards on August 1, 1987.

On November 15, 1990, the Clean Air Act Amendments of 1990 (CAA) were signed into law. Among the many provisions were new requirements for areas that had not attained the National Ambient Air Quality Standards. The CAA required EPA to designate all areas exceeding or having a significant potential to exceed the PM_{10} NAAQS prior to January 1, 1989 as nonattainment areas (NAAs). Pocatello, Chubbuck, Inkom, and a portion of the Fort Hall Indian Reservation met this criterion. The area was designated as the Power-Bannock Counties PM_{10} NAA.

The State of Idaho was required by the CAA to prepare a written plan for the Power-Bannock Nonattainment Area (PBNAA) stating controls necessary for the area to comply with the NAAQS. In March 1993, an Air Quality Improvement Plan (or SIP) was submitted to the Environmental Protection Agency. The plan described appropriate control measures and emission reductions to maintain compliance with the NAAQS. EPA indicated that the SIP fell short in implementing reasonably available control methods/reasonably available control technology (RACM/RACT) and was deficient with respect to secondary aerosols. By 1994, DEQ and the cities of Pocatello and Chubbuck had implemented the control strategies documented in the improvement plan. Subsequently, PM_{10} concentrations declined in the nonattainment area and the state received EPA approval for two extensions of the attainment date to December 31, 1996 (61 Fed. Reg. 20730 (May 8, 1996) and 61 Fed. Reg. 66602 (December 18, 1996)).

In June 1995, the town of Inkom was excluded from the Power-Bannock Counties PM_{10} Nonattainment Area and was redesignated to unclassified status (61 Fed. Reg. 29667 (June 12, 1996)). Surrogate PM_{10} data derived from total suspended particulate (TSP) monitoring data collected at the Inkom monitoring site from 1981 to 1988 showed substantial improvement in air quality with no recorded violations or exceedances. DEQ has continued PM_{10} monitoring and meteorological monitoring in Inkom to provide documentation of particulate levels for the redesignated area. Actual PM_{10} data from the monitoring site show no violations have been recorded from 1994 to present.

On November 5, 1998, EPA approved DEQ's request to split the PBNAA into two separate nonattainment areas, as requested by DEQ in April 1988. The Fort Hall Indian Reservation land is referred to as the Fort Hall PM_{10} Nonattainment Area (FHNAA) and the state land is known as the Portneuf Valley PM_{10} Nonattainment Area (PVNAA). As a result of the split, a small portion of the Astaris (FMC) facility (a commercial phosphate processing facility, now inactive) is included in the PVNAA.

In 1999, DEQ submitted a SIP for the PVNAA. In June of 2000 EPA informed DEQ that they found the SIP inadequate, specifically for transportation conformity purposes related to the motor vehicle emission budget. EPA instructed Bannock Planning Organization (BPO) to use the Build/No Build method for conformity. The finding was based on the exceedances of the PM_{10} NAAQS recorded in December 1999, and the need to re-visit the planning effort for the PVNAA. The PVNAA met EPA's criteria for the approval of a SIP under the Clean Data Policy until the air pollution episode in December of 1999 (See Table 3-7 and Section 3.2.2). EPA indicated that full planning (including developing an emissions inventory, conducting modeling, analyzing PM_{10} precursors, and demonstrating attainment) must be completed before they can consider approval of the SIP and the adequacy of the budget for conformity purposes.

In December 2000, EPA issued a Federal Register (FR) notice indicating a finding of attainment for PM_{10}; Portneuf Valley PM_{10} Nonattainment Area, Idaho (65 Fed. Reg. 76203 (December 6, 2000)). The comment period was extended and the final rule was issued in 2002 (67 Fed. Reg. 48552 (July 25, 2002)).

2.2 Roles and Responsibilities

DEQ, the Cities of Pocatello and Chubbuck, Bannock County, Idaho Transportation Department (ITD), BPO, and local industrial sources have made strides in implementing control strategies and improving air quality. Cooperation from industry as well as local and state governments has helped maintain compliance with the NAAQS, and will continue to do so in the future.
DEQ has primary responsibility for the control of air pollution sources in the PVNAA. Through the Idaho Environmental Protection and Health Act and Idaho Code §§ 58.01.01 et seq., DEQ has the authority to promulgate rules, issue permits, adopt State Implementation Plans, and enforce. These rules are entitled the Rules for the Control of Air Pollution in Idaho, IDAPA 58.01.01 et seq.

After adequate public review and comment, DEQ will submit a SIP/Maintenance Plan to EPA for federal approval. The SIP submittal will contain enforceable permits and other commitments to implement control strategies for sources under State and local jurisdiction. DEQ reviews and refines the emissions inventories as needed and enforces the overall control strategies throughout the NAA. DEQ will continue to act as the primary source of public information.

The state government, along with EPA, the Shoshone-Bannock Tribes (Tribes), and other organizations, will continue to work together to develop effective implementation plans and control strategies to maintain good air quality.

2.3 Non-Attainment Area Description

The following subsections offer a brief glimpse of the PVNAA meant to orient the reader to the area. Descriptions are given for the area's climatology, topography, and meteorology. The map of the area accurately depicts the complexity of the airshed, with topography and adjacent NAA's.

2.3.1 Summary

The PVNAA contains 96.6 square miles of Pocatello, Chubbuck and surrounding areas (See Figure 2-1). It includes federal land managed by the Bureau of Land Management (BLM) and the Caribou National Forest, as well as privately owned land in the cities of Pocatello and Chubbuck. The combined population of the two cities is approximately 76,000.

The topography of the PVNAA is complex. The City of Pocatello lies in the Portneuf Valley and extends from the southeast to the northwest, with the Pocatello Mountain Range to the east and the Bannock Mountain Range to the west. The City of Pocatello is located in the northern part of the valley and the western portion of the NAA is located in the Michaud Flats, which is part of the Snake River Plain. The elevation at the valley floor varies from 4,590 feet above sea level at the extreme eastern end of the valley to 4,445 feet at the Pocatello Airport near the northwestern end of the valley.

Currently, the economy of the area is centered around agriculture and mineral products. Major agricultural crops are potatoes, sugar beets, and wheat. Other economic activities include railroads, grain handling, phosphate and food processing facilities, the manufacture and distribution of semi-conductors, and medical supplies.

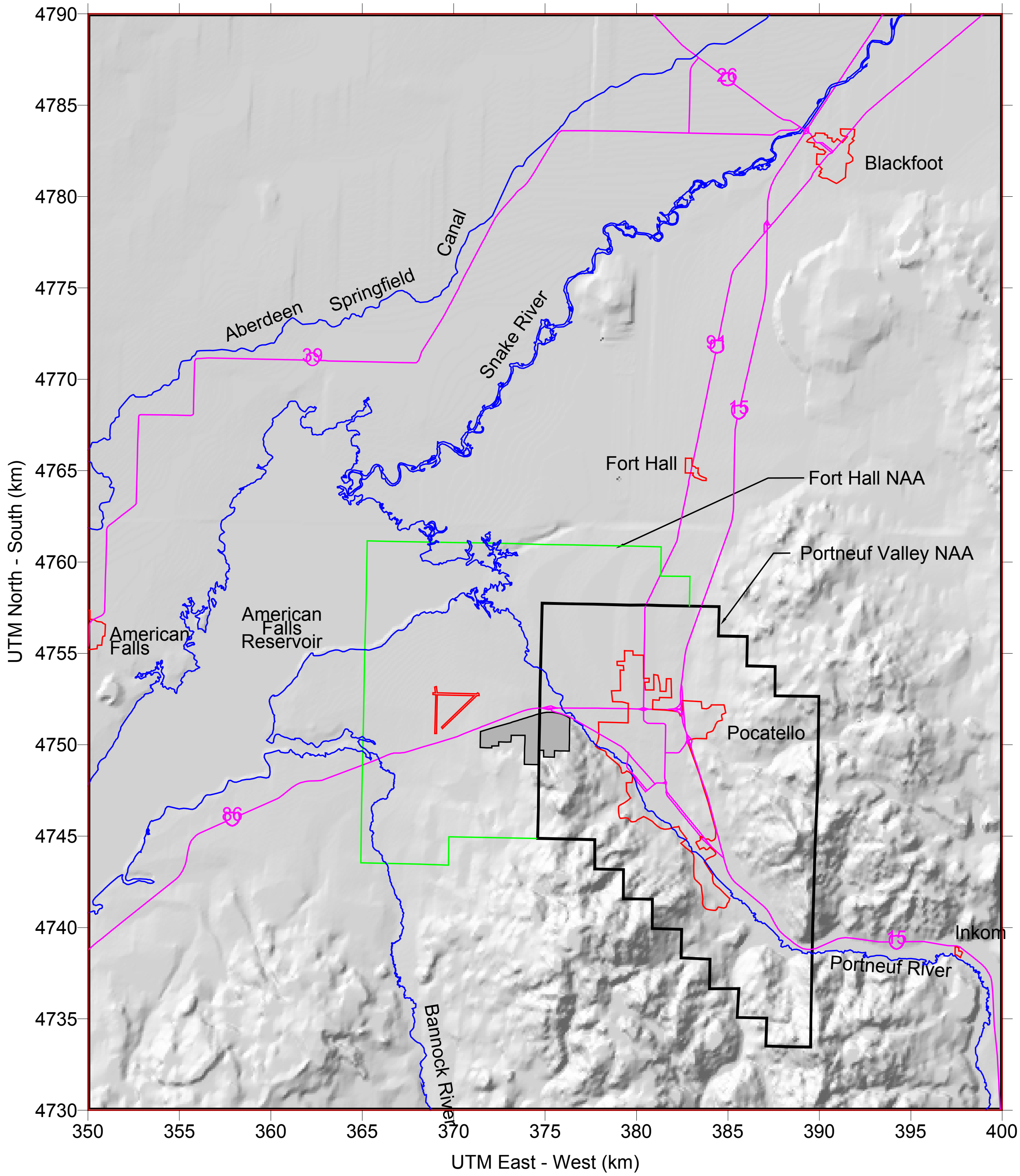


Figure 2-1 **Map of the area. This figure depicts the domain utilized for the dispersion-modeling endeavor, as well as showing the close proximity of both the FHNAA and the PVNAA.**

2.3.2 Legal Description

The legal description of the PVNAA is as follows:

Township 5	Range 34E, Sections 25-36
	Range 35E, Sections 31
Township 6	Range 34E, Sections 1-36
	Range 35E, Sections 5-9, 16-21, 28-33 plus the west ½ of Sections 10, 15, 22, 27, 34
Township 7	Range 34E, Sections 1-4, 10-14, and 24
	Range 35E, Sections 4-9, 16-21, 28-33 plus the west ½ of Sections 3, 10, 15, 22, 27, 34
Township 8	Range 35E, Section 4 plus the west ½ of Section 3

2.3.3 Climatology and Meteorology

The City of Pocatello is located at the mouth of the Portneuf Canyon along the southeastern edge of the Snake River Plain. The elevation of the city is approximately 4,500 feet above mean sea level. Mountainous terrain borders the city on the east, south, and west. The mountains rise abruptly to over 9,000 feet elevation within 15 miles to the east, and to over 7,500 feet elevation 10 miles south. The broad Snake River Valley extends to the west and north with intensive agriculture practiced in the immediate area. A desert composed mostly of lava rock along with sagebrush and sand is located approximately 25 to 30 miles north and west of the city.

During winter, brisk southwesterly winds often persist for days or weeks. These winds make for moderate cold winter conditions, producing unusually mild temperatures compared to the surrounding area. Spring months are normally wet and windy. Winds of 20 to 30 miles per hour (mph) may persist for days at a time. The Portneuf Valley is dominated by migratory weather disturbances that are greatly influenced by the complex terrain in the area. Figure 2-2 shows the climatological data for the area during the period 1971-2000 collected by the National Weather Service.

Temperatures for that period reflect an annual average of 46.5 °F. July is the warmest month with an average temperature of 69.2 °F and an average maximum temperature of 87.5 °F. January is the coldest month with an average temperature of 24.4 °F and an average minimum temperature of 16.3 °F. The average annual precipitation is 12.5 inches. Rainfall is distributed throughout the year, with the maximum in the spring. Annual average snowfall is 41.7 inches with the majority of the snow falling from November through April.

The most common wind direction in Pocatello is out of the southwest. More than 50% of the observed winds blow out of the quadrant between south and west. The average wind speed is 9.8 mph (1996-2002), with April being the windiest month (average wind speed 11.5). Windy conditions can occur anytime during the year; on average, however, the highest wind speeds occur during springtime weather disturbances.

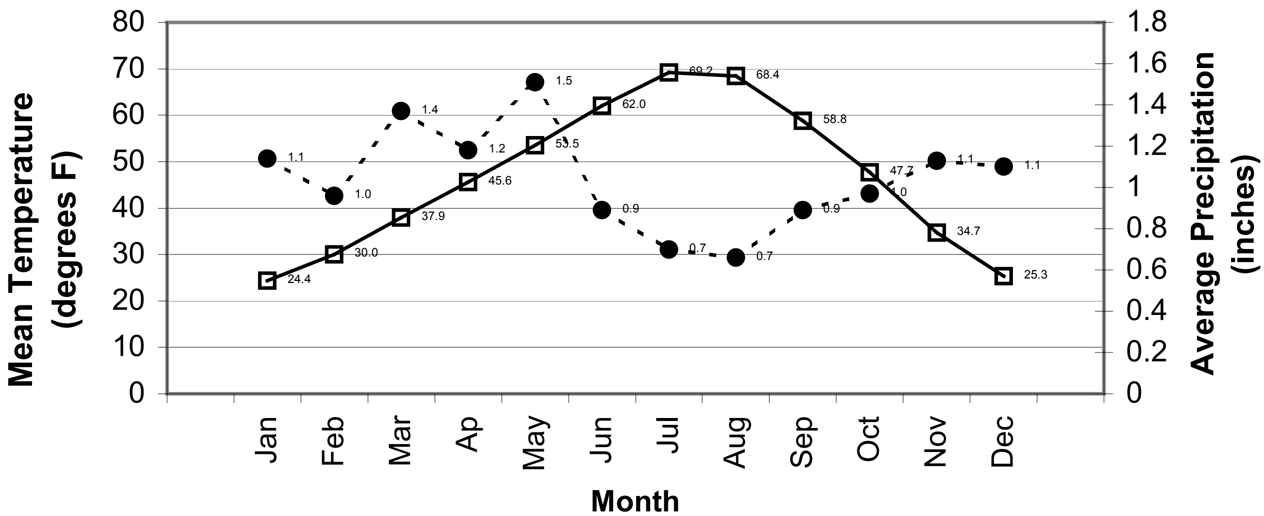


Figure 2-2 Climate Data 1971-2000 Obtained From the National Weather Service.

The NAA is sheltered from the predominant southwest-to-northeast wind pattern by the Bannock Mountain Range to the south and west, and the Pocatello Range to the northeast. In spite of some blocking effects from the mountain ranges, the valley usually ventilates well.

Visibility is generally good in Pocatello. Dense fog is reported on an average of 17 days per year. Fog, smoke, and haze occur most frequently during the months of January, February, and December.

2.4 Adjacent Fort Hall Non-Attainment Area

The FHNAA is adjacent to the PVNAA. The FHNAA falls under the jurisdiction of the Tribes and EPA. EPA promulgated a Federal Implementation Plan (FIP) for the Astaris-Idaho LLC facility (formerly FMC Corporation) in the FHNAA. The FIP covers only the Astaris (FMC) facility and does not take into consideration any other sources on the

NAA. EPA's ultimate goal was to ensure that all persons in the FHNAA can breathe air that meets the PM_{10} NAAQS. The FIP contains emission limits, work practice requirements, and monitoring, recordkeeping, and reporting requirements that EPA believes represent reasonably available control technology (RACT).

The Astaris (FMC) facility announced in late 2001 that they would cease operations by December 31, 2001; the actual date of closure was December 11, 2001. The plant is no longer in operation and is presently going through the process of decontamination and decommissioning.

2.5 Applicable Clean Air Act Requirements

Various sections of the 1990 CAA apply to this SIP revision, Maintenance Plan, and Redesignation Request. Following is a discussion of the applicable requirements and how this document meets them.

2.5.1 Section 107(d)(3)(E)

This section provides the requirements that must be met for the area to be redesignated as an attainment area. The conditions are as follows:

- Attainment of the NAAQS 24-hour PM_{10} standard is attained when the expected number of days with levels above 150 $\mu g/m^3$, averaged over a 3-year period, is less than or equal to one. The Portneuf Valley has not had a violation of the 24-hour PM_{10} standard since 1993, and as such has been in attainment since December 31, 1996. (See Sections 2.5.4 and 3.2.1)
- The applicable implementation plan has been fully approved under Section 110 (K). This submission contains the applicable implementation plan and upon EPA's approval, this condition will be met.
- The air quality improvement described earlier in this document is due to permanent and enforceable reductions in emissions. This SIP will demonstrate emissions reductions through various control measures and enforceable regulations (Section 6.0), and will also outline the commitment of DEQ to enforce these rules (Section 2.2.1). Additional emission reductions come from the closure of the Astaris (FMC) facility on the FHNAA in December 2001 (Section 5.1.2.4). The closure of this facility has a dramatic effect on emissions in the PVNAA.
- EPA has approved a maintenance plan for the area meeting the requirements of section 175A. This document is designed to satisfy this requirement. The maintenance demonstration can be found in Section 5.0.
- The NAA has met all of the requirements applicable under section 110 and part D. This document is designed to prove that the PVNAA meets this requirement.

2.5.2 Section 110 (a)(2)

This section contains the general requirements for all State Implementation Plans, these are typically collectively called the "Infrastructure SIP." The infrastructure can include, but is not limited to, the following:

- Provide for enforceable measures.
- Monitor ambient air and provide data.
- Provide a program for enforcement, regulation, modification and construction of stationary sources.
- Prohibit any source or other type of emission activity within the State in amounts that will
  - contribute significantly to nonattainment in any other state.
  - interfere with measures included in an applicable implementation plan for any other state to prevent Prevention of Significant Deterioration (PSD) to protect visibility.
- Provide for adequate authority, funds, and personnel to implement.
- Monitor emissions and report emissions.
- Provide for emergency authority similar to section 303.
- Provide for periodic revisions.
- Meet Part D requirements.
- Meet requirements for public consultation, PSD, and public notification.
- Provide for air quality modeling.
- Require stationary sources to pay fees.
- Provide for consultation and participation by local political subdivisions affected by the plan.

This document is designed to meet all of the requirements listed above. Upon EPA's approval, this document will meet the entire applicable infrastructure.

2.5.3 Section 172(c)

This section contains general provisions for nonattainment area plans. Following is a detailed list of the requirements in this section.

- Implement reasonably available control methods (RACM) including RACT.
- Provide for reasonable further progress (RFP).
- Provide an inventory of emission sources.
- Identify and quantify emissions, if any, of any such pollutant or pollutants which will be allowed in accordance with section 173 (a)(1)(B) from the construction and operation of new or modified major stationary sources.
- Require permits for the construction and operation of major stationary sources.
- Provide for enforceable emission limitations and other techniques as appropriate to provide for attainment.
- Meet the applicable provisions of section 110(a)(2).
- Use equivalent modeling, emissions inventory, and planning procedures if appropriate.
- Establish contingency measures for failure to meet reasonable further progress (RFP) or attainment requirements. Not applicable for areas after they attain.

This document is designed to satisfy and meet most if not all of the requirements listed above. The requirements for reasonable further progress, identification of certain emissions increases and other measures needed for attainment do not apply because they only have meaning for areas not attaining the standard. With respect to RACM and RACT, details can be found in Sections 6.1 and 6.2 as well as Appendices A and B. The PVNAA has attained the 24-hour PM_{10} standard since December 31, 1996 (Sections 2.5.4 and 3.2.1). The requirements for an emissions inventory are satisfied by the inventory contained within this document (Section 4.0). The federally approved PSD regulations for Idaho can be found at IDAPA 58.01.012.07 as incorporated by reference by EPA on July 23, 1993 (58 FR 39445).

2.5.4 Section 189 (a and e)

As a moderate PM_{10} nonattainment area, the PVNAA is required to meet section 189 (a) & (e) before the area can be redesignated as an attainment area. The requirements must be fully approved into the SIP and are as follows:

- A permit program to ensure that permits meet the requirements of section 172 is required for the construction and operation of new and modified major stationary sources of PM_{10}.
- Either (i) a demonstration that the plan will provide for attainment by the applicable attainment date or (ii) a demonstration that attainment by such date is impracticable.
- Provisions to assure that RACT for PM_{10} are implemented.
- For (189(e)) Precursors: The control requirements applicable to PM_{10} plans in effect under this part for major stationary sources of PM_{10} shall also apply to major stationary sources of PM_{10} precursors

For the permit program, states with initial PM_{10} nonattainment areas were required to submit a permit program for the construction and operation of new and modified major stationary sources of PM_{10} by June 30, 1992. Idaho did not submit a revision to its permit program for the construction and operation of new and modified major stationary sources of PM_{10} under the CAA of 1990 by the deadline. EPA issued a non-submittal finding letter to Idaho on January 15, 1993. The letter gave Idaho until July 15, 1994 to correct the New Source Review (NSR) program deficiency. DEQ submitted its NSR program on May 17, 1994, and EPA informed the state that the NSR program was complete on June 10, 1994.

For the demonstration of attainment by the attainment date (December 31, 1996), DEQ's position is that the PVNAA was in attainment by that date and has remained in attainment to the present. Several factors support DEQ's position, including:

- A Federal Register notice issued by EPA that states the area attained the standard by December 31, 1996.
- Air quality monitoring data that shows the area attained the standard by December 31, 1996.
- Air quality monitoring data that shows the area is still in attainment.
- Speciated linear rollback modeling that predicts the area will attain the 24-hour PM_{10} standard through 2020.

Since air quality data cannot stand alone as a demonstration of attainment, DEQ used various types of modeling. Since attainment was shown in 2000 utilizing a 2000 emissions inventory, DEQ suggests that if 1996 emissions had been modeled the PVNAA would also have shown attainment then. The 2000 emissions inventory was significantly larger than the 1996 emissions inventory (Table 2-1 and Figure 2-3). The comparison was made from 1993 through 2000 to show the differences in emissions inventories. For all pollutants the emissions increases from 1993 through 2000 are in part due to the larger modeling domain. Since we are in the year 2003 and the attainment date has passed, the air quality data can be relied on more heavily for the demonstration of attainment.

Table 2-1 1993 (NAA), 1997 (NAA), and 2000 (Modeling Domain (MD)) Emissions Inventories For the PVNAA.

Year	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	SO_2 (TPY)	NO_x (TPY)	NH_3 (TPY)
1993 NAA	4,824.98	1,537.57	2,421.71	3,661.41	591.72
1997 NAA	5,560.58	1,786.88	3,150.10	4,103.84	351.73
2000 MD	19,010.37	6,659.38	7,089.19	11,518.48	2,182.58

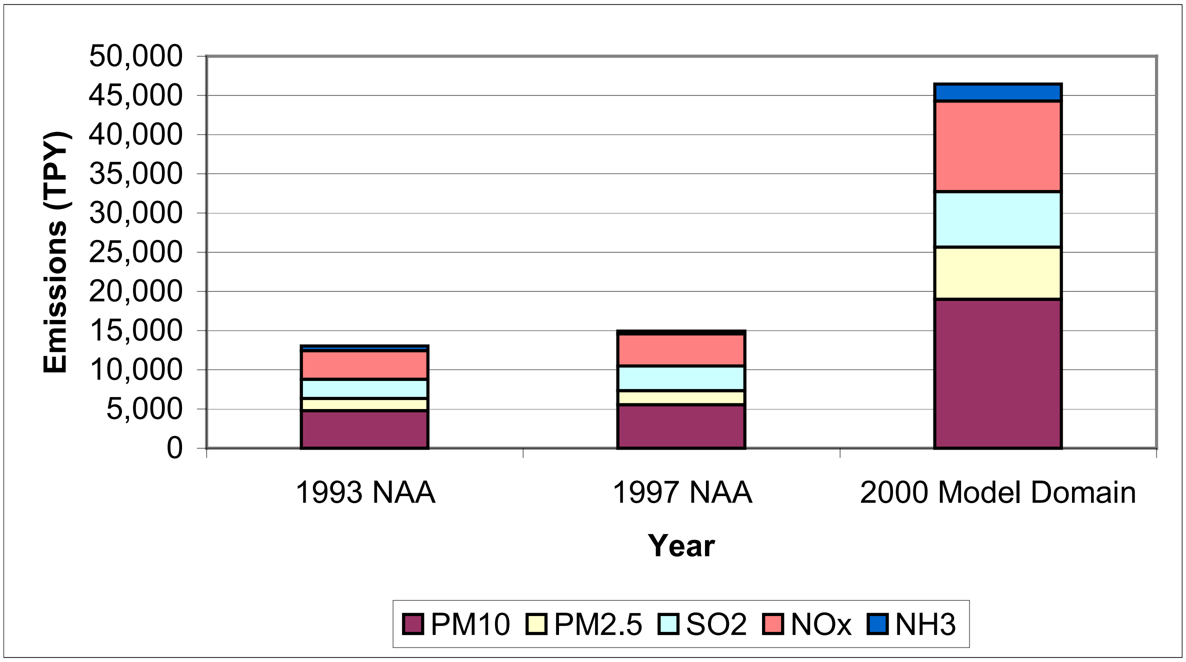


Figure 2-3 Emissions inventory summary for the years 1993(NAA), 1997(NAA), and 2000(MD).

This plan provides for both RACM and RACT. The RACM requirement applies to a variety of sources including, mobile, agriculture, road sanding, and residential wood combustion (RWC), whereas RACT applies to major industrial point sources in the nonattainment area, and is currently only applicable to the J. R. Simplot Don Plant in the PVNAA. Section 6 provides significant detail regarding RACT and RACM.

With respect to PM_{10} precursors of secondary aerosol formation, during winter inversions secondary aerosols (ammonium sulfate and ammonium nitrate) make up a considerable portion of the total PM_{10}, indicating that secondary aerosols and precursors contribute significantly to PM_{10} in excess of the NAAQS. This document deals with the precursors through the emissions inventory, dispersion modeling, chemical mass balance (CMB) modeling, and speciated linear rollback modeling.

2.6 Organization of the Portneuf Valley PM_{10} Non-Attainment Area SIP and Maintenance Plan

Section 3 of the document covers air quality in the PVNAA. Topics include monitoring, data, trend analysis, background concentrations, special studies, meteorology, and design value determination.

Section 4 summarizes the emissions inventories for the Portneuf Valley modeling domain for the following years: 2000, 2005, 2010, 2015, and 2020. This section also outlines the motor vehicle emissions budget (MVEB) for transportation conformity. The MVEB was calculated for a planning horizon of 2035 with a 20% safety margin.

Section 5 details the attainment and maintenance demonstrations. This section reviews various modeling (dispersion, CMB, and speciated linear rollback) covering both the 24-hour and annual PM_{10} standard, meteorological trends, and the multi-component hybrid approach for demonstrating attainment. This section also contains a plethora of evidence in support of attainment. The highlights of the maintenance demonstration include rollback modeling, emission trends, and contingency measures.

Section 6 provides in-depth information on the various control strategies employed in the PVNAA. The RACM requirement applies to agricultural sources, RWC, and road sanding, while the RACT requirement only applies to the J. R. Simplot Don Plant. Finally, Section 6 highlights conformity as related to transportation.

Section 7 identifies the various administrative requirements and describes how this plan satisfies those requirements. Commitments to adequate funding, personnel, and legal authority are described in this section.

Section 8, the last section, contains the overall conclusions from this plan and a request for the redesignation of the Portneuf Valley to attainment status for PM_{10}.

Various appendices are included as supplements to this document. The appendices cover the following topics:

- Appendix A RACM
- Appendix B Industrial Sources, RACT, and permits
- Appendix C Special Air Quality Studies - various
- Appendix D Emissions Inventory – Environmental Quality Management (EQ)
- Appendix E CALPUFF Dispersion Modeling – MFG, Inc.
- Appendix F Chemical Mass Balance Modeling - DEQ
- Appendix G Speciated Linear Rollback Modeling - EQ
- Appendix H Multi-component Hybrid Approach - EQ
- Appendix I Federal Register Notices
- Appendix J Public Involvement, Hearing, and Transcript.

