

**Far-Field Air Quality Impact Assessment
for the
Wind River Natural Gas Field Development Project
Proposed By Tom Brown, Inc.**

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Prepared for:

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TABLE OF CONTENTS

1.0 INTRODUCTION..... 1

 1.1 OVERVIEW OF APPROACH 1

2.0 PROJECT DESCRIPTION 3

3.0 METEOROLOGICAL MODELING..... 7

 3.1 MODEL DOMAIN..... 7

 3.2 METEOROLOGICAL, TERRAIN, AND LAND USE DATA 9

 3.2.1 Mesoscale Meteorological Data 9

 3.2.2 Terrain and Land Use Data 9

 3.2.3 Upper Air Meteorological Data 14

 3.2.4 Surface Meteorological Data 14

 3.2.5 Surface Precipitation Data..... 15

 3.3 CALMET METEOROLOGICAL MODELING..... 15

4.0 CALPUFF DISPERSION MODELING 19

 4.1 MODEL RECEPTORS..... 19

 4.2 OTHER CALPUFF CONSIDERATIONS..... 23

5.0 PROCESSING OF CALPUFF MODEL RESULTS 25

 5.1 APPEND, CALSUM AND POSTUTIL PROGRAMS 25

 5.2 CALPOST PROCESSING 26

 5.2.1 Visibility Calculations..... 26

 5.2.2 Calculating Changes in Lake Acid Neutralizing Capacity 37

 5.2.3 Terrestrial Deposition Calculations..... 44

6.0 ANALYSIS RESULTS 49

7.0 REFERENCES..... 57

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1.0 INTRODUCTION

At the direction of the Bureau of Indian Affairs, Wind River Agency, an Environmental Impact Statement (EIS) has been prepared in order to evaluate and disclose to the public potential direct, indirect and cumulative environmental impacts that may result from continued exploration for, and development of, resources associated with the Wind River Natural Gas Development Project (the "Project"). This document provides a detailed description of the procedures applied for the EIS analysis to quantify potential ambient air quality and air quality related values (AQRV) impacts that may result from the implementation of the Project alone and in conjunction with other cumulative sources of air pollutant emissions.

This Far-Field air quality assessment report is one of three documents that support the air quality analysis presented in the EIS. The other supporting documents are:

- Emissions Inventory for the Wind River Natural Gas Field Development Project (Buys and Associates, 2004a)
- Near-Field Air Quality Impact Assessment Report for the Wind River Natural Gas Field Development Project (Buys and Associates, 2004b)

1.1 OVERVIEW OF APPROACH

The Wind River Project Area (WRPA) Far-Field air quality assessment was performed in accordance with a written protocol defining methodologies designed to quantify potential air quality impacts from the proposed Project and surrounding development. This protocol was prepared by Buys and Associates with refinements resulting from review and input from the Bureau of Land Management, Wyoming Department of Environmental Quality, U.S. Forest Service, National Park Service, Environmental Protection Agency (EPA) Region VIII, the Bureau of Indian Affairs, Wind River Environmental Quality Council, and Project proponents. This procedure ensured that the air quality assessment methodology was technically acceptable to all parties providing input.

Potential ambient air quality impacts that could result upon implementation of the Project were assessed at two different distance scales: near-field (0 to 31 miles [0 to 50 km]) and far-field (12 to 170 miles, [20 to 270 km]). The Far-Field analysis is focused on project related and cumulative impacts upon areas of special concern (i.e., Federally designated Class I areas and areas identified as important to the Tribes). The near-field analysis is focused on potential impacts for all areas within and relatively near the Wind River Project Area (WRPA).

To assess potential far-field impacts, the CALPUFF set of models were applied. The CALPUFF set of models (CALMET, CALPUFF, CALPOST, and associated utilities) were designed specifically to assess ambient air quality impacts at significant distances from the source and therefore long pollutant travel times. For this analysis, the most current versions of the models were applied: CALMET Version 5.53, Level 030709; CALPUFF Version 5.711, Level 030625; and CALPOST Version 5.51, Level 030709.

The CALPUFF set of models were applied for meteorological calendar year 1995 and included cumulative impacts from the Project sources, permitted sources, and sources associated with reasonably foreseeable development. The predicted pollutant concentrations were compared to the most stringent of the State of Wyoming and National Air Quality Standards (WAAQS, NAAQS) and (for informational purposes only) to the Prevention of Significant Deterioration

(PSD) Class I and II increments. In addition, the predicted concentration and deposition results were processed to evaluate potential visibility and acid deposition impacts for comparison with the Federal Land Manager (FLM) Limits of Acceptable Change (LAC). The results of the CALPUFF analysis for the Proposed Action and Alternatives are provided in Appendix A and discussed in Section 6.

2.0 PROJECT DESCRIPTION

The Wind River Project Area (WRPA) is located in Fremont County, Wyoming (Figure 2-1). The WRPA currently contains 178 active producing wells, with accompanying production related facilities, roads, and pipelines. Total gas compression and treatment capacity is currently 14,600 horsepower (hp) within the WRPA. The Operators propose to drill 325 wells at 325 well locations under the Proposed Action, in addition to the 178 existing wells in the WRPA. Additional natural gas compression and treatment capacity required for the Proposed Action is estimated at 32,800 hp at 8 locations. Some of the additional compression capacity would be located outside of the WRPA.

Drilling density would occur at 1 to 32 wells per section depending on the target formation. Development would be phased in time and would not be uniformly spaced throughout the WRPA. The anticipate that future development in the WRPA would be concentrated primarily within the existing Pavillion, Muddy Ridge, and Sand Mesa fields. However, some exploration and development is planned for the Coastal Extension and Sand Mesa South areas, which currently have no producing wells. The five development areas and the overall WRPA boundary are presented in Figure 2-2.

Three differing levels of development are alternatives to the Proposed Action. Under Alternative A, the Operators propose to drill 485 wells at 485 well locations, but only 369 of these wells are projected to be successful. The additional treatment and transportation capacity for this alternative is projected to be 46,000 hp. Under Alternative B, the Operators propose to drill 233 wells at 233 well locations with only 182 of these wells projected to be successful. The additional treatment and transportation capacity is projected to be 22,700 hp. Under Alternative C, the No Action Alternative, the Operators would develop 100 wells on private lands and tribal lands for drainage offset, with all wells projected to be successful. The additional treatment and transportation capacity is projected to be 3,200 hp. Table 2-1 summarizes of number of wells, annual well development, and total compression for each alternative.

Table 2-1. Summary of WRPA Alternatives.

Alternative	Number of Proposed Wells	Proposed Annual Well Development Rate	Total New Compression (horsepower)
Proposed Action	325	38	32,800
Alternative A	485	39	46,050
Alternative B	233	38	22,700
Alternative C	100	14	3,200

After construction of well pads and roads, drilling and completion of a well, and interconnection to the gathering pipelines, each well pad would consist of a wellhead, a three-phase separator (to separate gas, produced water, and hydrocarbon condensate), and a condensate tank. The gas would be moved under well-head pressure to central production facilities (CPF) that would include a single or multiple compressor engines, a central separator, and central glycol dehydration units. After processing, the gas would then be transported to a sales pipeline for further distribution.

Figure 2-1.

Figure 2-2.

Emissions to the atmosphere from the proposed project would consist of the criteria pollutants nitrogen oxides (NO_x), carbon monoxide (CO), particulates (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and volatile organic compounds (VOC), and various hazardous air pollutants (HAP). These pollutants would be emitted from the following activities and sources:

- Well pad and road construction: equipment producing fugitive dust while moving and leveling earth;
- Drilling: vehicles generating fugitive dust on access roads, and drill rig engine exhaust;
- Completion: vehicles generating fugitive dust on access roads;
- Vehicle tailpipe emissions associated with all development phases;
- Well production operations: three-phase separator, flashing and breathing emissions from a condensate tank; and
- Central production facility: compressor engines and central glycol dehydration units.

Derivation of the emission rates applied for this analysis is detailed separately in the emissions inventory report (Buys and Associates, 2004a).

3.0 METEOROLOGICAL MODELING

3.1 MODEL DOMAIN

The initial step in the Far-Field analysis is determining the extent of the study area domain and performing the meteorological modeling. For this study, the study area domain was developed through examination of previous EIS studies in the region and review of the locations of the proposed project sources and areas of interest for the impact analysis. A proposed study domain was then presented in the assessment protocol and subsequently refined through the incorporation of comments from the project stakeholders.

The Far-Field analysis domain is presented in Figure 3-1 and includes the north-western two-thirds of Wyoming, southern Montana and far eastern Idaho. The study area domain extends approximately 270 miles east-west by 220 miles north-south (432 km by 352 km) and includes thirteen areas of special concern (i.e., national parks, wilderness areas, a roadless area, and Native American areas of interest). The analysis domain was developed on a Lambert Conformal Conic projection (LCC), with a central longitude/latitude at (108.55 degrees West, 42.55 degrees North) and first and second standard latitude parallels at 30 degrees and 60 degrees. The extent of the study area domain in LCC coordinates is (in kilometers) from the southwest corner at (-230.0, -32.0), to the northeast corner at (202.0, 320.0).

Figure 3-1. Modeling Domain

3.2 METEOROLOGICAL, TERRAIN, AND LAND USE DATA

CALMET includes a diagnostic wind model which combines surface and upper-air meteorological data with diagnostic effects of terrain and other factors to generate three-dimensional wind fields. CALMET also includes other interpolation algorithms to generate three-dimensional temperature, pressure, stability, and other meteorological variables and two-dimensional precipitation fields. The CALMET modeling (and subsequent CALPUFF modeling) was performed on a 4 km grid (108 grid cells east-west and 88 grid cells north-south). As there are only a limited number of meteorological stations available in the nearly 60,000 square mile analysis domain, and since there is considerable complex terrain in the area, the CALMET diagnostic model was provided with a coarse grid (20-km) resolution MM5 simulation. As an input to CALMET, the MM5 prognostic meteorological results were used to provide initial mesoscale flow features. The CALMET diagnostic algorithms and local observations were then applied to refine and further characterize local wind variations at a 4-km resolution.

In addition to the mesoscale flow feature input, CALMET requires terrain and land use data in addition to upper air data and local, sub-mesoscale surface meteorology and precipitation data. Each of these data sets are discussed in the following sub-sections.

3.2.1 Mesoscale Meteorological Data

The mesoscale meteorological data are provided by the MM5 model developed by the University of Pennsylvania. The MM5 input used in the Wind River analysis is the same data applied in the Southwest Wyoming Regional CALPUFF Air Quality Modeling Study, (Earth Tech, Inc., February 2001), specifically an MM5 simulation for calendar year 1995. The MM5 simulation is a four dimensional data assimilation (FDDA) and interpolation of the standard National Weather Service (NWS) upper-air meteorological stations. The MM5 simulation for calendar year 1995 was prepared using two modeling domains, a mother domain and a nested domain, both centered at the same location as this Wind River CALMET modeling domain, specifically, 42.55 degrees North, 108.55 degrees West. The mother domain is 1500 km west-east by 1380 km south-north (southwest corner of the domain at -750 km, -690 km), and used a grid spacing of 60 km. The nested domain covers the area from -330 km to 270 km west-east and -270 to 210 km south-north (600 km west-east by 480 km south-north), and used a grid spacing of 20 km. Therefore, the MM5 grid spacing for the majority of the Wind River modeling domain is 20 km. However, the northern portion of the Wind River domain (i.e., from south-north coordinate 210 km to 320 km) is covered only by the 60 km grid spacing mother domain. Since the proposed project and the majority of the sensitive areas of interest are included in the nested domain, this is not considered a significant limitation; especially since the MM5 model is coupled with a 4-km grid spacing CALMET model. More details regarding the specifics of how the MM5 simulation was developed are provided in the SWYTAF report.

The CALMET model uses the MM5 meteorology as an initial guess data field and applies terrain, land use, local surface meteorological data, local upper air meteorological data, and local precipitation data to develop meteorological parameters on a 4-km grid spacing. These parameters, wind speed, wind direction and wind precipitation, are then used in the CALPUFF model to calculate concentrations of emitted pollutants at the sensitive areas of interest.

3.2.2 Terrain and Land Use Data

In order to refine the local wind fields, CALMET requires land use and terrain data. Land use and terrain data as developed by United States Geological Survey (USGS) are available for

download for various 1-degree quadrangles (1:250,000 scale). For the Wind River analysis, the following quadrangles were utilized: Preston, Lander, Casper, Torrington, Driggs, Thermopolis, Arminto, New Castle, Gillette, Sheridan, Cody, Ashton, Bozeman, Billings, Hardin, and Ekalaka.

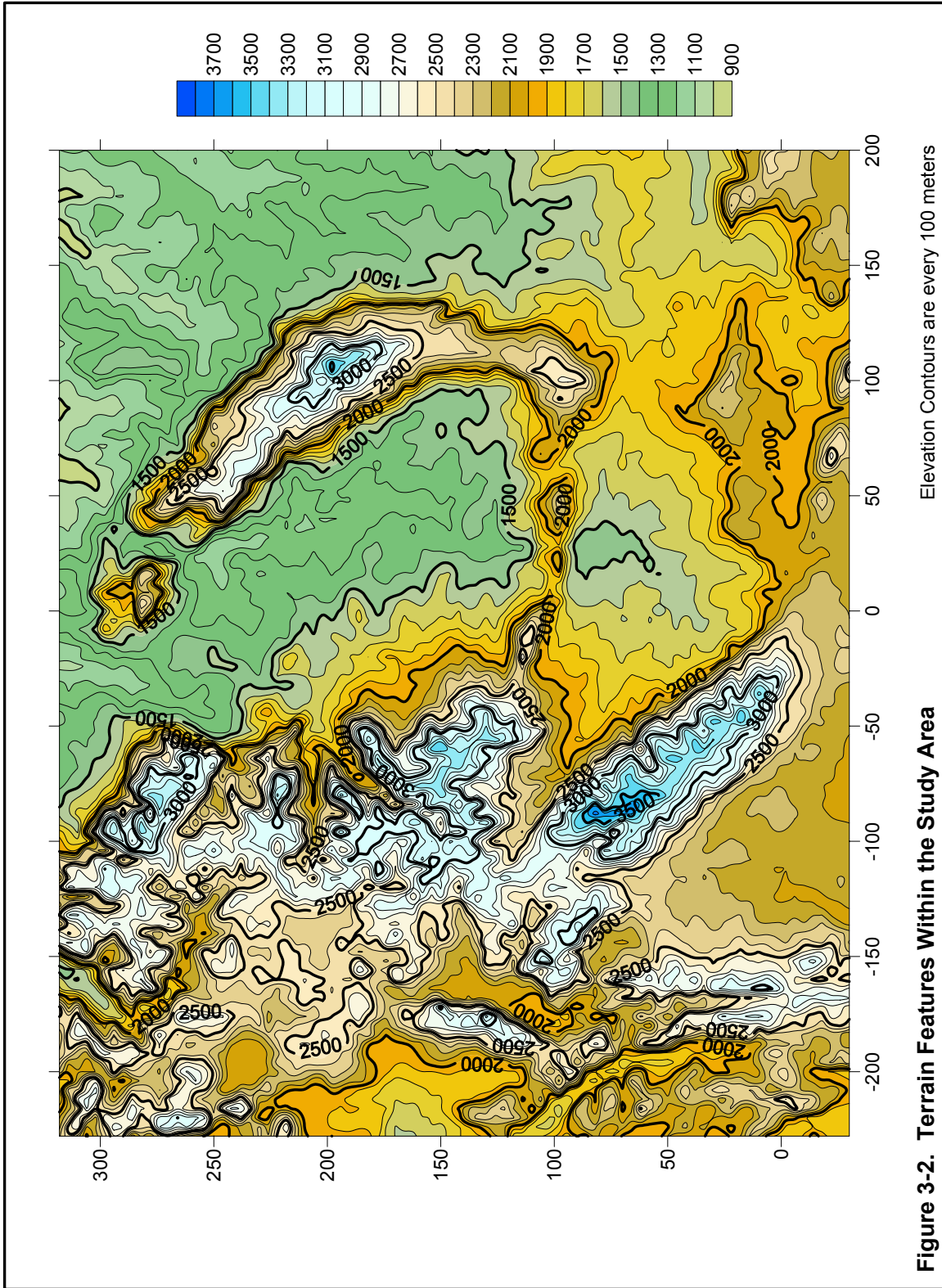
The terrain data were derived from 3-arc second (approximately 90-meter spacing) digital elevation model (DEM) produced by the United States Geological Survey (USGS). Since the CALMET and CALPUFF modeling domain was based on 4 km spacing, the terrain elevation at each 4 km grid cell was calculated by averaging all of the 90-meter data within the 4 km cell. A similar procedure was applied to the USGS land use category data. Figure 3-2 presents the terrain for the model domain.

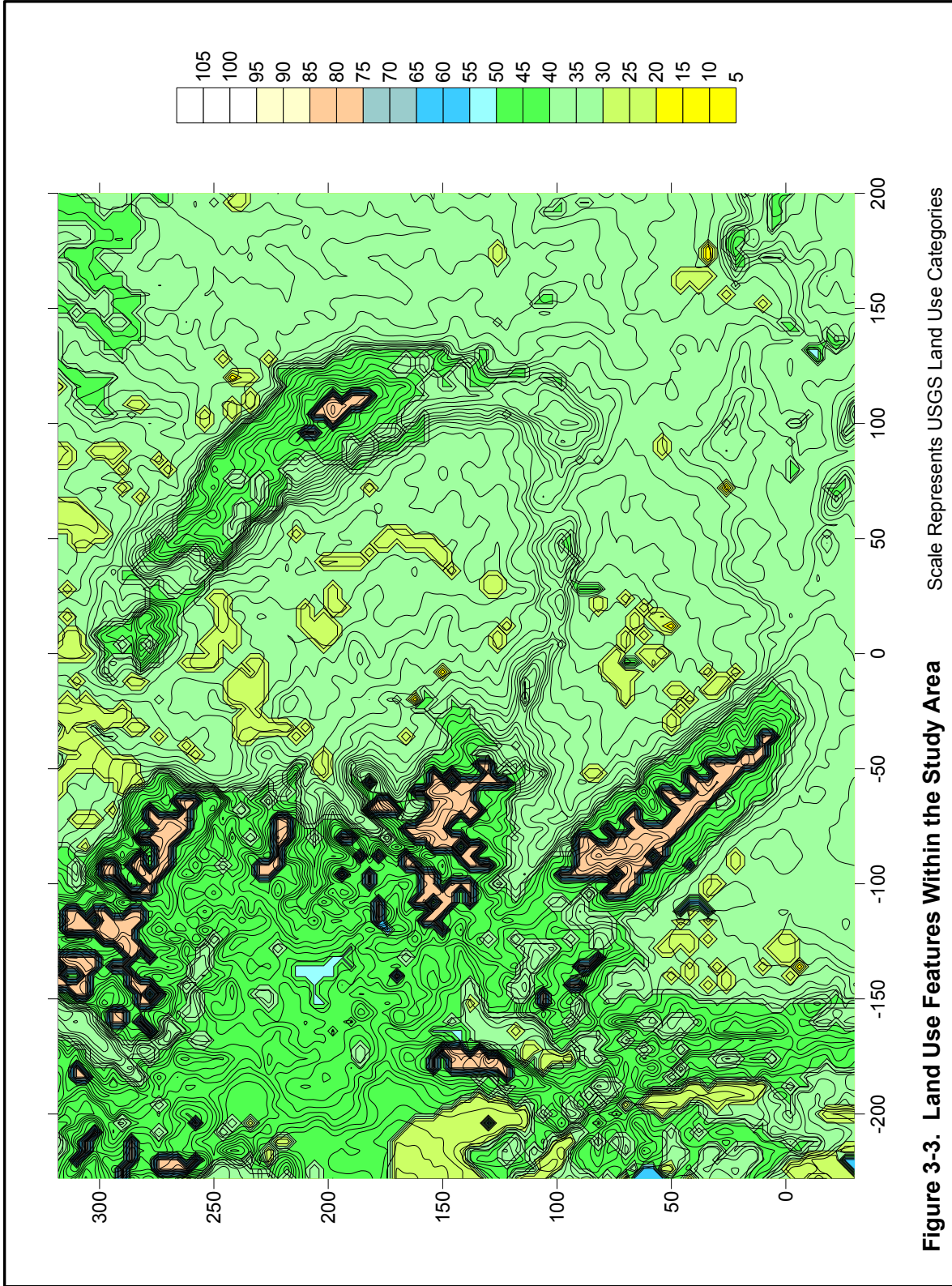
The land use data were derived from USGS Composite Theme Grid (CTG) data that are provided with a resolution of 200 meters. The USGS land use data contains 38 different use categories, while the CALMET model is capable of utilizing only 14 use categories. Therefore, a cross-reference was applied to the USGS land use categories to format the data for use in CALMET. The CALMET categories and associated physical parameters are presented in Table 3-1. The USGS 200-meter grid data were overlain on the CALMET 4-km by 4-km grid, and the predominate land use type was selected to represent land use for the 4 km cell. Figure 3-3 presents the terrain along with the USGS land use categories for the modeling domain.

Table 3-1. CALMET Land Use Categories and Associated Geophysical Parameters Based on the U.S. Geological Survey Land Use Classification System (Scire et al, 2000).

Land Use Category	Description	Surface Roughness (meters)	Albedo	Bowen Ratio	Soil Heat Flux	Anthropogenic Heat Flux (W/m ²)	Leaf Area Index
10	Urban or built-up land	1.0	0.18	1.5	.25	0.0	0.2
20	Agricultural land - unirrigated	0.25	0.15	1.0	.15	0.0	3.0
-20*	Agricultural land - irrigated	0.25	0.15	0.5	.15	0.0	3.0
30	Rangeland	0.05	0.25	1.0	.15	0.0	0.5
40	Forest land	1.0	0.10	1.0	.15	0.0	7.0
50	Water	0.001	0.10	0.0	1.0	0.0	0.0
51	Small water body	0.001	0.10	0.0	1.0	0.0	0.0
55	Large water body	0.001	0.10	0.0	1.0	0.0	0.0
60	Wetland	1.0	0.10	0.5	.25	0.0	2.0
61	Forested wetland	1.0	0.1	0.5	0.25	0.0	2.0
62	Non-forested wetland	0.2	0.1	0.1	0.25	0.0	1.0
70	Barren land	0.05	0.30	1.0	.15	0.0	0.05
80	Tundra	.20	0.30	0.5	.15	0.0	0.0
90	Perennial snow or ice	.20	.70	0.5	.15	0.0	0.0

NOTE: * Negative values indicate "irrigated" land use





3.2.3 Upper Air Meteorological Data

CALMET provides two options for upper air data, in one option, upper air flow is derived only from the MM5 simulation. In the second option, upper air flow is derived from a combination of the MM5 simulation and available local upper air meteorological data. This second option was applied for the Wind River study. There are four upper air stations operated by the National Weather Service in or surrounding the Wind River study domain: Lander, WY; Salt Lake City, UT; Grand Junction, Colorado; and Denver, Colorado. Data from all four of these stations were used in the CALMET model.

3.2.4 Surface Meteorological Data

Six publicly available sources of meteorological data were examined to obtain 1995 meteorological data for the Wind River analysis. The sources and results of the examination are as follows:

- CASTNET (Clean Air Status and Trends Network) operated by the US Environmental Protection Agency (USEPA) and National Park Service (NPS). There are three CASTNET stations in Wyoming (Centennial, Pinedale, and Yellowstone) and one station in Montana (Glacier National Park). Only the Pinedale and Yellowstone stations are within the Wind River study domain. However, no applicable meteorological data were available for Yellowstone since measurements at that station were not recorded before 1996. Therefore, only the Pinedale CASTNET data were utilized for the Wind River analysis. CASTNET data are available from the USEPA CASTNET web site.
- SAMSON (*Solar and Meteorological Surface Observation Network*) operated by the National Weather Service (NWS). SAMSON data are available from 1961 to 1990. As the SAMSON data do not include the 1995 Wind River analysis year, no SAMSON data were used in the analysis. SAMSON data are available for order from the National Climatic Data Center (NCDC).
- HUSWO (*Hourly United States Weather Observations*) operated by the NWS. HUSWO data are available for years 1990-1995. Three HUSWO stations are located within the Wind River domain: Casper, Lander, and Sheridan. Data from all three HUSWO stations were utilized for the Wind River analysis. HUSWO data are available for order from the NCDC.
- WBAN (*Weather Bureau-Army-Navy*) operated by the NWS. WBAN stations have been utilized since the 1950s. A total of 12 WBAN sites within the project area were utilized. The WBAN data were pre-processed into HUSWO format and examined prior to processing in CALMET. The supplementary WBAN data were obtained from the NCDC.
- RAWS (*Remote Automated Weather Stations*) compiled by the National Interagency Fire Center. The RAWS stations are operated by the Bureau of Land Management (BLM) and the US Forest Service (USFS) primarily for fire prevention and control purposes. The RAWS data are available from the Western Regional Climate Center at the Desert Research Institute in Reno, NV. There are 32 RAWS stations located in the Wind River domain that were utilized for the analysis. As in the case of the WBAN data, the RAWS data were pre-processed into HUSWO format and examined prior to processing in CALMET.

- *AWDN (Automated Weather Data Network) operated by the High Plains Regional Climate Center (HPRCC).* The Wyoming AWDN stations were located east of the Wind River domain and therefore were not incorporated into the analysis.

In total, the Wind River surface meteorological data set included 48 surface meteorological data stations as shown in Figure 3-4. The 48 stations include 1 CASTNET station, 3 HUSWO stations, 12 WBAN stations, and 32 RAWS stations.

3.2.5 Surface Precipitation Data

Data for 41 precipitation stations within the Wind River study domain were utilized. The precipitation data were acquired from the Cooperative Weather Observer stations, available for order form NCDC. The data were pre-processed and examined for conformance with the format required by the CALMET precipitation processors. The precipitation stations are presented in Figure 3-5.

3.3 CALMET METEOROLOGICAL MODELING

To develop the final wind field, stability class, precipitation, and other data needed by CALPUFF, the MM5, upper air, terrain, land use, surface meteorology, and precipitation data are all input into the CALMET model. When running the CALMET model, the user must select among a number of options through the CALMET input control file. The options within CALMET were set in accordance with the Interagency Workgroup on Air Quality Modeling (IWAQM) guidelines. An example of the CALMET control file used for the January Wind River simulation is presented in Exhibit 1.

As a quality assurance check of the input data and CALMET model results, wind fields on selected days were analyzed and visually compared to terrain features. The results of this analysis, an example of which is shown in Figure 3-6, indicate that the CALMET results accurately represent the expected wind fields based upon the given mesoscale meteorological features and local scale land use and terrain features. The CALMET model was applied for each month of 1995 meteorological data and the results subsequently used as the meteorological input for the CALPUFF model.

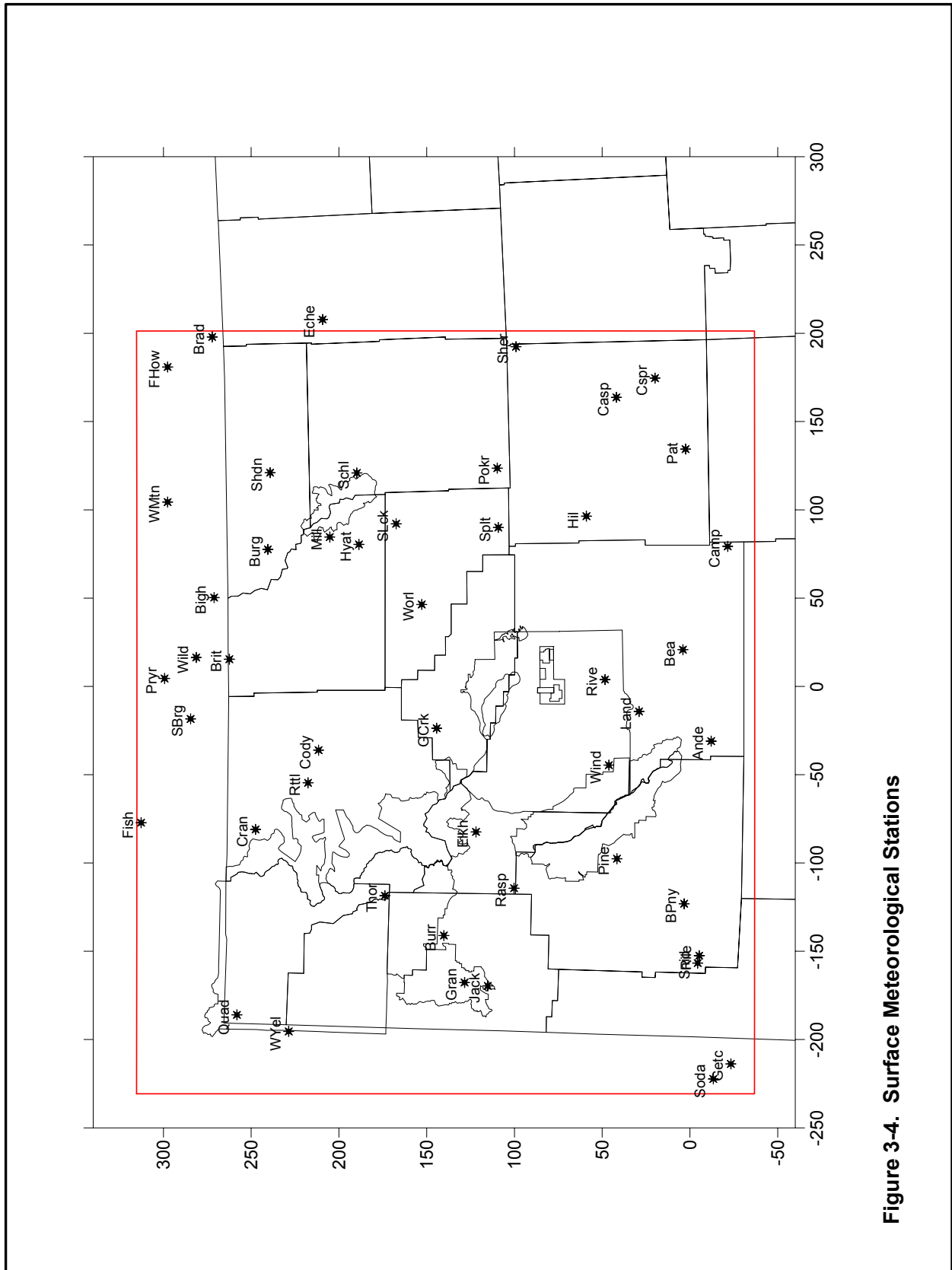


Figure 3-4. Surface Meteorological Stations

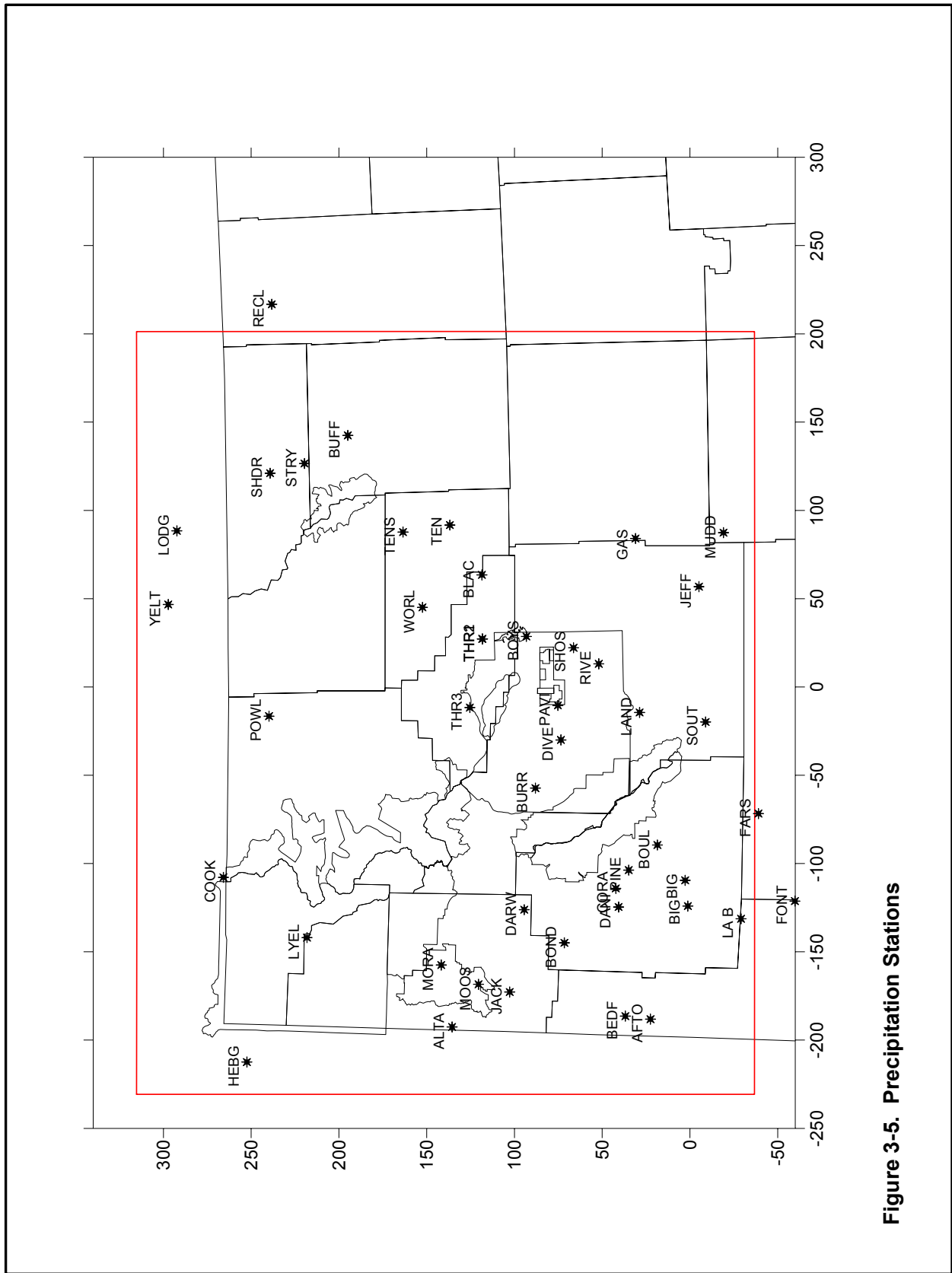


Figure 3-5. Precipitation Stations

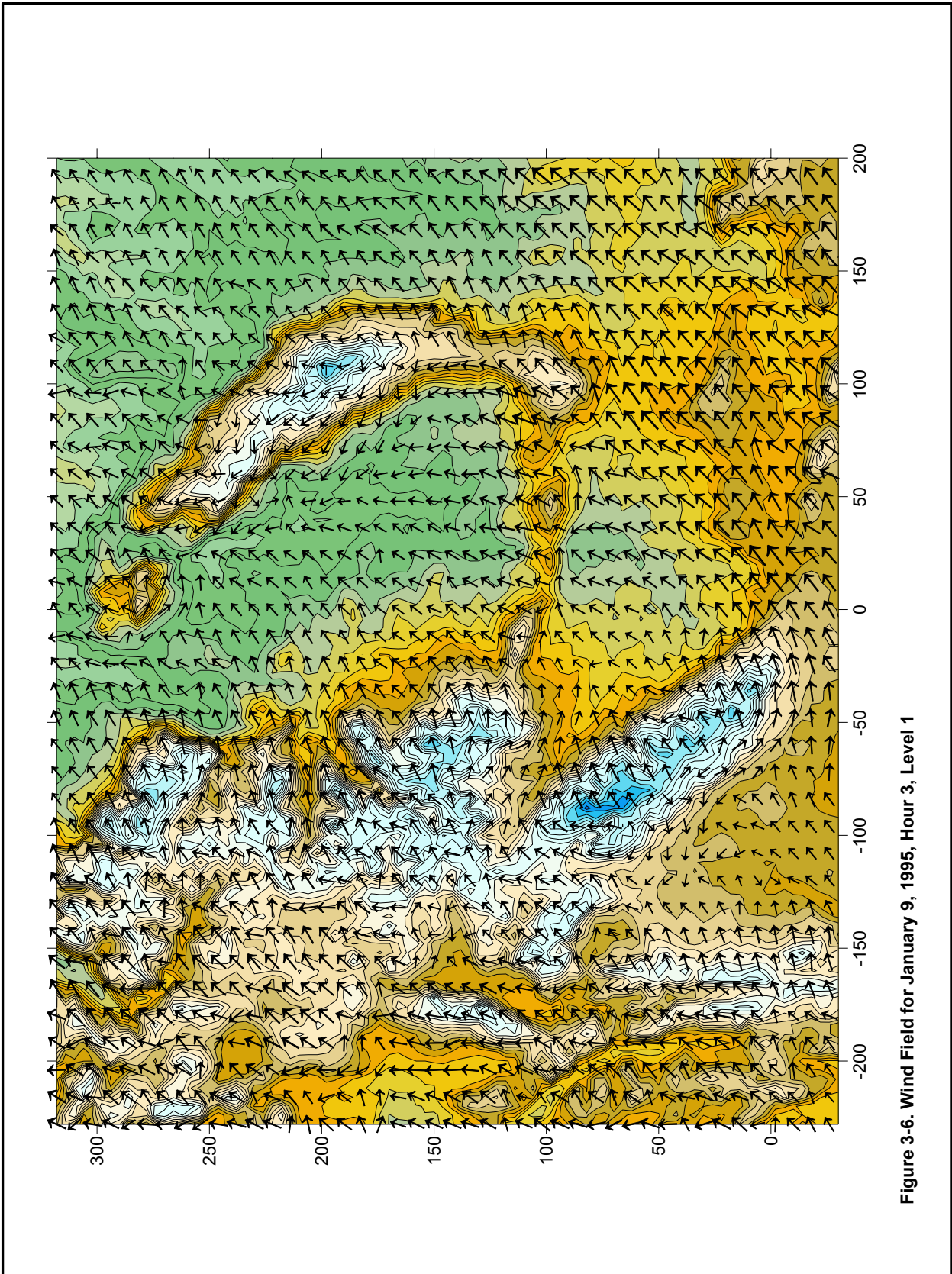


Figure 3-6. Wind Field for January 9, 1995, Hour 3, Level 1

4.0 CALPUFF DISPERSION MODELING

The CALPUFF model utilizes the CALMET meteorological output in addition to emission source data and an extensive set of control parameters to calculate ambient concentrations of pollutants at each model receptor. An example CALPUFF input file (for Wind River Proposed Action Sources, Receptor Group 1, January 1995) is presented in Exhibit 2. The CALPUFF input parameters utilized for the Wind River analysis follow the IWAQM guidelines with the exception of the use of the RIVAD chemical transformation module. The RIVAD chemical scheme was selected for this analysis as it incorporates a more detailed nitrogen oxides transformation process than does the MESOPUFF II option.

4.1 MODEL RECEPTORS

One of the primary inputs to the CALPUFF model is the receptor locations. For the Wind River analysis, a 4 km (2.5 mile) rectilinear receptor grid was developed for each of thirteen selected areas of special concern. Additional receptors were included along the boundary of each area of special concern. Individual receptors were utilized in the model to represent Phlox Mountain and ten high elevation lakes identified for acid deposition analysis.

The areas of special concern were as follows:

- Bridger Wilderness (PSD Class I)
- Cloud Peak Wilderness (PSD Class II)
- Fitzpatrick Wilderness Area (PSD Class I)
- Grand Teton National Park (PSD Class I)
- North Absaroka Wilderness (PSD Class I)
- Owl Creek Range (PSD Class II)
- Phlox Mountain (PSD Class II)
- Popo Agie Wilderness Area (PSD Class II)
- Teton Wilderness Area (PSD Class I)
- Washakie Wilderness Area (PSD Class I)
- Wind River Canyon (PSD Class II)
- Wind River Roadless Area (PSD Class II)
- Yellowstone National Park (PSD Class I)

The high elevation lakes identified for analysis were as follows:

- Black Joe Lake, Bridger Wilderness
- Deep Lake, Bridger Wilderness
- Emerald Lake, Cloud Peak Wilderness
- Florence Lake, Cloud Peak Wilderness
- Hobbs Lake, Bridger Wilderness
- Lower Saddlebag Lake, Popo Agie Wilderness
- Ross Lake, Fitzpatrick Wilderness
- Stepping Stone Lake, Absaroka Beartooth Wilderness
- Twin Island Lake, Absaroka Beartooth Wilderness
- Upper Frozen Lake, Bridger Wilderness

The receptor grids for the areas of special concern are presented in Figure 4-1, and the high elevation lakes of interest are presented in Figure 4-2.