3.0 AIR QUALITY

The basis for determining the air quality of any area is accurate and adequate monitoring data. Data collected from an area's monitoring network are used to establish air quality trends, to determine if and when air quality standards are exceeded, and to aid in the development of appropriate air quality control strategies when standards are exceeded. Likewise, because local meteorology plays an important role in the area's air quality, high quality meteorological data is extremely important in conducting modeling studies and interpreting the results.

3.1 Monitoring Sites

PM_{10} ambient air quality monitoring has been conducted since 1986 in the Pocatello area to characterize problems and support air quality improvement planning and analysis. Table 3-1 shows the various air monitoring stations, the parameters sampled for, and the dates that the monitoring has been conducted.

Table 3-1 Pocatello Area Air Quality Monitoring Locations.

Area	Location	Date in Operation	Parameters Monitored
Pocatello	Sewage Treatment Plant (STP)	1986-Present	Sulfur dioxide (SO_2)
		1986-2002	PM_{10}
	Idaho State University (ISU)	1988-1999	PM_{10}
	Chubbuck School (CS)	1988-1999	PM_{10}
		1998-2003	$PM_{2.5}$
	Garrett and Gould (G&G)	1990-Present	PM_{10}
		1998-Present	$PM_{2.5}$
		1994-1998	SO_2 , and Nitrogen oxides (NO_x)
		1994-1998	Meteorological data
Inkom	Inkom Bible Church	1994-2002	PM_{10}

The monitoring stations are subject to strict quality assurance standards. These stations use the EPA Federal Reference Method equipment and regulations to determine the areas' compliance with the NAAQS. The sites have been approved by the EPA for inclusion in the state's overall monitoring network and are designated as State and Local Air Monitoring Sites (SLAMS). Monitoring is conducted in accordance with 40 CFR 58 Subpart C. For the current monitoring sites, Table 3-2 shows the type of monitor employed and the sampling schedule. Table 3-3 depicts the historical monitors at the SLAMS locations and their respective years of operation, and Table 3-4 shows the years of operation for the current monitoring locations. The types of monitors used are described after the tables.

Table 3-2 Current Pocatello Area Air Quality Monitoring Locations.

Area	Location	Date in Operation	Parameter Monitored	Monitor Type	Sampling Schedule
Pocatello	Sewage Treatment Plant (STP)	1986-Present	SO_2	SO_2 Analyzer API 100 A & Calibrator	Continuous
	Garrett and Gould (G&G)	1990-Present	PM_{10}	Hi-Volume Filter 2 Grasbey 1200 VFC	1:3
		1995-Present	PM_{10}	TEOM R&P 1400A	Continuous
		1998-Present	$PM_{2.5}$	Partisol-FRM PM2.5 sampler 2 R&P 2025	1:6
		2001-Present	$PM_{2.5}$	TEOM R&P 1400A	Continuous

Table 3-3 Historical Monitoring Sites Respective Years of Operation.

Monitoring Site	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03
Sewage Treatment Plant (STP) PM_{10}	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Idaho State University (ISU) PM_{10}			■	■	■	■	■	■	■	■	■	■	■	■				
Chubbuck School (CS) PM_{10}			■	■	■	■	■	■	■	■	■	■	■	■				
CS Partisol-FRM $PM_{2.5}$ sampler													■	■	■	■	■	■
Garrett and Gould (G&G) SO_2 & NO_x									■	■	■	■	■					
G&G Meteorological data									■	■	■	■	■					
Inkom Bible Church PM_{10}									■	■	■	■	■	■	■	■	■	

Note: Shaded cells indicate years of operation.

Table 3-4 Current Monitoring Sites Respective Years of Operation.

Monitoring Site	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03
STP SO_2 Analyzer	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
G&G PM_{10} Hi-Vol Filter					■	■	■	■	■	■	■	■	■	■	■	■	■	■
G&G PM_{10} TEOM										■	■	■	■	■	■	■	■	■
G&G Partisol-FRM $PM_{2.5}$ sampler													■	■	■	■	■	■
G&G $PM_{2.5}$ TEOM																■	■	■

Note: Shaded cells indicate years of operation.

The following are brief descriptions of the PM_{10} monitors utilized by DEQ in the PVNAA. The PM_{10} Hi-Vol monitor is an EPA reference method while the TEOM is an EPA equivalent method for determining compliance with the PM_{10} NAAQS.

PM_{10} Hi-Vol

The PM_{10} Hi-Vol operates by pulling outside air into the sampler and trapping the particulates on a quartz fiber filter. The sampler utilizes a Sierra Anderson size selective air inlet to restrict the size of incoming particles to an aerodynamic diameter smaller than or equal to a nominal 10 micrometers (µm). The airflow into the PM_{10} Hi-Vol is regulated and measured to determine the total airflow through the sampler, and to control the size of incoming particles in conjunction with the inlet. The PM_{10} Hi-Vol operates for a 24-hour period. The total airflow and the mass of PM_{10} collected on the filters are used to calculate the mass of PM_{10} per volume of air, reported as $\mu g/m^3$.

TEOM (Tapered Element Oscillating Microbalance)

Tapered Element Oscillating Microbalance (TEOM) is a continuous particulate monitor for measuring the airborne particulate matter less than 10µm in diameter. The TEOM serves two purposes in Idaho's particulate monitoring network: 1) monitoring for compliance determination of the 24-hour and annual NAAQS for $PM_{10,}$ and 2) monitoring support for the Air Quality Advisory Program. The TEOM is the only filter-based mass monitor that measures the mass of particulate suspended in a gas stream in real time. The operation of the TEOM provides a useful supplement to the official data collected by the PM_{10} Hi-Vols, particularly on days not scheduled for sampling. The simultaneous operation of TEOM and PM_{10} Hi-Vols contributes to establishing a correlation between data collected by the two instruments.

3.2 Historical Air Quality Data

The 24-hr NAAQS for PM_{10} is in a statistical format of expected exceedances over a 3-year period. Sampling may not occur every day, so the number of days with measured values above the standard must be adjusted to account for days that were not sampled. For example, if a monitor sampled once every six days with one measured exceedance of the NAAQS, then the number of days expected to be above the NAAQS would be six. The NAAQS then requires that the expected number of exceedances be averaged over a 3-year period. For example, three exceedances of the NAAQS on an everyday sampling frequency over a 3-year period equals an Attainment Demonstration Number of 1.0 (three exceedances divided by three years), thus demonstrating attainment. See Table 3-5 for details concerning PM_{10} exceedances in the PVNAA for the SLAMS sites from the period 1988-2002. DEQ submits all air quality data to EPA, through the AIRS system. All monitoring data can be accessed through EPA's AIRS website (http://www.epa.gov/air/data/index.html).

3.2.1 Summary of Years and Sites

An analysis of the 24-hr PM_{10} data for three monitoring sites shows no violations of the 24-hour NAAQS have occurred since 1993 (See Table 3-6 for details). Since 1996, all sites in the nonattainment area have demonstrated attainment. EPA issued a Federal Register Notice indicating a finding of attainment; Portneuf Valley PM_{10} Non-Attainment Area, Idaho (67 Fed. Reg. 48552 (July 25, 2002)). This notice indicated the PVNAA had attained the NAAQS for particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}) as of December 31, 1996. The Annual NAAQS requires that the yearly average of the 24-hour measurements over a 3-year period be 50 $\mu g/m^3$ or less. Table 3-7 presents the annual air quality data. From 1991 to the present, the annual standard has been attained at all sites in the PVNAA.

Table 3-5 Portneuf Valley Non-Attainment Area PM_{10} Exceedances.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1988	0	0	0	STP (10) STP (10) STP (10)
1989	ISU (1)	0	0	STP (10) STP (11)
1990	STP (1)	0	0	STP (10)
1991	0	0	STP(9)	0
1992	0	0	0	0
1993	ISU/G&G (1)	0	0	0
1994	0	0	0	0
1995	0	0	0	0
1996	0	0	0	0
1997	0	0	0	0
1998	0	0	0	0
1999	0	0	0	G&G (12) G&G (12) G&G (12)
2000	0	0	0	0
2001	0	0	0	0
2002	0	0	0	0

( ) denotes month in which an exceedance occurred.

Table 3-6 SLAMS Sites (STP, CS, G&G, and ISU) PM_{10} Monitoring Data Summaries.

STP 24-hr PM_{10} Data Summary					
Year	**Number of Observations**	**Number of Exceedances**	**First High**	**Second High**	**3 Year Average Expected Exceedance Rate***
1988	106	3	171	159	-
1989	178	2	168	167	-
1990	171	2	259	165	4.9
1991	143	1	182	121	3.5
1992	129	0	150	142	2.1
1993	172	0	109	90	0.7
1994	224	0	88	86	0
1995	351	0	66	64	0
1996	353	0	89	87	0
1997	306	0	149	89	0
1998	118	0	77	71	0
1999	112	0	124	115	0
2000	117	0	141	94	0
2001	110	0	85	74	0
2002	54	0	74	52	0

ISU 24-hr PM_{10} Data Summary					
Year	**Number of Observations**	**Number of Exceedances**	**First High**	**Second High**	**3 Year Average Expected Exceedance Rate***
1989	63	1	181	137	-
1990	79	0	69	64	-
1991	61	0	133	99	2
1992	47	0	100	94	0
1993	56	1	232	120	2.3
1994	158	0	138	123	2.3
1995	355	0	81	80	2.3
1996	352	0	92	89	0
1997	298	0	68	57	0
1998	196	0	106	92	0
1999	94	0	74	70	0

Table 3-6 (continued)

CS 24-hr PM_{10} Data Summary					
Year	**Number of Observations**	**Number of Exceedances**	**First High**	**Second High**	**3 Year Average Expected Exceedance Rate***
1988	45	0	78	72	0
1989	61	0	120	83	0
1990	63	0	145	124	0
1991	52	0	122	99	0
1992	43	0	126	124	0
1993	61	0	119	107	0
1994	60	0	105	60	0
1995	61	0	67	60	0
1996	59	0	52	44	0
1997	61	0	54	41	0
1998	55	0	118	38	0
1999	28	0	39	33	0

G&G 24-hr PM_{10} Data Summary					
Year	**Number of Observations**	**Number of Exceedances**	**First High**	**Second High**	**3 Year Average Expected Exceedance Rate***
1991	60	0	135	106	-
1992	46	0	80	69	-
1993	59	1	204	105	2
1994	125	0	128	114	2
1995	349	0	97	91	2
1996	345	0	107	89	0
1997	290	0	92	61	0
1998	201	0	134	87	0
1999	199	3	183	168	1
2000	206	0	112	93	1
2001	347	0	124	88	1
2002	323	0	79	78	0

* Sum of Expected Violations for 3 consecutive years / 3 = 3 Year Average Expected Exceedance Rate. If the 3 Year Average Expected Exceedance Rate is 1.0 or less, attainment is demonstrated.

Table 3-7 Annual PM_{10} Concentrations For The PVNAA SLAMS Monitoring Sites.

Site	Year	Annual Average	3-year Average
STP	1986	54	-
	1987	43	-
	1988	54	50
	1989	53	50
	1990	46	51
	1991	46	48
	1992	53	48
	1993	36	45
	1994	35	41
	1995	27	33
	1996	31	31
	1997	28	29
	1998	27	29
	1999	32	29
	2000	31	30
	2001	27	30

ISU	1989	30	
	1990	22	
	1991	31	28
	1992	34	29
	1993	37	34
	1994	25	32
	1995	23	28
	1996	23	24
	1997	20	22
	1998	20	21

CS	1988	32	
	1989	35	
	1990	31	33
	1991	29	32
	1992	42	34
	1993	36	36
	1994	28	35
	1995	22	29
	1996	23	24
	1997	21	22
	1998	21	22

Table 3-7 (continued)

Site	Year	Annual Average	3-year Average
G&G	1991	32	
	1992	38	
	1993	39	36
	1994	31	36
	1995	23	31
	1996	24	26
	1997	20	22
	1998	22	22
	1999	25	22
	2000	25	24
	2001	28	26
	2002	25	26

3.2.2 1999 PM_{10} Episode

During December 1999, high PM_{10} concentrations were recorded in the Pocatello area. Appendix G details the 1999 episodic chemical mass balance (CMB) modeling. A stationary high-pressure system with associated light winds, fog, and daily average temperatures below freezing characterized the event. PM_{10} levels were increasing rapidly when the dispersion became poor, with wind speeds less than 3 mph for the event. Three PM_{10} exceedances were recorded at the Garrett and Gould monitoring site. Chemical analysis of the filters showed high levels of ammonium sulfate and other industrial pollutants while showing relatively low road dust, wood smoke and nitrate.

3.3 PM_{10} Background Concentration

The modeling domain (see Figure 2-1) was selected to allow the simulation of upwind regional sources that could contribute to PM_{10} concentrations within the PVNAA. However, to account for long-range transport and other sources outside the modeling domain, a background PM_{10} concentration was added to all predictions. In the 1993 SIP submittal, a 24-hour background PM_{10} concentration of 10 $\mu g/m^3$ was employed in the dispersion modeling. The concentration was based on 50% of the average total suspended particulate matter observed at the Craters of the Moon National Monument during 1988 though July 1990. More recent PM_{10} data from "pristine" regional sites are being collected for IMPROVE regional haze monitoring network sponsored by the United States Forest Service (USFS) and the National Park Service. Annual average PM_{10} concentration at the nearest IMPROVE sites (Bridger Wilderness and Yellowstone National Park) during 1993 to 1999 were typically between 5 μg/m^3 and 6 μg/m^3. Based on these more recent PM_{10} observations a background concentration of 5 μg/m^3 was added to all predictions. The decision to assume a smaller background concentration than used in the 1993 SIP is based on the larger modeling domain and the inclusion in the current study of more regional sources outside the PVNAAwhich accounts for a larger portion of the background.

3.4 Special Studies

To quantify the PM_{10} contributions and secondary aerosol issues in the Portneuf Valley, DEQ conducted SLAMS network monitoring, along with three other studies. Specific details pertaining to each of these studies can be found in Appendix C. The three studies, which help to quantify constituents within the valley, were:

- Pocatello Road Dust Study,
- Dichotomous Sampler Study, and
- Secondary Aerosol Study.

3.4.1 Pocatello Road Dust Study

The intention of this study was to develop an equation for determining PM_{10} and $PM_{2.5}$ emissions resulting from vehicular travel on paved roads and to obtain silt loadings. This study (Oct. 1996 – Sept. 1997) was conducted by the Bannock Planning Organization (BPO), along with the city, county, and ITD and DEQ. The study consisted of collecting silt-loading samples for one year and a one-time profile analysis on three different roads. The second part of the study was the full-scale profiling of actual PM_{10} using high-volume samples. The one-time profile analysis was completed April 6-17, 1997, because the roads typically contain the highest silt loadings in April due to winter road sanding.

3.4.2 Dichotomous Sampler Study

A dichotomous sampler was operated at the STP SLAMS site during 1987-1988. This unit operates by separating airborne particulate into fine (< 2.5μm) and coarse (2.5-10 μm) fractions. Information on the fraction of large and small particle sizes indicated a potential source contribution. Industrial point sources, combustion sources, and secondary aerosol reactions generally produce fine particles, whereas windblown dust is usually found in the coarse fraction.

3.4.3 Secondary Aerosol Study

The third study (1995) quantified secondary aerosol precursors and their contribution to the overall PM_{10} concentrations. On January 7, 1993

Pocatello exceeded the 24-hour PM_{10} NAAQS. This violation and subsequent analysis of the data confirmed that the secondary aerosol ammonium sulfate was the significant contributor to PM_{10} levels. The amounts of these compounds on the filters suggest that primary as well as secondary aerosol generating mechanisms were active during that day. These results and other filter analyses have shown that secondary aerosol mechanisms can be active under certain atmospheric conditions in the Portneuf Valley.

Understanding the formation mechanisms is the key to discovering how much control of such pollutants is necessary. Although general theories explain the environmental and chemical mechanisms conducive to secondary aerosol formation, experimental proof and conclusive evidence of these theories are still being researched. In the Portneuf Valley, the three main precursors of concern consist of oxides of nitrogen (NO_x), sulfur dioxide (SO_2), and ammonia (NH_3).

3.5 Summary of Meteorological Data During High PM_{10} Events

Historically high 24-hour PM_{10} concentrations in the PVNAA and FHNAA have been observed both near the Industrial Complex (the Astaris (FMC) facility and J. R. Simplot's Don Plant) and within the Pocatello urban area. Previous studies suggest local meteorological conditions often played a significant role during these episodes by influencing PM_{10} emission rates from fugitive dust sources, providing adverse dispersion conditions or favoring the formation of secondary aerosols. PM_{10} monitoring data have been collected at SLAMS sites, during saturation studies focusing on ambient conditions near the Industrial Complex, and at Tribal sites near the Industrial Complex. These data suggest high 24-hour PM_{10} concentrations in the past were usually associated with:

- ***Regional wind events.*** Occasionally the passage of strong frontal systems during the spring and sometimes the fall result in wind-blown dust events affecting a large geographic area. In addition to the high winds necessary for such events, PM_{10} emissions are also strongly related to the erosion potential of agricultural lands that can be affected by weather-related variables including temperature, snow cover, and precipitation.

- ***Fall harvest activities.*** During the Easter o n Michaud Flats monitoring program, high PM_{10} concentrations were bserved next to an unpaved haul road during potato harvest. Emissions from the road may have been exacerbated by the dry conditions that typically occur during autumn.

- ***Emissions from the Industrial Complex***. Many of the previous monitoring studies have characterized PM_{10} concentrations near the Industrial

Complex. PM_{10} concentrations above the NAAQS have been observed during all seasons of the year, but were more frequent during the fall and winter and were associated with windy conditions. High PM_{10} concentrations at these sites occurred when winds were from the Industrial Complex, suggesting fugitive dust sources within this area may have been responsible. Chemical samples collected at the Tribal sites also indicate some of these events may have been caused by building and terrain influenced downwash of elevated plumes within the Industrial Complex caused by high winds. High 24-hour PM_{10} concentrations near the Industrial Complex were less frequently observed after Simplot switched to a wet ore handling system, and more recently have not been observed since the closure of the Astaris (FMC) facility.

- ***Wintertime stagnation episodes.*** High 24-hour PM_{10} concentrations in the PVNAA have been associated with wintertime stagnation episodes. Further discussion on the meteorology during wintertime stagnation episodes is provided in the following paragraphs.

Wintertime stagnation episodes have contributed to high PM_{10} concentrations in the PVNAA, especially in the Pocatello urban area. Such episodes are associated with a deep stable layer, a strong subsidence inversion during the day, cold temperatures, light winds, high relative humidity, fog, and on many occasions snow cover. During nocturnal periods, the light winds and stable conditions inhibit dispersion, and plume rise from buoyant industrial sources is reduced. The strong inversion that forms during the day tends to trap pollutants near the surface, and the light winds provide little ventilation.

Chemical analyses of PM_{10} samples collected during these episodes indicate a large fraction of the mass consists of secondary aerosols including ammonium sulfate, ammonium nitrate, and mono ammonium phosphate. The cold temperatures and high relative humidity of wintertime episodes favor the formation of nitrate particles. Fog is a common feature of most of the wintertime episodes. Wet chemical mechanisms are thought to promote the formation of sulfate and phosphate aerosols, and for the more severe episodes, approximately 50% of the PM_{10} mass has been found to consist of ammonium sulfate.

The wind regimes observed during the 1995 Secondary Aerosol Study and predicted by the MM5 model for the December 23-31, 1999 episode are very complex. In general, most episodes feature classic stagnation conditions with weak to moderate drainage flow down the Snake River and Portneuf Valleys. Diurnally, the larger-scale flow down the Snake River Valley seems to force its way up and under the weaker drainage flow down the Portneuf Valley. Mid-day and afternoon flows tend to be up the Portneuf Valley, while evening and night flows tend to be down the same valley. The mountains in the Bannock and Pocatello Ranges block the flow from the Snake River Valley, thereby leaving a large area of weak and chaotic winds at their base. Lower-level winds tend to be completely detached from the upper level flow, which often comes from the west. The generally weak synoptic forcing, consistent with the center of a large high-pressure system, allows local conditions to dominate at lower levels.

An inversion can set up in the Portneuf Valley when a cold low passes through, filling the valley with cold air. A surface high pressure then builds quickly, trapping cold air in the valley and overriding it with warm air. Temperatures are inverted, and pollutants generated at ground level in the cold air cannot rise through the warmer air at the inversion boundary. During inversions, winds are generally light and variable. The little wind that is generated is often in response to topographic and thermal influences.

In the valley, in the late night and early morning, cold air flows down-valley (cold air sinking). Once this air flow reaches the mouth of the valley and is no longer under the influence of the valley topography, wind speed drops and direction becomes variable. Sunrise in late December and early January is approximately 8 a.m.. By approximately 9 a.m., the west bench hillsides are warming in early sunlight. This heating can cause a reversal of the down-valley flow, and an up-valley flow will often begin between 9 and 10 a.m.. With this up-valley flow, all the undispersed pollutants that have been generated and have been accumulating throughout the night at the mouth of the valley begin flowing into the valley in a concentrated wave. This wave includes ammonium sulfate/ammonium nitrate that has been forming through the reaction of sulfur dioxide with ammonia and accelerated by water vapor provided by high humidity, scrubber systems, and/or fog. This wave generally reaches the Garrett & Gould monitoring site between 10:30 a.m. and noon. As this concentrated wave moves into the valley, it disperses laterally throughout the valley, reducing pollutant concentration as it moves on. As the sun warms the valley, there will be as much vertical dispersion as the inversion will allow. After sunset (approximately 5 p.m. in late December and early January), the ground cools, pollutants sink, and the down-valley flow restarts.

Inversion effects can be made worse if snow is covering the ground. Snow cover acts as a reflector of incoming solar radiation. This has the effect of inhibiting the warming of the lowest layers of the atmosphere. Snow also acts as a moisture source, which can help produce fog. With the fog layer at the lowest level of the atmosphere, formation of ammonium sulfate/ammonium nitrate, sulfate, and nitrate can be further accelerated. The fog and increasing PM_{10} levels, in addition to the snow cover, further inhibit incoming solar radiation from heating the surface; this allows the lowest layer to cool even further, strengthening the inversion.

The strength of the inversion affects the amount of PM_{10} that can build up over time. Inversions that exhibit a rapid temperature increase with increasing elevation inhibit any upward transport of pollutants. This trapping effect is a major component of elevated PM_{10} levels in the urban portion of the nonattainment area. Under any poor dispersion conditions (i.e. high-pressure periods with light and variable winds), the valley may experience a late morning plume; meteorological factors such as wind, precipitation, and amount of solar warming dictate the duration and severity of the event.

3.6 Design Value Determination

The design value is the PM_{10} concentration that becomes the reference point from which emissions of PM_{10} must be reduced in order to demonstrate attainment. In accordance with EPA's guidance on determining a design value using measured concentrations, the data record used in developing the design value should be for a period when point and area sources emission rates are relatively constant and indicative of the usual condition. The attainment and maintenance are demonstrated when the fourth highest 24-hour PM_{10} concentration at the same location in three years is less than 150 $\mu g/m^3$. For the current SIP, the design concentration (146 $\mu g/m^3$) is the fourth highest PM_{10} concentration predicted using meteorology from the 9-day December 23-31, 1999 episode.

4.0 EMISSIONS INVENTORY

A detailed emissions inventory was prepared (by Environmental Quality Management (EQ)) for direct emissions of both PM_{10}, and $PM_{2.5}$, and also PM_{10} precursors – oxides of nitrogen (NO_x), sulfur dioxide (SO_2), volatile organic compounds (VOCs), carbon monoxide (CO), and ammonia (NH_3). Due to the potential regional nature of the contributing sources to the NAA, and the desire to characterize these regional sources in dispersion modeling that extends beyond the NAA boundaries, the inventory was based on sources located within a 50-km by 60-km modeling domain. The inventory consists of all industrial sources, area sources, non-road mobile sources, and on-road mobile sources. The temporal distribution of sources in the inventory was for two wintertime periods for 1995, a winter episodic period in 1999, a baseline data set for 2000, and future year data sets for 2005, 2010, 2015, and 2020.

The emissions inventory was developed according to the methodologies documented in the Inventory Preparation Plan/Quality Assurance Plan (IPP/QAP) for the Portneuf Valley PM_{10} Nonattainment Area. The framework for these emission tabulations includes a combination of current EPA emission factors (AP-42), emission models (MOBILE 6, NONROAD, PART5), and spatial and temporal surrogates used to distribute region-wide source emissions. Emissions were calculated and distributed across the modeling domain based on actual locations or surrogate distributions. Full details of the emissions inventory, including its development and results, are provided in Appendix D.

4.1 Industrial Sources

The industrial point sources are defined as facilities at specific stationary locations that emit pollutants. The emissions may be stack emissions, process-related fugitive emissions, or roadway-generated fugitives. For the 2000 PVNAA emissions inventory, industrial point sources with annual emissions greater than 2 tons per year (TPY) within the PVNAA are included in the industrial source inventory. Industrial point sources with annual emissions less than 2 TPY will be included in the area source inventory. Major sources located outside the PVNAA but within the modeling domain are also included in the industrial source inventory.

The industrial source inventories include PM_{10}, $PM_{2.5}$, NO_x, SO_2, NH_3, CO, and VOC emissions. Hourly, daily, and annual emission estimates have been developed for each significant industrial point source. The methods recommended by the EPA in Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition (AP-42), along with other appropriate methods, were used to estimate emissions from industrial point sources.

4.2 Area Sources

Appendix D goes into great detail surrounding the methodologies used in generating emissions for the area sources category, which includes a plethora of activities: combustion, fire, agricultural, waste disposal, road construction, VOC sources and fugitive dust. Many sources were categorized by source- and site-specific information. Other urban sources such as construction dust, heating, and wood smoke were based on the number of households, the population, activity studies, and the tendency to increase or decrease across the overall geographical area. These were derived from previous studies, population growth projections, and reports containing local fuel use patterns and quantities along with general construction plans and practices. Most of the emissions in this category were estimated using the general methodology of combining an EPA emission factor with appropriate activity data. Local activity data was used where available.

4.3 Mobile Sources

Mobile sources were inventoried as on-road vehicles and off-road vehicles, tools, and equipment. The techniques used for each overall mobile source category are quite different from one another. For example, very specific combustion and reentrained dust models exist for on-road mobile sources, while less specific surrogate base equations are used for non-road mobile sources.

The on-road mobile sources include mobile exhaust, paved and unpaved road dust, and tire and brake wear. The on-road mobile sources were allocated on a gridded basis over the PVNAA using vehicle miles traveled (VMT) compiled by road type (Interstate, Arterial, Collector, and Local Road) as provided by BPO for each 500-m by 500-m grid in the modeling domain. The Pocatello Road Dust Study (see section 3.4 and Appendix C), was used, as was AP-42 for paved and unpaved road dust. Vehicular emissions were estimated using EPA emission factor models (MOBILE6 and PART5), combined with vehicle activity and transportation modeling. The on-road vehicle exhaust emissions for PM_{10}, $PM_{2.5}$, NO_x, CO, SO_2, and VOC were estimated by combining emission factors with link-level activity and study grid specific estimates of vehicle miles traveled, roadway types, and vehicle speeds. Existing and future year mobile source controls were incorporated directly because MOBILE6 and PART5 considered regulatory programs in base and future years.

Non-road mobile sources includes equipment in the following categories: railroad locomotives, aircraft, recreational, lawn and garden, commercial and institutional, construction, agricultural, logging, and marine. EPA approved the use of the NONROAD model as a tool to develop the non-road source category emissions. The model provides county specific emissions. The NONROAD model was used to estimate emissions from all categories except aircraft and locomotive emissions, which were estimated using EPA approved methods. Appendix D provides full detail regarding the calculation of non-road mobile emissions.

4.3.1 Motor Vehicle Emissions Budget Requirements

The PM_{10} SIP/Maintenance Plan must identify not-to-be-exceeded limits on PM_{10}, NO_x, and VOC emissions from on-road mobile sources. The budgets outlined in this section apply specifically to the PVNAA.