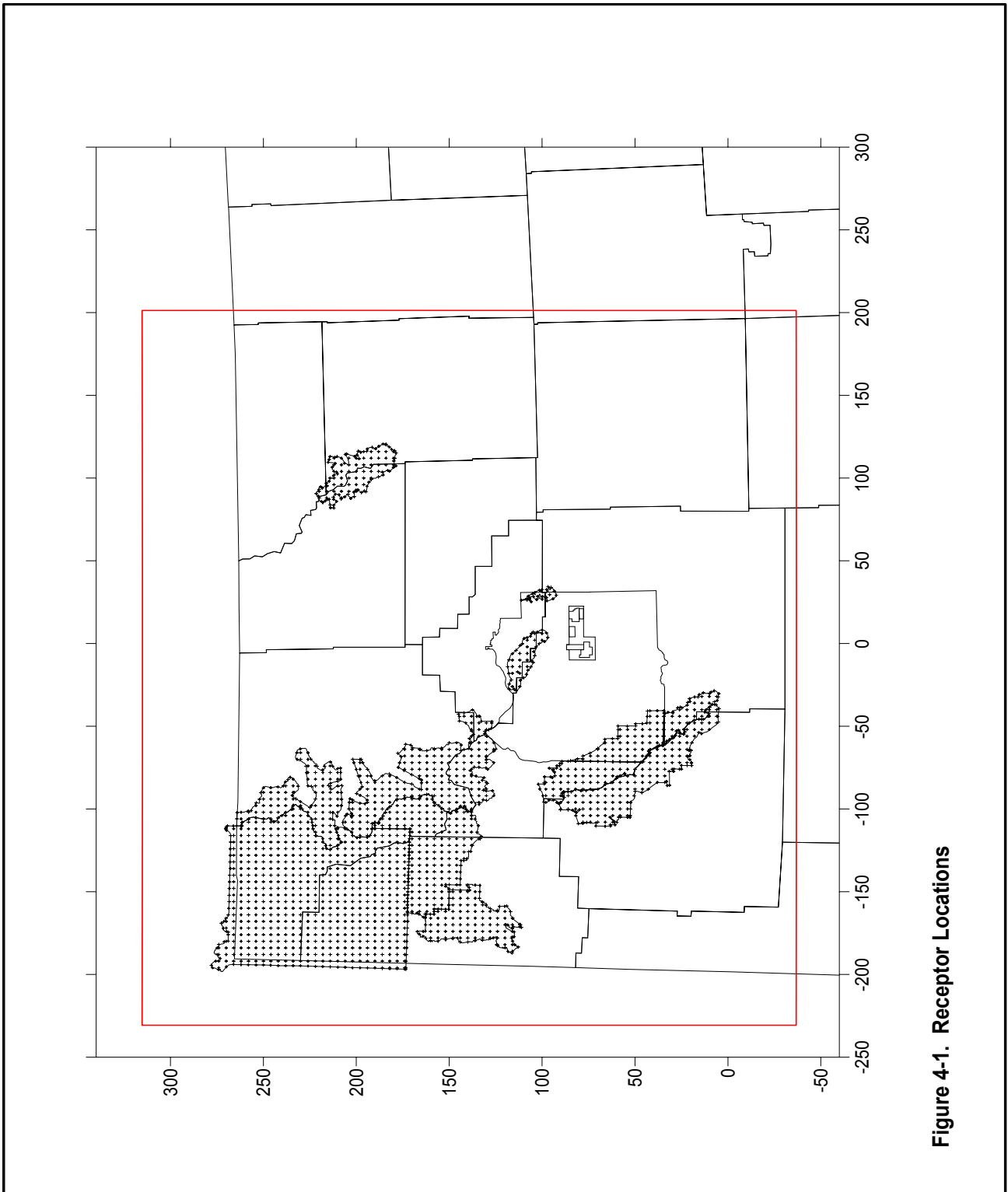


Figure 4-1. Receptor Locations

Figure 4-2 High elevation lake Receptors

4.2 OTHER CALPUFF CONSIDERATIONS

In addition to the meteorological data and receptor grids previously described, CALPUFF requires an ozone data file for use with the chemical transformation module. The ozone data utilized for this analysis made use of data collected during the Mount Zirkel visibility study, and routinely collected at Yellowstone National Park, Craters of the Moon National Park, Pinedale, and Centennial NDDN sites. The ozone data file assigned a background ozone value to each computational grid cell in the modeling domain based on the nearest of the six ozone monitoring locations. A default background ozone concentration of 49 ppb was used when hourly ozone data were missing.

A background ammonia concentration is also required for the chemical transformation calculations. The default ammonia concentration for arid lands of 1 ppb was assumed for the CALPUFF model.

Eight pollutant species were modeled in the analysis, with five species being emitted from sources and three species being computed internally by the model. The emitted and computed species were as follows:

- SO₂ (emitted)
- SO₄ (computed)
- NO (emitted)
- NO₂ (emitted)
- HNO₃ (computed)
- NO₃ (computed)
- PM₁₀ (emitted)
- PM_{2.5} (emitted)

The CALPUFF model was applied individually for ten emission source groups. The ten sets of CALPUFF runs were as follows (with a four-letter identified used in the model runs noted in parentheses):

- Existing sources associates with the Wind River Project (WREX)
- Wind River Proposed Action emissions (WRPP)
- Wind River Alternative A (increased development) emissions (WRAA)
- Wind River Alternative B (decreased development) emissions (WRAB)
- Wind River Alternative C (no action) emissions (WRNA)
- Wind River Post-Construction (Proposed Action) emissions (WRPC)

- Operating Sources Permitted after 2001 (PEPP)
- Permitted but not yet Operating (RFFA) emissions (RAPP)
- Reasonable Foreseeable Development (RFD) emissions (RDPP)
- Well emissions from Non-NEPA related sources (WELL)

The output files from each of the above listed model runs were subsequently post-processed to obtain the necessary results.

5.0 PROCESSING OF CALPUFF MODEL RESULTS

5.1 APPEND, CALSUM AND POSTUTIL PROGRAMS

In order to obtain data useful for comparing to standards and levels of acceptable change (LACs), the CALPUFF model output files must be processed with the CALPOST model and associated utilities. Three utility programs were applied in order to prepare the CALPUFF results for use in CALPOST; APPEND, CALSUM, and POSTUTIL.

The APPEND utility was applied to combine the individual monthly data periods into a single annual run. For each source group, the append utility was applied individually for pollutant concentration, dry deposition flux, and wet deposition flux data.

The CALSUM utility was utilized to arithmetically sum the CALPUFF results for various source groups. A cumulative source group was created by summing the result files for four source groups not associated with the Project; Permitted sources, RFFA sources, RFD sources and Non-project well sources. In order to predict total impacts, the CALSUM utility was again applied to sum the cumulative source group data with each of the project alternatives.

The POSTUTIL utility was applied for two functions: 1) to sum the wet and dry deposition fluxes and in turn calculate the total nitrogen (N) and total sulfur (S) deposition rates, and 2) to repartition nitric acid (HNO₃) and nitrate (NO₃) concentration to determine the potential ammonia (NH₃) limiting effects on the development of nitrate. POSTUTIL computes the total sulfate concentrations from all sources and estimates available ammonia for nitrate formation after the preferential scavenging of ammonia by sulfate. This allows non-linearity associated with ammonia limiting effects to be included in the predicted impacts. Quarterly background ammonia concentrations as monitored at three CASTNET sites were utilized for the repartition calculations. The CASTNET sites and monitoring years were as follows: Centennial, WY – 1989 through 2001, Pinedale, Wyoming – 1989 through 2001, and Yellowstone – 1996 through 2000. The following table (5-1) summarizes the ammonia data utilized for in the repartition calculations.

Table 5-1. Background Ammonia Concentrations.

Quarter	Ammonia (NH ₄) Concentration (µg/m ³)	Ammonia (NH ₄) Concentration (ppb*)
1	0.197	0.268
2	0.293	0.398
3	0.350	0.475
4	0.192	0.261

* ppb = parts per billion

5.2 CALPOST PROCESSING

Following the preparation of the CALPUFF files with the APPEND, CALSUM and POSTUTIL utilities, the CALPOST program was applied to determine the predicted pollutant concentrations, deposition fluxes and visibility impacts for each area of special concern.

5.2.1 Visibility Calculations

The visibility assessment methodology utilized for this analysis is referred to as "Method 6" in the CALPOST routine. This methodology computes light extinction from speciated background particulate concentrations, modeled pollutant concentrations and relative humidity adjustment factors. The relative humidity factors are applied equally to both the modeled and background particulate concentrations. In addition to changes in light extinction, CALPOST also calculates the change in visibility conditions as measured in deciviews. The following formulas were used in calculating the visibility impacts.

Particle scattering can be broken down by the contributions of different particulate species.

$$b_{\text{source}} = b_{\text{SO}_4} + b_{\text{NO}_3} + b_{\text{fine}} + b_{\text{coarse}}$$

Extinction due to each of the particle scattering components is obtained by applying a scattering/absorption efficiency to the concentration ($\mu\text{g}/\text{m}^3$ for particulate species) as follows:

$$b_{\text{SO}_4} = 3 [(\text{NH}_4)_2\text{SO}_4]f(\text{Rh})$$

$$b_{\text{NO}_3} = 3 [\text{NH}_4\text{NO}_3]f(\text{Rh})$$

$$b_{\text{fine}} = 1.0 [\text{PM}_{2.5}]$$

$$b_{\text{coarse}} = 0.6 [\text{PM}_{\text{course}}]$$

Note that the relative humidity factor $f(\text{Rh})$ is applied in the above equations only to the hygroscopic species SO_4 and NO_3 .

Total atmospheric extinction can be calculated as below, where the Rayleigh scattering component of air is assumed to be 10 Mm^{-1} .

$$b_{\text{ext}} = b_{\text{SO}_4} + b_{\text{NO}_3} + b_{\text{fine}} + b_{\text{coarse}} + b_{\text{Ray}}$$

The deciview (dv) index is calculated from extinction as follows:

$$dv = 10 \ln (b_{\text{ext}} / 10 \text{ Mm}^{-1})$$

The change in deciviews caused by an emission source can be calculated as follows:

$$\Delta dV = 10 \ln [(b_{\text{background}} + b_{\text{source}} / b_{\text{background}})]$$

Visual range is a commonly used measure of visibility although it is not one of the criterion used in the evaluation of AQRVs,. Visual range is calculated from extinction as follows:

$$\text{Visual Range (km)} = 3912 / b_{\text{ext}} (\text{Mm}^{-1})$$

In order to estimate visibility impacts, CALPOST must be provided with estimated background visibility conditions. For this analysis, two sets of background conditions were applied. One estimate of background visibility was derived from the estimated regional particle concentrations published in the Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report (USDA-FS et al December 2000a). For areas west of the Mississippi River, the FLAG document estimates the hygroscopic particle extinction at 0.6 inverse megameters (Mm^{-1}) and the non-hygroscopic particle extinction at $4.5 Mm^{-1}$. These background particle extinction values were combined with monthly relative humidity factors published in the Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, (EPA September 2003).

The second CALPOST application utilizes the same published $f(Rh)$ factors along with particle concentrations measured at three Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring sites; Bridger, Yellowstone, and North Absaroka. Background visibility conditions were ascribed to the areas of concern as indicated in Table 5-2. Table 5-3 presents the quarterly averaged background extinction coefficients measured at the IMPROVE sites. The IMPROVE background conditions represent the 20th percentile of the best visibility days. Tables 5-4 through 5-6 summarize each of the background visibility data sets for both the FLAG and IMPROVE methods, and Figures 5-1 through 5-5 present the reconstructed background conditions graphically. Note that the FLAG reconstructed background extinction values are relatively constant through the year, varying slightly with changes in relative humidity, while the IMPROVE background extinction values exhibit greater variation with seasonal changes in the particle concentrations.

Table 5-2. Applied Visibility Background Conditions.

Area of Special Concern	Applied Background Visibility Conditions
Bridger Wilderness	Bridger
Fitzpatrick Wilderness	Bridger
Wind River Roadless Area	Bridger
Popo Agie Wilderness	Bridger
Wind River Canyon	Bridger
Owl Creek Range	Bridger
Phlox Mountain	Bridger
Yellowstone NP	Yellowstone
Teton NP	Yellowstone
Teton Wilderness	Yellowstone
North Absaroka Wilderness	North Absaroka
Washakie Wilderness	North Absaroka
Cloud Peak Wilderness	North Absaroka

Table 5-3. IMPROVE Dry Extinction Coefficients (Mm^{-1}) for Quarterly Averaged 20th Percentile Cleanest Days.¹

IMPROVE Site	Quarter	Ammonium Sulfate	Ammonium Nitrate	Organic Carbon	Elemental Carbon	Fine Soil	Coarse Particle	Total Hygroscopic	Total Non-Hygroscopic	Monitoring Period of Record
Bridger	1	0.709	0.136	0.838	0.323	0.070	0.434	0.845	1.666	1989 - 2002
Bridger	2	1.440	0.290	1.897	0.365	0.310	1.228	1.730	3.800	1988 - 2002
Bridger	3	1.667	0.235	3.367	0.605	0.317	1.348	1.902	5.637	1988 - 2002
Bridger	4	0.779	0.137	1.019	0.309	0.086	0.621	0.915	2.035	1988 - 2002
Yellowstone	1	0.842	0.284	1.646	0.452	0.129	0.745	1.126	2.973	1988 - 2002
Yellowstone	2	1.178	0.324	2.215	0.651	0.464	1.201	1.502	4.531	1988 - 2002
Yellowstone	3	1.572	0.238	4.119	1.138	0.444	1.629	1.811	7.330	1988 - 2002
Yellowstone	4	0.839	0.195	1.702	0.385	0.142	0.762	1.033	2.990	1988 - 2002
North Absaroka	1	0.845	0.246	0.647	0.238	0.089	0.722	1.091	1.696	2000 - 2002
North Absaroka	2	1.310	0.350	1.233	0.373	0.295	0.996	1.660	2.897	2000 - 2002
North Absaroka	3	1.386	0.332	4.220	1.062	0.468	1.200	1.718	6.949	2000 - 2002
North Absaroka	4	0.514	0.167	0.574	0.131	0.066	0.397	0.681	1.167	2000 - 2002

¹ IMPROVE data provided by Scot Copeland, USDA-FS Washakie Ranger District, Lander WY, October 2003.

Table 5-4. Bridger Wilderness 20% Cleanest Reconstructed Visibility Conditions (also applied to Fitzpatrick, Wind River Canyon, Wind River Wilderness Owl Creek, and Popo Agie).

Month	f(Rh) (Bridger) (unitless)	FLAG Hygroscopic Particle Extinction (1/Mm)	FLAG Non- Hygroscopic Particle Extinction (1/Mm)	FLAG Reconstructed b_{ext} (1/Mm)	FLAG Deciview (dv)	FLAG Standard Visual Range (km)	IMPROVE Hygroscopic Particle (1/Mm)	IMPROVE Non- Hygroscopic (1/Mm)	IMPROVE Reconstructed b_{ext} (1/Mm)	IMPROVE Deciview (dv)	IMPROVE Standard Visual Range (km)
Jan	2.50	0.6	4.5	16.000	4.7	244	0.845	1.666	13.778	3.2	284
Feb	2.30	0.6	4.5	15.880	4.6	246	0.845	1.666	13.609	3.1	287
Mar	2.30	0.6	4.5	15.880	4.6	246	0.845	1.666	13.609	3.1	287
Apr	2.10	0.6	4.5	15.760	4.5	248	1.730	3.800	17.432	5.6	224
May	2.10	0.6	4.5	15.760	4.5	248	1.730	3.800	17.432	5.6	224
Jun	1.80	0.6	4.5	15.580	4.4	251	1.730	3.800	16.914	5.3	231
Jul	1.50	0.6	4.5	15.400	4.3	254	1.902	5.637	18.489	6.1	211
Aug	1.50	0.6	4.5	15.400	4.3	254	1.902	5.637	18.489	6.1	211
Sep	1.80	0.6	4.5	15.580	4.4	251	1.902	5.637	19.060	6.5	205
Oct	2.00	0.6	4.5	15.700	4.5	249	0.915	2.035	13.865	3.3	282
Nov	2.50	0.6	4.5	16.000	4.7	244	0.915	2.035	14.323	3.6	273
Dec	2.40	0.6	4.5	15.940	4.7	245	0.915	2.035	14.231	3.5	275

Table 5-5. Yellowstone National Park Reconstructed 20% Cleanest Visibility Conditions (also applied to Grand Teton NP, and Teton Wilderness).

Month	f(Rh) (Yellowstone) (unitless)	FLAG Hygroscopic Particle Extinction (1/Mm)	FLAG Non- Hygroscopic Particle Extinction (1/Mm)	FLAG Reconstructed b_{ext} (1/Mm)	FLAG Deciview (dv)	FLAG Standard Visual Range (km)	IMPROVE Hygroscopic Particle (1/Mm)	IMPROVE Non- Hygroscopic (1/Mm)	IMPROVE Reconstructed b_{ext} (1/Mm)	IMPROVE Deciview (dv)	IMPROVE Standard Visual Range (km)
Jan	2.50	0.6	4.5	16.0	4.7	244	1.126	2.973	15.788	4.6	248
Feb	2.30	0.6	4.5	15.9	4.6	246	1.126	2.973	15.563	4.4	251
Mar	2.20	0.6	4.5	15.8	4.6	247	1.126	2.973	15.450	4.4	253
Apr	2.10	0.6	4.5	15.8	4.5	248	1.502	4.531	17.685	5.7	221
May	2.10	0.6	4.5	15.8	4.5	248	1.502	4.531	17.685	5.7	221
Jun	1.90	0.6	4.5	15.6	4.5	250	1.502	4.531	17.385	5.5	225
Jul	1.70	0.6	4.5	15.5	4.4	252	1.811	7.330	20.408	7.1	192
Aug	1.60	0.6	4.5	15.5	4.4	253	1.811	7.330	20.227	7.0	193
Sep	1.80	0.6	4.5	15.6	4.4	251	1.811	7.330	20.590	7.2	190
Oct	2.10	0.6	4.5	15.8	4.5	248	1.033	2.990	15.160	4.2	258
Nov	2.40	0.6	4.5	15.9	4.7	245	1.033	2.990	15.470	4.4	253
Dec	2.50	0.6	4.5	16.0	4.7	244	1.033	2.990	15.574	4.4	251

Table 5-6. North Absaroka Reconstructed 20% Cleanest Visibility Conditions (also applied to , Washakie and Cloud Peak).

Month	f(Rh) (North Absaroka) (unitless)	FLAG Hygroscopic Particle Extinction (1/Mm)	FLAG Non- Hygroscopic Particle Extinction (1/Mm)	FLAG Reconstructed b_{ext} (1/Mm)	FLAG Deciview (dv)	FLAG Standard Visual Range (km)	IMPROVE Hygroscopic Particle (1/Mm)	IMPROVE Non- Hygroscopic (1/Mm)	IMPROVE Reconstructed b_{ext} (1/Mm)	IMPROVE Deciview (dv)	IMPROVE Standard Visual Range (km)
Jan	2.40	0.6	4.5	15.9	4.7	245	1.091	1.696	14.315	3.6	273
Feb	2.20	0.6	4.5	15.8	4.6	247	1.091	1.696	14.096	3.4	277
Mar	2.20	0.6	4.5	15.8	4.6	247	1.091	1.696	14.096	3.4	277
Apr	2.10	0.6	4.5	15.8	4.5	248	1.660	2.897	16.384	4.9	239
May	2.10	0.6	4.5	15.8	4.5	248	1.660	2.897	16.384	4.9	239
Jun	1.90	0.6	4.5	15.6	4.5	250	1.660	2.897	16.052	4.7	244
Jul	1.60	0.6	4.5	15.5	4.4	253	1.718	6.949	19.698	6.8	198
Aug	1.50	0.6	4.5	15.4	4.3	254	1.718	6.949	19.526	6.7	200
Sep	1.80	0.6	4.5	15.6	4.4	251	1.718	6.949	20.042	7.0	195
Oct	2.00	0.6	4.5	15.7	4.5	249	0.681	1.167	12.528	2.3	312
Nov	2.30	0.6	4.5	15.9	4.6	246	0.681	1.167	12.732	2.4	307
Dec	2.40	0.6	4.5	15.9	4.7	245	0.681	1.167	12.800	2.5	305

Figure 5-1. Bridger Wilderness Reconstructed Visibility Conditions

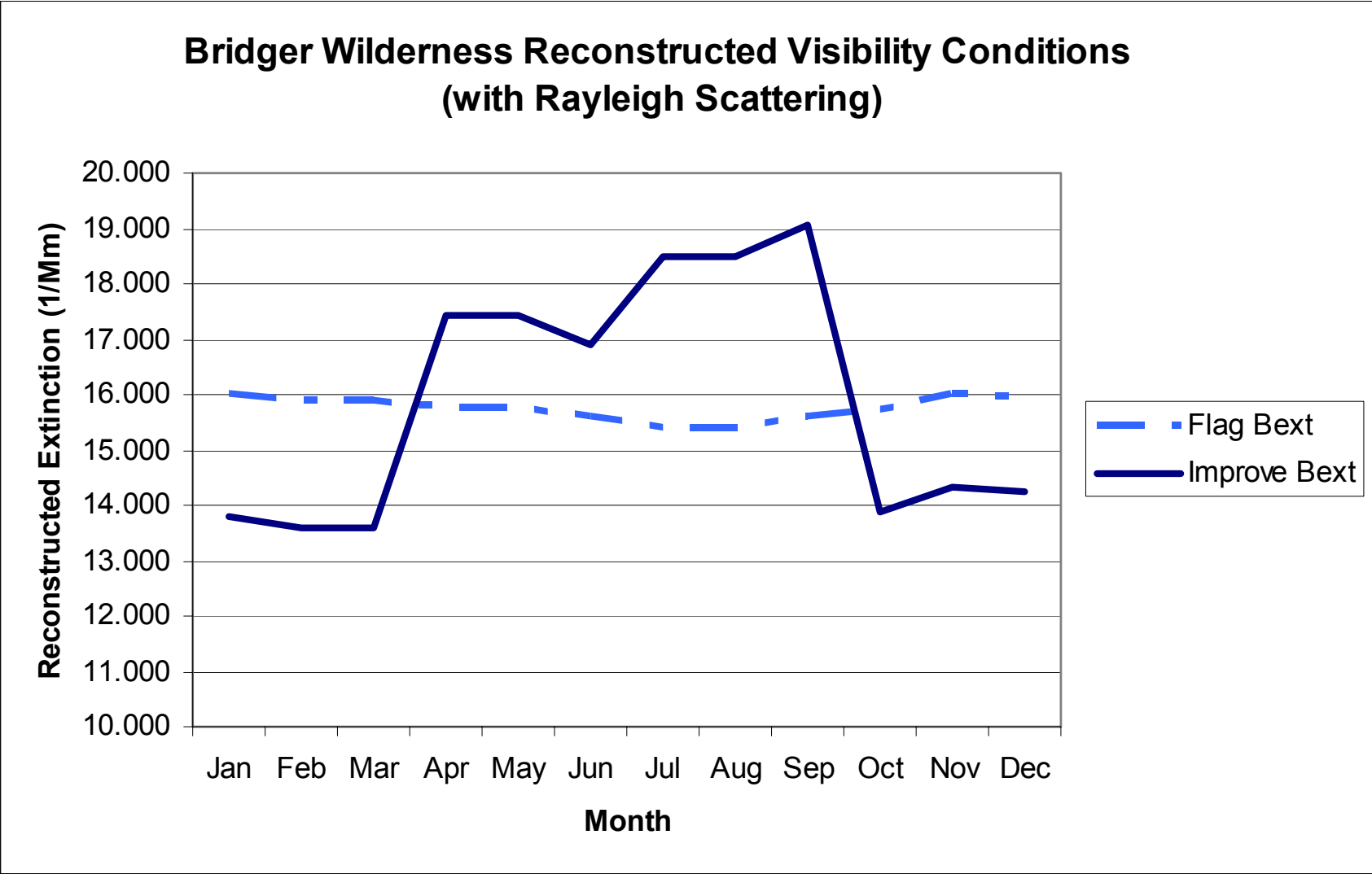


Figure 5-2. Yellowstone National Park Reconstructed Visibility Conditions

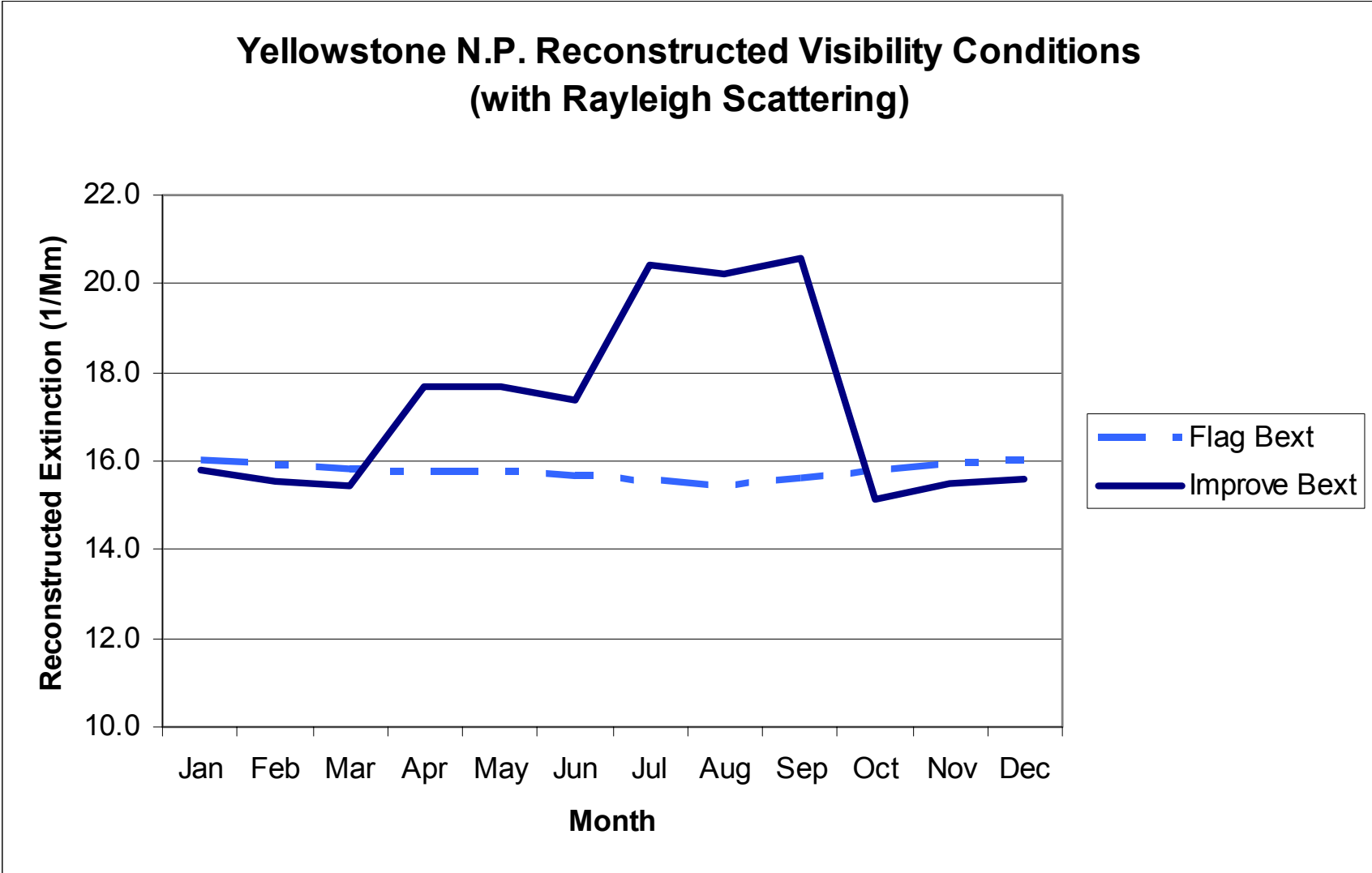


Figure 5-3. North Absaroka Wilderness Reconstructed Visibility Conditions

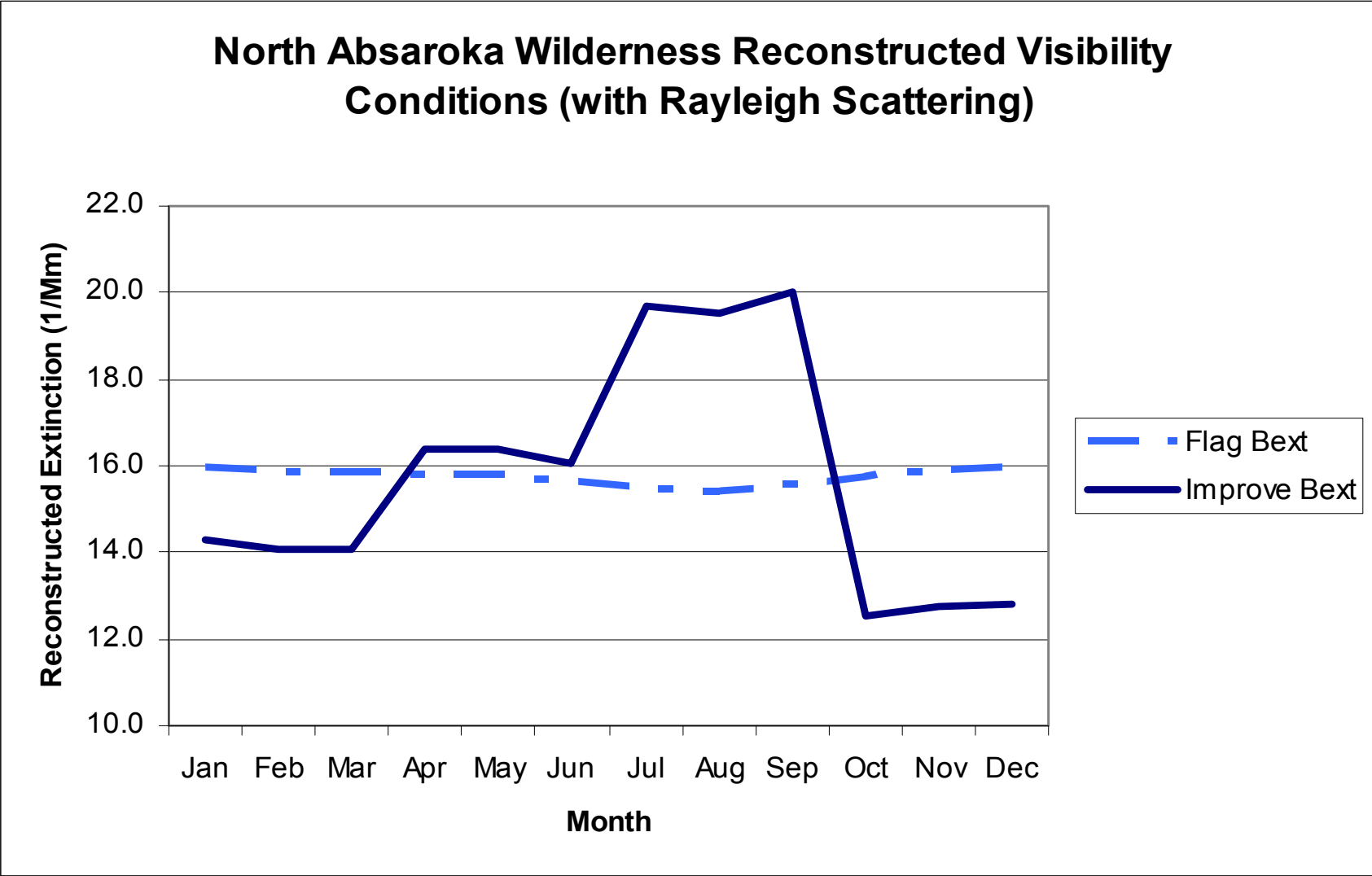


Figure 5-4. FLAG Reconstructed Visibility Conditions

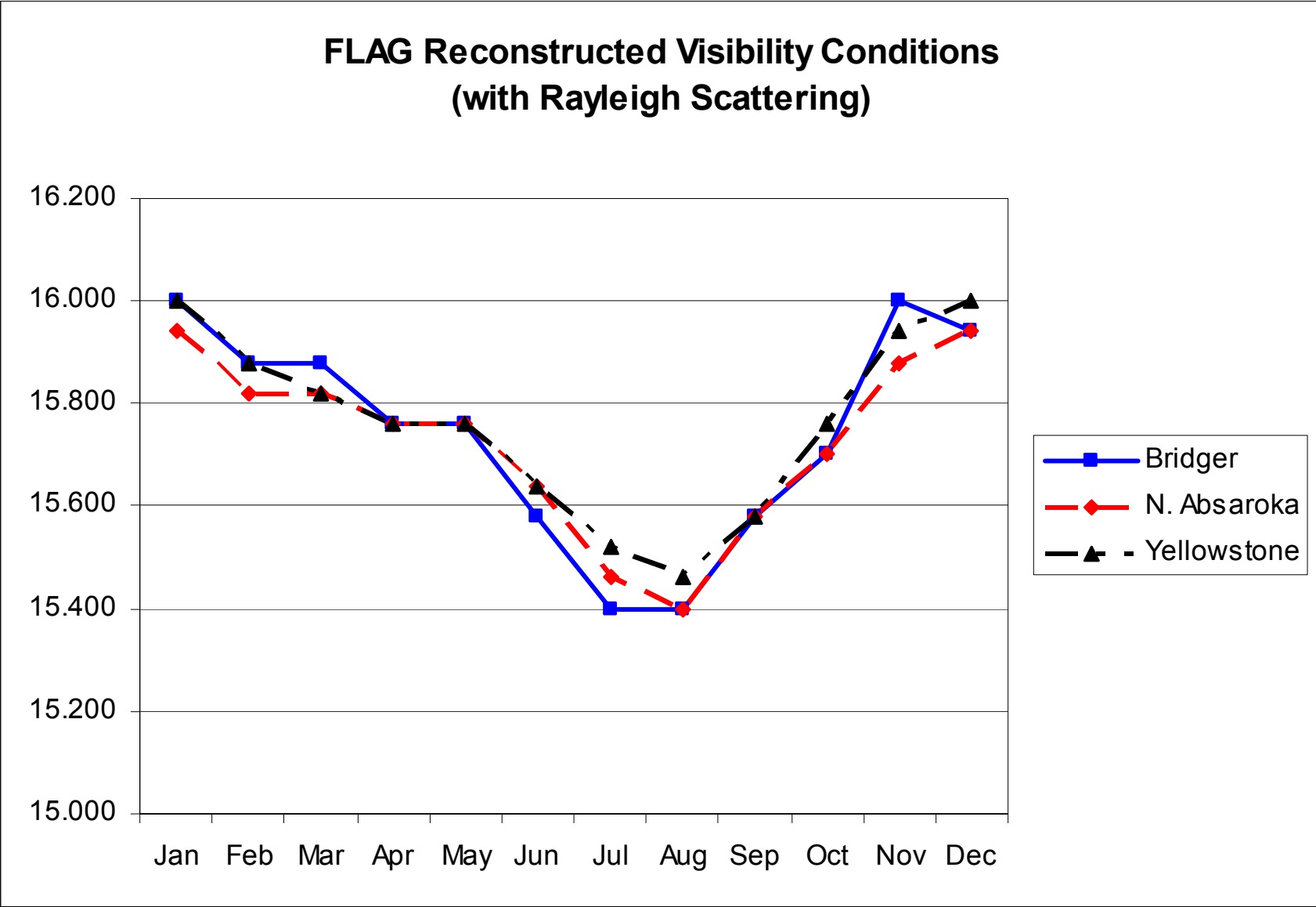
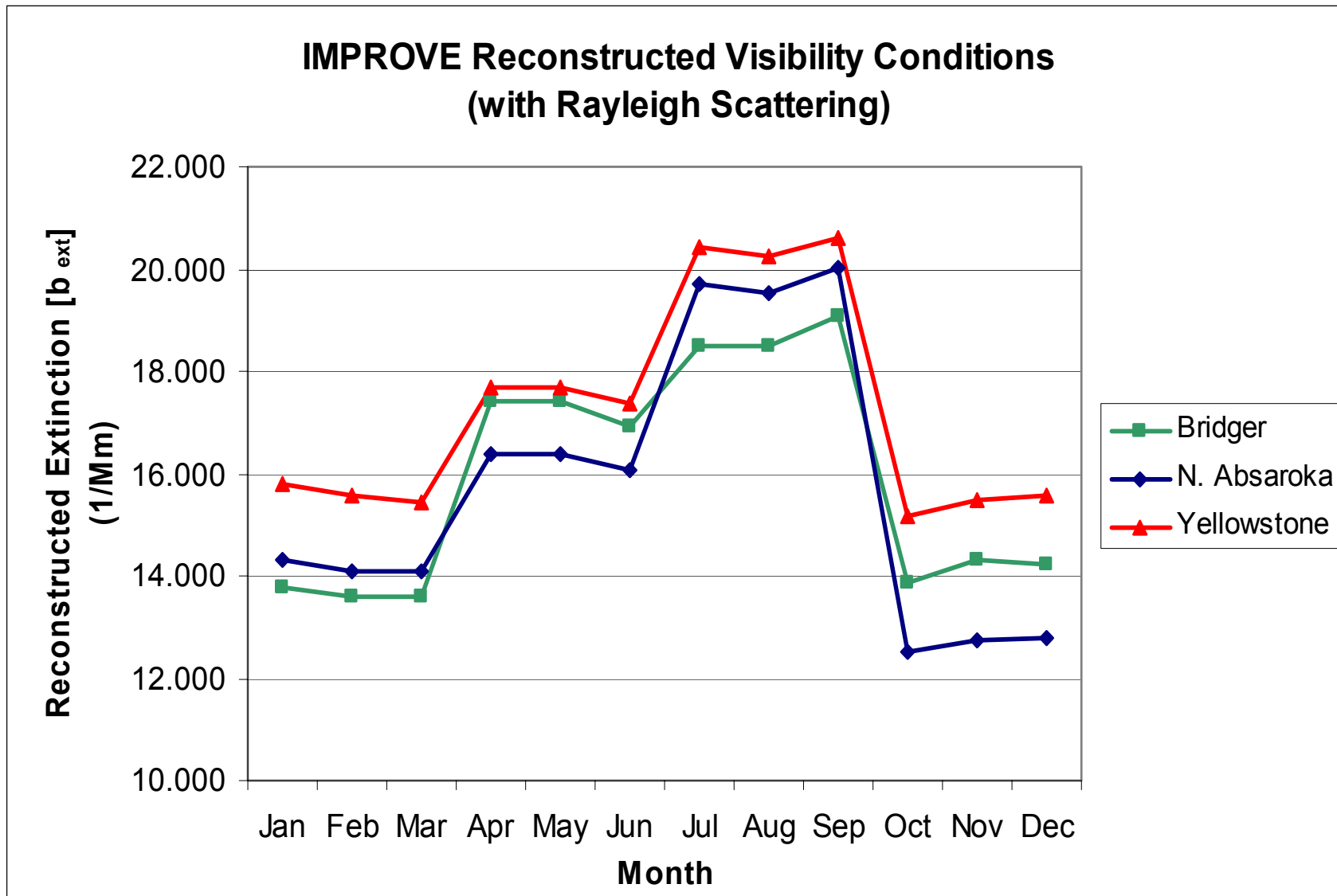


Figure 5-5. IMPROVE Reconstructed Visibility Conditions



5.2.2 Calculating Changes in Lake Acid Neutralizing Capacity

The deposition of sulfate and nitrate species from air pollution sources may cause changes in water body chemistry and can impact the acid neutralizing capacity (ANC) of high elevation lakes. Potential ANC impacts were calculated manually by applying the screening methodology prescribed by the US Forest Service (USDA-FS, January 2000a). Total annual nitrogen (N) and sulfur (S) deposition fluxes as averaged by CALPOST were input to the following equations to calculate the potential change in ANC.

% Alkalinity Change = $[Hdep/ANC(o)] \times 100$ where:

ANC(o) = baseline ANC for lake catchment in eq, or

$$ANC(o) = W * P * (1-Et) * A * (10,000m^2/ha) * 10^6 \text{ eq}/\mu\text{eq} * 10^3 \text{ liters}/m^3$$

W = watershed area in ha

P = average annual precipitation in meters

Et = fraction of precipitation lost to evaporation and transpiration (0.33 assumed)

A = Baseline Alkalinity ($\mu\text{eq}/l$)

Hdep = acid deposition in eq = $[H(s) + H(n0)] * W * 10,000 \text{ m}^2/ha$

Hs = sulfur dep in $\text{eq}/m^2/yr = Ds * ha/10,000 \text{ m}^2 * 1,000 \text{ g}/kg * \text{eq}/16 \text{ g S}$

Hn = nitrogen dep in $\text{eq}/m^2/yr = Dn * ha/10,000 \text{ m}^2 * 1,000 \text{ g}/kg * \text{eq}/14 \text{ g N}$

Ds = sulfur deposition in $\text{kg}/ha/yr$ for all sulfur species

Dn = nitrogen deposition in $\text{kg}/ha/yr$ from all nitrogen specie

As indicated in the above equations, baseline alkalinity levels for the high elevation lakes of concern are required for the ANC impact calculations. Baseline ANC data were obtained from USFS and represent measurements collected through the year 2003. The basis for the background ANC data is the 10th percentile of measurements observed at the lake outlet. Table 5-7 summarizes the baseline ANC data for the lakes of interest while Figures 5-6 through 5-15 present charts of the measured baseline levels. Of note is Upper Frozen lake for which only a small number of samples are available (six). The baseline ANC level for Upper Frozen lake is dominated by one very low ANC sample collected in 1999. As presented in the following charts, seven of the ten lakes exhibit increasing or neutral changes in baseline ANC levels, indicating that current acid deposition rates are not adversely impacting ANC levels. Three lakes however, Hobbs, Lower Saddlebag and Ross, exhibit varying degrees of declining ANC levels, possibly resulting in part from acid deposition.

Table 5-7. Baseline ANC Levels for Lakes of Special Concern.