Under Section 176 (c) of the CAA, transportation plans, programs, and projects in the NAAs that are funded or approved under Title 23 of the U.S. Code (U.S.C.) or the Federal Transit Act must conform to the on-road MVEBs specified in the applicable SIP. Federal transportation conformity regulations are found in 40 CFR Part 93 (as adopted by IDAPA 58.01.01.563-574), Subpart T – Conformity to State of Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded, or Approved under Title 23 U. S. C. or the Federal Transit Laws. Part 93, Subpart A of this chapter was revised by the EPA and published in the August 15, 1997 Federal Register. Section 93.102 (b)(2)(iii) of that revised regulation identifies NO_x and VOC as the two PM_{10} precursor pollutants that must also have an MVEB if deemed significant.

The conformity rule does not require sulfur oxides to be addressed, although SO_2 was addressed in the emissions inventory. The PVNAA emissions inventory estimates 0.27 tons per day (TPD) SO_2 contribution from mobile sources on December 27, 1999. This equates to less than one percent (0.89%) of the total SO_2. Using the mobile source contribution percentage of 0.89% it would appear that less than 1 $\mu g/m^3$ [(71.76 $\mu g/m^3$ (highest SO_4 concentration at G&G) * 0.89% = 0.64 $\mu g/m^3$)] can be attributed to mobile sources. In addition to mobile SO_2 emissions being a small contributor to the overall total SO_2, it is also a small percentage of the overall precursors emitted by mobile sources. According to the Portneuf Valley 2000 Emissions Inventory, SO_2 emissions from mobile sources are roughly 2% of the overall precursors from mobile sources (2,909.49 TPY NO_x (60%), 1,831.22 TPY VOC (38%), 99.78 TPY SO_2 (2%) (See Figure 4-1).

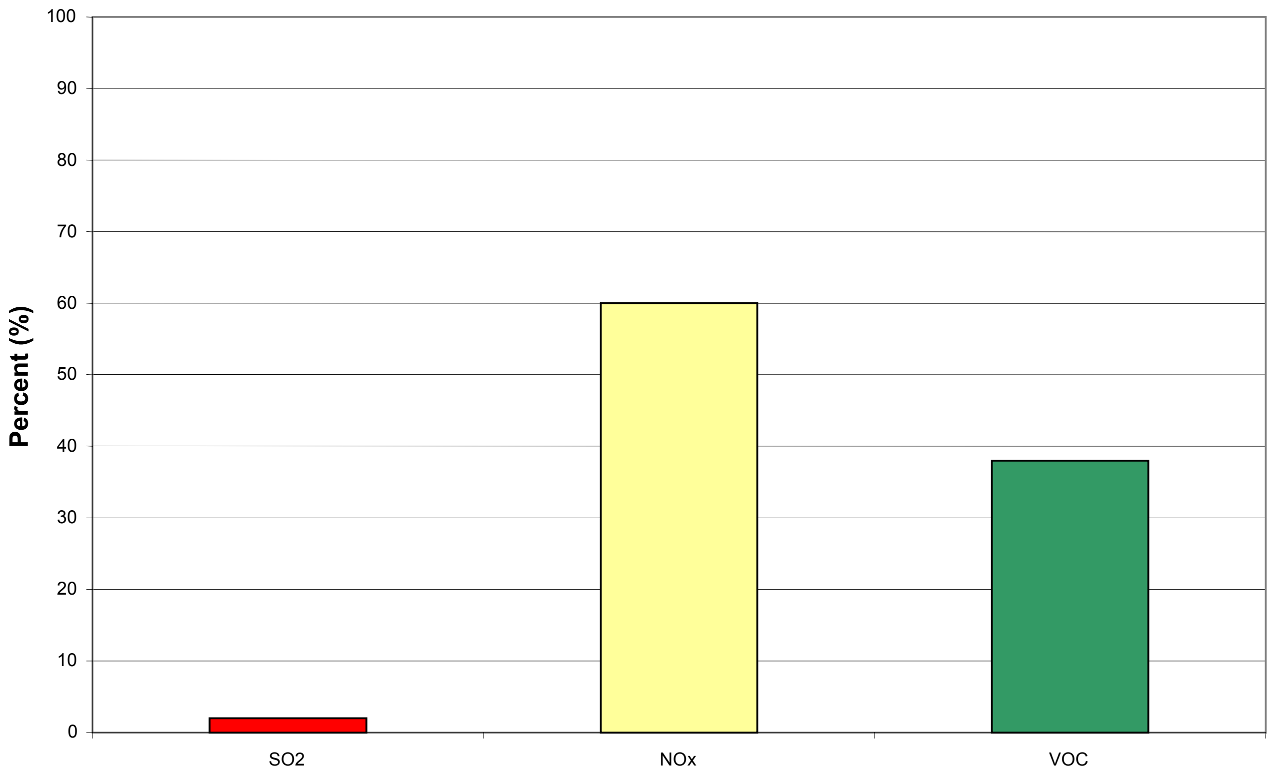


Figure 4-1 Percent of the 2000 PVNAA precursor emissions due to mobile sources.

The MVEB is developed following the transportation conformity rule under 40 CFR Section 93.118 (as adopted by IDAPA 58.01.01.563-574). In general, the conformity process is a way to ensure that federally funded and approved plans, programs and projects promote or do not interfere with the intent of the SIP to meet and maintain NAAQS. The MVEB is compared to vehicle emissions from planned roadways.

In Pocatello, BPO is responsible for developing a long range transportation plan (LRTP) that incorporates all the new transportation projects anticipated within the 20-year planning horizon. The BPO is also responsible for developing the transportation improvement program (TIPs – one plan that is updated or redeveloped every 3 to 5 years) that incorporates all the transportation projects that have identified funding sources and are scheduled to be built within 3 to 5 years.

A travel demand model was used to estimate the VMT on each roadway and the speeds for areas within the PVNAA. These estimates were developed using 2000 Census data, growth projections, and roadway capacities. For areas outside the PVNAA but within the modeling domain, a 3% growth factor was applied. The speeds and local conditions were used as inputs into EPA's MOBILE6 vehicle emissions model to calculate the average emission rates for each roadway segment. The emission rates were then multiplied by the VMT to calculate the total vehicle emissions for each roadway segment. In a similar fashion, EPA's PART5 model was used to calculate brake and tire wear emissions and the Pocatello road dust study was used to calculate re-entrained road dust. The combination of these three calculations and models was used to develop the total PM_{10} emissions as well as emissions for NO_x and VOC.

The MVEB is developed as part of the SIP and Maintenance Plan to place a ceiling or cap on emissions from transportation projects. The Maintenance Plan covers 10 years from the approval date. The conformity process compares projected emissions from TIPs and LRTPs with the budgeted emissions set out in the Maintenance Plan's MVEB. When developing the MVEB it is important to take into consideration the planning cycles for the Maintenance Plan and LRTP.

The LRTP covers a 20-year planning horizon. Since it is conceivable that transportation planners will be developing a new LRTP during the last year of the Maintenance Plan, the MVEB should be large enough to accommodate the LRTP planning cycles. The MVEB should incorporate expected transportation emissions 30 years from the approval date of the Maintenance Plan. When developing the MVEB, the budgets set for the last year of the Maintenance Plan should account for projected emissions 20 years beyond as part of the LRTP process. Since it is difficult to estimate what will happen 30 years from the date of approval, a safety margin should also be included.

Emissions were calculated for the planning horizon of 2035 and a 20% safety margin was added to the projected total emissions. These emissions were used to develop the MVEB for the year 2020. This will require the projected emissions for TIP and LRTP for the years 2020 through 2035 are below or equal to the year 2020 MVEB for PM_{10}, NO_x and VOC.

The emission budgets included as part of this plan are shown in Table 4-1 and Figure 4-2. The conformity rule will require the emission projections from future TIPs and LRTPs be less than or equal to the budget levels. The conformity process assures that transportation projects will not cause or contribute to NAAQS violations.

Table 4-1 Motor Vehicle Emission Budget for the PVNAA.

Year	PM_{10} (TPY)	NO_x (TPY)	VOC (TPY)
2005	897	1,575	983
2010	1,120	1,085	716
2020	1,364	514	585

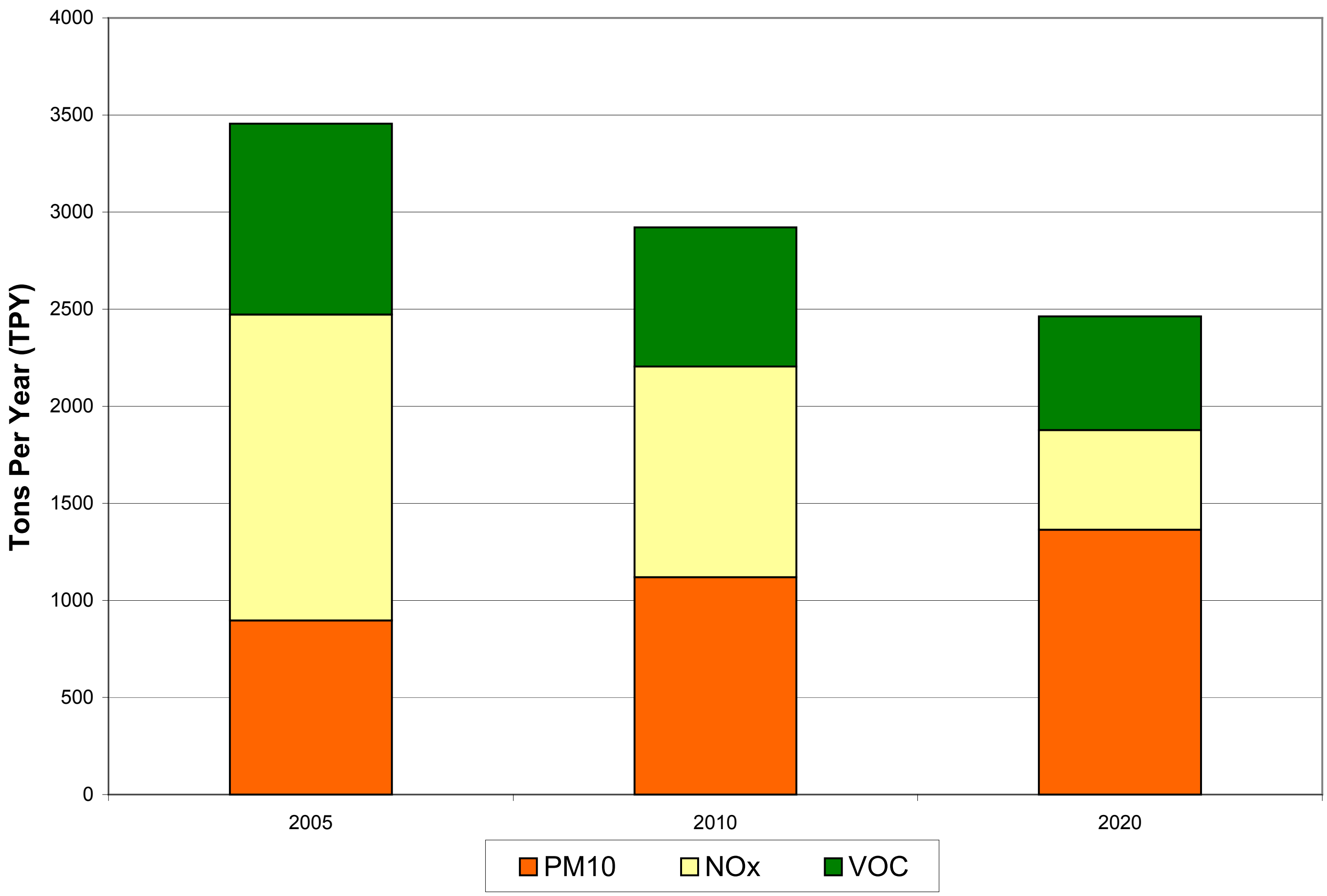


Figure 4-2 Motor vehicle emissions budgets for 2005, 2010, and 2020 for the Pollutants PM_{10}, NO_x, and VOC.

4.3.2 Budget

The MVEB is comprised of on-road mobile sources including fugitive dust from paved and unpaved roads and vehicle emissions (exhaust, tire and brake wear). The MVEB becomes applicable when the EPA determines that the budget is adequate for transportation conformity purposes. 40 CFR section 93.118(b)(2) requires, at a minimum, the MVEB to be applicable for the last year of the maintenance plan, and for any other years for which the maintenance plan establishes MVEBs. BPO and DEQ have chosen to set an MVEB for NO_x, VOC, and PM_{10} for 2005, 2010, and 2020 (Table 4-1 and Figure 4-2). EQ was contracted to complete the speciated rollback modeling, while MFG Inc., was subcontracted to complete the dispersion modeling for the PVNAA. The speciated rollback modeling, along with the multicomponent approach, finds that the PM_{10} annual standard is protected in the PVNAA from 2000-2020 (Table 4-2).

Table 4-2 Compliance with NAAQS (PM_{10} annual standard).

Year	Resulting annual PM_{10} concentration ($\mu g/m^3$)	NAAQS (annual PM_{10} standard) ($\mu g/m^3$)	Compliance
2005	25	50	Yes
2010	25	50	Yes
2020	25.1	50	Yes

In accordance with the conformity rule, the emissions budget applies as a ceiling on emissions in the year for which it is defined or until a SIP revision modifies the budget. Thus, the 2005 MVEB will apply for any conformity horizon year through 2009. The 2010 MVEB will apply for any conformity horizon year from 2010 through 2019, and the 2020 MVEB will apply for all subsequent years out to 2035.

4.3.3 Adequacy Determination

The adequacy determination of the MVEB, 40 CFR 93.118(e)(4) states that "EPA will not find a motor vehicle emissions budget in a submitted control strategy implementation plan revision or maintenance plan adequate for transportation conformity purpose unless the following minimum criteria are satisfied..." These minimum criteria, and the State of Idaho's actions to meet them (in bold), are:

(i) The submitted SIP/Maintenance Plan was endorsed by the Governor (or his or her designee) and was subject to a state public hearing,
The SIP/Maintenance Plan was adopted as a revision to the Implementation Plan for the Control of Air pollution in the State of Idaho (Idaho SIP). This adoption was signed by C. Stephen Allred, DEQ director (Governor's designee), and included in this document. The plan was also subject to a public hearing (See Appendix J).

(ii) Before the SIP/Maintenance Plan was submitted to EPA, consultation among federal, state, and local agencies occurred; full implementation plan documentation was provided to EPA, and EPA's stated concerns, if any, were addressed.
Before this plan was submitted to EPA, consultation with a variety of entities occurred. During the process of developing the major technical portion of the plan (Emission Inventory and Modeling) the technical advisory committee, consisting of DEQ, EPA, ITD, BPO, and the Tribes, conducted weekly conference calls. All methodology and decisions about the emissions inventory, modeling, and conformity budget were jointly decided by the technical advisory committee members.

(iii) The motor vehicle emissions budget(s) is clearly identified and precisely quantified.
The motor vehicle emisisons budget (MVEB) is clearly identified and precisely quantified in Section 4-3 of this document. The MVEB is included in and determined from the emissions inventory. The emissions inventory used the 2002 census data. The MVEB was also verified in the speciated rollback modeling demonstration. The transportation conformity allows for a 20% safety margin to compensate for discrepancies between the timing of the SIP/Maintenance Plan and the 20-year horizon for the LRTP. The MVEB with the safety margin was included in the rollback modeling assuring NAAQS compliance through 2035.

(iv) The motor vehicle emission budget(s), when considered with all other emissions sources, is consistent with applicable requirements for reasonable further progress, attainment, or maintenance (whichever is relevant to the given plan);
In the emissions inventory, vehicle emissions with projected growth rates were considered with all other emission sources in the modeled attainment demonstrations (see Appendix D). Additionally, the rollback analysis included in the MVEB and the safety margin, along with all other sources, demonstrate out-year attainment of the NAAQS.

(v) The motor vehicle emissions budget(s) is consistent with and clearly related to the emissions inventory and the control measures in the submitted control strategy implementation plan.
The MVEB is based directly upon the motor vehicle emissions inventory (based on BPO projections, VMT, and census data). Control measures within the PVNAA related to the transportation sector include such things as road sanding and street sweeping.

(vi) Revisions to previously submitted plans explain and document any changes to previously submitted budget and control measures; impacts on point and area sources emisisons, any changes to established safety margins; and reasons for the changes.
No budget exists presently for the PVNAA. Once the SIP/Maintenance plan is approved and the MVEB deemed appropriate for transportation conformity purposes, the area will have a budget with which to conform. Until that time the PVNAA is required to show conformity through the Build / No Build test. There are no alterations to previous budgets since one does not exist for the PVNAA. The previous SIP contained a variety of control measures for residential wood combustion (RWC), road sanding, and operating permits. This plan revision will continue those control measures.

4.4 Inventory Summaries

Emissions inventories for the base year 2000 and projected years 2005, 2010, 2015, 2020 are summarized in the following sections and tables.

4.4.1 2000 Base Year

Table 4-3 summarizes the 2000 base year emissions inventory for the PVNAA. This table shows the emissions per source category in tons per year for the following pollutants: PM_{10}, $PM_{2.5}$, SO_2, CO, NH_3, NO_x, and VOC. Within the NAA, not including the modeling domain, the PM_{10} is primarily from paved roads re-entrained dust. The largest source of $PM_{2.5}$

is due to agricultural windblown dust. VOC, CO, and NO_x emissions primarily originate from on-road mobile sources. Within the NAA, the largest source of NH_3 and SO_2 is the J. R. Simplot Don Plant. In contrast, within the modeling domain the largest source of NH_3 is livestock and the J. R. Simplot Don Plant is third largest. Base year emissions were calculated on the basis of the year 2000 activity levels area and mobile sources. The industrial sources were treated as allowables from permitted sources facility operational levels for process fugitives, and operational levels of activity for industrial roads and stockpiles.

4.4.2 Projected Year Inventories

The emissions inventory that is presented for the following years: 2005, 2010, 2015, 2020 can be found in Tables 4-4 through 4-7 for the various cataloged pollutants for the area. For future year emission projections, appropriate growth factors were applied such as population projections and household projections for many area wide fugitives, transit projections for mobile sources, and an expansion plan and permit limits for industrial facilities. In some cases growth of certain source categories may be assigned directly to population growth or household growth, and in some other cases growth may be inferred for particular sources. Some sources may remain stable or decrease in the area, depending upon other forecasts for the regional economy, agriculture, and tourism. Many of these factors were considered in estimating future year emissions for the PVNAA (see Appendix D for details).

Table 4-3 Base Year 2000 Emissions Inventory (TPY) Per Source Category For The PVNAA.

Source Category	PM_{10}	$PM_{2.5}$	VOC	NO_x	CO	NH_3	SO_2
Industrial – American Micro Systems	3.48	1.61	2.87	38.58	31.66	0.16	1.06
Industrial – Ash Grove Cement	-	-	-	-	-	-	-
Industrial – Astaris Idaho LLC (FMC)	-	-	-	-	-	-	-
Industrial – Bannock Paving #140	37.47	9.89	19.75	85.65	73.75	-	31.11
Industrial – Bannock Paving #141	12.05	2.61	-	-	-	-	-
Industrial – Basic American Foods	-	-	-	-	-	-	-
Industrial – Castle Concrete #143	5.93	2.29	-	-	-	-	-
Industrial – Castle Concrete #144	-	-	-	-	-	-	-
Industrial – Chevron Pipeline / NW	8.62	1.76	41.83	9.21	23.03	-	-
Industrial – ConAgra Malting Great Western	25.82	14.35	2.88	52.39	44.01	0.26	0.31
Industrial – Dal Tile Corp.	-	-	-	-	-	-	-
Industrial – General Mills Blackfoot	-	-	-	-	-	-	-
Industrial – General Mills Pocatello	3.31	0.72	-	-	-	-	-
Industrial – Idaho State University	22.48	6.44	2.84	87.76	41.92	0.23	67.17
Industrial – J. K. Merrill #30	-	-	-	-	-	-	-
Industrial – J. K. Merrill #43	24.65	4.27	0.01	0.88	0.22	0.04	3.13
Industrial – J. R. Simplot Co. Food Group	-	-	-	-	-	-	-
Industrial – J. R. Simplot, Don Plant	434.08	90.57	130.30	580.26	173.66	177.96	2,554.00
Industrial – Kimberly Clark/Ballard Medical	0.03	0.03	2.74	0.37	0.31	0.00	0.00
Industrial – McNabb Grain	-	-	-	-	-	-	-
Industrial – Nonpareil Corp.	-	-	-	-	-	-	-
Industrial – Northwest Pipeline	-	-	-	-	-	-	-
Industrial – Pocatello Ready Mix	33.30	8.65	0.06	1.02	0.86	0.01	0.01
Industrial – Pocatello Regional Med. Center	0.10	0.10	0.07	1.28	1.07	0.01	0.01
Industrial – Union Pacific Railroad	22.48	6.76	25.30	38.01	559.68	2.84	1.51
Industrial – Weight Watchers Food Co.	6.95	3.40	1.62	29.45	24.74	0.53	0.18
Fuel Combustion – Commercial/Institutional	6.67	6.67	-	49.49	97.82	0.53	21.11
Fuel Combustion – Residential	43.51	43.51	80.77	94.71	307.91	0.79	25.92
Solvent Utilization	-	-	735.25	-	-	-	-
Gasoline Storage and Transport	-	-	307.74	-	-	-	-
Landfills	29.70	4.46	45.95	-	-	-	-
Municipal Waste Treatment	-	-	-	-	-	86.69	-
Biogenic	-	-	242.99	19.24	-	-	-
Agricultural Tilling	66.69	13.34	-	-	-	-	-
Agricultural Harvesting	0.01	0.00	-	-	-	-	-
Fertilizer Application	-	-	-	-	-	6.83	-
Windblown Dust (Ag)	367.98	147.05	-	-	-	-	-
Windblown Dust (non Ag)	117.91	47.16	-	-	-	-	-
Livestock	-	-	-	-	-	-	-
Pesticide Application	-	-	4.16	-	-	-	-
Fires	80.29	72.26	102.63	18.43	709.71	-	-
Residential/Commercial Construction	184.95	61.65	90.10	-	-	-	-
Road Construction	82.41	16.48	0.49	-	-	-	-
Storage Piles	0.16	0.05	-	-	-	-	-
Nonroad Equipment Exhaust	26.94	24.80	232.60	240.79	3,286.85	-	59.40
Aircraft LTO	-	-	-	-	-	-	-
Railroad Locomotives	14.48	13.16	22.75	582.16	58.26	-	55.02
Mobile Exhaust On Road	34.33	31.26	1,186.68	1,677.76	15,927.14	-	61.49
Paved Roads – Reentrained Dust	721.51	41.13	-	-	-	-	-
Unpaved Roads – Reentrained Dust	12.73	0.73	-	-	-	-	-
All Source Categories	**2,431.00**	**677.13**	**3,282.38**	**3,607.43**	**21,362.6**	**276.88**	**2,881.42**

Table 4-4 Projected 2005 Emissions Inventory (TPY) Per Source Category For The PVNAA.

Source Category	PM_{10}	$PM_{2.5}$	VOC	NO_x	CO	NH_3	SO_2
Industrial – American Micro Systems	3.48	1.61	2.87	38.58	31.66	0.16	1.06
Industrial – Ash Grove Cement	-	-	-	-	-	-	-
Industrial – Astaris Idaho LLC (FMC)	-	-	-	-	-	-	-
Industrial – Bannock Paving #140	37.47	9.89	19.75	85.65	73.75	-	31.11
Industrial – Bannock Paving #141	12.05	2.61	-	-	-	-	-
Industrial – Basic American Foods	-	-	-	-	-	-	-
Industrial – Castle Concrete #143	5.93	2.29	-	-	-	-	-
Industrial – Castle Concrete #144	-	-	-	-	-	-	-
Industrial – Chevron Pipeline / NW	8.62	1.76	41.83	9.21	23.03	-	-
Industrial – ConAgra Malting Great Western	25.82	14.35	2.88	52.39	44.01	0.26	0.31
Industrial – Dal Tile Corp.	-	-	-	-	-	-	-
Industrial – General Mills Blackfoot	-	-	-	-	-	-	-
Industrial – General Mills Pocatello	3.31	0.72	-	-	-	-	-
Industrial – Idaho State University	22.48	6.44	2.84	87.76	41.92	0.23	67.17
Industrial – J. K. Merrill #30	-	-	-	-	-	-	-
Industrial – J. K. Merrill #43	24.65	4.27	0.01	0.88	0.22	0.04	3.13
Industrial – J. R. Simplot Co. Food Group	-	-	-	-	-	-	-
Industrial – J. R. Simplot, Don Plant	415.52	88.80	6.41	193.69	119.14	146.98	2,208.85
Industrial – Kimberly Clark/Ballard Medical	0.03	0.03	2.74	0.37	0.31	0.00	0.00
Industrial – McNabb Grain	-	-	-	-	-	-	-
Industrial – Nonpareil Corp.	-	-	-	-	-	-	-
Industrial – Northwest Pipeline	-	-	-	-	-	-	-
Industrial – Pocatello Ready Mix	33.30	8.65	0.06	1.02	0.86	0.01	0.01
Industrial – Pocatello Regional Med. Center	0.10	0.10	0.07	1.28	1.07	0.01	0.01
Industrial – Union Pacific Railroad	22.48	6.76	25.30	38.01	559.68	2.84	1.51
Industrial – Weight Watchers Food Co.	6.95	3.40	1.62	29.45	24.74	0.53	0.18
Fuel Combustion – Commercial/Institutional	7.14	7.14	-	52.97	104.70	0.57	22.59
Fuel Combustion – Residential	46.91	46.91	87.24	101.14	332.27	0.84	27.75
Solvent Utilization	-	-	776.15	-	-	-	-
Gasoline Storage and Transport	-	-	325.08	-	-	-	-
Landfills	30.80	4.62	47.66	-	-	-	-
Municipal Waste Treatment	-	-	-	-	-	95.38	-
Biogenic	-	-	242.99	19.24	-	-	-
Agricultural Tilling	66.69	13.34	-	-	-	-	-
Agricultural Harvesting	0.01	0.00	-	-	-	-	-
Fertilizer Application	-	-	-	-	-	6.83	-
Windblown Dust (Ag)	367.98	147.05	-	-	-	-	-
Windblown Dust (non Ag)	117.91	47.16	-	-	-	-	-
Livestock	-	-	-	-	-	-	-
Pesticide Application	-	-	4.16	-	-	-	-
Fires	80.33	72.30	102.68	18.44	709.95	-	-
Residential/Commercial Construction	198.49	66.16	96.70	-	-	-	-
Road Construction	89.73	17.95	0.53	-	-	-	-
Storage Piles	0.16	0.05	-	-	-	-	-
Nonroad Equipment Exhaust	26.33	24.24	194.26	234.64	3,669.75	-	71.27
Aircraft LTO	-	-	-	-	-	-	-
Railroad Locomotives	14.73	13.41	23.22	446.06	61.17	-	57.77
Mobile Exhaust On Road	26.62	24.43	889.96	1,380.23	13,500.07		69.87
Paved Roads – Reentrained Dust	863.85	49.24	-	-	-	-	-
Unpaved Roads – Reentrained Dust	13.88	0.79	-	-	-	-	-
All Source Categories	**2,573.75**	**686.24**	**2,897.0**	**2,790.9**	**19,298.3**	**254.68**	**2,562.5**

Table 4-5 Projected 2010 Emissions Inventory Per Source Category For The PVNAA.