Water Body of Concern	Wilderness Area	Annual Precipitation	Watershed Area (Hectares)	10% Lowest ANC ¹ (µeq/l)	Number of Samples	Monitoring Period
BLACK JOE LAKE	Bridger	92.5 cm	890	67.0	61	1984 - 2003
DEEP LAKE	Bridger	92.5 cm	205	59.9	58	1984 - 2003
EMERALD LAKE	Cloud Peak	78 cm	293	69.8	26	1993 - 2003
FLORENCE LAKE	Cloud Peak	78 cm	417	33.0	28	1993 - 2003
HOBBS LAKE	Bridger	108 cm	293	69.9	65	1984 - 2003
LOWER SADDLEBAG LAKE	Popo Agie	est 100 cm	155	55.5	43	1989 - 2003
ROSS LAKE	Fitzpatrick	est 108 cm	4455	53.5	44	1988 - 2003
STEPPING STONE LAKE	Absaroka Beartooth	146 cm	26.4	19.9	10	1993 - 2003
TWIN ISLAND LAKE	Absaroka Beartooth	130 cm	44.9	17.6	10	1993 - 2003
UPPER FROZEN LAKE	Bridger	92.5cm	64.83	5.0	6	1997 - 2003

¹Baseline ANC values compiled from 24 data files provided by Terry Svalberg and Jeff Sorkin of the USDA-FS. ANC levels represent the 10th percentile of the ANC levels measured at the lake outlet.

Figure 5-6. Black Joe Lake Baseline ANC Levels.

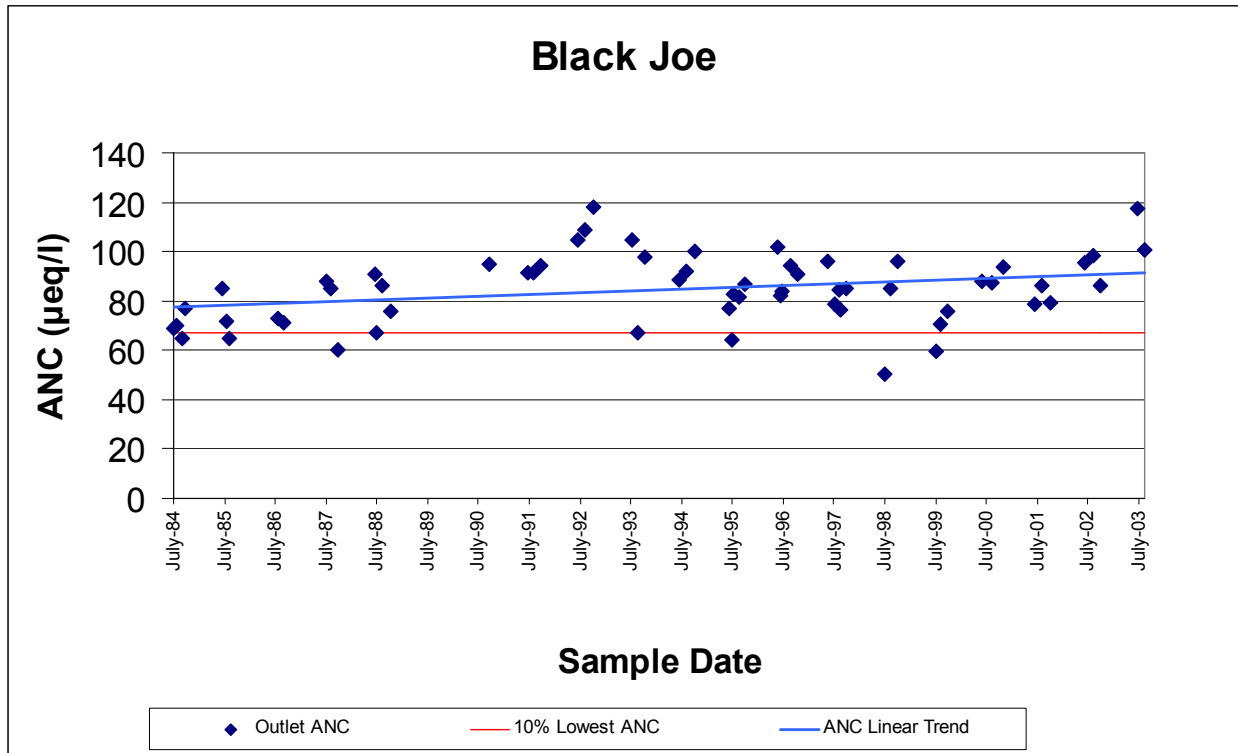


Figure 5-7. Deep Lake Baseline ANC Levels.

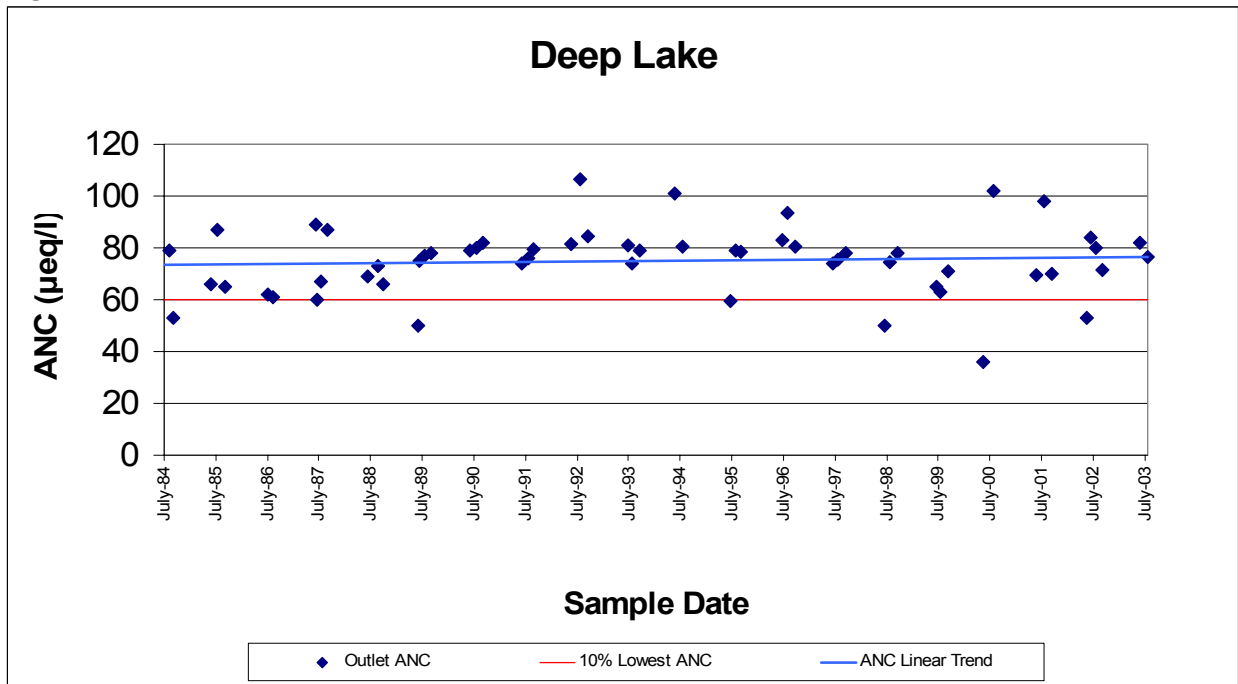


Figure 5-8. Emerald Lake Baseline ANC Levels.

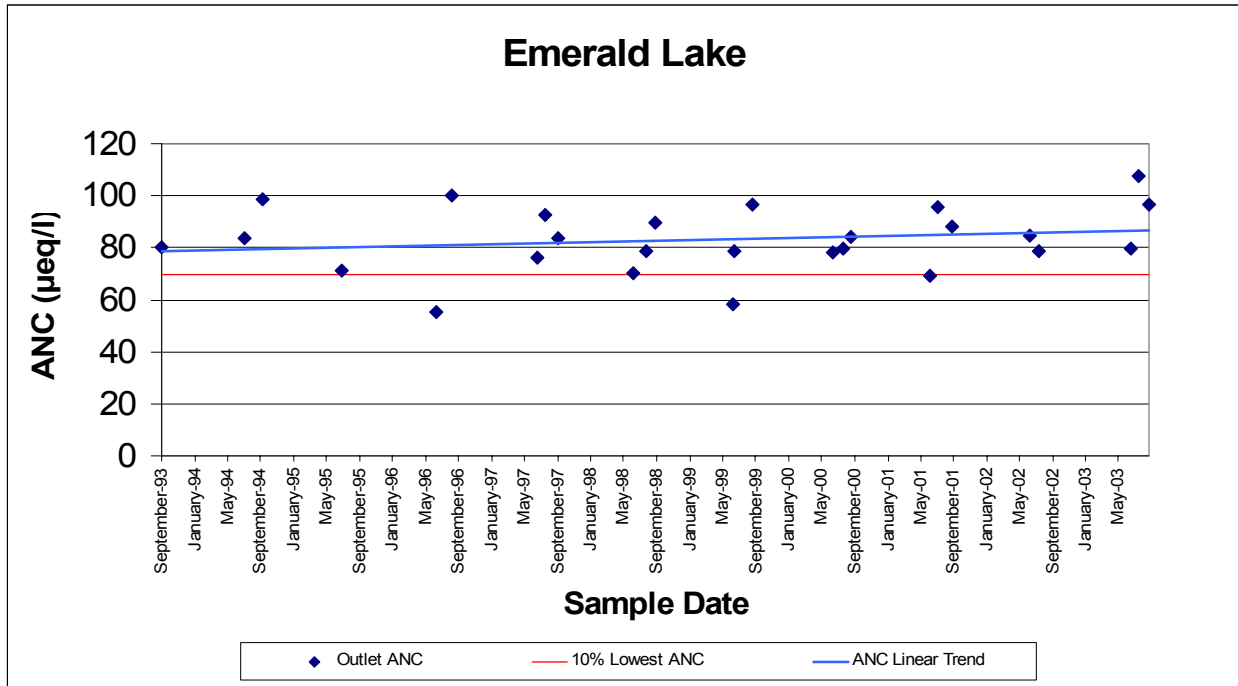


Figure 5-9. Florence Lake Baseline ANC Levels.

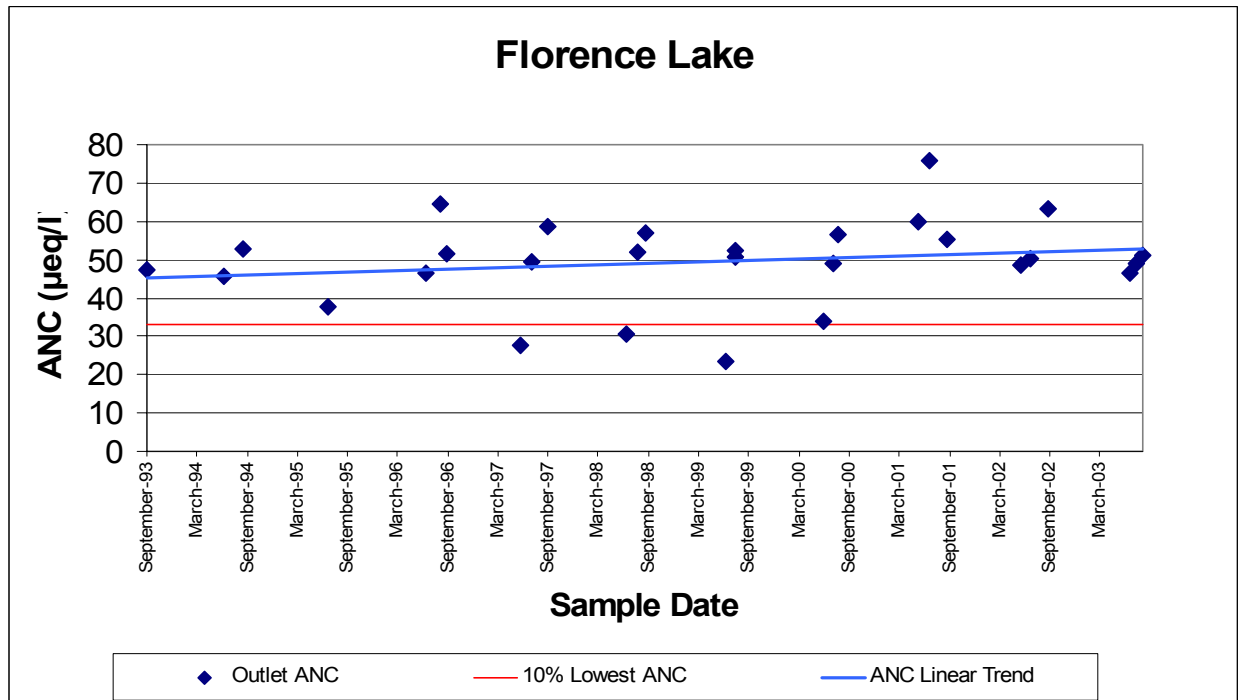


Figure 5-10. Hobbs Lake Baseline ANC Levels.

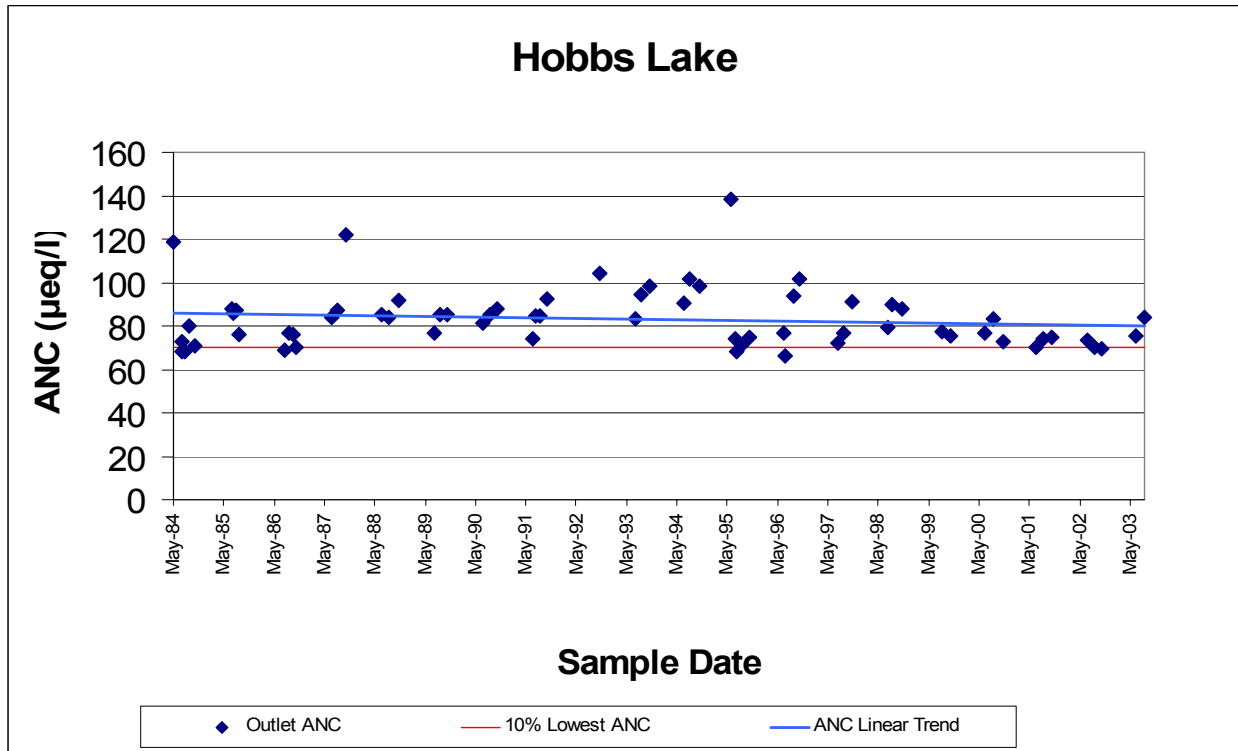


Figure 5-11. Lower Saddlebag Lake Baseline ANC Levels.

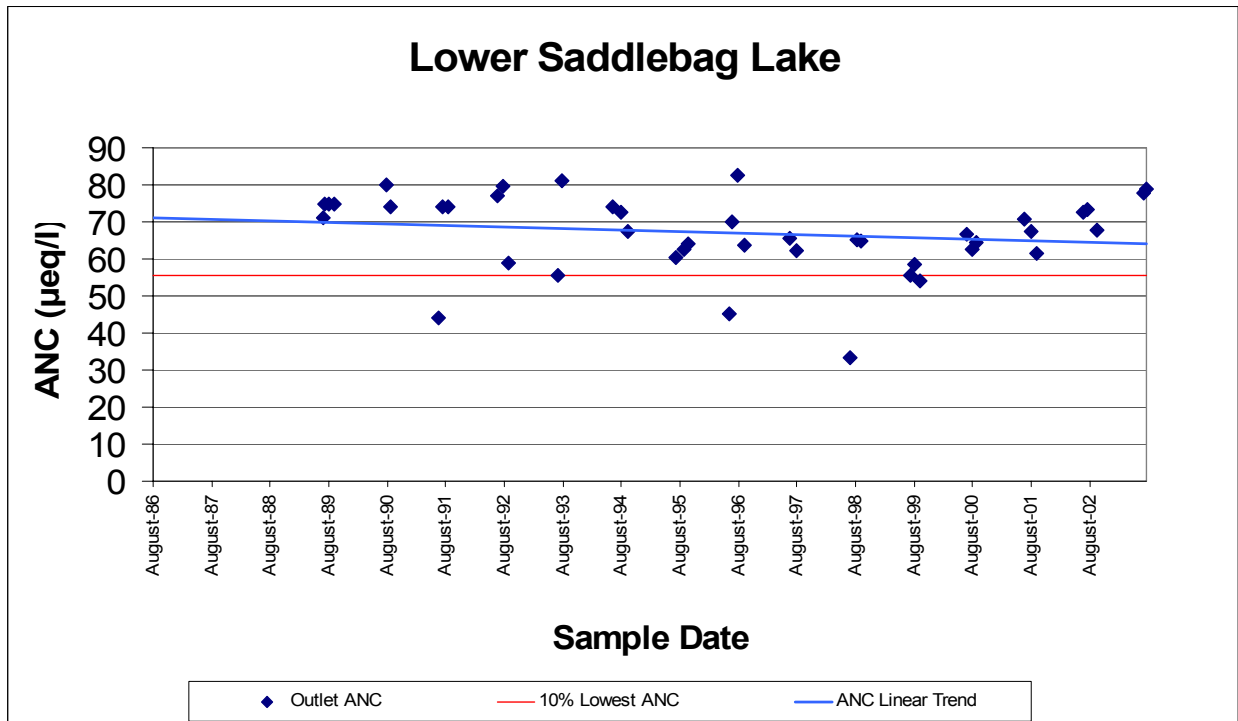


Figure 5-12. Ross Lake Baseline ANC Levels.

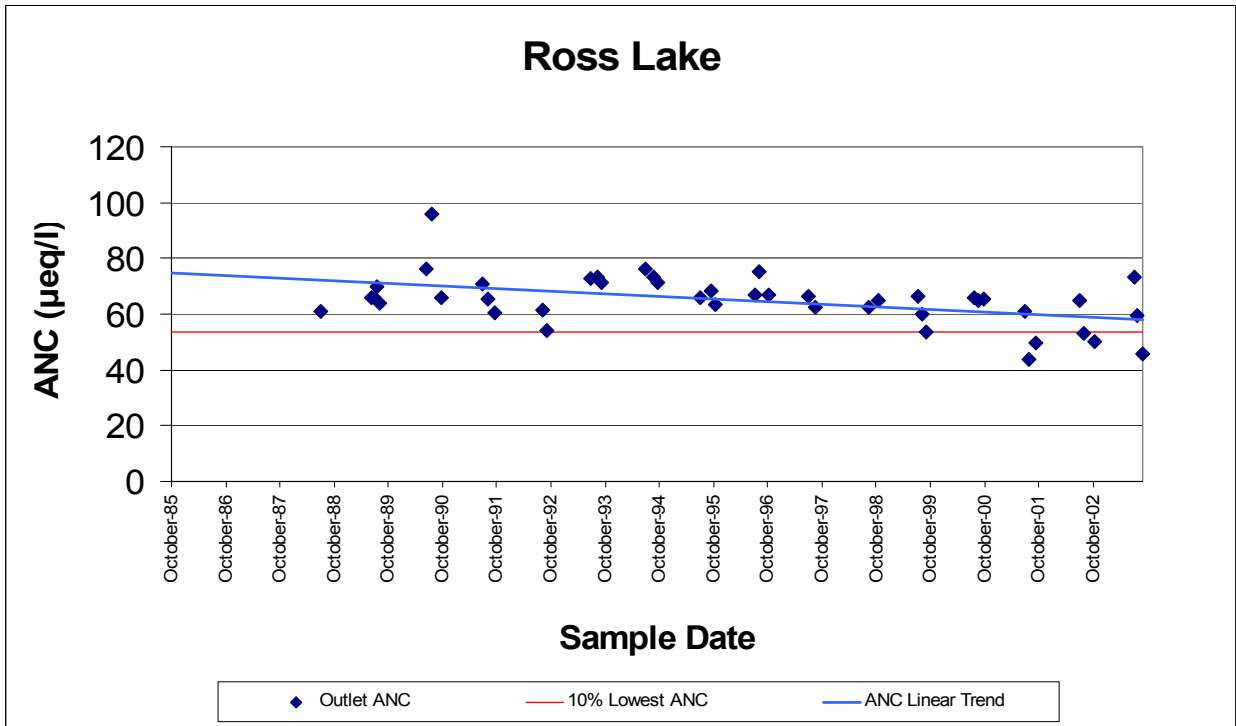


Figure 5-13. Stepping Stone Lake Baseline ANC Levels.

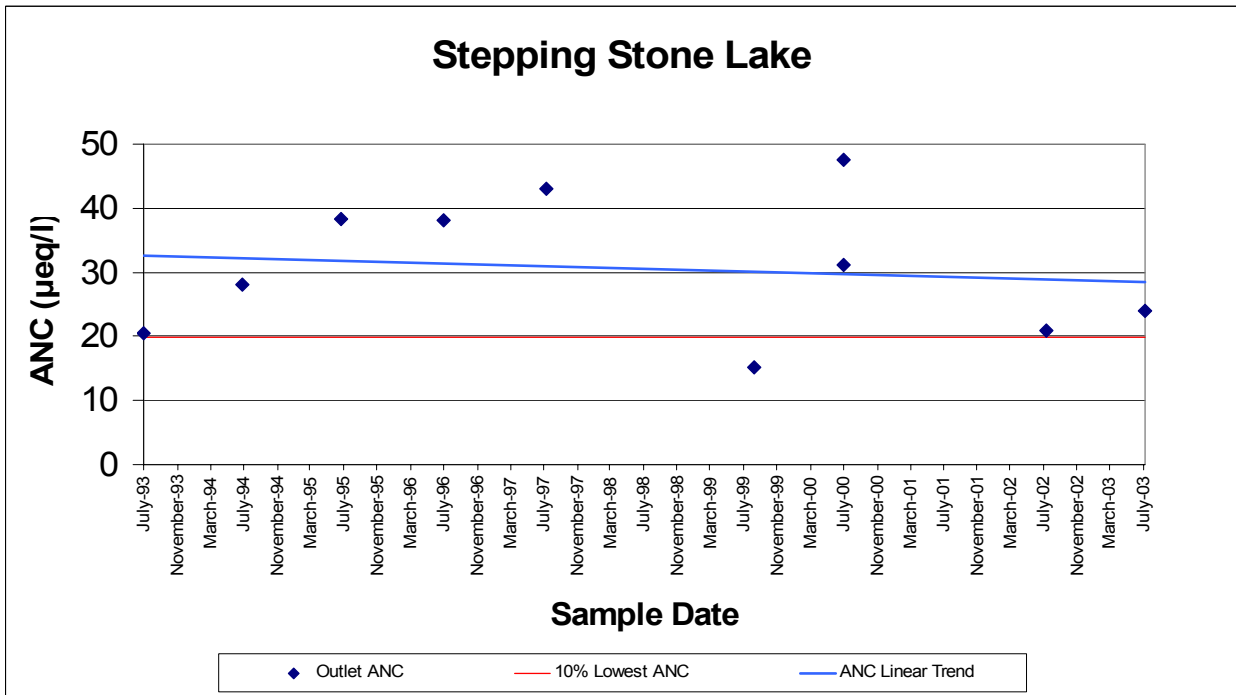


Figure 5-14. Twin Island Lake Baseline ANC Levels.

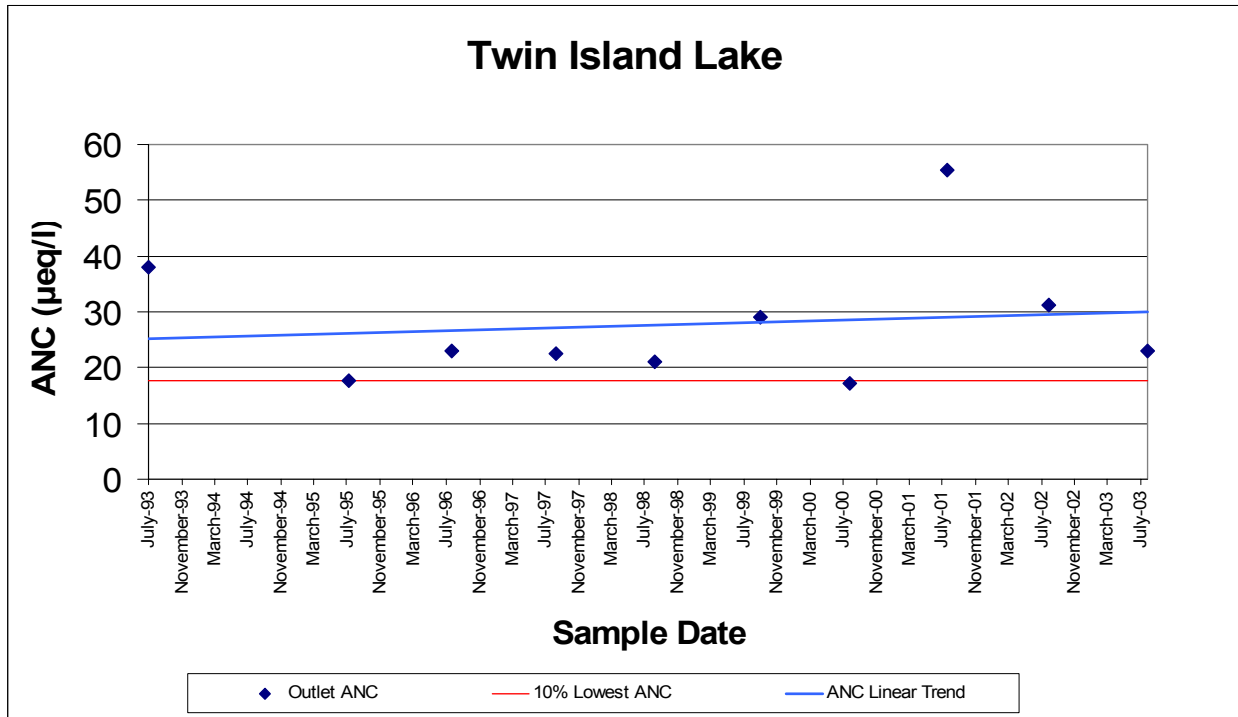
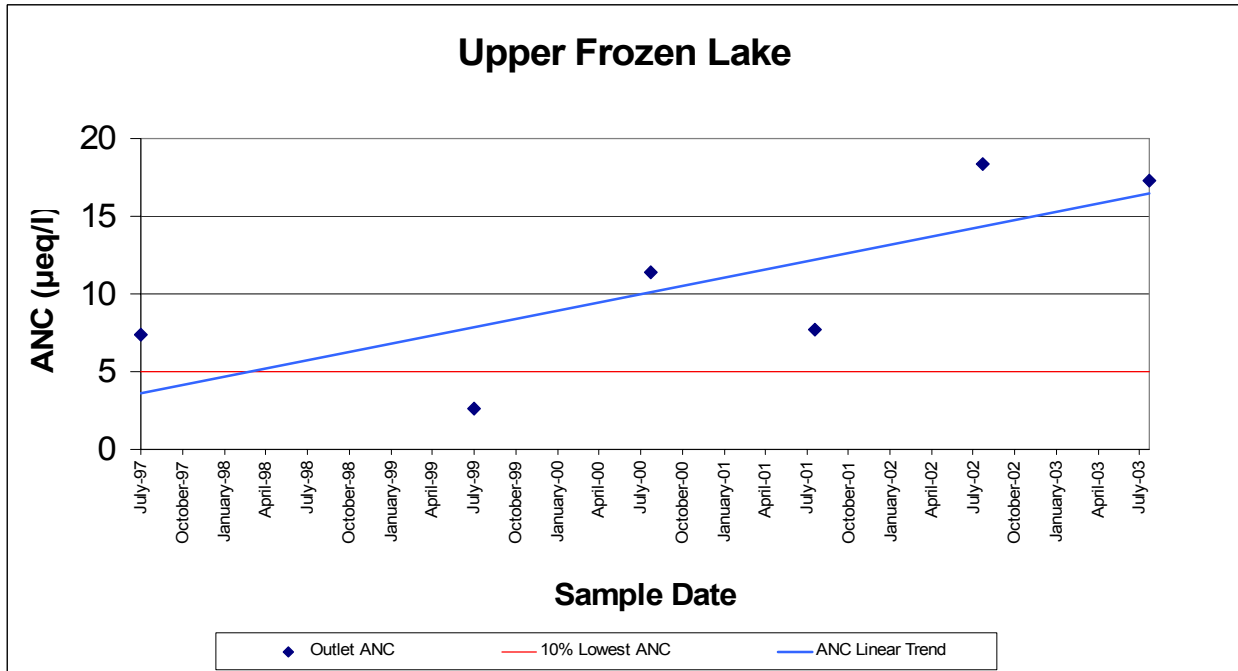


Figure 5-15. Upper Frozen Lake Baseline ANC Levels.



5.2.3 Terrestrial Deposition Calculations

Terrestrial deposition impacts were predicted for dry and wet nitrogen (N) and sulfur (S) chemical species using the CALPUFF multiple-resistance routine for predicting dry deposition and the empirical scavenging coefficient approach for predicting wet deposition. Dry and wet deposition fluxes of gaseous and particulate N and S species were processed through POSTUTIL and CALPOST to obtain total (wet + dry) N and S deposition reported as the rate of material deposited on an area (micrograms per cubic meter per second or $\mu\text{g m}^{-3} \text{sec}^{-1}$).

In order to assess total deposition impacts, dry and wet deposition monitoring data taken from Pinedale, Wyoming and Yellowstone National Park were used to characterize background deposition for areas of special concern as outlined in Table 5-8. Wet deposition data are available through the National Atmospheric Deposition Program (NADP). The NADP assesses wet deposition by measuring the chemical composition of precipitation (rain and snow). Similarly, the Clean Air Status and Trends Network (CASTNet) measures dry deposition of nitrogen and sulfur compounds. Pinedale NADP wet deposition data are available for the period 1982 through 2002, while Yellowstone NADP data are available for the period 1980 through 2002. Dry deposition data from the Pinedale, Wyoming CASTNet station are available from 1989 through 2001, and from the Yellowstone CASTNet station from 1996 through 2001.

Table 5-8. Applied Background Deposition.

Area of Special Concern	Applied Background Deposition
Bridger Wilderness	Pinedale
Fitzpatrick Wilderness	Pinedale
Cloud Peak Wilderness	Pinedale
Wind River Roadless Area	Pinedale
Popo Agie Wilderness	Pinedale
Wind River Canyon	Pinedale
Owl Creek Range	Pinedale
Phlox Mountain	Pinedale
Yellowstone NP	Yellowstone
Teton NP	Yellowstone
Teton Wilderness	Yellowstone
North Absaroka Wilderness	Yellowstone
Washakie Wilderness	Yellowstone

Total terrestrial deposition levels of concern (LOC) have been estimated for several Class I areas, including the Bridger Wilderness in Wyoming (Fox et al. 1989). Estimated total terrestrial deposition LOC include the “red line” (defined as the total deposition that the area can tolerate) and the “green line” (defined as the acceptable level of total deposition). Total deposition LOC for Bridger include a “red line” set at $10 \text{ kg ha}^{-1} \text{ year}^{-1}$ for nitrogen and $20 \text{ ha}^{-1} \text{ year}^{-1}$ for sulfur, and a “green line” set at $3 \text{ to } 5 \text{ ha}^{-1} \text{ year}^{-1}$ for nitrogen and $5 \text{ ha}^{-1} \text{ year}^{-1}$ for sulfur. Since Bridger Wilderness is the only area of special concern listed in Table 5-8 that is represented in the Fox et al. (1989) study, the Bridger LOC were applied for all areas of special concern.

Tables 5-9 through 5-12 summarize the annual average wet and dry components of total nitrogen and sulfur deposition at Pinedale and Yellowstone. Figures 5-13 through 5-16 present graphical representations of the Pinedale and Yellowstone total deposition data for the time periods available, along with comparisons to the Bridger “red line” and lower “green line.”

Table 5-9. Background Nitrogen Deposition at Pinedale, Wyoming.

Chemical Species	Dry Deposition ¹ (kg N ha ⁻¹ yr ⁻¹)	Wet Deposition ² (kg N ha ⁻¹ yr ⁻¹)	Total Deposition (kg N ha ⁻¹ yr ⁻¹)
Ammonium (NH ₄ ⁺)	0.1	0.3	0.4
Nitrate (NO ₃ ⁻)	0.0	0.5	0.5
Nitric acid (HNO ₃)	0.4	-	0.4
TOTAL	0.5	0.8	1.3

Table 5-10. Background Sulfur Deposition at Pinedale, Wyoming.

Chemical Species	Dry Deposition ¹ (kg S ha ⁻¹ yr ⁻¹)	Wet Deposition ² (kg S ha ⁻¹ yr ⁻¹)	Total Deposition (kg S ha ⁻¹ yr ⁻¹)
Sulfate (SO ₄ ²⁻)	0.1	0.7	0.8
Sulfur dioxide (SO ₂)	0.3	-	0.3
TOTAL	0.4	0.7	1.1

Table 5-11. Background Nitrogen Deposition at Yellowstone National Park.

Chemical Species	Dry Deposition ¹ (kg N ha ⁻¹ yr ⁻¹)	Wet Deposition ² (kg N ha ⁻¹ yr ⁻¹)	Total Deposition (kg N ha ⁻¹ yr ⁻¹)
Ammonium (NH ₄ ⁺)	0.2	0.4	0.6
Nitrate (NO ₃ ⁻)	0.0	0.4	0.4
Nitric acid (HNO ₃)	0.1	-	0.1
TOTAL	0.3	0.8	1.1

Table 5-12. Background Sulfur Deposition at Yellowstone National Park.

Chemical Species	Dry Deposition ¹ (kg S ha ⁻¹ yr ⁻¹)	Wet Deposition ² (kg S ha ⁻¹ yr ⁻¹)	Total Deposition (kg S ha ⁻¹ yr ⁻¹)
Sulfate (SO ₄ ²⁻)	0.1	0.6	0.7
Sulfur dioxide (SO ₂)	0.2	-	0.2
TOTAL	0.3	0.6	0.9

¹ Source: Dry deposition collected at Yellowstone CASTNet site (YEL408) from 1996-2001.

² Source: Wet deposition data collected at Yellowstone NADP site (WY08) from 1980-2002.

Deposition data represent the annual average over each respective time period.

Figure 5-13. Total Nitrogen Deposition at Pinedale, Wyoming.

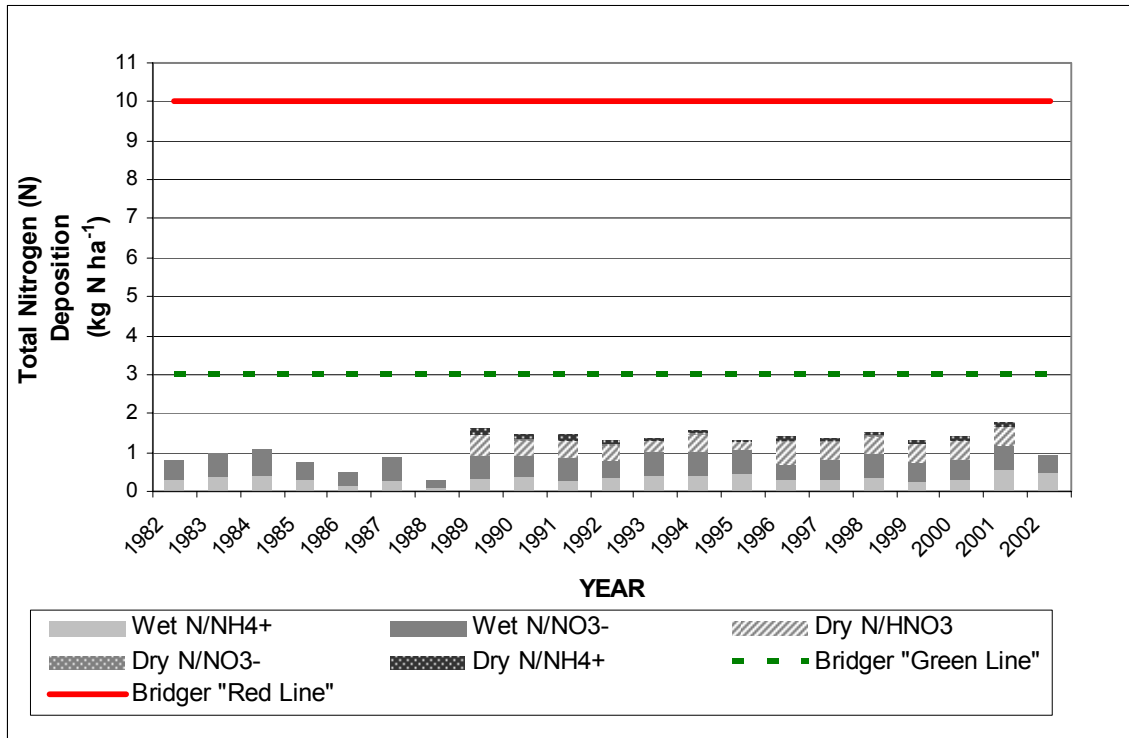


Figure 5-14. Total Sulfur Deposition at Pinedale, Wyoming.