Source Category	PM_{10}	$PM_{2.5}$	VOC	NO_x	CO	NH_3	SO_2
Industrial – American Micro Systems	3.48	1.61	2.87	38.58	31.66	0.16	1.06
Industrial – Ash Grove Cement	-	-	-	-	-	-	-
Industrial – Astaris Idaho LLC (FMC)	-	-	-	-	-	-	-
Industrial – Bannock Paving #140	37.47	9.89	19.75	85.65	73.75	-	31.11
Industrial – Bannock Paving #141	12.05	2.61	-	-	-	-	-
Industrial – Basic American Foods	-	-	-	-	-	-	-
Industrial – Castle Concrete #143	5.93	2.29	-	-	-	-	-
Industrial – Castle Concrete #144	-	-	-	-	-	-	-
Industrial – Chevron Pipeline / NW	8.62	1.76	41.83	9.21	23.03	-	-
Industrial – ConAgra Malting Great Western	25.92	14.35	2.88	52.39	44.01	0.26	0.31
Industrial – Dal Tile Corp.	-	-	-	-	-	-	-
Industrial – General Mills Blackfoot	-	-	-	-	-	-	-
Industrial – General Mills Pocatello	3.31	0.72	-	-	-	-	-
Industrial – Idaho State University	22.48	6.44	2.84	87.76	41.92	0.23	67.17
Industrial – J. K. Merrill #30	-	-	-	-	-	-	-
Industrial – J. K. Merrill #43	24.65	4.27	0.01	0.88	0.22	0.04	3.13
Industrial – J. R. Simplot Co. Food Group	-	-	-	-	-	-	-
Industrial – J. R. Simplot, Don Plant	415.52	88.60	6.41	193.69	119.14	146.98	2,208.85
Industrial – Kimberly Clark/Ballard Medical	0.03	0.03	2.74	0.37	0.31	0.00	0.00
Industrial – McNabb Grain	-	-	-	-	-	-	-
Industrial – Nonpareil Corp.	-	-	-	-	-	-	-
Industrial – Northwest Pipeline	-	-	-	-	-	-	-
Industrial – Pocatello Ready Mix	33.30	8.65	0.06	1.02	0.86	0.01	0.01
Industrial – Pocatello Regional Med. Center	0.10	0.10	0.07	1.28	1.07	0.01	0.01
Industrial – Union Pacific Railroad	22.48	6.76	25.30	38.01	559.68	2.84	1.51
Industrial – Weight Watchers Food Co.	6.95	3.40	1.62	29.45	24.74	0.53	0.18
Fuel Combustion – Commercial/Institutional	7.61	7.61	-	56.45	111.57	0.61	24.07
Fuel Combustion – Residential	50.30	50.30	93.70	107.57	356.64	0.89	29.57
Solvent Utilization	-	-	817.06	-	-	-	-
Gasoline Storage and Transport	-	-	342.42	-	-	-	-
Landfills	31.91	4.79	49.37	-	-	-	-
Municipal Waste Treatment	-	-	-	-	-	104.07	-
Biogenic	-	-	242.99	19.24	-	-	-
Agricultural Tilling	66.69	13.34	-	-	-	-	-
Agricultural Harvesting	0.01	0.00	-	-	-	-	-
Fertilizer Application	-	-	-	-	-	6.83	-
Windblown Dust (Ag)	367.98	147.05	-	-	-	-	-
Windblown Dust (non Ag)	117.91	47.16	-	-	-	-	-
Livestock	-	-	-	-	-	-	-
Pesticide Application	-	-	4.16	-	-	-	-
Fires	80.37	72.34	102.72	18.44	710.20	-	-
Residential/Commercial Construction	212.03	70.68	103.29	-	-	-	-
Road Construction	97.06	19.41	0.58	-	-	-	-
Storage Piles	0.16	0.05	-	-	-	-	-
Nonroad Equipment Exhaust	26.99	24.85	161.62	214.29	4,107.09	-	82.65
Aircraft LTO	-	-	-	-	-	-	-
Railroad Locomotives	13.36	12.16	21.33	382.10	64.23	-	60.66
Mobile Exhaust On Road	23.42	21.61	629.88	964.45	11,250.52	-	78.89
Paved Roads – Reentrained Dust	980.95	55.91	-	-	-	-	-
Unpaved Roads – Reentrained Dust	14.67	0.84	-	-	-	-	-
All Source Categories	2,713.62	699.55	2,675.50	2,300.82	17,520.64	263.46	2,587.18

Table 4-6 Projected 2015 Emissions Inventory Per Source Category For The PVNAA.

Source Category	PM_{10}	$PM_{2.5}$	VOC	NO_x	CO	NH_3	SO_2
Industrial – American Micro Systems	3.48	1.61	2.87	38.58	31.66	0.16	1.06
Industrial – Ash Grove Cement	-	-	-	-	-	-	-
Industrial – Astaris Idaho LLC (FMC)	-	-	-	-	-	-	-
Industrial – Bannock Paving #140	37.47	9.89	19.75	85.65	73.75	-	31.11
Industrial – Bannock Paving #141	12.05	2.61	-	-	-	-	-
Industrial – Basic American Foods	-	-	-	-	-	-	-
Industrial – Castle Concrete #143	5.93	2.29	-	-	-	-	-
Industrial – Castle Concrete #144	-	-	-	-	-	-	-
Industrial – Chevron Pipeline / NW	8.62	1.76	41.83	9.21	23.03	-	-
Industrial – ConAgra Malting Great Western	25.82	14.35	2.88	52.39	44.01	0.26	0.31
Industrial – Dal Tile Corp.	-	-	-	-	-	-	-
Industrial – General Mills Blackfoot	-	-	-	-	-	-	-
Industrial – General Mills Pocatello	3.31	0.72	-	-	-	-	-
Industrial – Idaho State University	22.48	6.44	2.84	87.76	41.92	0.23	67.17
Industrial – J. K. Merrill #30	-	-	-	-	-	-	-
Industrial – J. K. Merrill #43	24.65	4.27	0.01	0.88	0.22	0.04	3.13
Industrial – J. R. Simplot Co. Food Group	-	-	-	-	-	-	-
Industrial – J. R. Simplot, Don Plant	415.52	88.60	6.41	193.69	119.14	146.98	2,208.85
Industrial – Kimberly Clark/Ballard Medical	0.03	0.03	2.74	0.37	0.31	0.00	0.00
Industrial – McNabb Grain	-	-	-	-	-	-	-
Industrial – Nonpareil Corp.	-	-	-	-	-	-	-
Industrial – Northwest Pipeline	-	-	-	-	-	-	-
Industrial – Pocatello Ready Mix	33.30	8.65	0.06	1.02	0.86	0.01	0.01
Industrial – Pocatello Regional Med. Center	0.10	0.10	0.07	1.28	1.07	0.01	0.01
Industrial – Union Pacific Railroad	22.48	6.76	25.30	38.01	559.68	2.84	1.51
Industrial – Weight Watchers Food Co.	6.95	3.40	1.62	29.45	24.74	0.53	0.18
Fuel Combustion – Commercial/Institutional	8.08	8.08	-	59.92	118.45	0.65	25.56
Fuel Combustion – Residential	53.69	53.69	100.17	114.00	381.00	0.94	31.40
Solvent Utilization	-	-	857.96	-	-	-	-
Gasoline Storage and Transport	-	-	359.76	-	-	-	-
Landfills	33.01	4.95	51.08	-	-	-	-
Municipal Waste Treatment	-	-	-	-	-	112.76	-
Biogenic	-	-	242.99	19.24	-	-	-
Agricultural Tilling	66.69	13.34	-	-	-	-	-
Agricultural Harvesting	0.01	0.00	-	-	-	-	-
Fertilizer Application	-	-	-	-	-	6.83	-
Windblown Dust (Ag)	367.98	147.05	-	-	-	-	-
Windblown Dust (non Ag)	117.91	47.16	-	-	-	-	-
Livestock	-	-	-	-	-	-	-
Pesticide Application	-	-	4.16	-	-	-	-
Fires	80.42	72.38	102.77	18.45	710.44	-	-
Residential/Commercial Construction	225.58	75.19	109.89	-	-	-	-
Road Construction	104.38	20.88	0.62	-	-	-	-
Storage Piles	0.16	0.05	-	-	-	-	-
Nonroad Equipment Exhaust	29.10	26.80	163.61	206.80	4,529.36	-	93.42
Aircraft LTO	-	-	-	-	-	-	-
Railroad Locomotives	13.05	11.87	20.92	371.66	67.44	-	63.70
Mobile Exhaust On Road	23.50	22.05	480.77	618.61	10,407.49	-	84.68
Paved Roads – Reentrained Dust	1,096.64	62.51	-	-	-	-	-
Unpaved Roads – Reentrained Dust	18.39	1.05	-	-	-	-	-
All Source Categories	**2,860.78**	**718.51**	**2,601.07**	**1,946.97**	**17,134.58**	**272.24**	**2,612.08**

Table 4-7 Projected 2020 Emissions Inventory Per Source Category For The PVNAA.

Source Category	PM_{10}	$PM_{2.5}$	VOC	NO_x	CO	NH_3	SO_2
Industrial – American Micro Systems	3.48	1.61	2.87	38.58	31.66	0.16	1.06
Industrial – Ash Grove Cement	-	-	-	-	-	-	-
Industrial – Astaris Idaho LLC (FMC)	-	-	-	-	-	-	-
Industrial – Bannock Paving #140	37.47	9.89	19.75	85.65	73.75	-	31.11
Industrial – Bannock Paving #141	12.06	2.61	-	-	-	-	-
Industrial – Basic American Foods	-	-	-	-	-	-	-
Industrial – Castle Concrete #143	5.93	2.29	-	-	-	-	-
Industrial – Castle Concrete #144	-	-	-	-	-	-	-
Industrial – Chevron Pipeline / NW	8.621	1.76	41.83	9.21	23.03	-	-
Industrial – ConAgra Malting Great Western	25.82	14.35	2.88	52.39	44.01	0.26	0.31
Industrial – Dal Tile Corp.	-	-	-	-	-	-	-
Industrial – General Mills Blackfoot	-	-	-	-	-	-	-
Industrial – General Mills Pocatello	3.31	0.72	-	-	-	-	-
Industrial – Idaho State University	22.48	6.44	2.84	87.76	41.92	0.23	67.17
Industrial – J. K. Merrill #30	-	-	-	-	-	-	-
Industrial – J. K. Merrill #43	24.65	4.27	0.01	0.88	0.22	0.04	3.13
Industrial – J. R. Simplot Co. Food Group	-	-	-	-	-	-	-
Industrial – J. R. Simplot, Don Plant	415.52	88.60	6.41	193.69	119.14	146.98	2,208.85
Industrial – Kimberly Clark/Ballard Medical	0.03	0.03	2.74	0.37	0.31	0.00	0.00
Industrial – McNabb Grain	-	-	-	-	-	-	-
Industrial – Nonpareil Corp.	-	-	-	-	-	-	-
Industrial – Northwest Pipeline	-	-	-	-	-	-	-
Industrial – Pocatello Ready Mix	33.30	8.65	0.06	1.02	0.86	0.01	0.01
Industrial – Pocatello Regional Med. Center	0.10	0.10	0.07	1.28	1.07	0.01	0.01
Industrial – Union Pacific Railroad	22.48	6.76	25.30	38.01	559.68	2.84	1.51
Industrial – Weight Watchers Food Co.	6.95	3.40	1.62	29.45	24.74	0.53	0.18
Fuel Combustion – Commercial/Institutional	8.55	8.55	-	63.40	125.32	0.68	27.04
Fuel Combustion – Residential	57.09	57.09	106.63	120.43	405.37	1.00	33.23
Solvent Utilization	-	-	898.87	-	-	-	-
Gasoline Storage and Transport	-	-	377.10	-	-	-	-
Landfills	34.12	5.12	52.79	-	-	-	-
Municipal Waste Treatment	-	-	-	-	-	121.45	-
Biogenic	-	-	242.99	19.24	-	-	-
Agricultural Tilling	66.69	13.34	-	-	-	-	-
Agricultural Harvesting	0.01	0.00	-	-	-	-	-
Fertilizer Application	-	-	-	-	-	6.83	-
Windblown Dust (Ag)	367.98	147.05	-	-	-	-	-
Windblown Dust (non Ag)	117.91	47.16	-	-	-	-	-
Livestock	-	-	-	-	-	-	-
Pesticide Application	-	-	4.16	-	-	-	-
Fires	80.46	72.42	102.81	18.46	710.69	-	-
Residential/Commercial Construction	239.12	79.71	116.49	-	-	-	-
Road Construction	117.71	22.34	0.66	-	-	-	-
Storage Piles	0.16	0.05	-	-	-	-	-
Nonroad Equipment Exhaust	31.87	29.35	175.25	216.83	4,964.66	-	103.94
Aircraft LTO					-	-	-
Railroad Locomotives	12.66	11.52	20.42	362.59	70.81	-	66.88
Mobile Exhaust On Road	25.63	24.05	415.31	452.72	10,136.19	-	92.44
Paved Roads – Reentrained Dust	1,213.03	69.14			-	-	-
Unpaved Roads – Reentrained Dust	20.18	1.15			-	-	-
All Source Categories	**3,009.35**	**739.49**	**2,619.85**	**1,791.96**	**17,333.44**	**281.02**	**2,636.86**

5.0 ATTAINMENT AND MAINTENANCE DEMONSTRATIONS

The following sections summarize the attainment and maintenance demonstrations for the PVNAA. Specifically, section 5.1 outlines the attainment of the 24-hour PM_{10} standard as well as demonstrates maintenance of the standard out to 2020. Both demonstrations utilize various portions of the multicomponent hybrid approach to provide evidence of the area's air quality, demonstrating compliance with the NAAQS. Section 5.2 demonstrates attainment and maintenance of the annual PM_{10} standard using linear speciated rollback modeling. Sections 5.3 through 5.5 outline maintenance plan requirements, while section 5.6 defines contingency measures for the PVNAA.

5.1 24-hour PM_{10} Standard

For the attainment demonstration, DEQ is required to show that the PVNAA attained the 24-hour PM_{10} NAAQS by the attainment date of December 31, 1996. Due to the controls implemented in accordance with the 1993 SIP submittal and air quality monitoring data, no violations have occurred in the PVNAA since January 7, 1993; additionally, the data indicates that the controls in place on the attainment date were adequate to ensure attainment. EPA determined that the PVNAA had attained the PM_{10} NAAQS by December 31, 1996. 67 Fed. Reg. 48552 (July 25, 2002). It is also important to note that, based upon monitoring data, the area has remained in attainment from 1996 to present (2003) (see Section 2.5.4 for more details). The linear speciated rollback modeling provides the modeled demonstration of attainment. Because of dispersion modeling challenges, DEQ relied on rollback modeling in conjunction with the multi-component approach to demonstrating attainment. Rollback modeling predicted that in the base year the 24-hour PM_{10} concentration was 146 $\mu g/m^3$ which is below the 24-hour PM_{10} NAAQS (150 $\mu g/m^3$).

As part of the maintenance plan requirements, DEQ must prove that the PVNAA will maintain the 24-hour PM_{10} NAAQS for 10 years beyond the attainment date (2006). Monitoring data proves that the PVNAA has maintained the NAAQS from 1994 to present (2003). The results of the rollback modeling, along with the rest of the multi-component analysis, show that the PVNAA will be in attainment through 2020 (24 years past the attainment date). The predicted 24-hour rollback model results show 24-hour PM_{10} concentrations well below the NAAQS, from 2005 (106 $\mu g/m^3$) through 2020 (111 $\mu g/m^3$). The other major contributor to demonstrating maintenance is the closure of the Astaris (FMC) facility on the FHNAA. With the closure of this facility, emissions were significantly reduced. Figure 5-11 shows a dramatic decrease in emissions within the modeling domain from 2000 to 2005, with emissions remaining below the 2000 levels out to 2020.

The following subsections detail the various sections of the multi-component analysis and how they pertain to the 24-hour standard demonstration of attainment and maintenance within the PVNAA.

5.1.1 Air Dispersion Modeling

Dispersion modeling for PM_{10} in the Portneuf Valley is a challenging problem due to its complex meteorology, a large number and variety of PM_{10} and precursor sources, and the need to consider secondary aerosol formation. The modeling methodologies selected were based on guidance from a Project Oversight Committee. This committee consisted of staff from DEQ, EPA, Tribes, BPO, and ITD. The features of the dispersion modeling approach include:

- The CALPUFF modeling system, which was selected for the PVNAA based on the importance of the industrial sources and the need to simulate local scale dispersion and transport. The selected 50 x 60 km study domain was larger than the PVNAA to include sources that might influence PM_{10} concentrations within the airshed and allow plumes from the Industrial Complex to re-circulate within the region.
- A simple aqueous phase chemistry algorithm, added to CALPUFF to account for the apparent large SO_2 to sulfate conversion in fog and clouds that accompany all the wintertime episodes.
- The Penn State and National Center for Atmospheric Research (NCAR) Mesoscale Model (MM5 v3.5), applied to simulate the complex wind regime of the airshed, supplemented by observations and processing with the CALMET meteorological component of the CALPUFF modeling system. The MM5 simulations used a four-way nested grid system with an inner domain mesh size of 1.33 km.
- The PVNAA emission inventory, which provided temporally and spatially resolved PM_{10} and PM_{10} precursor emissions for both industrial sources and regional area sources. Emission inventories were developed for 1995, 1999, 2000, 2005, 2010, 2015, and 2020.

The coupled CALPUFF/MM5 modeling system was applied to simulate three wintertime stagnation episodes: January 2-3, 1995; February 5-6, 1995; and December 23-31, 1999. The 1995 events did not exceed the NAAQS but are similar to more severe episodes and occurred during the 1995 Secondary Aerosol Study. The aerosols and meteorological data collected during this study were used as the basis for a model performance assessment.

Simulations were performed with many different model options for dispersion, treatment of complex terrain, and construction of the three-dimensional wind fields. Model performance was also assessed by comparing PM_{10}, sulfate, and nitrate model predictions to monitored observations from the December 23-31, 1999 episode. Monitored 24-hour PM_{10} concentrations at the G&G site exceeded 150 µg/m^3 three times during this nine-day period and daily ammonium sulfate concentrations were approximately 100 µg/m^3.

The dispersion model simulations do not capture all aspects of observed PM_{10} and secondary aerosol concentration behavior within the airshed. The simulations are not well correlated temporally with the observations, as predictions are often too high during the early morning and nocturnal hours. The highest predictions also do not occur on the same days. It appears the MM5 simulations describe many features of the winds during such episodes, but the stochastic variability of winds in the PVNAA during stagnant conditions is difficult to predict.

The attainment demonstration is based on the emission inventory prepared for 2000, while the maintenance demonstrations are based on future year emission inventories for 2005 and 2010. Attainment and maintenance are demonstrated when the fourth highest 24-hour PM_{10} concentration at the same location in three years is less than 150 µg/m^3. For the current analysis, the design concentration is the fourth highest PM_{10} concentration predicted using meteorology from the nine-day December 23-31, 1999 episode.

The CALPUFF dispersion model simulations predict the 24-hour PM_{10} NAAQS is attained and will be maintained at the G&G monitoring site and almost all locations within the PVNAA. From 2000 to 2010, the respective predicted design and maximum PM_{10} concentrations at G&G increase due to mobile source emissions. Maximum 24-hour PM_{10} modeled concentrations are above 150 µg/m^3 in several areas of the modeling domain. The maximum predicted 24-hour PM_{10} concentrations at all other receptors are 161 µg/m^3, 170 µg/m^3, and 180 µg/m^3, for 2000, 2005, and 2010, respectively. Table 5-1 provides the summary of the maximum and design 24-hour PM_{10} concentrations.

Design concentrations are about 15% lower than the maximum predictions and occur within the Pocatello urban area. Design PM_{10} concentrations in the PVNAA are predicted to exceed the 24-hour NAAQS southeast of the G&G monitoring site (Figures 5-1 to 5-3). The maximum predicted 24-hour concentration is 162 µg/m^3 in 2010, 8% greater than the 24-hour NAAQS of 150 µg/m^3. For 2010, the area predicted to have PM_{10} concentrations greater than the NAAQS extends from just east of the

G&G site to an area north of Ross Park following Fourth and Fifth Avenues.

Comparisons with chemical mass balance (CMB) data collected during the episodes suggest the vehicle suspended dust component is being over-estimated and the Industrial Source group under-predicted in some of the simulations. This behavior may be related to biases in the MM5 simulations where wind speeds are under-predicted in the urban area, artificially enhancing the influence of the urban area sources. Over-prediction of the vehicle suspended dust component may also be caused by initial depletion of coarse particles that is not accounted for by the methods used to characterize this source group in the modeling.

Table 5-1 Summary of Maximum and Design 24-hour PM_{10} Concentrations by Emission Scenario for December 23-31, 1999 Episode.

	24-hour PM_{10} Concentrations ($\mu g/m^3$)					
	Garrett & Gould		Entire Modeling Domain			
Emission Scenario	**Maximum**	**Design (4^{th}High)**	**Maximum Concentration**	**Location of Maximum**	**Design (4^{th}High) Concentration**	**Location of Design Concentration**
Observed	183	146	183	Garrett & Gould	146	Garrett & Gould
1999 Est. Actual	159	141	324 (b)	Inside Industrial Complex	203	Pocatello Urban
1999 Est. 24-hr Max	212	158	616 (b)	Inside Industrial Complex	402 (b)	Inside Industrial Complex
2000 Allowable/ potential to emit (PTE)	143	136	182 (a)	Fort Hall Landfill	151	Pocatello Urban
2005 Allowable/ PTE	151	136	181 (a)	Fort Hall Landfill	156	Pocatello Urban
2010 Allowable/ PTE	160	143	185 (a)	Fort Hall Landfill	162	Pocatello Urban
2010 Allowable/ PTE ISU on Gas	160	143	179	Pocatello Urban	157	Pocatello Urban

Notes:

Actual – episode average industrial emission estimates

Allowable/PTE – 24-hour allowable permit limits or maximum potential to emit industrial emissions.

Predictions based on 1.33 km MM5 simulations with the Blackadar PBL scheme and CALPUFF with similarity theory diffusion, PDF treatment of convective conditions, CALPUFF treatment of terrain, and wet chemistry. All predictions include a background of 5 $\mu g/m^3$.

(a) Maximum predicted concentration occurs within the Fort Hall Landfill. Emissions for this source category may be overestimated for wintertime conditions. The maximum predicted 24-hour PM_{10} concentrations at all other receptors are 161 $\mu g/m^3$, 170 $\mu g/m^3$, and 180 $\mu g/m^3$, for 2000, 2005, and 2010, respectively.

(b) High PM_{10} concentrations near the Industrial Complex actually occur with the boundaries of the Astaris (FMC) and Simplot facilities. A more refined analysis should exclude emissions from a facility when assessing PM_{10} concentrations within their plant site boundary. Fenceline PM_{10} concentrations would also be more appropriately assessed using "hot spot" techniques as might be applied in dispersion modeling for New Source Review.

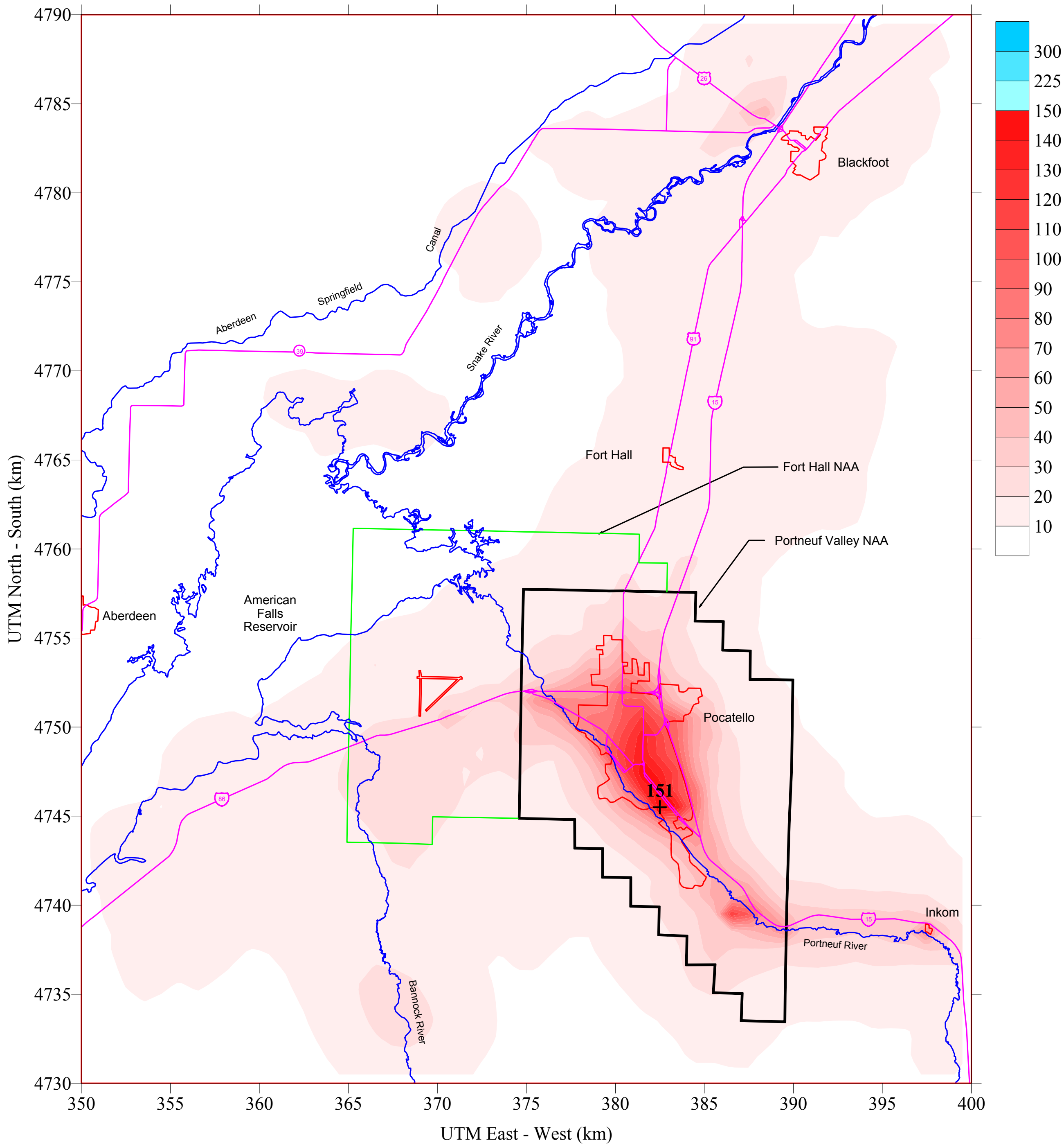


Figure 5-1 Design 24-Hour PM_{10} ($\mu g/m^3$) for December 23-31, 1999, 2000 Allowable Industrial Emissions (No Astaris (FMC) Facility).

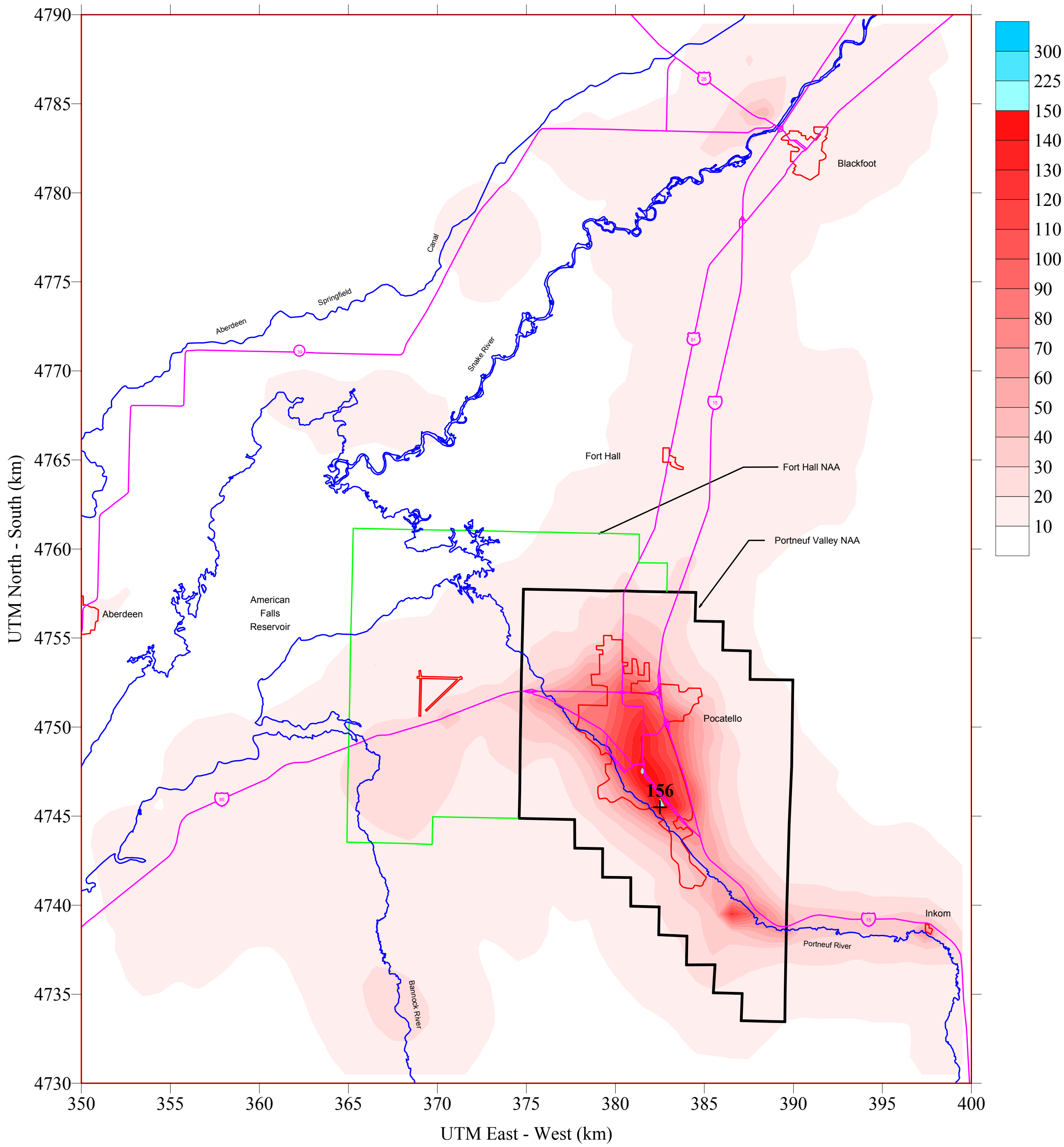


Figure 5-2 **Design 24-Hour PM_{10} ($\mu g/m^3$) Concentrations for December 23-31, 1999, 2005 Allowable Industrial Emissions.**

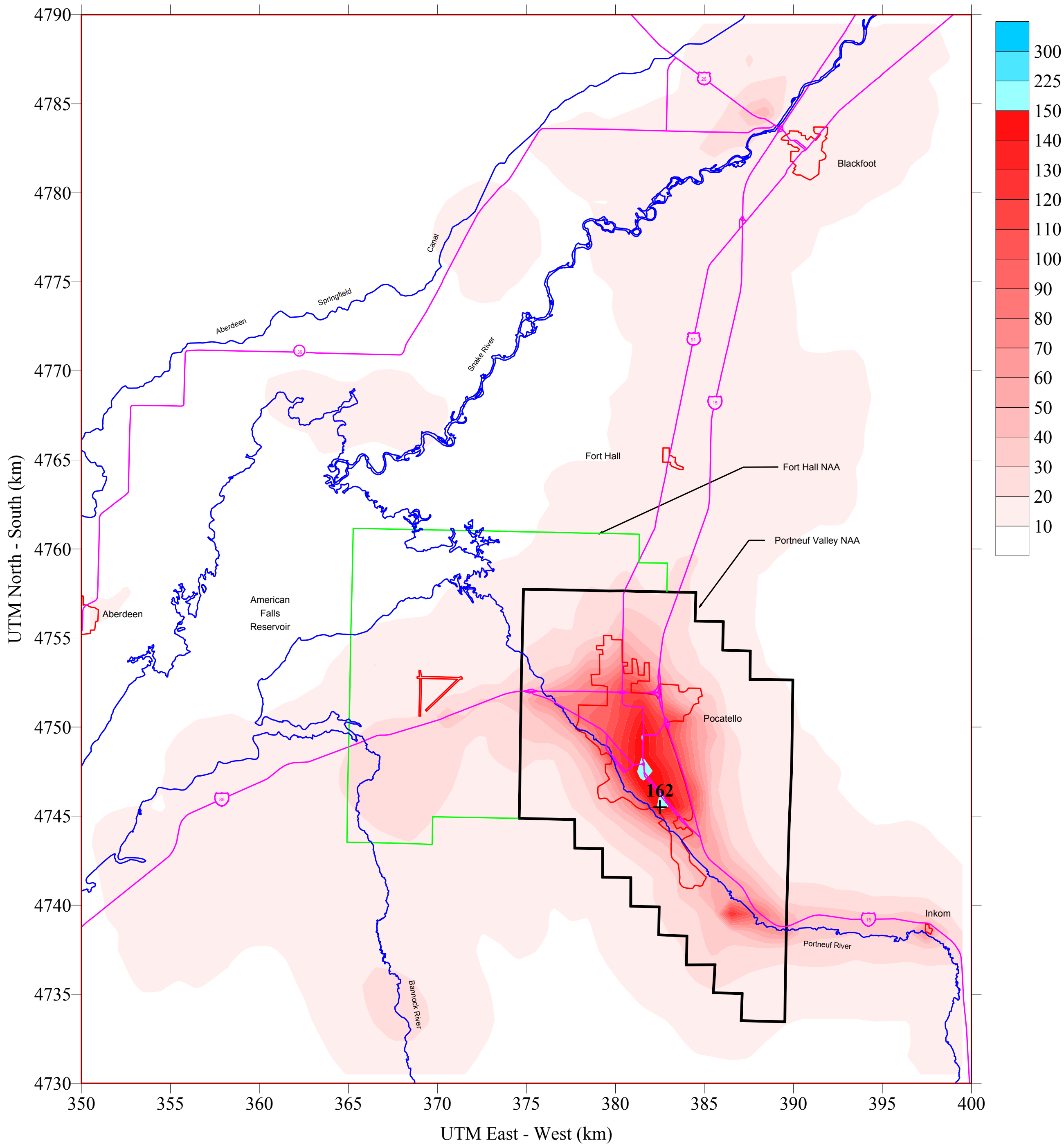


Figure 5-3 Design 24-Hour PM_{10} ($\mu g/m^3$) Concentrations for December 23-31, 1999, 2010 Allowable Industrial Emissions.

Table 5-2 summarizes episode average source group contributions to PM_{10} predictions at G&G for the December 23-31, 1999 simulations. The predicted increase in PM_{10} from 2000 to 2010 is primarily caused by a 25% increase in mobile source related emissions. This increase is offset by the decrease in the industrial source group contributions from the 1999 allowable PTE case, which includes the Astaris (FMC) facility. Mobile source PM_{10} emissions are primarily caused by vehicle entrained dust from paved roads, a category that is apparently over-predicted in the dispersion modeling simulations. Although it is difficult to assess directly based on the ambiguity of the CMB analysis, industrial source impacts may be under-estimated in the CALPUFF simulations. The net result of this modeling bias is to not take enough credit for the closure of the Astaris (FMC) facility and to over emphasize the influence of the mobile sources in the analysis.

The source contributions to PM_{10} concentrations predicted on the maximum day, design day, and for the episode average, are shown in Table 5-3 for the 2010 simulation. These source group contributions were assembled from the predictions at the worst-case receptor shown in Figure 5-3. The source contributions for the maximum day and design day differ. The industrial source group and sulfate are the largest PM_{10} contributions on the design day, while the highest concentrations on the maximum day are primarily caused by the vehicle suspended dust from the mobile source group.

Table 5-3 also shows the effect of reducing the contributions of the mobile source group to more closely match results from the CMB source apportionment studies. The CMB results in Table 5-2 suggest the mobile source group may be over-estimated by about a factor-of-four (based on the ratio of the 1999 CMB road dust (10.2 $\mu g/m^3$) to Predicted 1999 Mobile Source (45.8 $\mu g/m^3$) contributions). When this adjustment is applied to the predicted concentrations from the mobile source group, the revised design concentration becomes 91 $\mu g/m^3$, well under the NAAQS. In addition, the PVNAA maintains the NAAQS at every receptor in the 2010 simulations. However the dispersion modeling also appears to underestimate the industrial source group and this bias is not accounted for in Table 5-3.

Table 5-2 Predicted Source Contributions for December 23-31, 1999 at Garrett and Gould based on Different Emission Cases.

Garrett & Gould PM_{10} Source Group Contributions (Percent) December 23-31, 1999 Episode						
Source Group	**1999 CMB**	**1999 Actual**	**1999 24-hr Max**	**2000 Allowable /PTE**	**2005 Allowable /PTE**	**2010 Allowable /PTE**
Ammonium Nitrate	6.7%	10.2%	7.5%	12.1%	10.0%	8.2%
Ammonium Sulfate	48.1%	32.8%	41.5%	23.9%	22.4%	22.2%
Road Dust	8.6%					
Mobile Sources		37.5%	30.6%	42.1%	46.1%	48.7%
Other Area Sources		10.4%	8.5%	11.5%	11.5%	11.1%
Industry/RWC	36.7%					
RWC		4.0%	3.3%	3.8%	3.9%	3.9%
Industry		5.1%	8.6%	6.5%	6.2%	5.9%

Garrett & Gould PM_{10} Source Group Contributions ($\mu g/m^3$)						
Source Group	**1999 CMB**	**1999 Actual**	**1999 24-hr Max**	**2000 Allowable /PTE**	**2005 Allowable /PTE**	**2010 Allowable /PTE**
Ammonium Nitrate	8.0	12.5	11.2	13.5	11.5	9.8
Ammonium Sulfate	57.5	40.1	62.2	26.7	25.7	26.7
Road Dust	10.2					
Mobile Sources		45.8	45.8	46.9	52.9	58.5
Other Area Sources		12.7	12.7	12.8	13.2	13.3
Industry/RWC	43.8					
RWC		4.9	4.9	4.3	4.5	4.7
Industry		6.2	12.8	7.2	7.1	7.1
Mean PM_{10} ($\mu g/m^3$)	119.5	122.3	149.8	111.4	114.8	120.1

Table 5-3 Predicted PM_{10} Source Contributions For 2010 at Worst Case Receptor in the Model Domain.

2010 PM_{10} Source Group Contributions ($\mu g/m^3$) for 2010 at Worst Case Receptor (a) December 23-31, 1999 Episode			
Source Group	**Contribution On Maximum Day**	**Contribution On Design Day**	**Average Contribution**
PM_{10} ($\mu g/m^3$)	179.6	162.1	133.2
Ammonium Nitrate	8.2	10.9	9.4
Ammonium Sulfate	15.9	64.4	25.0
Mobile Sources	118.7	40.8	64.6
Other Area Sources	13.8	15.6	14.1
Industry	14.1	28.1	16.6
RWC	8.8	2.2	3.5
PM_{10} Source Group Contributions ($\mu g/m^3$) for 2010 at Worst Case Receptor Vehicle Suspended Dust Adjusted Based on CMB Source Contributions (b)			
Source Group	**Revised Contribution On New Maximum Day**	**Revised Contribution On New Design Day**	**Revised Average Contribution**
PM_{10} ($\mu g/m^3$)	131.5	90.6	84.7
Ammonium Nitrate	10.9	8.2	9.4
Ammonium Sulfate	64.4	15.9	25.0
Mobile Sources	10.2	29.7	16.2
Other Area Sources	15.6	13.8	14.1
Industry	28.1	14.1	16.6
RWC	2.2	8.8	3.5

(a) Location of receptor is shown in Figure 5-3.

(b) Mobile source contribution reduced by a factor-of-four based on the over-prediction of the source category when compared to the CMB results for December 23-31, 1999.

5.1.2 Multi-Component Hybrid Analysis Approach

The overall goal of the attainment demonstration is to provide convincing evidence that the emissions control strategies included in the SIP are adequate to provide for attainment and maintenance of the PM_{10} NAAQS in the PVNAA. This demonstration has historically been done in other areas, with other SIPs, based solely on the results of dispersion modeling analysis. In this instance, however, the results should not be based on a single number from the dispersion model. The model provides invaluable insight into the culpable sources, transport and fate of PM_{10}, and hot spot locations. However, due to uncertainties within the modeling system (emissions, wind fields, chemistry etc.), additional information will be used to provide this evidence.

The "multi-component" analysis approach is designed based on the draft template for $PM_{2.5}$ entitled *Guidance for Demonstrating Attainment of Air Quality Goals for $PM_{2.5}$ and Regional Haze*-Draft, U. S. EPA, January 2, 2001. The primary concepts borrowed are related to a weight of evidence determination in that document, but not the rigorous formality of specific steps or components. Thus, the multi-component approach includes the concepts of performing complementary analysis of measured air quality, emissions inventory, meteorological data, dispersion modeling, and other modeling (chemical mass balance, speciated rollback, etc.).

Corroboratory analysis using all available aspects of air quality assessment will allow for an assessment methodology alternative to the standard demonstration methodology which relies exclusively on dispersion modeling to demonstrate compliance. The PVNAA dispersion modeling has been shown to provide results that cannot be fully reconciled with monitored air quality data. The estimated concentrations at the monitors, however, were reasonable based on the range of uncertainties in the meteorological wind fields, the emission estimates, the source characterization, and the model's characterization of atmospheric phenomena. These estimates from the modeling were thus an essential part of the multi-component demonstration and serve as an influential tool along with other components of air emissions, modeling, and monitoring to determine whether the NAAQS can be achieved and attained. This alternate tool allowed the selection of appropriate emission reduction measures, as well as demonstrated attainment of the 24-hour and annual PM_{10} NAAQS.

This proposed approach builds a demonstration of compliance with the NAAQS for the period 2000-2020. The foundation of this case was the dispersion modeling because of its ability to resolve temporal and spatial issues of emissions, meteorology, and the atmospheric physics of the study area. The model's ability to directly compare modeled concentrations to the NAAQS, and to integrate scientific considerations regarding transport and dispersion with source and emission characteristics as well as observed data, give the modeling results a prominent role. This prominence is highest when the model performs satisfactorily in terms of reproducing observed data. The model is not as convincing when the estimates are far in excess of the observed data. The dispersion modeling for the PVNAA showed that the modeling was within a reasonable estimating range of the maximum observed concentrations. Even though the modeled concentrations were significantly higher than the observed concentrations, the modeling for the PVNAA meets the criteria for representativeness of the area and can be used in a relative sense. This allows the multi-component approach to proceed with a reasonable conviction that the modeling is telling part of the ambient air quality story and that supplemental related analysis can provide a preponderance of evidence to convincingly conclude the NAAQS is currently being attained and will continue to be attained in the future.

The types of corroborative analyses used, as recommended in the guidance are: application of air quality models, trends in observed air quality, estimated emissions, and an outcome of observational models (CMB and rollback). These are recommended along with consideration of factors affecting credibility of each analysis, and evaluation of analysis outcomes to evaluate whether an analysis is viable for assessing a PVNAA strategy for compliance. Guidance suggests other types of analysis can be identified and used, thus, this analysis will include several ambient air assessment analyses including:

- CALPUFF Modeling of PVNAA episodes, base year, and future years for compliance with the 24-hour NAAQS,
- Monitoring data including filter analysis of observed data as well as trends analysis of historical data,
- Determination of the effect of the largest industrial source, Astaris (FMC), being shut down (located in the FHNAA),
- Climatological review of the weather data and coincidence with high PM_{10} ambient air days,
- CMB analysis,
- Speciated rollback analysis, and
- Base year and future year emission inventories.

Proposed corroboration of the analyses will be based on the combined conclusions regarding whether each analysis supports or does not support the attainment probability. See Appendix H for the full multi-component hybrid approach and the corresponding credibility schedule for all of the analyses.

5.1.2.1 Rollback Modeling

Speciated rollback modeling was performed to further the demonstration that the 24-hour and annual PM_{10} concentrations will be in compliance with the NAAQS. The speciated linear rollback model is a simple, spatially averaged mathematical model that assumes a linear relationship between a) ambient particulate concentrations for each chemical component and b) the area-wide emissions of corresponding chemically similar primary particulate emissions and precursor gases. The model disaggregates the major airborne particle components into chemically distinct groups that are contributed by different types of sources. A full description of the rollback methodology can be found in Appendix G.

The rollback model uses chemically resolved background and ambient air PM_{10} concentrations (filter analyses), emissions inventories, and chemical source profiles to assess the impacts of sources and source groups on PM_{10} concentrations. Ratios of emissions and concentrations for future years as compared to a design concentration in a base year are used to determine compliance for future years and alternate control strategies. Table 5-4 summarizes the 24-hour PM_{10} speciated rollback model results from 2000 to 2020. Two scenarios were pursued with the rollback modeling: scenario 1 deals only with primary particulate emissions and does not address secondary aerosol formation, while scenario 2 is NO_x limited or ammonia unlimited. A graphical depiction of this data is shown in Figure 5-4.

Even though the total design 24-hour concentrations into the future are similar with either scenario, the basis of these concentrations is significantly different in terms of secondary aerosol emissions. The reason concentrations between scenarios 1 and 2 are similar is because the relative change in emissions between the base year and future years is similar. Regardless, scenario 1, which does not consider secondary aerosols, does not seem to apply to the PVNAA airshed especially during the wintertime episodes where secondary reactions in the atmosphere are common.

Regardless of the year, the speciated linear rollback model demonstrates that the 24-hour PM_{10} standard will be maintained. The trends for 24-hour PM_{10} concentrations show a dramatic decrease (44 or 41 $\mu g/m^3$) from the base year by 2005 followed by a gradual increase from 2005 to 2020. This dramatic decrease is due to the closure of the Astaris (FMC) facility (2001), which eliminated about 3,000 tons of SO_2 per year from the airshed. Although not shown, the closure results in a reduction of 61 tons per year of ammonium sulfate emissions and a reduction of 6,370 tons per year of secondary ammonium sulfate emissions.

Figure 5-5 shows the final data that were used as the speciated ambient concentrations for the 24-hour rollback model evaluation. The speciated ambient 24-hour monitoring seems to represent a typical secondary aerosol event, where ammonium sulfate makes up the majority (48%) of the 24-hour PM_{10} design concentration. The geologic component is the second largest contributor followed by organic, ammonium nitrate, and ammonium phosphate.

Table 5-4 Summary of the 24-hour Rollback Model Results Across the Modeling Domain for the Period 2000 to 2020.

Emissions Case	Base Year µg/m^3	2005 µg/m^3	2010 µg/m^3	2015 µg/m^3	2020 µg/m^3
Scenario 1- No Secondary Aerosols	146	103	104	107	110
Scenario 2 - NO_x Limited	146	106	107	108	111

Note: 24-Hour NAAQS = 150 µg/m^3

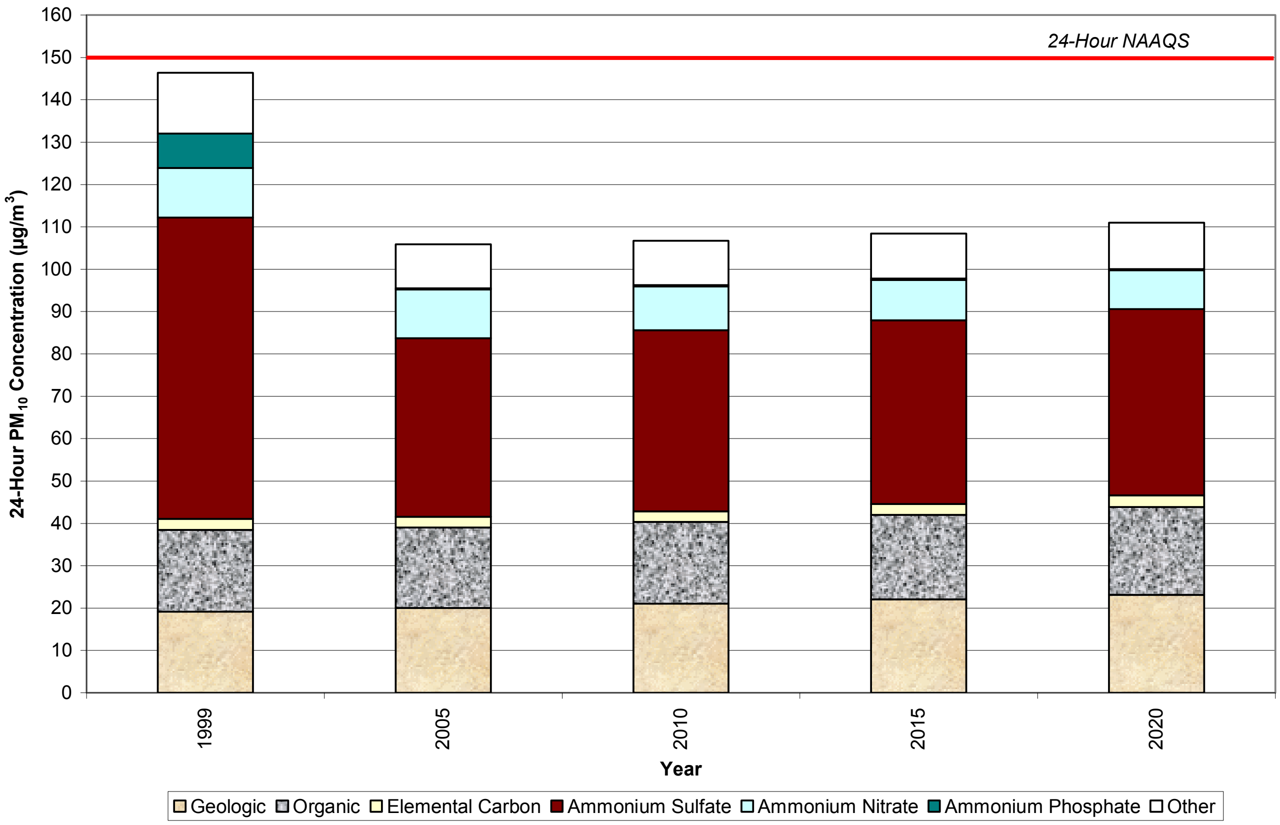
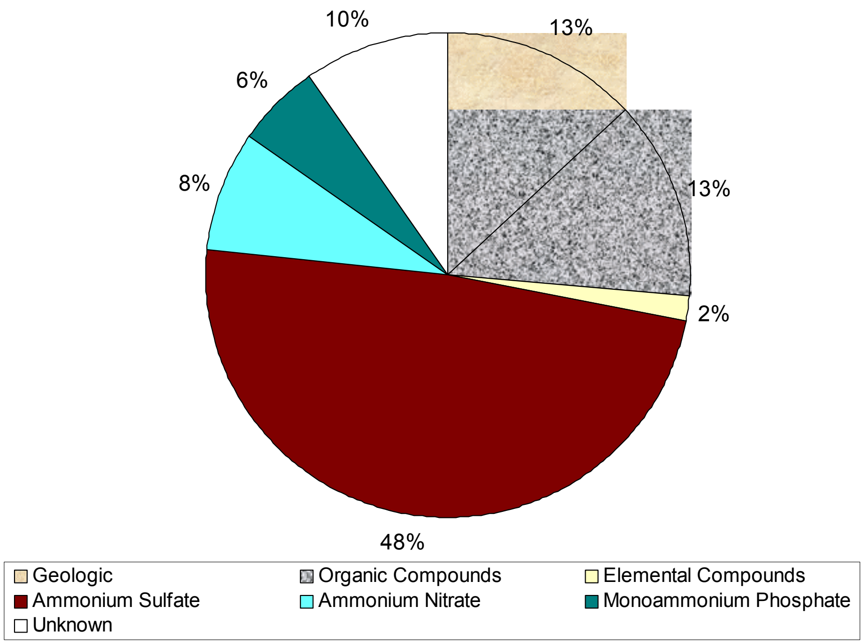


Figure 5-4 Predicted 24-hour PM_{10} Concentrations by Speciated Rollback Modeling – Scenario 2.



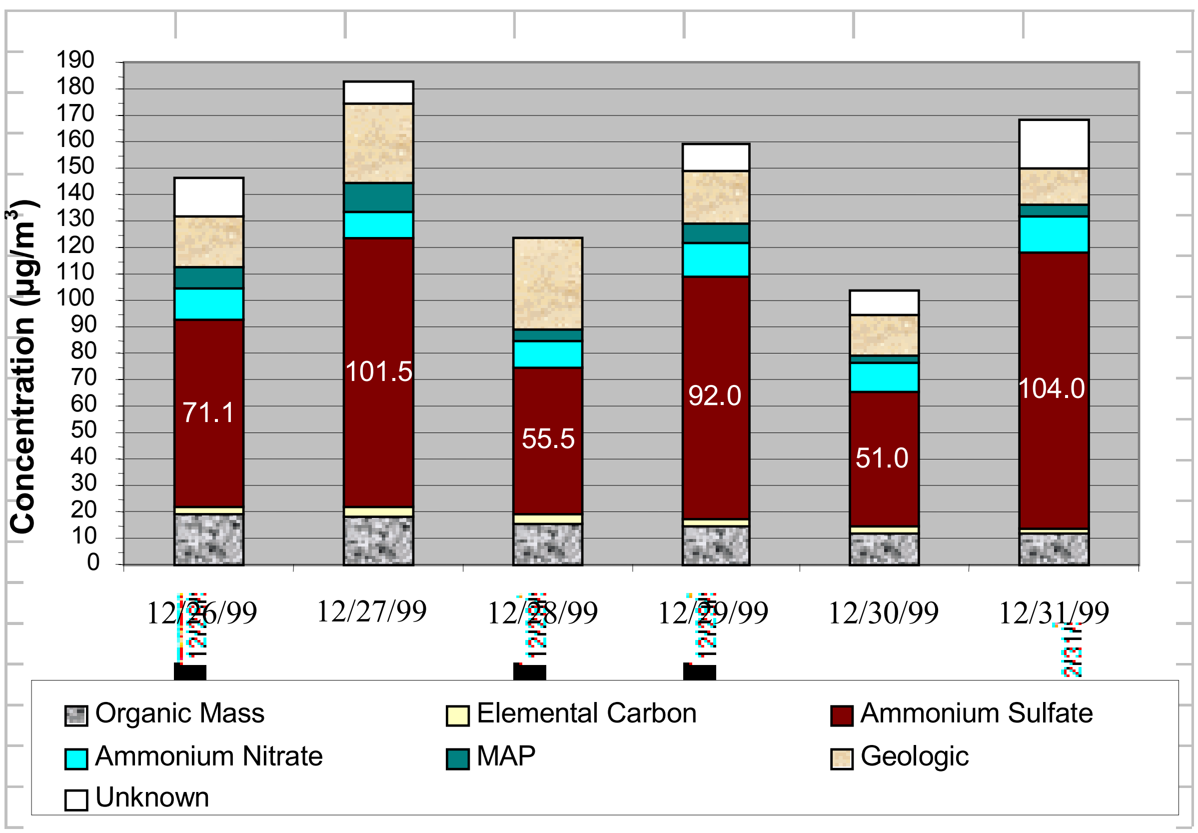


Figure 5-5 Relative and Absolute on PM_{10} Filters for 24-hour Simulation.

5.1.2.2 Air Quality Data

The basis for determining the air quality of any area is accurate and adequate monitoring data. Data collected from an area's monitoring network are used to establish air quality trends, to determine if and when air quality standards are exceeded, and to aid in the development of appropriate air quality control strategies when standards are exceeded. Likewise, because local meteorology plays an important role in the area's air quality, high quality meteorological data is extremely important in conducting modeling studies and interpreting the results.

PM_{10} ambient air quality monitoring has been conducted since 1986 in the Pocatello area to characterize problems and support improvement planning and analysis. Table 5-5 shows the various air monitoring stations, the parameters sampled for, and the dates monitoring has been conducted.

Table 5-5 Pocatello Area Air Quality Monitoring Locations.

Area	Location	Date in Operation	Parameters Monitored
Pocatello	Sewage Treatment Plant (STP)	1986-Present	SO_2
		1986-2002	PM_{10}
	Idaho State University (ISU)	1988-1999	PM_{10}
	Chubbuck School (CS)	1988-1999	PM_{10}
		1998-2003	$PM_{2.5}$
	Garrett and Gould (G&G)	1990-Present	PM_{10}
		1998-Present	$PM_{2.5}$
		1994-1998	SO_2 , and NO_x
		1994-1998	Meteorological data
Inkom	Inkom Bible Church	1994-2002	PM_{10}

The monitoring stations are subject to strict quality assurance standards. These stations use the EPA Federal Reference Method equipment and regulations to determine the area's compliance with the NAAQS. The sites have been approved by the EPA for inclusion in the state's overall monitoring network and are designated as State and Local Air Monitoring Sites (SLAMS). Monitoring is conducted in accordance with 40 CFR 58 Subpart C.