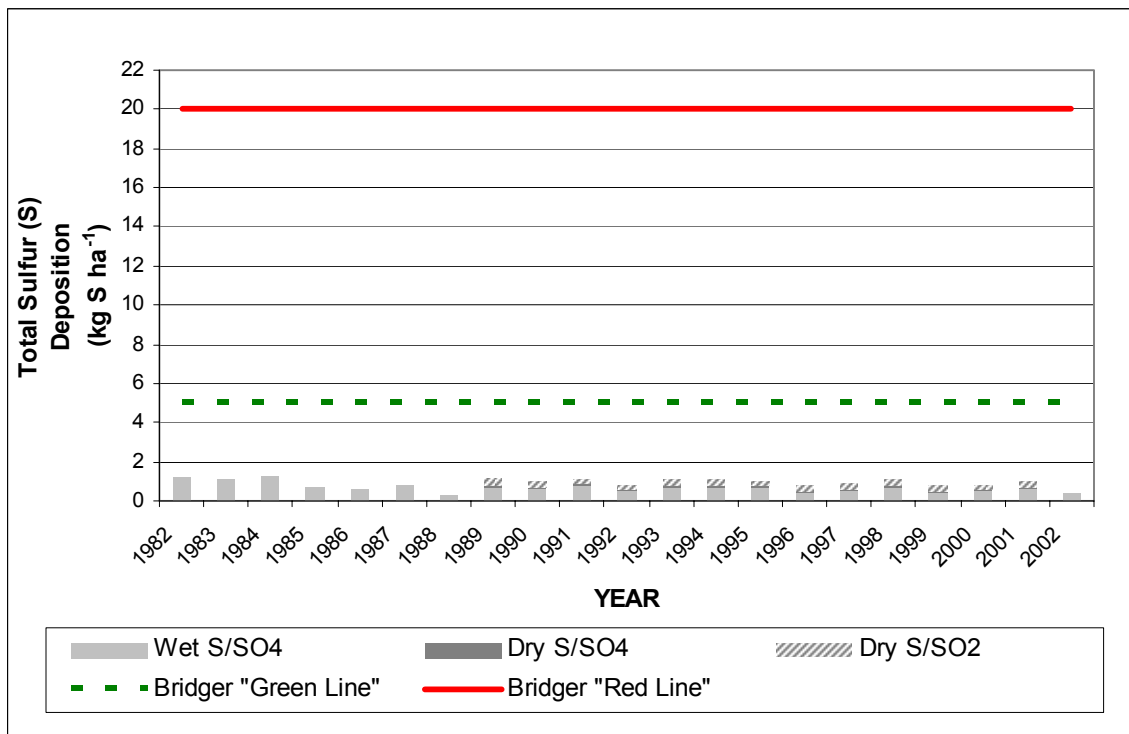


Figure 5-15. Total Nitrogen Deposition at Yellowstone National Park

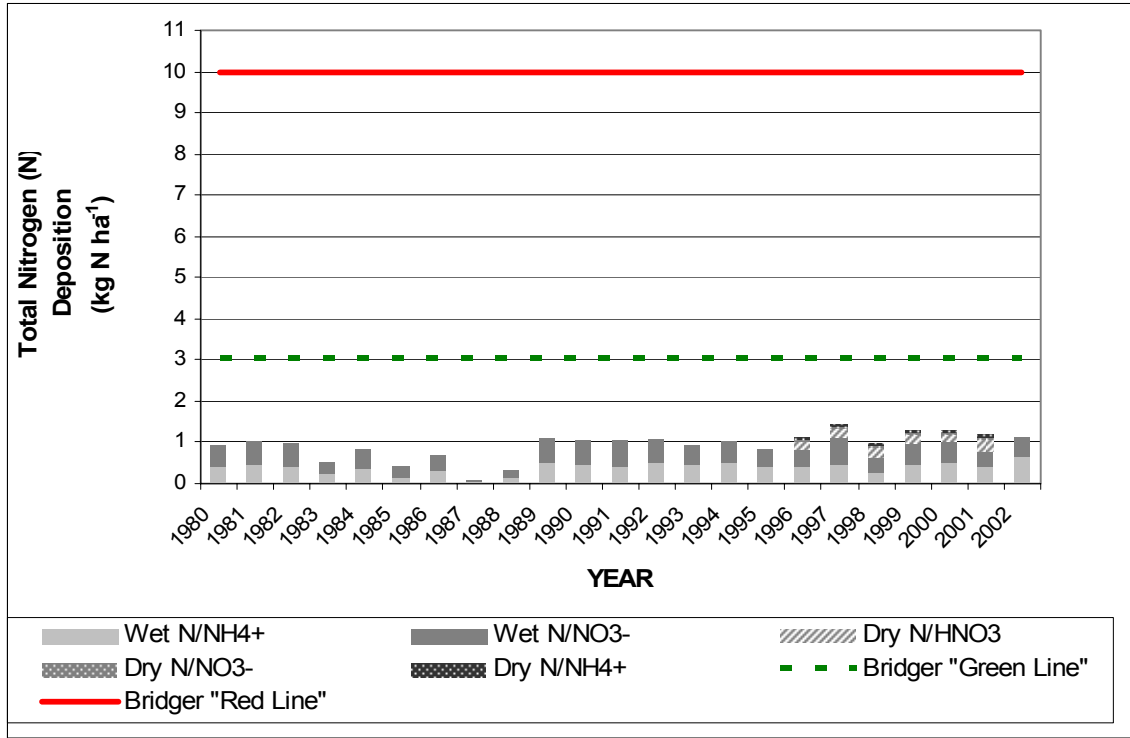
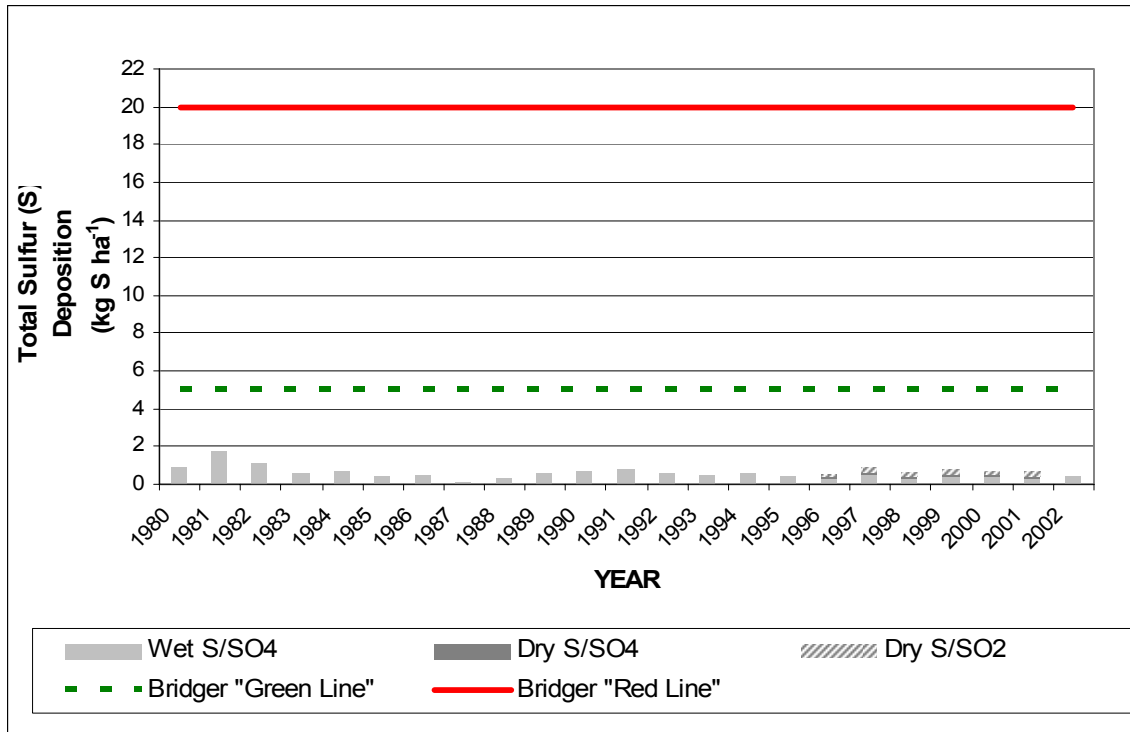


Figure 5-16. Total Sulfur Deposition at Yellowstone National Park



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6.0 ANALYSIS RESULTS

Results of the Far-Field analysis are summarized in Appendix A. Impacts for each of the following emission source groups are presented.

- 1) Wind River Proposed Action
- 2) Wind River Alternative A (Increased Development)
- 3) Wind River Alternative B (Decreased Development)
- 4) Wind River Alternative C (No Action)
- 5) Wind River Proposed Action Post-Construction
- 6) Wind River Existing Sources
- 7) Operational Permitted Sources
- 8) Permitted Sources Not Yet Operational (RFFA)
- 9) NEPA Reasonable Foreseeable Development (RFD)
- 10) Non-Project Well Sources
- 11) Cumulative Emission Sources (Operational Permitted + RFFA + RFD + Well)
- 12) Cumulative + Wind River Alternative A Sources
- 13) Cumulative + Wind River Alternative B Sources
- 14) Cumulative + Wind River Alternative C Sources
- 15) Cumulative + Wind River Proposed Action Sources
- 16) Cumulative + Wind River Proposed Action Post-Construction Sources

For the above listed emission source groups, impacts to air quality and air quality related values were predicted for each of 13 areas of special concern and 10 high elevation lakes. Detailed discussions concerning the predicted impacts are presented in the Wind River Gas Field Development EIS (BIA 2004). For reference, predicted visibility impacts and comparisons to the 0.5 change in deciview threshold follow. The visibility impact summaries are presented based upon estimated background conditions calculated utilizing both the modified FLAG and IMPROVE methodologies. Visibility data presented in the EIS were based upon the IMPROVE background conditions.

Table 6-1. Proposed Action Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	0	0	0.19	0	0	0.18
Cloud Peak	0	0	0.17	0	0	0.19
Fitzpatrick	0	0	0.13	0	0	0.11
North Absaroka	0	0	0.05	0	0	0.05
Owl Creek	3	0	0.93	3	1	1.07
Popo Agie	0	0	0.20	0	0	0.22
Phlox Mountain	0	0	0.17	0	0	0.20
Teton NP	0	0	0.02	0	0	0.02
Teton Wilderness	0	0	0.04	0	0	0.04
Washakie	0	0	0.10	0	0	0.09
Wind River Canyon	3	2	1.71	19	2	1.96
Wind River Roadless	0	0	0.19	0	0	0.17
Yellowstone NP	0	0	0.02	0	0	0.05
Total Days Max Δ dV	6	2	1.71	22	3	1.96

Table 6-2. Proposed Action Post-Construction Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	0	0	0.12	0	0	0.11
Cloud Peak	0	0	0.10	0	0	0.11
Fitzpatrick	0	0	0.06	0	0	0.06
North Absaroka	0	0	0.04	0	0	0.04
Owl Creek	1	0	0.66	1	0	0.76
Popo Agie	0	0	0.13	0	0	0.12
Phlox Mountain	0	0	0.11	0	0	0.12
Teton NP	0	0	0.02	0	0	0.01
Teton Wilderness	0	0	0.02	0	0	0.02
Washakie	0	0	0.06	0	0	0.06
Wind River Canyon	3	0	0.67	4	0	0.78
Wind River Roadless	0	0	0.11	0	0	0.10
Yellowstone NP	0	0	0.04	0	0	0.03
Total Days Max Δ dV	4	0	0.67	5	0	0.78

Table 6-3. Alternative A Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	0	0	0.24	0	0	0.23
Cloud Peak	0	0	0.22	0	0	0.24
Fitzpatrick	0	0	0.15	0	0	0.13
North Absaroka	0	0	0.07	0	0	0.07
Owl Creek	4	1	1.09	4	2	1.25
Popo Agie	0	0	0.25	0	0	0.27
Phlox Mountain	0	0	0.21	0	0	0.25
Teton NP	0	0	0.03	0	0	0.03
Teton Wilderness	0	0	0.05	0	0	0.05
Washakie	0	0	0.13	0	0	0.12
Wind River Canyon	26	3	1.94	31	4	2.22
Wind River Roadless	0	0	0.24	0	0	0.22
Yellowstone NP	0	0	0.07	0	0	0.06
Total Days Max Δ dV	30	4	1.94	35	6	2.22

Table 6-4. Alternative B Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	0	0	0.16	0	0	0.14
Cloud Peak	0	0	0.14	0	0	0.16
Fitzpatrick	0	0	0.12	0	0	0.10
North Absaroka	0	0	0.04	0	0	0.04
Owl Creek	3	0	0.80	3	0	0.92
Popo Agie	0	0	0.17	0	0	0.19
Phlox Mountain	0	0	0.14	0	0	0.16
Teton NP	0	0	0.02	0	0	0.02
Teton Wilderness	0	0	0.03	0	0	0.03
Washakie	0	0	0.08	0	0	0.08
Wind River Canyon	9	1	1.55	11	1	1.78
Wind River Roadless	0	0	0.17	0	0	0.16
Yellowstone NP	0	0	0.01	0	0	0.04
Total Days Max Δ dV	12	1	1.55	14	1	1.78

Table 6-5. Alternative C Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	0	0	0.03	0	0	0.03
Cloud Peak	0	0	0.02	0	0	0.02
Fitzpatrick	0	0	0.01	0	0	0.02
North Absaroka	0	0	0.01	0	0	0.01
Owl Creek	0	0	0.06	0	0	0.07
Popo Agie	0	0	0.03	0	0	0.04
Phlox Mountain	0	0	0.03	0	0	0.02
Teton NP	0	0	0.00	0	0	0.00
Teton Wilderness	0	0	0.01	0	0	0.01
Washakie	0	0	0.01	0	0	0.01
Wind River Canyon	0	0	0.12	0	0	0.14
Wind River Roadless	0	0	0.02	0	0	0.02
Yellowstone NP	0	0	0.01	0	0	0.01
Total Days Max Δ dV	0	0	0.12	0	0	0.14

Table 6-6. Cumulative Source Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	5	0	0.86	4	0	0.96
Cloud Peak	41	11	1.71	41	12	1.65
Fitzpatrick	1	0	0.60	1	0	0.70
North Absaroka	3	0	0.75	4	0	0.73
Owl Creek	7	3	1.65	7	3	1.90
Popo Agie	5	0	0.99	6	3	1.14
Phlox Mountain	4	2	1.14	6	1	1.32
Teton NP	1	0	0.54	1	0	0.55
Teton Wilderness	0	0	0.36	0	0	0.35
Washakie	4	0	0.92	4	0	0.89
Wind River Canyon	9	2	1.76	9	3	2.03
Wind River Roadless	5	1	1.02	5	2	1.18
Yellowstone NP	0	0	0.47	0	0	0.42
Total Days Max Δ dV	85	19	1.76	88	24	2.03

Table 6-7. Cumulative and Proposed Action Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	5	0	0.99	5	2	1.10
Cloud Peak	43	11	1.72	42	12	1.66
Fitzpatrick	1	0	0.62	2	0	0.72
North Absaroka	3	0	0.79	4	0	0.76
Owl Creek	12	3	1.71	12	4	1.97
Popo Agie	8	2	1.14	6	3	1.27
Phlox Mountain	4	3	1.16	7	1	1.34
Teton NP	1	0	0.54	1	0	0.55
Teton Wilderness	0	0	0.37	0	0	0.35
Washakie	4	0	0.93	4	0	0.90
Wind River Canyon	27	5	1.87	30	6	2.15
Wind River Roadless	5	1	1.09	6	2	1.26
Yellowstone NP	0	0	0.47	0	0	0.42
Total Days Max Δ dV	113	25	1.87	119	30	2.15

Table 6-8. Cumulative and Proposed Action Post-Construction Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	5	0	0.92	5	1	1.02
Cloud Peak	43	11	1.72	42	12	1.66
Fitzpatrick	1	0	0.61	2	0	0.71
North Absaroka	3	0	0.78	4	0	0.75
Owl Creek	9	3	1.69	10	3	1.94
Popo Agie	6	2	1.06	6	3	1.19
Phlox Mountain	4	3	1.15	7	1	1.33
Teton NP	1	0	0.54	1	0	0.55
Teton Wilderness	0	0	0.37	0	0	0.35
Washakie	4	0	0.93	4	0	0.89
Wind River Canyon	12	3	1.83	13	3	2.10
Wind River Roadless	5	1	1.06	6	2	1.22
Yellowstone NP	0	0	0.47	0	0	0.42
Total Days Max Δ dV	93	23	1.83	100	25	2.10

Table 6-9. Cumulative and Alternative A Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	6	1	1.01	5	2	1.13
Cloud Peak	43	11	1.72	42	12	1.66
Fitzpatrick	1	0	0.63	2	0	0.73
North Absaroka	3	0	0.80	4	0	0.77
Owl Creek	13	4	1.73	13	6	1.99
Popo Agie	8	2	1.18	7	3	1.31
Phlox Mountain	4	3	1.17	7	1	1.35
Teton NP	1	0	0.54	1	0	0.55
Teton Wilderness	0	0	0.38	0	0	0.35
Washakie	4	0	0.93	4	0	0.90
Wind River Canyon	38	6	1.94	42	8	2.22
Wind River Roadless	5	1	1.11	6	2	1.28
Yellowstone NP	0	0	0.47	0	0	0.42
Total Days Max Δ dV	126	28	1.94	133	34	2.22

Table 6-10. Cumulative and Alternative B Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	5	0	0.97	5	2	1.07
Cloud Peak	43	11	1.72	42	12	1.66
Fitzpatrick	1	0	0.62	2	0	0.71
North Absaroka	3	0	0.78	4	0	0.75
Owl Creek	12	3	1.70	12	3	1.95
Popo Agie	6	2	1.12	6	3	1.24
Phlox Mountain	4	3	1.16	7	1	1.34
Teton NP	1	0	0.54	1	0	0.55
Teton Wilderness	0	0	0.37	0	0	0.35
Washakie	4	0	0.93	4	0	0.89
Wind River Canyon	20	4	1.85	21	5	2.12
Wind River Roadless	5	1	1.08	6	2	1.25
Yellowstone NP	0	0	0.47	0	0	0.42
Total Days Max Δ dV	104	24	1.85	110	28	2.12

Table 6-11. Cumulative and Alternative C Visibility Impacts.

Area of Special Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	5	0	0.88	5	0	0.98
Cloud Peak	41	11	1.71	41	12	1.65
Fitzpatrick	1	0	0.60	1	0	0.70
North Absaroka	3	0	0.76	4	0	0.73
Owl Creek	8	3	1.65	7	3	1.90
Popo Agie	5	0	1.00	6	3	1.15
Phlox Mountain	4	2	1.14	6	1	1.32
Teton NP	1	0	0.54	1	0	0.55
Teton Wilderness	0	0	0.36	0	0	0.35
Washakie	4	0	0.92	4	0	0.89
Wind River Canyon	9	2	1.77	9	3	2.04
Wind River Roadless	5	1	1.03	5	2	1.19
Yellowstone NP	0	0	0.47	0	0	0.42
Total Days Max Δ dV	86	19	1.77	89	24	2.04

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- Scire et al. 2000. A User's Guide for the CALPUFF Dispersion Model (Version 5). Earth Tech, Inc.
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EXHIBIT 1
EXAMPLE CALMET INPUT FILE

Example CALMET Control File (January 1995)

WIND RIVER EIS
4 KM GRID RESOLUTION -- 108 x 88 grid cells (432 km x 352 km domain)
JANUARY 1-31, 1995

----- Run title (3 lines) -----

CALMET MODEL CONTROL FILE

INPUT GROUP: 0 -- Input and Output File Names

Subgroup (a)

Default Name Type File Name
GEO.DAT input ! GEODAT=GEO4KM_N.DAT !
SURF.DAT input ! SRFDAT=wrsurf01.dat !
CLOUD.DAT input * CLDDAT= *
PRECIP.DAT input ! PRCDAT=ppt01.dat !
MM4.DAT input ! MM4DAT=MM4_9501.DAT !
WT.DAT input * WTDAT= *
CALMET.LST output ! METLST=wrcalm01.lst !
CALMET.DAT output ! METDAT=wrcalm01.dat !
PACOUT.DAT output * PACDAT= *

All file names will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
T = lower case ! LCFILES = T !
F = UPPER CASE

NUMBER OF UPPER AIR & OVERWATER STATIONS:

Number of upper air stations (NUSTA) No default ! NUSTA = 4 !
Number of overwater met stations
(NOWSTA) No default ! NOWSTA = 0 !

!END!

Subgroup (b)

Upper air files (one per station)

Default Name Type File Name
UP1.DAT input 1 ! UPDAT=UA95DEN.DAT! !END!
UP2.DAT input 2 ! UPDAT=UA95GJT.DAT! !END!
UP3.DAT input 3 ! UPDAT=UA95LND.DAT! !END!
UP4.DAT input 4 ! UPDAT=UA95SLC.DAT! !END!

Subgroup (c)

Overwater station files (one per station)

Default Name Type File Name

Subgroup (d)

Other file names

Default Name Type File Name
DIAG.DAT input * DIADAT= *
PROG.DAT input * PRGDAT= *
TEST.PRT output ! TSTPRT= TEST.PRT !
TEST.OUT output ! TSTOUT= TEST.OUT !
TEST.KIN output ! TSTKIN= TEST.KIN !
TEST.FRD output ! TSTFRD= TEST.FRD !
TEST.SLP output ! TSTSLP= TEST.SLP !

NOTES: (1) File/path names can be up to 70 characters in length
(2) Subgroups (a) and (d) must have ONE 'END' (surround by delimiters) at the end of the group

Far-Field Air Quality Impact Assessment

(3) Subgroups (b) and (c) must have an 'END' (surround by delimiters) at the end of EACH LINE

!END!

INPUT GROUP: 1 -- General run control parameters

Starting date: Year (IBYR) -- No default ! IBYR= 1995 !
Month (IBMO) -- No default ! IBMO= 1 !
Day (IBDY) -- No default ! IBDY= 1 !
Hour (IBHR) -- No default ! IBHR= 0 !

Base time zone (IBTZ) -- No default ! IBTZ= 7 !
PST = 08, MST = 07
CST = 06, EST = 05

Length of run (hours) (IRLG) -- No default ! IRLG= 744 !

Run type (IRTYPE) -- Default: 1 ! IRTYPE= 1 !

0 = Computes wind fields only
1 = Computes wind fields and micrometeorological variables
(u*, w*, L, zi, etc.)
(IRTYPE must be 1 to run CALPUFF or CALGRID)

Compute special data fields required
by CALGRID (i.e., 3-D fields of W wind
components and temperature)
in addition to regular Default: T ! LCALGRD = T !
fields ? (LCALGRD)
(LCALGRD must be T to run CALGRID)

Flag to stop run after
SETUP phase (ITEST) Default: 2 ! ITEST = 2 !
(Used to allow checking
of the model inputs, files, etc.)
ITEST = 1 - STOPS program after SETUP phase
ITEST = 2 - Continues with execution of
COMPUTATIONAL phase after SETUP

!END!

INPUT GROUP: 2 -- Map Projection and Grid control parameters

Projection for all (X,Y):

Map projection
(PMAP) Default: UTM ! PMAP = LCC !

UTM : Universal Transverse Mercator
TTM : Tangential Transverse Mercator
LCC : Lambert Conformal Conic
PS : Polar Stereographic
EM : Equatorial Mercator
LAZA : Lambert Azimuthal Equal Area

False Easting and Northing (km) at the projection origin
(Used only if PMAP= TTM, LCC, or LAZA)
(FEAST) Default=0.0 ! FEAST = 0.000 !
(FNORTH) Default=0.0 ! FNORTH = 0.000 !

UTM zone (1 to 60)
(Used only if PMAP=UTM)
(IUTMZN) No Default ! IUTMZN = 12 !