Monitoring in and around the Pocatello area has consisted of monitoring for PM_{10}, $PM_{2.5}$, SO_2, NO_x, and meteorological data. Historical PM_{10} sites are located at the Pocatello Sewage Treatment Plant (STP), Idaho State University (ISU), Chubbuck School (CS), and Inkom. The current Portneuf Valley Monitoring Network (Table 5-6) includes monitoring for the following: SO_2 at STP, $PM_{2.5}$ at CS, and PM_{10} (Hi-Vol Filters and TEOM) and $PM_{2.5}$ (Partisol-FRM $PM_{2.5}$ sampler, and TEOM) at Garrett and Gould (G&G). Table 5-7 shows the years of operation for the current monitoring locations.

Table 5-6 Current Pocatello Area Air Quality Monitoring Locations.

Area	Location	Date in Operation	Parameter Monitored	Monitor Type	Sampling Schedule
Pocatello	Sewage Treatment Plant (STP)	1986-Present	SO_2	SO_2 Analyzer API 100 A & Calibrator	Continuous
	Garrett and Gould (G&G)	1990-Present	PM_{10}	Hi-Volume Filter 2 Grasbey 1200 VFC	1:3
		1995-Present	PM_{10}	TEOM R&P 1400A	Continuous
		1998-Present	$PM_{2.5}$	Partisol-FRM $PM_{2.5}$ sampler 2 R&P 2025	1:6
		2001-Present	$PM_{2.5}$	TEOM R&P 1400A	Continuous

Table 5-7 Current Monitoring Sites and Their Respective Years of Operation.

Monitoring Site	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03
STP SO_2 Analyzer	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
G&G PM_{10} Hi-Vol Filter					■	■	■	■	■	■	■	■	■	■	■	■	■	■
G&G PM_{10} TEOM										■	■	■	■	■	■	■	■	■
G&G Partisol-FRM $PM_{2.5}$ sampler													■	■	■	■	■	■
G&G $PM_{2.5}$ TEOM																■	■	■

Note: Shaded cells indicate years of operation

An analysis of the 24-hour PM_{10} data for three monitoring sites shows that no violations of the 24-hour NAAQS have occurred since 1993, see Table 5-8 for details. Since 1996, all sites in the nonattainment area have demonstrated attainment. EPA determined the PVNAA has been in attainment for PM_{10} since December 1996 by final rule dated July 25, 2002. (67 Fed. Reg. 48522 (July 25, 2002).

Table 5-8 Portneuf Valley Nonattainment Area PM_{10} Exceedances.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1988	0	0	0	STP (10) STP (10) STP (10)
1989	ISU (1)	0	0	STP (10) STP (11)
1990	STP (1)	0	0	STP (10)
1991	0	0	STP(9)	0
1992	0	0	0	0
1993	ISU/G&G (1)	0	0	0
1994	0	0	0	0
1995	0	0	0	0
1996	0	0	0	0
1997	0	0	0	0
1998	0	0	0	0
1999	0	0	0	G&G (12) G&G (12) G&G (12)
2000	0	0	0	0
2001	0	0	0	0
2002	0	0	0	0

( ) denotes month exceedance occurred.

5.1.2.3 Trend Analysis of Historical Data

The major component of all 24-hour PM_{10} exceedances and violations in the downtown Pocatello area has been ammonium sulfate (see Figure 5-5). Figures 5-6 to 5-9 depict a summary of the PM_{10} and $PM_{2.5}$ levels from the winter periods (November through February) of 1999 to 2003. During the December 23-31, 1999 episode as described in figure 5-6, three days exceeded the 24-hour PM_{10} standard. During this period the Astaris (FMC) facility was phasing in a number of their environmental controls. The Astaris (FMC) facility ceased operation in December 2001. Figure 5-7 shows the effects of the environmental controls at Astaris (FMC) as well as the closure of the facility. Figures 5-8 and 5-9 (graphs of the 2001-2002 and 2002-2003 winters) show graphically that winter air quality has significantly improved since the Astaris (FMC) facility has closed. In the winter of 2001-2002, there were no 24-hour values above 70 μg/m^3 and for the winter of 2002-2003, there were no 24-hour values above 50 μg/m^3.

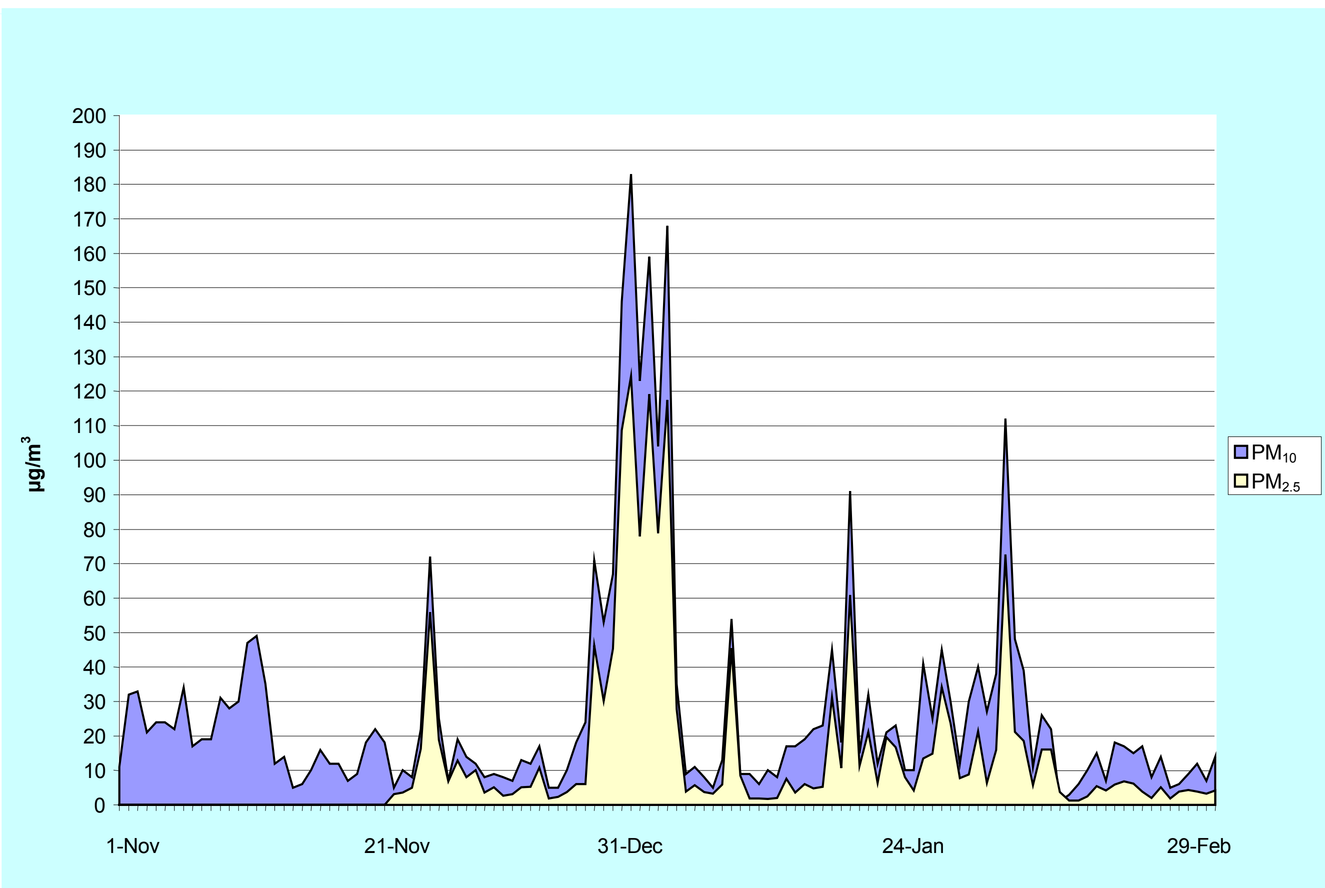


Figure 5-6 November 1999 to February 2000 G&G PM_{10} and $PM_{2.5}$.

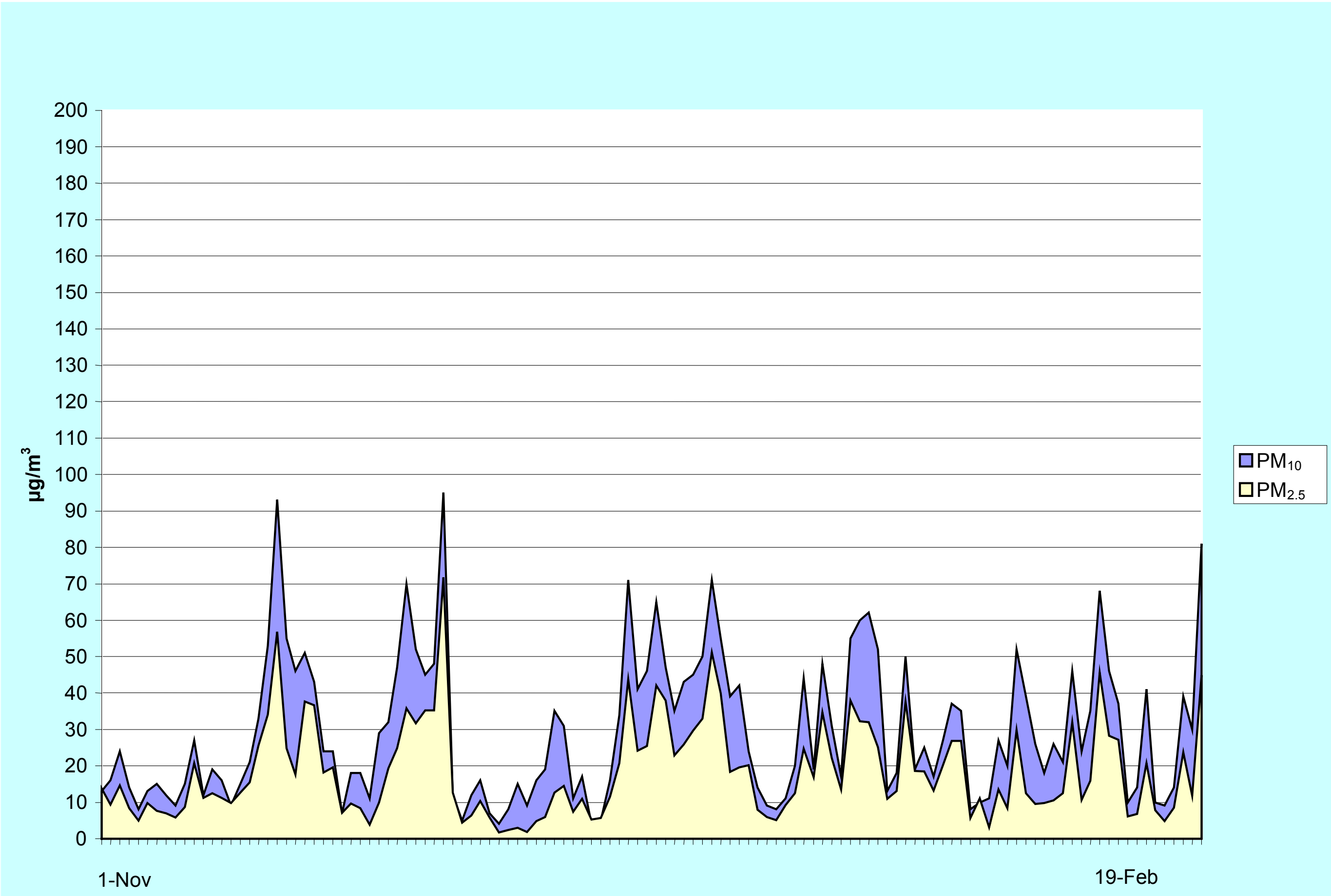


Figure 5-7 November 2000 to February 2001 G&G PM_{10} and $PM_{2.5}$.

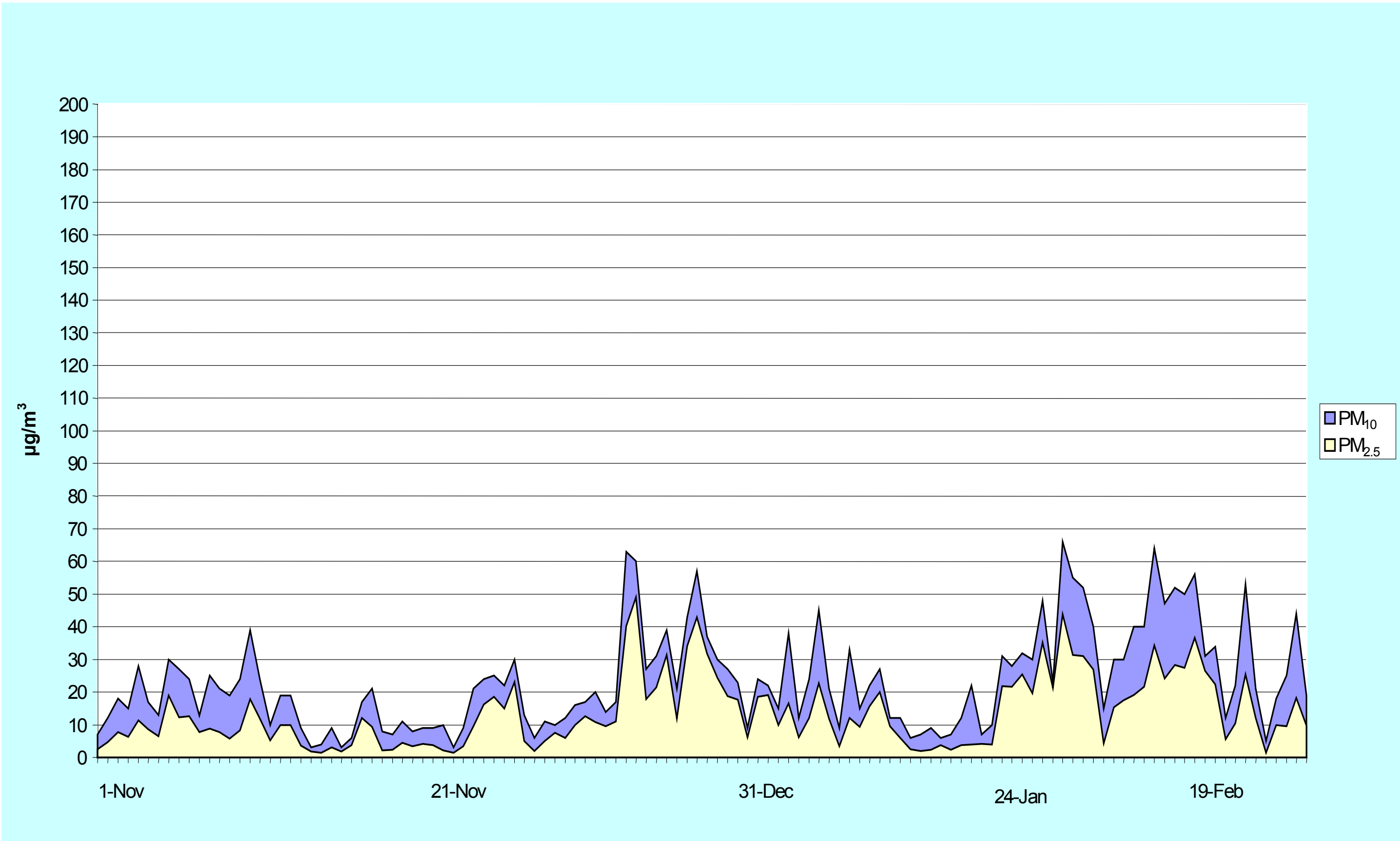


Figure 5-8 November 2001 to February 2002 G&G PM_{10} and $PM_{2.5}$.

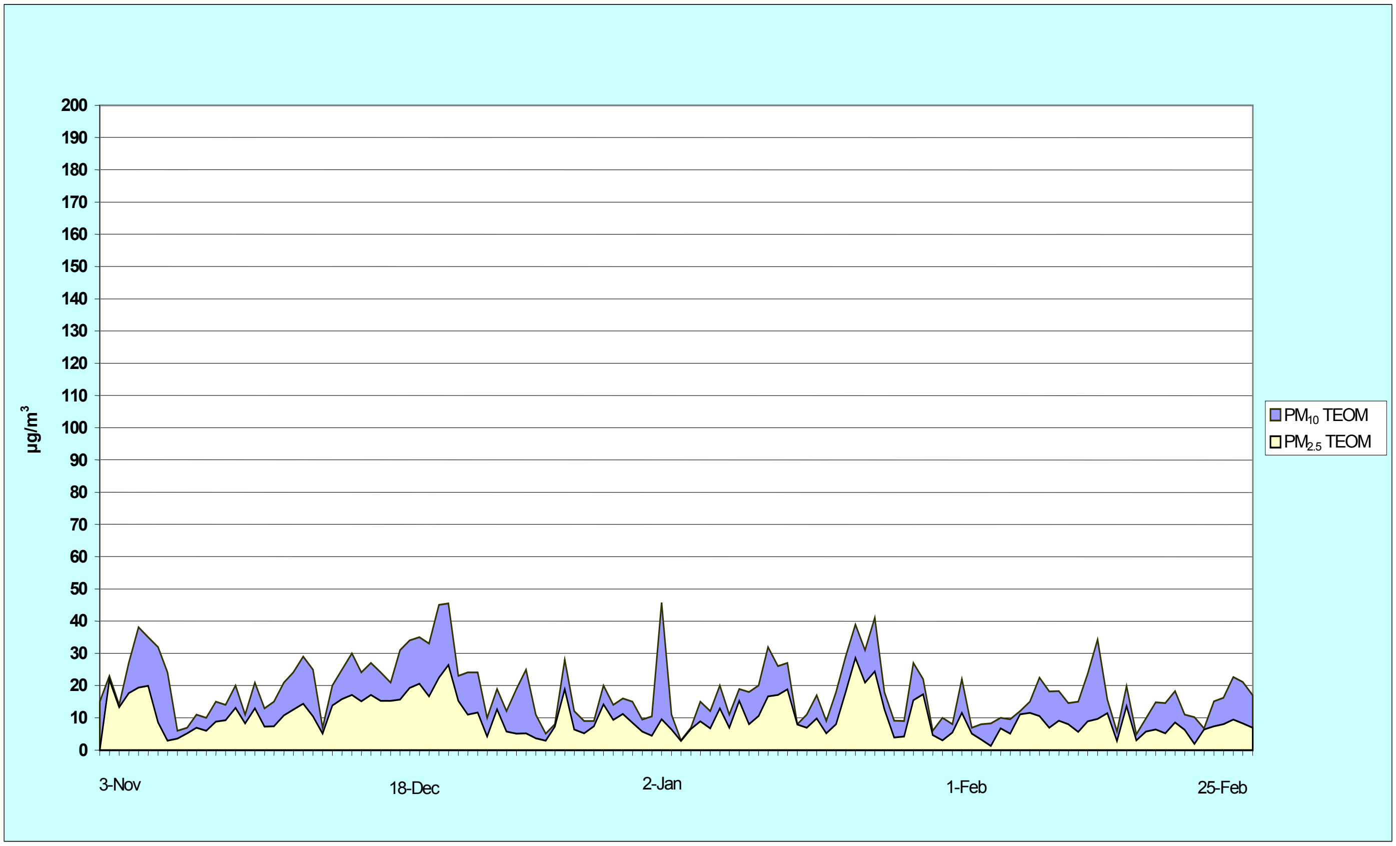


Figure 5-9 November 2002 to February 2003 G&G PM_{10} and $PM_{2.5}$.

5.1.2.4 Effect of the Astaris (FMC) Closure

The Astaris (FMC) facility, within the FHNAA, ceased operation in December 2001. The plant is presently going through decontamination and decommissioning. Figure 5-10 depicts the change in emissions for the industrial source category across the modeling domain. The decrease in emissions from 2000 to 2005 was due mainly to the closure of the Astaris (FMC) facility. The industrial emissions for all pollutants represented are predicted to decrease through the 20-year horizon after the 2000 base year emissions. Figure 5-11 depicts the emission inventory for all the source categories within the modeling domain. As modeled, the NH_3 emissions remain relatively consistent from 2000 to 2020, while emissions in all other source categories (PM_{10}, SO_2, and NO_x) are expected to decrease from the 2000 base year emissions. There is a slight increase predicted in PM_{10} emissions through the 20-year horizon, however, these emissions still would not reach the level seen in 2000.

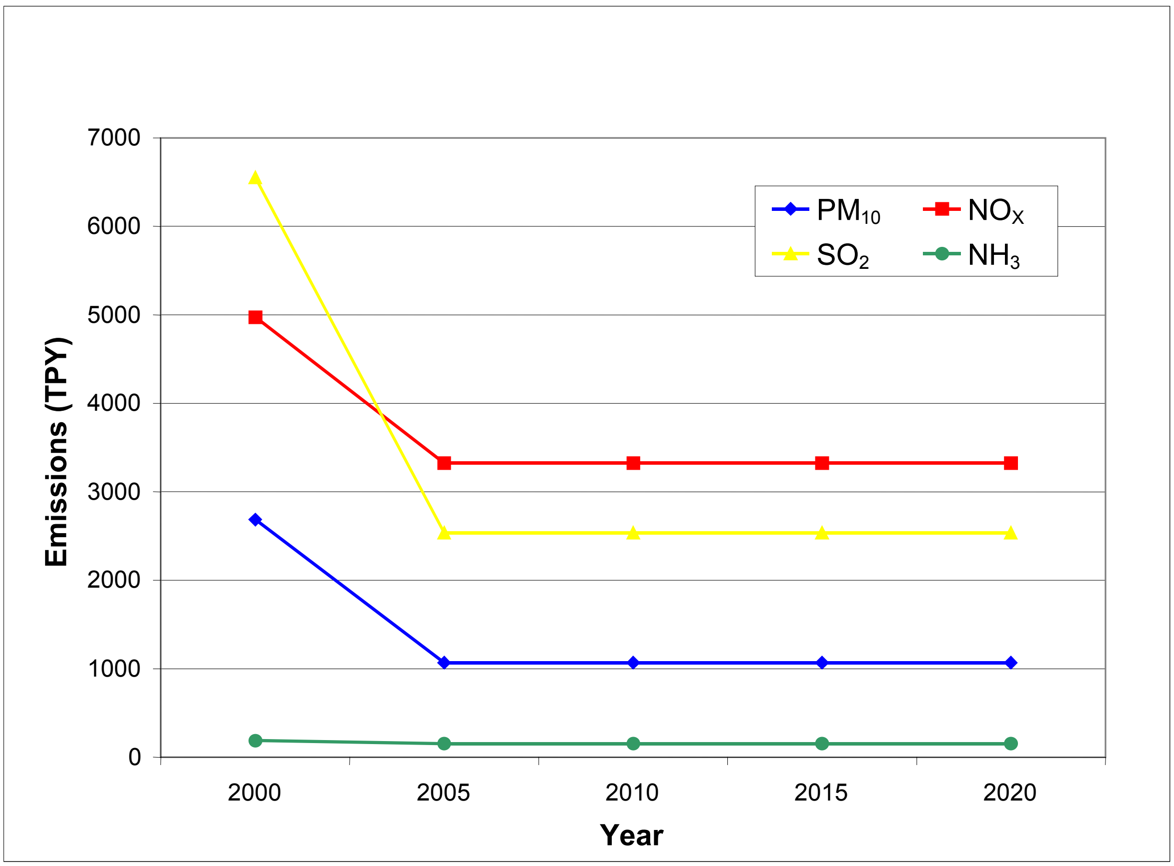


Figure 5-10 Emission Inventory Trends for the Industrial Source Category. The Decrease in Emissions from 2000 to 2005 is Mainly due to the Closure of the Astaris (FMC) facility.

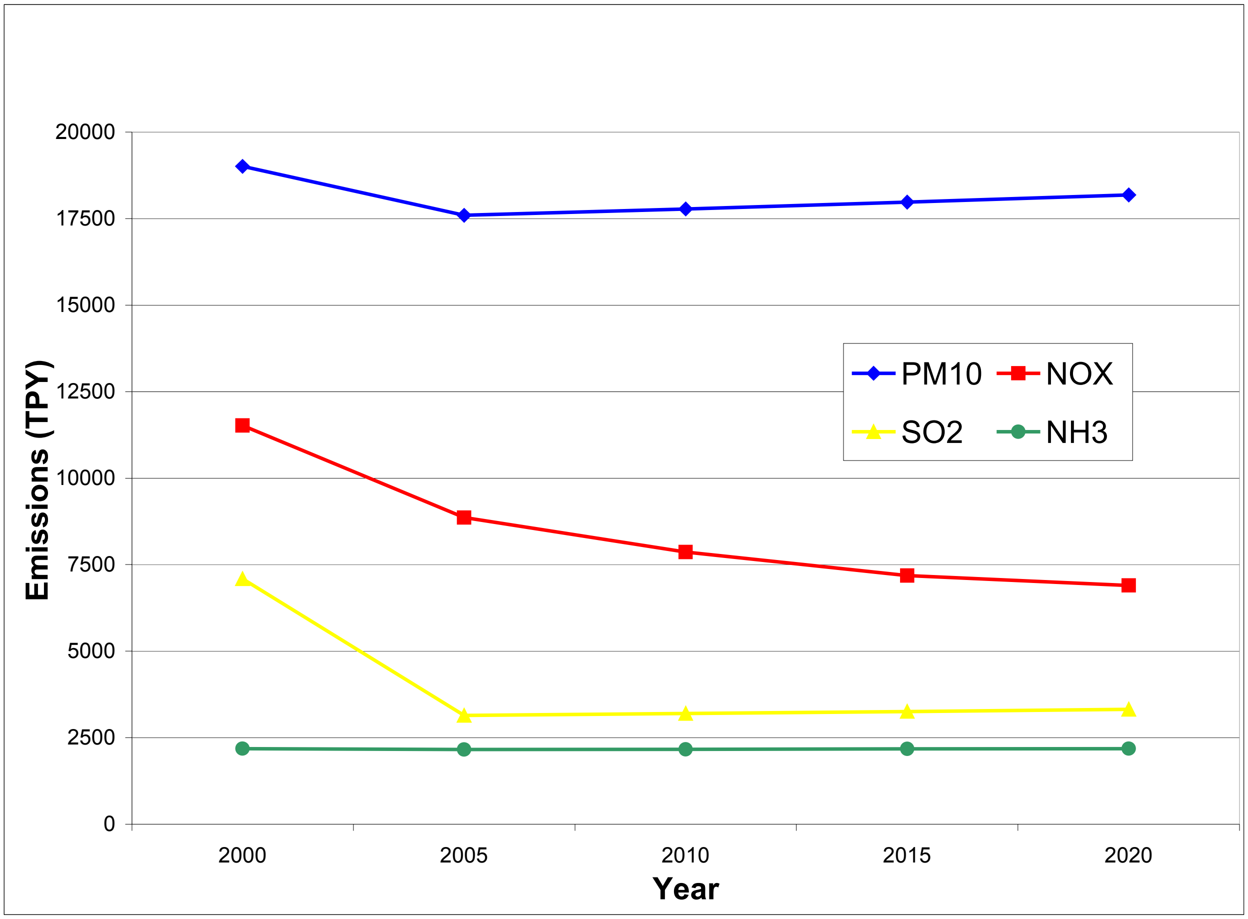


Figure 5-11 Emissions Inventory Trends for all Sources within the Modeling Domain from 2000 to 2020.

5.1.2.5 Climatological Review of Meteorological Data with High Ambient Days

The majority of times when secondary aerosols are high in the PVNAA are in December or January when low wind speeds and stagnant conditions exist. In general, high secondary aerosol days are predominantly a wintertime occurrence in Pocatello. Meteorological factors affect secondary aerosol (ammonium sulfate/ammonium nitrate) concentrations. This thereby warrants identifying meteorological conditions that can contribute to increases in PM_{10} concentrations driven by increases in secondary aerosol formation, known as Poor Dispersion Conditions (PDC).

To establish a meteorological profile that will help forecast air quality trends, and to track meteorological conditions that may contribute to PM_{10} buildups, we have identified the following PDC set that will likely lead to a buildup of PM_{10}:

- any day with a maximum temperature of 32 °F or less, and
- any day with a mean wind speed of 5.5 mph or less, and
- any day when the ground is snow-covered, and
- any day with precipitation of 0.06 inch or less.

Figure 5-12 shows the number of days each winter (November through February) that meet these PDC (or meteorological conditions) from 1984 through 2003, based on data from the Pocatello National Weather Service.

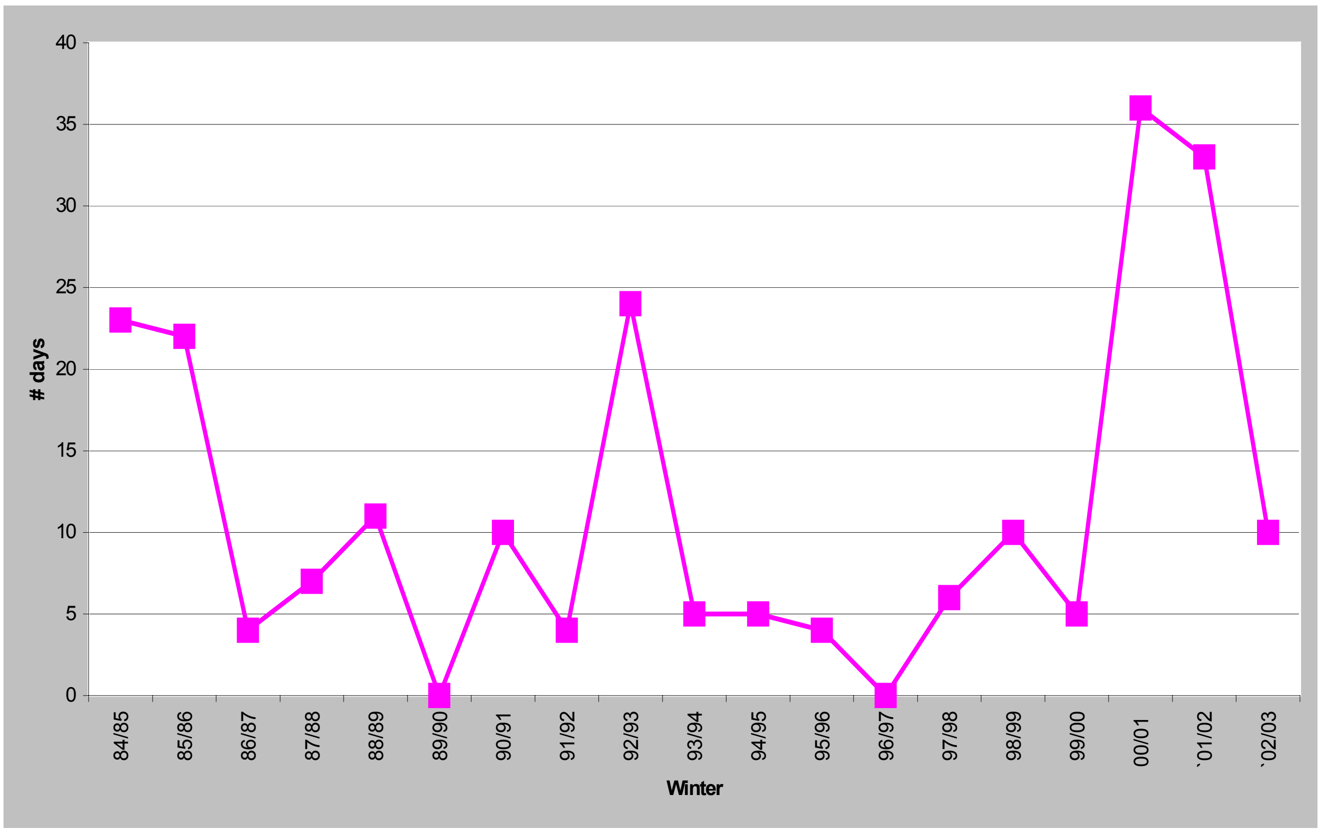


Figure 5-12 Number of Days which met PDC from 1984 to Present During Winter Months (November-February).

The classic inversion typically exhibits: cold high-pressure systems with low-pressure gradients, resulting in low winds and shallow inversions that inhibit dispersion and allow buildup of higher concentrations of air pollutants. With a high-pressure system, there will not likely be any appreciable precipitation to scour pollutants out of the atmosphere.

To test the fit of these PDC to actual PM_{10} conditions, all days that were classified MODERATE (> 54 $\mu g/m^3$) or greater from November through February since January 2001 when controls were in place at Astaris (FMC) were examined. Since January 2001, there have been 15 days that reached MODERATE levels. Fourteen of these 15 moderate days fit the PDC. Table 5-9 presents the meteorological and PM_{10} conditions for the period February 12 through February 17, 2002.

Table 5-9 Meteorological and PM_{10} Conditions for the Period February 12-17 2002

Date	PM_{10}	Max Temp (°F)	Avg. Wind speed (mph)	Snow cover	Precipitation (inches)
12-Feb-02	40	25	4.1	3	0
13-Feb-02	64	32	5.5	3	T
14-Feb-02	47	30	**5.8**	3	0
15-Feb-02	52	24	4.1	2	T
16-Feb-02	50	29	**6**	2	0
17-Feb-02	56	**38**	2.7	2	0

During the 6-day period shown in Table 5-9, 3 days fit the PDC while 3 days did not. The days that did not meet PDC are shaded; the condition that was not met (failed) is underlined and bolded. Feburary 17, 2002 was the only day in this period that failed to meet PDC that had MODERATE air quality recorded.

Before January 2001, 68% of the MODERATE days occurred on days that did not meet PDC. However, since 2001, with all major sources in the modeling domain operating with controls and in a steady predictable manner, 93% of all MODERATE days met PDC; one day (February 17, 2002) became MODERATE that did not meet PDC. This shows that the PDC will be a valuable tool to predict PM_{10} trends for the Daily Air Quality Index (AQI) and Woodstove Program.

Since 2001, as seen in Figure 5-12, the Pocatello region has had the most number of PDC days on record (compared to other years), and yet no ambient PM_{10} monitoring data from November to February showed concentrations greater than 100 $\mu g/m^3$. This is likely a result of FMC Federal Implementation Plan (FIP) controls, and the Astaris (FMC) site closure, in combination with pre-existing road sanding agreements and the woodstove program.

5.1.2.6 Chemical Mass Balance Analysis

Two chemical mass balance (CMB) analyses were performed for the PVNAA. The first was performed on the December 23-31, 1999 winter episode, and the second was performed to evaluate the Pocatello PM_{10} source contributions during 2001 and 2002. The latter was undertaken specifically to provide supporting information for the multi-component approach.

For the December 1999 episode, CMB analysis indicated the most significant contributor to PM_{10} was ammonium sulfate (51%). Industrial sources were also found to be significant contributors, ranging from 26% to 46%. Ammonium nitrate contributed less than 10% on average; road dust ranged from 2% to 17%. The model did not identify wood smoke and vehicle exhaust. Because the wood burning source profiles are similar to local industrial source profiles, it is probable that the wood smoke contribution is covered by the industrial contributions. Table 5-10 provides an overview of the CMB modeling results for the December 1999 episode.

Table 5-10 CMB Modeling Results for Pocatello, Idaho.

Site	Date	PM_{10} µg/m^3	Road dust µg/m^3 /(%)	Industrial µg/m^3 /(%)	$NH_{4(2)}SO_4$ µg/m^3 /(%)	NH_4NO_3 µg/m^3 /(%)	CMB Mass (%)
STP	Dec. 26, 1999	120	4.1 (3%)	43.4 (34%)	71.5 (56%)	8.9 (7%)	106.6
STP	Dec. 26, 1999	121	4.2 (3%)	41.7 (34%)	66.8 (55%)	7.6 (6%)	99.5
G&G	Dec 26, 1999	141	10.6 (6%)	76.1 (46%)	67.5 (41%)	11.2 (7%)	117.3
G&G	Dec, 27, 1999	177	18.2 (9%)	80.7 (39%)	97.3 (47%)	9.9 (5%)	116.4
G&G	Dec. 28, 1999	118	22.8 (17%)	49.8 (37%)	52.8 (39%)	9.1 (7%)	114
STP	Dec. 29, 1999	110	2.2 (2%)	32.7 (26%)	79.1 (61%)	12.5 (10%)	115
G&G	Dec. 29, 1999	153	12.1 (7%)	68.4 (37%)	91.2 (50%)	12.1 (7%)	119.4
G&G	Dec. 30, 1999	100	10.8 (10%)	38.3 (34%)	52.3 (46%)	10.2 (9%)	111.6
G&G	Dec. 31, 1999	160	8.9 (5%)	45.2 (26%)	105.4 (61%)	12.2 (7%)	107.3

For the 2001-2002 CMB analysis, the primary PM_{10} sources in Pocatello are geologic, secondary aerosol, primary particulate from phosphate industry sources, residential woodburning, and mobile sources. The geologic portion includes road dust, while the mobile source is just the tail pipe emissions for the CMB (see Appendix F). The primary PM_{10} emissions from automobiles are insignificant; however, the automobiles emit significant NO_x emissions, which are precursors of secondary ammonium nitrate. Secondary aerosols make significant contributions during the winter stagnation periods. The amount of influence from the industries located at the mouth of the valley depends on meteorological conditions. Higher impacts were observed during periods of light winds or stable conditions when the industrial plume spreads from the northeast into the valley in the late morning hours. Wood burning contributes in cold seasons. The concentrations of geologic materials are fairly constant even in different seasons. Specifically this CMB analysis indicated the following:

- Phosphate industry primary particulates and sulfate secondary aerosol contributed approximately 47 $\mu g/m^3$ or 58% to the highest 24-hour PM_{10} concentration, which was 81 $\mu g/m^3$ measured in 2001, prior to the Astaris (FMC) facility closure.
- The phosphate industry (primary PM_{10} and sulfate) emission contributions to the highest two 24-hour samples were 56% lower in 2002 after Astaris (FMC) shut down, consistent with a 62% decrease based on the reductions for these two species in the emissions inventory.
- PM_{10} trends statewide revealed a very consistent increase of 28% in 2002 for the two highest PM_{10} samples at each site. Typical urban sources of emissions in Pocatello (wood burning and geologic sources) increased similarly while the industrial sources of emissions decreased 56% between 2001 and 2002.
- An analysis of statewide climatological variation suggests that the 2002 highest PM_{10} concentration of 66 $\mu g/m^3$ was recorded during the worst stagnation year since 1994 (based on the highest two PM_{10} impacts each year). Since this 2002 value represents current emission levels, it may be independently concluded that the Portneuf Valley airshed is currently in attainment and will easily remain in attainment through the year 2020, with an estimated maximum PM_{10} concentrations of 78 $\mu g/m^3$, assuming an 18% growth rate for all sources between now and then.
- The 1989-2002 database of 40 speciated wintertime samples provides additional corroboration of the CMB results by showing that the analysis included all significant sources. In addition, it showed that non-industrial sources have a maximum wintertime contribution of about 60 $\mu g/m^3$ and that above 60 $\mu g/m^3$ the industrial sources dominate. This data set also provided estimates of the maximum historical wintertime contributions for all individual source categories. This allowed another independent and very conservative demonstration of attainment, with a predicted concentration in 2020 at the G&G site of 133 $\mu g/m^3$.

5.2 Annual Standard

For the attainment demonstration, DEQ is required to show that the PVNAA attained the annual PM_{10} NAAQS by the required attainment date of December 31, 1996. The last exceedance of the annual PM_{10} NAAQS was in 1990. Based on the controls implemented in the PVNAA and air quality monitoring data, no violations have occurred in the PVNAA. It is also important to note that the area has remained in attainment from 1990 to present (2004) based on monitoring data (see Table 5-11 for the annual average monitoring data). Upon agreement with EPA, DEQ, assisted by EQ, used linear speciated rollback modeling to provide the modeled demonstration of attainment. Rollback modeling predicted that in the base year the annual PM_{10} concentration was 26 $\mu g/m^3$, well below the annual PM_{10} NAAQS (50 $\mu g/m^3$)(see Table 5-12).

As part of the maintenance plan requirements, DEQ is required to prove that the PVNAA will maintain the annual PM_{10} NAAQS for 10 years beyond the attainment date (i.e., until 2006). Monitoring data proves that the PVNAA has maintained the NAAQS from 1990 to present (2003). The results of the rollback modeling along with the rest of the multi-component hybrid analysis show that the PVNAA will be in attainment through 2020 (24 years past the attainment date). The predicted annual rollback model results show that the annual PM_{10} concentrations are well below the NAAQS, with 2005 concentrations predicted at 25 $\mu g/m^3$. The other major contributor to demonstrating maintenance is the closure of the Astaris (FMC) facility on the FHNAA. With the closure of this plant, emissions were significantly reduced. Figure 5-11 shows a dramatic decrease in emissions (TPY) within the modeling domain from 2000 to 2005, with emissions remaining below the 2000 levels out to 2020. The following 5.2 subsections detail the various sections of the multi-component analysis and how they pertain to the annual standard demonstration of attainment and maintenance within the PVNAA.

5.2.1 Measured Annual Standard Values for the PVNAA

The Annual NAAQS requires that the yearly average of the 24-hour measurements over a 3-year period be 50 $\mu g/m^3$ or less. Table 5-11 presents the annual air quality data. From 1991 to the present, the annual standard has been attained at all sites in the PVNAA.

The annual average PM_{10} at STP and G&G were compared with the Palmer Drought Severity Index. The plot in Figure 5-13 shows that from 1988 through 1992 the area was in drought conditions. In 1993 the area was wetter than normal. This, plus the conversion of the Simplot facility to a wet process with a slurry pipeline, may have accounted for the large drop in the annual average at STP in 1993. As the wetter than normal years continued, annual averages dropped slightly until 1999. In the fall of 1999, the current drought began and reached “exceptional” drought (the worst rating on the index) in 2001. Even with this dry weather, however, the annual averages have remained relatively steady.

Table 5-11 Annual PM_{10} Concentrations for the PVNAA SLAMS Monitoring Sites.

Site	Year	Annual Average	3-year Average
STP	1986	54	
	1987	43	
	1988	54	50
	1989	53	50
	1990	46	51
	1991	46	48
	1992	53	48
	1993	36	45
	1994	35	41
	1995	27	33
	1996	31	31
	1997	28	29
	1998	27	29
	1999	32	29
	2000	31	30
	2001	27	30
ISU	1989	30	
	1990	22	
	1991	31	28
	1992	34	29
	1993	37	34
	1994	25	32
	1995	23	28
	1996	23	24
	1997	20	22
	1998	20	21
CS	1988	32	
	1989	35	
	1990	31	33
	1991	29	32
	1992	42	34
	1993	36	36
	1994	28	35
	1995	22	29
	1996	23	24
	1997	21	22
	1998	21	22

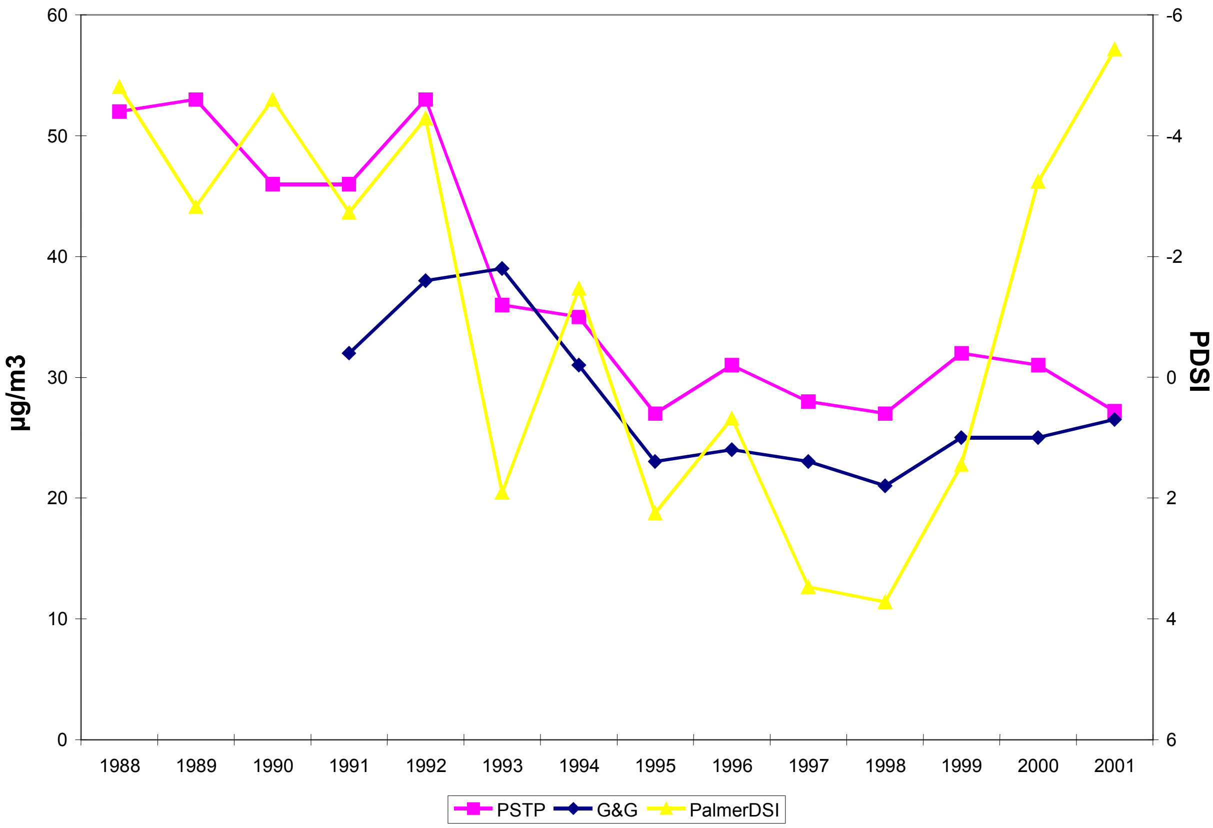


Figure 5-13 PM_{10} Annual Averages and Annual Palmer Drought Severity Index.

5.2.2 Rollback Analysis

Table 5-12 presents the speciated rollback results for the base year out to 2020 for the annual averaging periods. Two scenarios were pursued with the rollback modeling. The first scenario deals only with primary particulate emissions and does not address secondary aerosol formation, while the second scenario is NO_x limited or ammonia unlimited. The DEQ has determined that the PVNAA more closely fits scenario 2, due to the high amount of secondary aerosol formation during inversions and the fact that scenario 1 does not address secondary aerosol formation.

Table 5-13 summarizes the components of PM_{10}, while Figure 5-14 depicts the final data that was used as the speciated ambient concentrations for the annual rollback model evaluation. The findings of the annual speciation of the ambient monitoring show crustal material as the major contributor with less secondary aerosols as expected with an urban area surrounded by agriculture. The crustal component is 60% of the total, followed by organics, ammonium nitrate, and ammonium sulfate.

Regardless of the year, the speciated linear rollback model demonstrated that the annual NAAQS for PM_{10} will be maintained in the PVNAA. Annual PM_{10} concentrations by 2020 were estimated to decrease by about 1 μg/m^3 from a base year (2000) value of 26 μg/m^3 to 25 μg/m^3. Annual concentrations primarily consist of geologic material and organic mass. The annual composition for scenario 2 is shown in Figure 5-15; the future trends show little variability for the annual PM_{10} concentrations.

Table 5-12 Summary of Annual Rollback Model Results Across the Modeling Domain for the Base Year and Future Years.

Emissions Case	Base Year μg/m^3	2005 μg/m^3	2010 μg/m^3	2015 μg/m^3	2020 μg/m^3
Scenario 1- No Secondary Aerosols	26	26	26	26	27
Scenario 2 - NO_x Limited	26	25	25	25	25

Note: Annual NAAQS = 50 μg/m^3

Table 5-13 Summary of the Speciation Used in the Annual Ambient Concentrations for the Rollback Model.

Season: Date:	Winter 1/19/2001	Spring 4/19/01	Summer 9/22/01	Fall 10/17/01	Annual Average	Adj.[a] Annual Average
PM_{10} Concentrations as Measured at Garrett & Gould (µg/m^3)[b]						
PM_{10}	31.0	23.0	29.0	22.0	26.3	**26.3**
Components of PM_{10} Concentrations (µg/m^3)						
Geologic	10.6	20.9	28.0	17.8	19.3	**15.7**
Organic Mass	7.6	4.3	7.1	5.0	6.0	**4.9**
Elemental Carbon	0.9	0.3	1.0	0.5	0.7	**0.6**
Ammonium Sulfate	4.2	1.0	2.1	0.9	2.1	**1.7**
Ammonium Nitrate	11.6	0.8	0.9	2.0	3.8	**3.1**
Monoammonium phosphate (MAP)	0.2	0.4	0.7	0.4	0.4	**0.3**
Unknown	-4.1	-4.7	-10.8	-4.6	-6.1	**0.0**

[a] Chosen as the annual design concentration. This speciation was adjusted so that the sum of the components added up to 26.3 µg/m^3.
[b] PM_{10} concentrations were corrected to standard temperature and pressure.

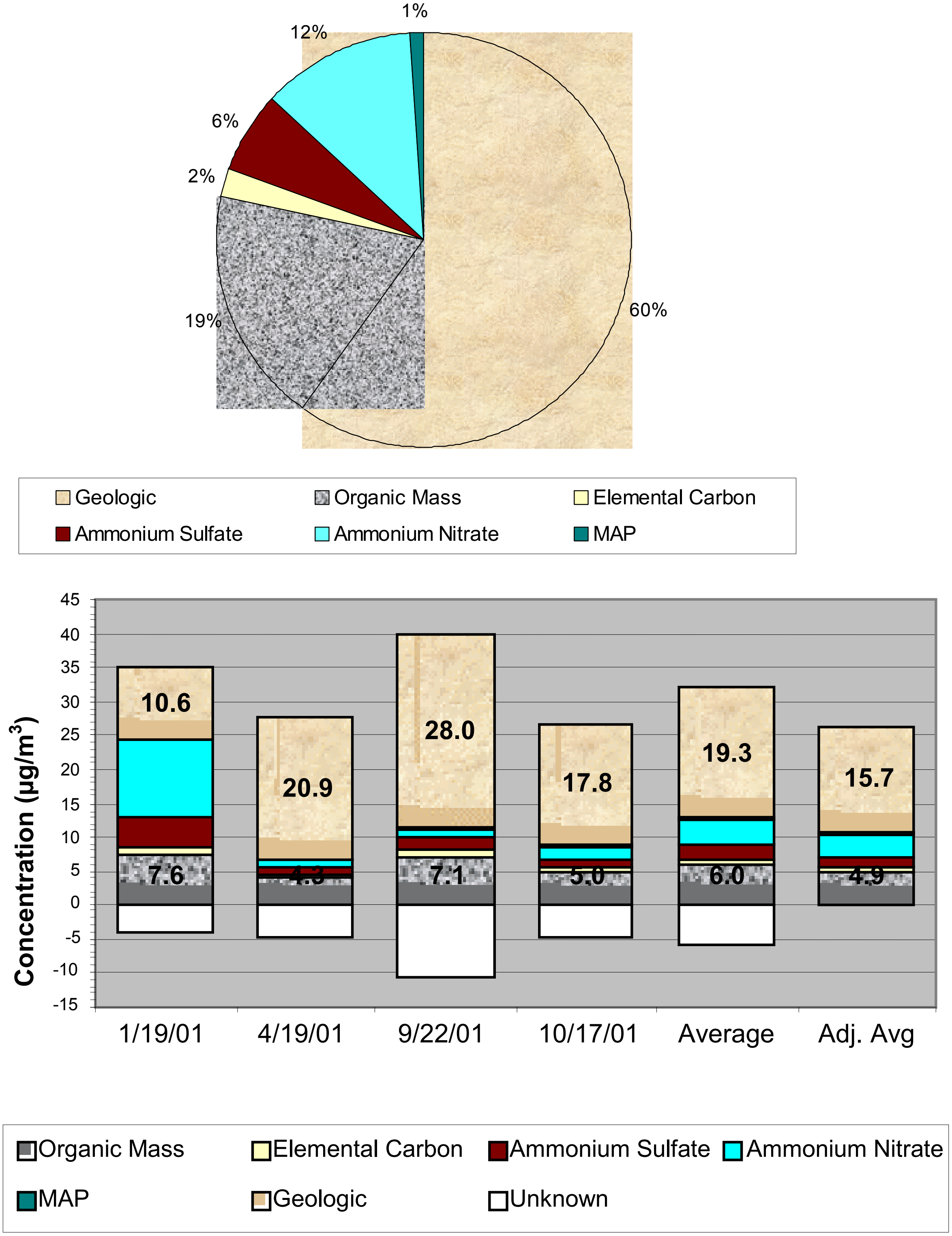


Figure 5-14 **Relative and Absolute Speciation on PM_{10} Filters for Annual Simulation.**

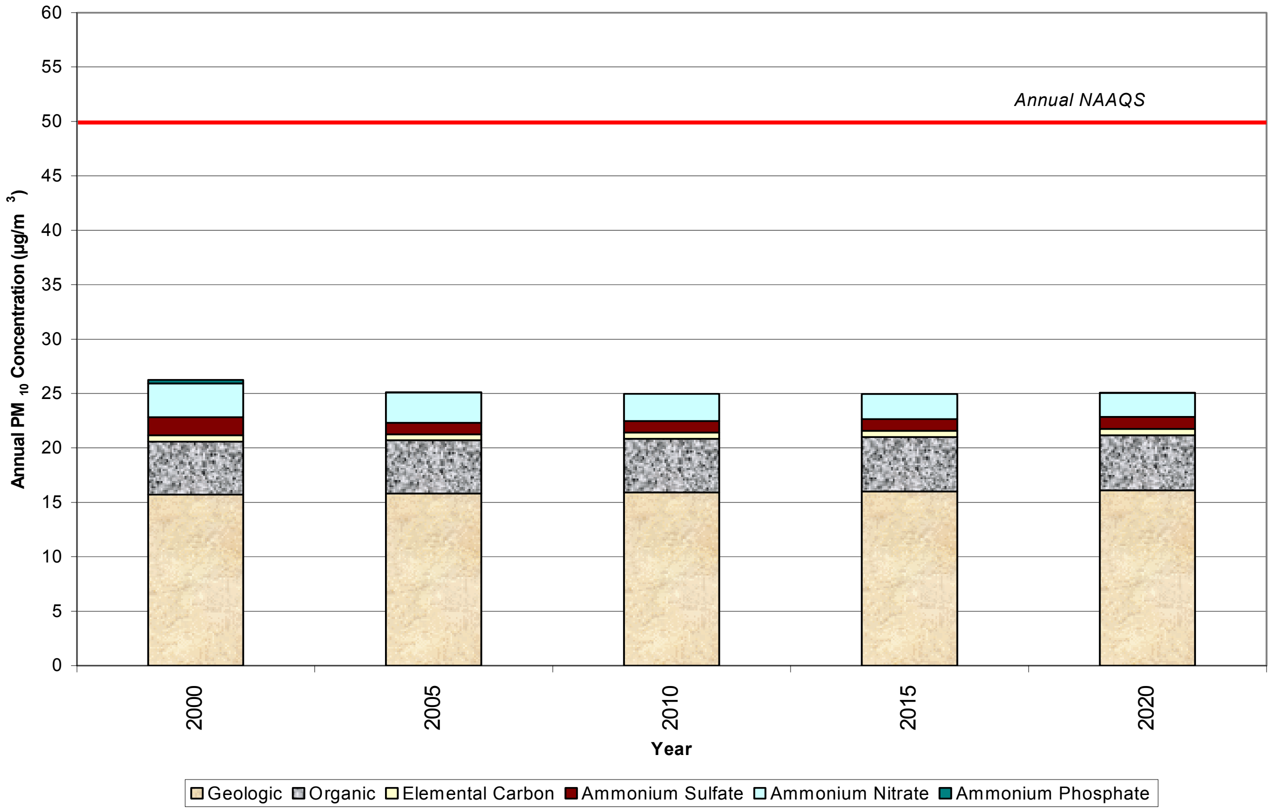


Figure 5-15 Predicted Annual PM_{10} Concentrations by Speciated Rollback Modeling – Scenario 2.

5.3 Continued Air Monitoring and Verification of Attainment

DEQ is responsible for monitoring PM_{10} levels in the Portneuf Valley. DEQ commits to comply with the continued air monitoring requirement of Title III, Section 319, of the CAA. The PM_{10} sites are operated in compliance with EPA monitoring guidelines set forth in 40 CFR Part 58, Ambient Air Quality Surveillance, and Appendices A through D of Part 58.

On an annual basis, the DEQ will analyze the three most recent consecutive years of ambient PM_{10} monitored data to verify continued attainment of the NAAQS for PM_{10} in accordance with 40 CFR Part 50. In keeping with the requirements of Title III, Section 319, of the CAA (as defined in 40 CFR Part 58.26), DEQ will continue to submit to EPA by July 1 of each year an annual report of PM_{10} data collected during the previous calendar year. These data, along with the data contained in the annual reports for the previous two years, will provide all the necessary information to determine whether the Portneuf Valley continues to comply with the PM_{10} NAAQS.

5.4 Permitting Program Role

Idaho Administrative Code rules for air pollution control (58.01.01) contain various permitting rules. The Industrial permitting rules are found in IDAPA 58.01.01.200-500. The permitting program requires permits for the construction and operation of new or modified major stationary sources within the NAA. Additionally, there are rules that are applicable to the SIP NAA dealing with fugitive dust (58.01.01.650-651) and open burning (58.01.01.600-616).

5.5 Commitment of Review and Update Maintenance Plan

DEQ commits to provide a revision to this plan should it be required (Section 110(a)(2)(H) of the CAA). See 57 FR 13556. The Environmental Protection and Health Act, Idaho Code § 39-105, and the rules for the control of air pollution, IDAPA 58.01.01, promulgated thereunder, provide the authority to the state to revise SIPs and to satisfy CAA requirements. The monitoring data will be analyzed to verify continued attainment with the NAAQS, and the plan will be reviewed should a significant upward trend in design values occur. Finally, if any of the underlying EPA assumptions are modified, such as the motor vehicle emissions or a large increase in industrial or fugitive dust emissions, the plan will be reviewed to determine if any revision re necessary.

5.6 Contingency Measures

Section 175D of the CAA requires that a maintenance plan include contingency provisions as necessary to promptly correct any violation of the NAAQS that may occur after redesignation of the area to attainment. Section 172(c)(9) of the CAA also indicates that any NAA implementation plan must contain contingency measures to be undertaken if the area fails to make reasonable further progress (RFP), or to attain the NAAQS by the applicable attainment date (PVNAA December 31, 1996). The contingency measures listed in both sections are required to take effect in any such case without further action by the State or the Administrator. Neither section specifies the number of contingency measures to be adopted or the magnitude of the emission reductions to be achieved. Following is a list of the contingency measures to be implemented in the PVNAA Plan:

1. **Modification to the RWC Ordinances for the Cities of Pocatello and Chubbuck**
   For this Plan revision, DEQ worked with the Cities of Pocatello and Chubbuck to modify the RWC ordinances to lower the trigger level for calling a burn ban. After the appropriate public notifications, both cities approved the ordinance change lowering the trigger level to call a burn ban from PM_{10} concentrations of 120 $\mu g/m^3$ to 100 $\mu g/m^3$. This allows for a greater safety margin and a protection of the sensitive groups by enacting the burn ban sooner during an episode. At present, the trigger level is 100 $\mu g/m^3$, however it is important to note that the

cities have agreed to accept the trigger level at the value DEQ deems necessary in the future.

2. **Modification to ISU's permit**
   Currently, DEQ's permitting program is working on a revision to ISU's permit. The revision will allow DEQ to take a credit for ISU switching from burning coal to natural gas. For the past 5 years ISU has been voluntarily switching from coal to natural gas when DEQ calls a burn ban. Via the dispersion modeling demonstration, it was determined that with such an ISU switch, the PM_{10} would have decreased from a concentration of 162 $\mu g/m^3$ to 157 $\mu g/m^3$.

Based on the multi-component hybrid approach to demonstrate attainment and maintenance, the PVNAA is below the standard 29% - 26%, respectively, from 2005 to 2020 [2005: 106 $\mu g/m^3$ is 44 $\mu g/m^3$ below the standard {44/150}* 100) = 29%]. This indicates that the actual emissions could increase in the Portneuf Valley and the PM_{10} concentration will still remain below the standard. This possible emissions increase allows for an adequate safety margin for transportation conformity. Should the Portneuf Valley have a violation in the future, the event will be evaluated and the filters will be chemically analyzed to target further controls. This will allow the root cause of the violation to be determined so that the appropriate additional contingency measures can be implemented. The following is a list of the possible additional measures which may need to be developed in the PVNAA, should violations occur in the future:

- Adopt local ordinances that require the covering of all loads of material that may have the potential to contribute to PM_{10}
- Adopt local ordinances that require no track out onto paved roads from construction sites
- Eliminate local permits that allow any kind of uncontrolled, outdoor burning not specifically allowed under Idaho State law
- Begin a vehicle inspection and maintenance program
- Expand mandatory burning restrictions to include clean burning woodstoves during air quality alerts
- Adopt local ordinances that prohibit the construction of any unpaved private roads, driveways or parking lots
- Transportation Control Measure (TCM) – Rideshare type program
- TCM – Dust control and prevention – paving dirt roads and alleys

Due to the continual changes in the mixture of PM_{10} sources and evolving technologies to understand and control PM_{10} emissions and precursor gases, other contingency measures may become viable in the future. DEQ will continue to evaluate the need for and viability of additional contingency measures and will consider future additions to the previously listed contingency measures if it becomes necessary.

6.0 CONTROL STRATEGIES

The CAA requires that moderate PM_{10} Nonattainment area plans include provisions to implement RACM (Reasonably Available Control Measures) no later than 4 years after the nonattainment designation is made. The CAA further requires that the plan provide for implementation of control on PM_{10} sources, including precursors (SO_x and NO_x) unless precursors are determined to not be significant to PM_{10}violations.

The overall strategy for improving air quality in the PVNAA consisted of many different components. Collectively, these components are responsible for reducing PM_{10} emissions in the PVNAA and have contributed to the demonstration of attaining and maintaining the NAAQS. Following are descriptions of the RACT and RACM applied to sources in the PVNAA. It is important to note that since controls were already in place for the base year inventory (2000), no emission reduction credit (ERC) is needed.

6.1 Reasonably Available Control Measures

The following subsections detail the RACM for the PVNAA. Topics covered include; agriculture, RWC program, AQI hotline, the air pollution emergency rule, road sanding, and transportation control measures.

6.1.1 Agricultural Sources

Agricultural operations occasionally contribute to the ambient PM_{10} levels in many rural areas and in some urban areas. Typically, all agricultural operations are generically classified as soil preparation, soil maintenance, and crop harvesting operations. Reasonably available control measures for agricultural sources include using best management practices and land conservation practices under the Food Security Act (FSA) of 1985, which was reauthorized in 1996 and 2002. Appendix A contains the reauthorized 2002 farm bill as it pertains to conservation.

In addition to the FSA, the Natural Resources Conservation Service (NRCS) implemented the conservation practice standard for surface roughening in February of 2002 (see appendix A). The purpose of this standard is to reduce wind erosion on cultivated land, especially during periods of high probability for erosive winds as well as to reduce sheet and rill erosion on sloping cropland.

6.1.2 Residential Wood Combustion

The RWC program was developed to provide the public with information on good burning practices. The program includes improved performance and efficiency of wood heating equipment, reduced reliance on wood burning during critical air quality periods, and established reasonable alternatives to the use of wood for heat. The city ordinances also prohibit the sale or offering for sale of any solid fuel-burning appliance which was not certified by the EPA. The ordinances followed the required public notice and comment periods. In September of 2003 (after prior appropriate public notification), both the City of Pocatello and the City of Chubbuck modified their RWC ordinances to lower the trigger level for calling burn bans. Prior to 2003 the trigger level for a mandatory burn ban was set at PM_{10} concentrations of 120 $\mu g/m^3$, whereas now the trigger level is 100 $\mu g/m^3$. A voluntary burn ban is called at 80 $\mu g/m^3$. The ordinances and program descriptions can be found in Appendix A.

In addition to the RWC ordinance, the State of Idaho also provides a tax reduction for anyone replacing old non-certified wood stoves with gas, propane, pellet, or EPA certified wood stoves. The EPA requires manufacturers to produce clean-burning wood stoves and establish limits on the amount of particulate matter (smoke) a new stove can emit.

6.1.3 Air Quality Index Program

In 1993 DEQ initiated the Air Quality Index (AQI) program to provide easy to understand public information on air quality. This program consists of a DEQ phone hotline and website (http://www.deq.state.id.us/air/dailyreports/aqi_report_pro.shtml) that provides information on measured and predicted ambient air pollution levels. The hotline provides year round pollutant levels for PM_{10}, $PM_{2.5}$, and SO_2, burn ban information, and activity restrictions/recommendations for sensitive groups.

The AQI tells you how clean the air is and whether it may affect a person's health. EPA, state, and local agencies work together to report current and forecast conditions for ozone and particle pollution on the EPA AIRNow Forecast Today Website (http://www.epa.gov/cgibin/airnow.cgi?MapDisplay=FOREMAP). Air quality forecasts are provided by state and local agencies, using EPA's AQI, which is a uniform index that provides general information to the public about air quality. $PM_{2.5}$ is the pollutant which is reported for the PVNAA on the AIRNow Forecast Today Website.

6.1.4 Air Pollution Emergency Rule (Open Burning Ban)

The purpose of this rule is to define criteria for an air pollution emergency, to formulate a plan for preventing or alleviating such an emergency, and to specify rules for carrying out the plan. An official copy of this rule can be found in Appendix A.

DEQ has defined four stages of an atmospheric stagnation and/or degraded air quality episode: Stage 1 - Air Pollution Forecast and Caution is actuated by a local forecast of stagnant atmospheric conditions (all open burning is prohibited as this stage); State 2 – Alert is the first stage at which air pollution control actions by industrial sources are to begin; Stage 3 – Warning indicates that air quality is further degraded and that control actions are necessary to maintain or improve air quality; Stage 4 – Emergency indicates that air quality has degraded to a level that will substantially endanger public health and that the most stringent control actions are necessary. The PM_{10} concentrations associated with each of these stages are given inTable 6-1.

Once an episode stage is reached or DEQ determines that reaching a particular stage is imminent, emergency action corresponding to that stage will remain in effect until air quality measurement indicates that another stage has been attained. At such time, actions corresponding to the just-attained stage will go into effect. This procedure will continue until the episode is terminated. Announcements will be made by the news media during regularly scheduled television and radio news broadcasts and in all editions of specified newspapers.

Table 6-1 PM_{10} Air Pollution Episode Emergency Rule Stages.

Pollutant	Averaging Period	Stage 1 Forecast & Caution	Stage 2 Alert	Stage 3 Warning	Stage 4 Emergency
PM_{10}	24-hour average	150 μg/m^3	350 μg/m^3	420 μg/m^3	500 μg/m^3
	1-hour average	385 μg/m^3	-	-	-

6.1.5 Road Sanding

Within the PVNAA, the PM_{10} is primarily from paved roads' reentrained dust. Four techniques for reducing winter road sanding emissions were identified in the 1993 plan. They include reduced quantity of sanding material used, cleanup of sanding materials as soon as conditions allow, improved specifications for sanding material, and the use of alternative materials such as chemical deicers. City, county, and state transportation departments have implemented all four techniques. Bannock County, the Cities of Pocatello and Chubbuck, and the Idaho Transportation Department (ITD) all estimate they have reduced the amount of sanding material between 15 and 30%. These reduction estimates were provided by those responsible for sanding. All entities use regenerative air street sweepers to clean up the sanding material as soon as possible. Also, the Cites of Pocatello and Chubbuck, Bannock County, and the ITD have signed agreements (Appendix A) stating they will reduce the amount of sanding material, use material that passes the Los Angeles abrasion test of 30% maximum loss, and clean sanding material from roads as soon as possible.

6.1.6 Transportation Control Measures

There are no required Transportation Control Measures (TCMs) for the PVNAA. The BPO, in cooperation with the City of Pocatello, City of Chubbuck, Bannock County, and ITD have developed the *Portneuf Valley PM_{10} Nonattainment Area Strategic Plan for Controlling Transportation Related Air Pollution (Strategy Plan).*

This plan identified two different TCMs for the transportation community to implement that would help control vehicle related emissions: 1) Travel Demand Management (Rideshare) and 2) Dust Control and Prevention Program.

Since no TCMs are required in the PVNAA, none will be implemented.

6.1.7 Tier 2 Federal Motor Vehicle Emission Requirements

For the on-road mobile sources, the effects of the Federal Motor Vehicle Program Controls are incorporated into the MOBILE6 and PART5 models. Additionally, BPO provided estimates of VMT for roadway segments in the future years by using their transportation modeling system. The Tier 2 motor vehicle emissions limits, which begin to take effect in 2004, will substantially reduce tailpipe emissions. Tier 2 limits emissions of NOx from new light-duty vehicles to an average of 0.07 grams per mile (g/mi.) (Table 6-2). For comparison, model year 1999 vehicle emissions range from 0.30 to 1.53 g/mi. Tier 2 also limits emissions of nonmethane hydrocarbons (NMHC), CO and particulate matter (PM). The Tier 2 standard will be phased in between 2004 and 2007 for passenger cars and light light-duty trucks, and between 2008 and 2009 for heavy light-duty trucks. Manufacturers can meet the standard by averaging across their fleet, and trading. In addition, sulfur in gasoline will be reduced to an average of 30 parts per million (ppm), with a cap of 80 ppm. By comparison, the average sulfur content of gasoline sold outside of California in 1996 was 340 ppm.

Table 6-2 Emission Standards for Light Duty Vehicles Grams/Mile Over 100,000 Mile Useful Life.

	NOx*	NMHC*	PM*	CO*
Tier 1	0.60	0.31	0.10	4.2
Tier 2	0.07	0.09++	0.01++	2.4 – 4.2++

* Oxides of nitrogen (NOx), nonmethane hydrocarbons (NMHC), particulate matter (PM), and carbon monoxide (CO).
++ While Tier 2 does not explicitly define average standards for pollutants other than NOx, average NMHC, PM and CO emission limits are implicit in the bin structure.

The greatest impact the Tier 2 standards will have on the PVNNA emission inventory is in the future NOx and VOC categories. Even with increased population and motor vehicle growth, NOx emissions are predicted to decrease from around 1,650 tons per year in the 2000 base year to around 450 tons per year in 2020. In VOC emissions comparative decrease is expected, from around 1,200 tons per year to around 400 tons per year.

6.2 Reasonably Available Control Technology

Section 172 (c)(1) of the Clean Air Act requires state implementation plans for nonattainment areas to implement reasonably available control measures, including RACT, for existing major stationary sources. The EPA document *Procedures for Identifying Reasonably Available Control Technology for Stationary Sources of PM_{10}* (EPA-452/R-93-001), defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. Like best available control technology (BACT), RACT is an emissions limit rather than a control technology and is to be determined on a case-by-case basis. In the PVNAA, the J. R. Simplot Don Plant is the only major source, thereby making it the only source for which RACT requirements applies.

6.2.1 Operating Permits

DEQ's Air Quality Division is responsible for protecting Idaho's air quality. Issuing permits to sources of air emissions is one of the ways DEQ fulfills this responsibility. Permits set the conditions for operation of facilities that generate air pollution. DEQ issues the following four categories of air quality permits:

- Permits to Construct (PTC),
- Tier II Operating Permits,

- Tier I (Title V) Operating Permits , and
- Permit by Rule Registrations.

An air quality permit to construct (PTC) is required prior to construction or modification of buildings, structures, and installations that emit, or may emit, regulated pollutants into the air (IDAPA 58.01.01.200 through 228). DEQ performs an objective review of an applicant's plans and specifications to ensure they satisfy all environmental and regulatory requirements. The review also may include ambient air dispersion modeling, and pollution-control equipment evaluation.

Tier II operating permits are facility-wide permits that are issued for a number of reasons, see IDAPA 28.01.01.400-410.

A Tier I operating permit (also known as a Title V Operating Permit) is required by the federal CAA for facilities that typically emit, or may emit, large quantities of criteria pollutants and hazardous air pollutants into the air (major sources). A Tier I operating permit is also required for other facilities that are subject to CAA requirements, including New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAPS). Idaho facilities with Tier I Operating Permits are required to report semiannually and annually on monitoring activities and compliance with permit requirements (see IDAPA 58.01.01.300-399).

A Permit by Rule (PBR) is a provision of the rules under which a portable source may voluntarily register with DEQ and meet specific requirements for a particular source of air pollution. Currently, the opportunity to obtain a PBR is available only to nonmetallic mineral processing plants (i.e., portable rock crushing facilities). Sources that obtain only a PBR may not operate in the same location for more than 12 months. Applicants complete and submit a simple, two-page registration form. Once registered, the facility is authorized to operate (see IDAPA 58.01.01790-799).

6.2.2 J. R. Simplot Don Plant

The CAA of 1990 revised the State Implementation Plan (SIP) requirements for PM_{10} nonattainment areas to require the application of RACT on all major sources within the designated NAA. The J. R. Simplot Don Plant is a major source within the PVNAA. This RACT assessment was not solely limited to PM_{10}. Since secondary aerosols are a significant portion of the PM_{10} problem, PM_{10} precursors (SO_2 and NO_x) also needed to be addressed. The RACT assessment focused on point sources within Simplot with annual emissions greater than 10 TPY.

EPA guidance defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. With this in mind, DEQ has concurred with Simplot about what constitutes RACT (see Appendix B) for this facility. The rationale for this concurrence can also be found in Appendix B. Table 6-3 outlines the RACT control technology for the J. R, Simplot Don Plant and also lists the emission RACT limits. The measurement techniques that will be used to show compliance with the RACT emission limits are included in the permit.

Table 6-3 RACT for the J. R. Simplot Don Plant.

Source	Control Technology	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)
#300 sulfuric	Single contact AmmSOx scrubber and a Dynawave reverse jet scrubber	TBD	170	16.0
#400 sulfuric	Double contact process (SO_2) and a mist eliminator (PM_{10})	TBD	333	TBD
Phosphoric Acid Plant	Wet scrubber stack (PM_{10})	2.77	-	-
Granulation I	2 baghouses (PM_{10}) and a venturi scrubber	10.9	-	-
Granulation II	2 venturi scrubbers cyclone and venturi scrubber (PM_{10})	10.7	-	-
Granulation III	Venturi scrubber and baghouse (PM_{10}) and a low NOx burner	5.7	-	3.4
Ammonium Sulfate	Venturi scrubber plus a venturi wet scrubber	-	-	-
Cooling towers	Drift eliminator (PM_{10})	28.2	-	-
B & W Boiler	Low NOx burner	-	-	2.88
HPB & W Boiler	LoNOx® burner	-	-	7

\- indicates less than 10 TPY and was not considered for RACT
TBD – to be determined based on test results

6.3 Conformity

The CAA requires that federal actions conform and are consistent with the approved SIP. Conformity addresses pollutant emissions through the process of reviewing plans, projects, and programs that are funded and/or approved by the federal government prior to implementation. The conformity process assures that state and local entities plan and discuss programs that conform to the SIP.

In an effort to provide rules and a framework for how local transportation and air quality entities should consult on conformity issues, the state developed rules governing how the federal consultation process under 40 CFR section 105 should occur. The state transportation conformity rule IDAPA 58.01.01.563 through 574 sets forth procedures and criteria that must be followed as part of the consultation process to show conformity of Transportation Improvement Programs, Long Range Transportation Plans, and projects. The state transportation conformity rules also adopts by reference the federal transportation conformity statues under 40 CFR §§ 93.100 through 128.

The state has the authority to prohibit certain federal actions which do not "conform" to the SIP. In order to receive continued transportation funding or approvals from the Federal Highway Authority/ Federal Transit Authority (FHWA/FTA), state and local transportation agencies with plans, programs, or projects in nonattainment or maintenance areas must demonstrate that they meet the MVEB (see Section 4.3) and the transportation conformity requirements of the CAA as set forth in the transportation conformity rule 40 CFR, Parts 51 and 93, see also IDAPA 58.01.01.563-564. The federal rule requires that actions funded, permitted and/or approved by the federal government within or adjacent to an air quality nonattainment area, do not:

- Cause or significantly contribute to NAAQS violations,
- Increase the frequency or severity of existing violations, and/or,
- Delay timely attainment of the federal and state ambient air quality standards or milestones identified by the applicable SIP.

7.0 ADMINISTRATIVE REQUIREMENTS

The following subsections provide a brief overview of the various CAA administrative requirements, pertaining to the PVNAA SIP, maintenance plan, and redesignation request. Also provided are the applicable Idaho code.

7.1 Consultation and Public Notification Procedures

Section 110(a)(2)(M) of the CAA requires that SIPs provide for public consultation and participation by affected local political subdivisions. The public participation effort by DEQ and other agencies on the development of the Portneuf Valley Nonattainment Area Plan has been extensive. Work commenced on this project in July of 2001. During the phase of developing the technical portions of the Plan (dispersion modeling, emissions inventory, and the attainment and maintenance demonstrations), weekly meetings were held with the technical review committee (BPO, ITD, DEQ, EPA, MFG, EQ, and the Tribes). These meetings provided a cooperative atmosphere where the various PM_{10} issues and jurisdictional differences could be worked out. Agreement was made as each critical component was established, including Technical Analysis Protocol (TAP), Memorandum of Understanding (MOU), work plans, IPP/QAP, modeling issues resolution, and emission inventory issues resolution. In addition to the weekly meetings, the committee also held three group meetings at the beginning, middle, and end of the project.

In addition to the technical committee listed above, DEQ has worked and consulted with the Cities of Pocatello and Chubbuck, Bannock County, and ITD, on issues related to fugitive dust, road sanding, road clean up, and wood stove ordinances. The tight working relationship between all parties and mutual interests in air quality in and around the Portneuf Valley has provided for a cooperative partnership in addressing the complex airshed issues.

The public comment period for the plan was open from May 6, 2004 through June 9, 2004, as required by IDAPA 58.01.01.578.04 (Rules for the Control of Air Pollution in Idaho), 40 CFR 51, Appendix V, 2.0. Criteria, and Section 110 of the CAA. A public hearing was held June 8, 2004, in accordance with these rules.

Comment packages that included the plan and associated appendices were made available at DEQ's state office in Boise, DEQ's regional office in Pocatello as well as the Marshall Public Library and the Idaho State University Library in Pocatello. In addition, the narrative portion (without appendices) was made available for review on DEQ's website. Comments were accepted in a variety of forms; electronic mail, postal mail, and verbal testimony from the public hearing. Complete documentation of comments and public hearing testimony, including DEQ responses, is contained in Appendix J.

7.2 Sources Prohibited from Impacting Other States

Section 110 (a)(2)(D) of the CAA requires that the implementation plan provide for adequate provisions to prohibit any source within the State from emitting any air pollutant in amounts which will contribute significantly to an NAA in any other state with respect to the NAAQS. DEQ certifies that the PVNAA is located sufficiently away from any adjacent states (Wyoming and Utah) that its sources are precluded from causing or significantly contributing to a NAAQS problem in other states. This is not, however, true for Indian Reservations. The PVNAA sits adjacent to the Fort Hall Indian Reservation and the FHNAA. It is important to note that the emissions from the PVNAA do not significantly contribute to NAAQS exceedances on the FHNAA (see Appendix E or the FIP for Astaris (FMC)). The sources within the adjacent NAAs will continue to be controlled or will have permits that will limit their growth, so neither NAA is expected to impact the other in the foreseeable future.

7.3 Assurance of Adequate Funding, Personnel, and Authority

Section 110(a)(2)(E) of the CAA requires that the state have adequate funding, staff, and legal authority under State law to carry out the implementation plan. The State of Idaho has adequate funding, personnel, and authority to enforce the emissions limitations and control measures listed in the plan and certify that these controls are in compliance with state and federal law. The Idaho Environmental Protection and Health Act (EPHA) gives authority to the Director of the Idaho DEQ to supervise and administer a system to safeguard air quality in the State of Idaho (Idaho Code §39.105).

The Pocatello Regional Office has field staff that perform inspections and enforcement activities, administer the PM_{10} program, and spend a significant amount of their time servicing the Portneuf Valley PM_{10} monitoring network. DEQ state office staff, including both engineers and inspectors, develop permits and perform enforcement activities. Additionally, DEQ technical services staff spend part of their time assisting in inspections, reviewing source test reports for compliance, and performing other analyses as needed.

The implementation of selected control measures relies on funding from a variety of sources. DEQ’s Air Programs base grant is one main source, which funds planning, compliance, curtailment, air monitoring and surveillance in the PVNAA. Idaho has and expects to maintain staffing levels adequate to continue such implementation.

Idaho Code § 39-105(3)(j), Idaho Code §§ 39-105 and 39-107 of the EPHA authorize the Board of Environmental Quality to promulgate rules governing air pollution.

7.4 Control Requirements Applied to Major Sources of PM_{10} Precursors

Section 189 (e) of the CAA provides that the control requirement for major stationary sources of PM_{10} shall also apply to major stationary sources of PM_{10} precursors, except where the Administrator determines that such sources do not contribute significantly to PM_{10} levels which exceed the standard in the area.

In the PVNAA secondary aerosols account for a majority of the PM_{10} concentrations during wintertime inversions. During the 1999 episode (December 26-31, 1999), ammonium sulfate accounted for 39 to 61% of the daily PM_{10} concentrations, whereas ammonium nitrate accounted for 5 to 10%. Due to the large impact on air quality from secondary aerosols, DEQ addressed major sources of PM_{10} precursors. The largest source of SO_2 is the J. R. Simplot Don Plant. RACT is in place for the Simplot plant, details of which can be found in Appendix B.

7.5 Applicable Idaho Administrative Code

The Rules for the Control of Air Pollution in Idaho, promulgated pursuant to the EPHA, are in the Idaho administrative code at IDAPA 58.01.01. DEQ has implemented the PM_{10} NAAQS since its initial promulgation in 1987.

Both the air quality Permit(s) to Construct and Tier II operating permit(s) programs require a demonstration that the source at issue will not cause or significantly contribute to a violation of a national ambient air quality standard (See IDAPA 58.01.01.203.02 and 58.01.01.403.02). Estimates of ambient concentrations are based on applicable air quality models, data bases, and other requirements specified in 40 CFR Part 51, Appendix W (Guidance on Air Quality Models) and IDAPA 58.01.01.202.02 and 58.01.01.403.03. Thus, because the permitting rules require a demonstration that the predicted emissions will not cause or significantly contribute to a violation of a NAAQS, new sources should not jeopardize continued maintenance of the NAAQS PM_{10} standard.

In addition to permitting authorities, the state has the authority to implement controls in response to air pollution forecasts, alerts, warnings, and emergency episodes (IDAPA 58.01.01.550 through 58.01.01.562). Transportation Conformity rules are at IDAPA 58.01.01.563 through 58.01.01.574.

8.0 CONCLUSIONS & REQUEST FOR REDESIGNATION

This State Implementation Plan (SIP) demonstrates that the PVNAA meet the 24-hour PM_{10} NAAQS by the attainment date of December 31, 1996. Additionally, within this plan demonstration also exists to show that the PVNAA will maintain the standard out to 2020. The continued improvement in the air quality in the PVNAA since the last violation in 1993, has been the result of permanent and enforceable control measures. Since the enactment of the key control strategies in the 1993 and 1998 plans (road sanding, RWC, open burning programs, and TCM's) ambient concentrations of PM_{10} have continued to decrease. Additionally, the closure of the FMC(Astaris) facility in 2001 accounted for a large decrease in emissions and help prove that the area will maintain the 24-hour NAAQS until 2020. The State of Idaho will continue to aggressively monitor PM_{10} concentrations in the PVNAA. If violations occur, this maintenance plan contains contingency provisions to ensure prompt corrective action is taken. This plan fulfills the entire requirements of the CAA as they pertain to SIP's and Maintenance Plans. Thus, DEQ requests that EPA re-designate The Portneuf Valley Nonattainment area to attainment for the PM_{10} NAAQS in accordance with Section 207 of the CAA.

APPENDICIES

Appendix A	*RACM*
Appendix B	*Industrial Sources, RACT, and permits*
Appendix C	*Special Air Quality Studies - various*
Appendix D	*Emissions Inventory - EQ*
Appendix E	*CALPUFF Dispersion Modeling - MFG*
Appendix F	*Chemical Mass Balance Modeling - DEQ*
Appendix G	*Speciated Linear Rollback Modeling - EQ*
Appendix H	*Multi-component Hybrid Approach - EQ*
Appendix I	*Federal Register Notices*
Appendix J	*Public Involvement, Hearing, and Transcript*