Hemisphere for UTM projection?
(Used only if PMAP=UTM)
(UTMHEM) Default: N ! UTMHEM = N !
N : Northern hemisphere projection
S : Southern hemisphere projection

Latitude and Longitude (decimal degrees) of projection origin
(Used only if PMAP= TTM, LCC, PS, EM, or LAZA)
(RLAT0) No Default ! RLAT0 = 42.550N !
(RLON0) No Default ! RLON0 = 108.550W !

```

TTM : RLON0 identifies central (true N/S) meridian of projection
      RLAT0 selected for convenience
LCC : RLON0 identifies central (true N/S) meridian of projection
      RLAT0 selected for convenience
PS  : RLON0 identifies central (grid N/S) meridian of projection
      RLAT0 selected for convenience
EM  : RLON0 identifies central meridian of projection
      RLAT0 is REPLACED by 0.0N (Equator)
LAZA: RLON0 identifies longitude of tangent-point of mapping plane
      RLAT0 identifies latitude of tangent-point of mapping plane
  
```

Matching parallel(s) of latitude (decimal degrees) for projection

(Used only if PMAP= LCC or PS)

```

(XLAT1)                No Default          ! XLAT1 = 30N  !
(XLAT2)                No Default          ! XLAT2 = 60N  !
  
```

LCC : Projection cone slices through Earth's surface at XLAT1 and XLAT2

PS : Projection plane slices through Earth at XLAT1
(XLAT2 is not used)

Note: Latitudes and longitudes should be positive, and include a letter N,S,E, or W indicating north or south latitude, and east or west longitude. For example,
35.9 N Latitude = 35.9N
118.7 E Longitude = 118.7E

Datum -region

The Datum-Region for the coordinates is identified by a character string. Many mapping products currently available use the model of the Earth known as the World Geodetic System 1984 (WGS-G). Other local models may be in use, and their selection in CALMET will make its output consistent with local mapping products. The list of Datum-Regions with official transformation parameters provided by the National Imagery and Mapping Agency (NIMA).

NIMA Datum - Regions(Examples)

```

-----
WGS-G   WGS-84 GRS 80, Global coverage
NAS-C   NORTH AMERICAN 1927 Clarke 1866, MEAN FOR (CONUS)
NWS-27  NWS 6370KM Radius, Global Sphere (NAD27)
NWS-84  NWS 6370KM Radius, Global Sphere (WGS84)
ESR-S   ESRI REFERENCE Normal Sphere (6371KM Radius), Global Reference Sphere
  
```

Datum-region for output coordinates

```

(DATUM)                Default: WGS-G          ! DATUM = NAS-C  !
  
```

Horizontal grid definition:

Rectangular grid defined for projection PMAP,
with X the Easting and Y the Northing coordinate

```

      No. X grid cells (NX)      No default      ! NX = 108  !
      No. Y grid cells (NY)      No default      ! NY = 88   !
  
```

```

Grid spacing (DGRIDKM)          No default      ! DGRIDKM = 4.  !
                                Units: km
  
```

Reference grid coordinate of
SOUTHWEST corner of grid cell (1,1)

```

      X coordinate (XORIGKM)      No default      ! XORIGKM = -230.000  !
      Y coordinate (YORIGKM)      No default      ! YORIGKM = -32.000  !
                                Units: km
  
```

Vertical grid definition:

```

      No. of vertical layers (NZ)  No default      ! NZ = 10  !
  
```

```

      Cell face heights in arbitrary
      vertical grid (ZFACE(NZ+1))  No defaults
                                Units: m
  
```

```

      ! ZFACE = 0.,20.,40.,80.,160.,300.,600.,1000.,1500.,2200.,3000.  !
  
```

!END!

INPUT GROUP: 3 -- Output Options

DISK OUTPUT OPTION

Save met. fields in an unformatted
output file ? (LSAVE) Default: T ! LSAVE = T !
(F = Do not save, T = Save)

Type of unformatted output file:
(IFORMO) Default: 1 ! IFORMO = 1 !

- 1 = CALPUFF/CALGRID type file (CALMET.DAT)
- 2 = MESOPUFF-II type file (PACOUT.DAT)

LINE PRINTER OUTPUT OPTIONS:

Print met. fields ? (LPRINT) Default: F ! LPRINT = T !
(F = Do not print, T = Print)
(NOTE: parameters below control which
met. variables are printed)

Print interval
(IPRINF) in hours Default: 1 ! IPRINF = 1 !
(Meteorological fields are printed
every 1 hours)

Specify which layers of U, V wind component
to print (IUVOUT(NZ)) -- NOTE: NZ values must be entered
(0=Do not print, 1=Print)
(used only if LPRINT=T) Defaults: NZ*0
! IUVOUT = 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 !

Specify which levels of the W wind component to print
(NOTE: W defined at TOP cell face -- 10 values)
(IWOUT(NZ)) -- NOTE: NZ values must be entered
(0=Do not print, 1=Print)
(used only if LPRINT=T & LCALGRD=T)

Defaults: NZ*0
! IWOUT = 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 !

Specify which levels of the 3-D temperature field to print
(ITOUT(NZ)) -- NOTE: NZ values must be entered
(0=Do not print, 1=Print)
(used only if LPRINT=T & LCALGRD=T)

Defaults: NZ*0
! ITOUT = 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 !

Specify which meteorological fields
to print
(used only if LPRINT=T) Defaults: 0 (all variables)

Variable	Print ?	
-----	(0 = do not print, 1 = print)	-----
! STABILITY =	0	! - PGT stability class
! USTAR =	0	! - Friction velocity
! MONIN =	0	! - Monin-Obukhov length
! MIXHT =	0	! - Mixing height
! WSTAR =	0	! - Convective velocity scale
! PRECIP =	0	! - Precipitation rate
! SENSHEAT =	0	! - Sensible heat flux
! CONVZI =	0	! - Convective mixing ht.

Testing and debug print options for micrometeorological module

Print input meteorological data and

Far-Field Air Quality Impact Assessment

```
internal variables (LDB)          Default: F      ! LDB = F !
(F = Do not print, T = print)
(NOTE: this option produces large amounts of output)

First time step for which debug data
are printed (NN1)                 Default: 1      ! NN1 = 1 !

Last time step for which debug data
are printed (NN2)                 Default: 1      ! NN2 = 2 !

Testing and debug print options for wind field module
(all of the following print options control output to
wind field module's output files: TEST.PRT, TEST.OUT,
TEST.KIN, TEST.FRD, and TEST.SLP)

Control variable for writing the test/debug
wind fields to disk files (IOUTD)
(0=Do not write, 1=write)        Default: 0      ! IOUTD = 0 !

Number of levels, starting at the surface,
to print (NZPRN2)                 Default: 1      ! NZPRN2 = 1 !

Print the INTERPOLATED wind components ?
(IPR0) (0=no, 1=yes)             Default: 0      ! IPR0 = 0 !

Print the TERRAIN ADJUSTED surface wind
components ?
(IPR1) (0=no, 1=yes)             Default: 0      ! IPR1 = 0 !

Print the SMOOTHED wind components and
the INITIAL DIVERGENCE fields ?
(IPR2) (0=no, 1=yes)             Default: 0      ! IPR2 = 0 !

Print the FINAL wind speed and direction
fields ?
(IPR3) (0=no, 1=yes)             Default: 0      ! IPR3 = 0 !

Print the FINAL DIVERGENCE fields ?
(IPR4) (0=no, 1=yes)             Default: 0      ! IPR4 = 0 !

Print the winds after KINEMATIC effects
are added ?
(IPR5) (0=no, 1=yes)             Default: 0      ! IPR5 = 0 !

Print the winds after the FROUDE NUMBER
adjustment is made ?
(IPR6) (0=no, 1=yes)             Default: 0      ! IPR6 = 0 !

Print the winds after SLOPE FLOWS
are added ?
(IPR7) (0=no, 1=yes)             Default: 0      ! IPR7 = 0 !

Print the FINAL wind field components ?
(IPR8) (0=no, 1=yes)             Default: 0      ! IPR8 = 0 !

!END!

-----
INPUT GROUP: 4 -- Meteorological data options
-----

NO OBSERVATION MODE              (NOOBS) Default: 0      ! NOOBS = 0 !
  0 = Use surface, overwater, and upper air stations
  1 = Use surface and overwater stations (no upper air observations)
      Use MM5 for upper air data
  2 = No surface, overwater, or upper air observations
      Use MM5 for surface, overwater, and upper air data

NUMBER OF SURFACE & PRECIP. METEOROLOGICAL STATIONS

  Number of surface stations      (NSSTA) No default      ! NSSTA = 78 !

  Number of precipitation stations
  (NPSTA=-1: flag for use of MM5 precip data)
  (NPSTA) No default              ! NPSTA = 57 !

CLOUD DATA OPTIONS
  Gridded cloud fields:
  (ICLOUD) Default: 0            ! ICLOUD = 0 !
  ICLOUD = 0 - Gridded clouds not used
```

Far-Field Air Quality Impact Assessment

ICLOUD = 1 - Gridded CLOUD.DAT generated as OUTPUT
 ICLOUD = 2 - Gridded CLOUD.DAT read as INPUT

FILE FORMATS

Surface meteorological data file format
 (IFORMS) Default: 2 ! IFORMS = 2 !
 (1 = unformatted (e.g., SMERGE output))
 (2 = formatted (free-formatted user input))

Precipitation data file format
 (IFORMP) Default: 2 ! IFORMP = 2 !
 (1 = unformatted (e.g., PMERGE output))
 (2 = formatted (free-formatted user input))

Cloud data file format
 (IFORMC) Default: 2 ! IFORMC = 1 !
 (1 = unformatted - CALMET unformatted output)
 (2 = formatted - free-formatted CALMET output or user input)

!END!

 INPUT GROUP: 5 -- Wind Field Options and Parameters

WIND FIELD MODEL OPTIONS

Model selection variable (IWFCOD) Default: 1 ! IWFCOD = 1 !
 0 = Objective analysis only
 1 = Diagnostic wind module

Compute Froude number adjustment
 effects ? (IFRADJ) Default: 1 ! IFRADJ = 1 !
 (0 = NO, 1 = YES)

Compute kinematic effects ? (IKINE) Default: 0 ! IKINE = 0 !
 (0 = NO, 1 = YES)

Use O'Brien procedure for adjustment
 of the vertical velocity ? (IOBR) Default: 0 ! IOBR = 0 !
 (0 = NO, 1 = YES)

Compute slope flow effects ? (ISLOPE) Default: 1 ! ISLOPE = 1 !
 (0 = NO, 1 = YES)

Extrapolate surface wind observations
 to upper layers ? (IEXTRP) Default: -4 ! IEXTRP = -4 !
 (1 = no extrapolation is done,
 2 = power law extrapolation used,
 3 = user input multiplicative factors
 for layers 2 - NZ used (see FEXTRP array)
 4 = similarity theory used
 -1, -2, -3, -4 = same as above except layer 1 data
 at upper air stations are ignored)

Extrapolate surface winds even
 if calm? (ICALM) Default: 0 ! ICALM = 0 !
 (0 = NO, 1 = YES)

Layer-dependent biases modifying the weights of
 surface and upper air stations (BIAS(NZ))
 -1<=BIAS<=1
 Negative BIAS reduces the weight of upper air stations
 (e.g. BIAS=-0.1 reduces the weight of upper air stations
 by 10%; BIAS= -1, reduces their weight by 100 %)
 Positive BIAS reduces the weight of surface stations
 (e.g. BIAS= 0.2 reduces the weight of surface stations
 by 20%; BIAS=1 reduces their weight by 100%)
 Zero BIAS leaves weights unchanged (1/R**2 interpolation)
 Default: NZ*0
 ! BIAS = 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 , 0 !

Minimum distance from nearest upper air station
 to surface station for which extrapolation
 of surface winds at surface station will be allowed
 (RMIN2: Set to -1 for IEXTRP = 4 or other situations
 where all surface stations should be extrapolated)
 Default: 4. ! RMIN2 = 10.0 !

Use gridded prognostic wind field model

output fields as input to the diagnostic
wind field model (IPROG) Default: 0 ! IPROG = 4 !
(0 = No, [IWFCOD = 0 or 1]
1 = Yes, use CSUMM prog. winds as Step 1 field, [IWFCOD = 0]
2 = Yes, use CSUMM prog. winds as initial guess field [IWFCOD = 1]
3 = Yes, use winds from MM4.DAT file as Step 1 field [IWFCOD = 0]
4 = Yes, use winds from MM4.DAT file as initial guess field [IWFCOD = 1]
5 = Yes, use winds from MM4.DAT file as observations [IWFCOD = 1]
13 = Yes, use winds from MM5.DAT file as Step 1 field [IWFCOD = 0]
14 = Yes, use winds from MM5.DAT file as initial guess field [IWFCOD = 1]
15 = Yes, use winds from MM5.DAT file as observations [IWFCOD = 1]

Timestep (hours) of the prognostic
model input data (ISTEPPG) Default: 1 ! ISTEPPG = 1 !

RADIUS OF INFLUENCE PARAMETERS

Use varying radius of influence Default: F ! LVARY = F!
(if no stations are found within RMAX1,RMAX2,
or RMAX3, then the closest station will be used)

Maximum radius of influence over land
in the surface layer (RMAX1) No default ! RMAX1 = 100. !
Units: km

Maximum radius of influence over land
aloft (RMAX2) No default ! RMAX2 = 100. !
Units: km

Maximum radius of influence over water
(RMAX3) No default ! RMAX3 = 100. !
Units: km

OTHER WIND FIELD INPUT PARAMETERS

Minimum radius of influence used in
the wind field interpolation (RMIN) Default: 0.1 ! RMIN = 0.1 !
Units: km

Radius of influence of terrain
features (TERRAD) No default ! TERRAD = 30. !
Units: km

Relative weighting of the first
guess field and observations in the
SURFACE layer (R1) No default ! R1 = 15. !
(R1 is the distance from an
observational station at which the
observation and first guess field are
equally weighted)

Relative weighting of the first
guess field and observations in the
layers ALOFT (R2) No default ! R2 = 15. !
(R2 is applied in the upper layers
in the same manner as R1 is used in
the surface layer).

Relative weighting parameter of the
prognostic wind field data (RPROG) No default ! RPROG = 0. !
(Used only if IPROG = 1)
Units: km

Maximum acceptable divergence in the
divergence minimization procedure
(DIVLIM) Default: 5.E-6 ! DIVLIM= 5.0E-06 !

Maximum number of iterations in the
divergence min. procedure (NITER) Default: 50 ! NITER = 50 !

Number of passes in the smoothing
procedure (NSMTH(NZ))
NOTE: NZ values must be entered
Default: 2,(mxnz-1)*4 ! NSMTH =
2 , 4 , 4 , 4 , 4 , 4 , 4 , 4 , 4 , 4 , 4 !

Maximum number of stations used in
each layer for the interpolation of
data to a grid point (NINTR2(NZ))
NOTE: NZ values must be entered Default: 99. ! NINTR2 =
99 , 99 , 99 , 99 , 99 , 99 , 99 , 99 , 99 , 99 !

Critical Froude number (CRITFN) Default: 1.0 ! CRITFN = 1. !

Empirical factor controlling the

influence of kinematic effects
(ALPHA) Default: 0.1 ! ALPHA = 0.1 !

Multiplicative scaling factor for
extrapolation of surface observations
to upper layers (FEXTR2(NZ)) Default: NZ*0.0
! FEXTR2 = 0., 0., 0., 0., 0., 0., 0., 0., 0., 0. !
(Used only if IEXTRP = 3 or -3)

BARRIER INFORMATION

Number of barriers to interpolation
of the wind fields (NBAR) Default: 0 ! NBAR = 0 !

THE FOLLOWING 4 VARIABLES ARE INCLUDED
ONLY IF NBAR > 0

NOTE: NBAR values must be entered No defaults
for each variable Units: km

X coordinate of BEGINNING
of each barrier (XBBAR(NBAR)) ! XBBAR = 0. !

Y coordinate of BEGINNING
of each barrier (YBBAR(NBAR)) ! YBBAR = 0. !

X coordinate of ENDING
of each barrier (XEBAR(NBAR)) ! XEBAR = 0. !

Y coordinate of ENDING
of each barrier (YEBAR(NBAR)) ! YEBAR = 0. !

DIAGNOSTIC MODULE DATA INPUT OPTIONS

Surface temperature (IDIOPT1) Default: 0 ! IDIOPT1 = 0 !
0 = Compute internally from
hourly surface observations
1 = Read preprocessed values from
a data file (DIAG.DAT)

Surface met. station to use for
the surface temperature (ISURFT) No default ! ISURFT = 4 !
(Must be a value from 1 to NSSTA)
(Used only if IDIOPT1 = 0)

Domain-averaged temperature lapse
rate (IDIOPT2) Default: 0 ! IDIOPT2 = 0 !
0 = Compute internally from
twice-daily upper air observations
1 = Read hourly preprocessed values
from a data file (DIAG.DAT)

Upper air station to use for
the domain-scale lapse rate (IUPT) No default ! IUPT = 3 !
(Must be a value from 1 to NUSTA)
(Used only if IDIOPT2 = 0)

Depth through which the domain-scale
lapse rate is computed (ZUPT) Default: 200. ! ZUPT = 200. !
(Used only if IDIOPT2 = 0) Units: meters

Domain-averaged wind components
(IDIOPT3) Default: 0 ! IDIOPT3 = 0 !
0 = Compute internally from
twice-daily upper air observations
1 = Read hourly preprocessed values
a data file (DIAG.DAT)

Upper air station to use for
the domain-scale winds (IUPWND) Default: -1 ! IUPWND = -1 !
(Must be a value from -1 to NUSTA)
(Used only if IDIOPT3 = 0)

Bottom and top of layer through
which the domain-scale winds
are computed
(ZUPWND(1), ZUPWND(2)) Defaults: 1., 1000. ! ZUPWND= 1., 1000. !
(Used only if IDIOPT3 = 0) Units: meters

Observed surface wind components
 for wind field module (IDIOPT4) Default: 0 ! IDIOPT4 = 0 !
 0 = Read WS, WD from a surface
 data file (SURF.DAT)
 1 = Read hourly preprocessed U, V from
 a data file (DIAG.DAT)

Observed upper air wind components
 for wind field module (IDIOPT5) Default: 0 ! IDIOPT5 = 0 !
 0 = Read WS, WD from an upper
 air data file (UP1.DAT, UP2.DAT, etc.)
 1 = Read hourly preprocessed U, V from
 a data file (DIAG.DAT)

LAKE BREEZE INFORMATION

Use Lake Breeze Module (LLBREZE)
 Default: F ! LLBREZE = F !
 Number of lake breeze regions (NBOX) ! NBOX = 0 !
 X Grid line 1 defining the region of interest ! XG1 = 0. !
 X Grid line 2 defining the region of interest ! XG2 = 0. !
 Y Grid line 1 defining the region of interest ! YG1 = 0. !
 Y Grid line 2 defining the region of interest ! YG2 = 0. !
 X Point defining the coastline (Straight line)
 (XBCST) (KM) Default: none ! XBCST = 0. !
 Y Point defining the coastline (Straight line)
 (YBCST) (KM) Default: none ! YBCST = 0. !
 X Point defining the coastline (Straight line)
 (XECST) (KM) Default: none ! XECST = 0. !
 Y Point defining the coastline (Straight line)
 (YECST) (KM) Default: none ! YECST = 0. !
 Number of stations in the region Default: none ! NLB = 0 !
 (Surface stations + upper air stations)
 Station ID's in the region (METBXID(NLB))
 (Surface stations first, then upper air stations)
 ! METBXID = 0 !

!END!

INPUT GROUP: 6 -- Mixing Height, Temperature and Precipitation Parameters

EMPIRICAL MIXING HEIGHT CONSTANTS

Neutral, mechanical equation
 (CONSTB) Default: 1.41 ! CONSTB = 1.41 !
 Convective mixing ht. equation
 (CONSTE) Default: 0.15 ! CONSTE = 0.15 !
 Stable mixing ht. equation
 (CONSTN) Default: 2400. ! CONSTN = 2400. !
 Overwater mixing ht. equation
 (CONSTW) Default: 0.16 ! CONSTW = 0.16 !
 Absolute value of Coriolis
 parameter (FCORIOI) Default: 1.E-4 ! FCORIOI = 1.0E-04!
 Units: (1/s)

SPATIAL AVERAGING OF MIXING HEIGHTS

Conduct spatial averaging
 (IAVEZI) (0=no, 1=yes) Default: 1 ! IAVEZI = 1 !
 Max. search radius in averaging
 process (MNMDAV) Default: 1 ! MNMDAV = 4 !
 Units: Grid
 cells
 Half-angle of upwind looking cone
 for averaging (HAFANG) Default: 30. ! HAFANG = 30. !

Far-Field Air Quality Impact Assessment

Layer of winds used in upwind averaging (ILEVZI)
(must be between 1 and NZ) Units: deg.
Default: 1 ! ILEVZI = 1 !

OTHER MIXING HEIGHT VARIABLES

Minimum potential temperature lapse rate in the stable layer above the current convective mixing ht. (DPTMIN) Default: 0.001 ! DPTMIN = 0.001 !
Units: deg. K/m

Depth of layer above current conv. mixing height through which lapse rate is computed (DZZI) Default: 200. ! DZZI = 200. !
Units: meters

Minimum overland mixing height (ZIMIN) Default: 50. ! ZIMIN = 50. !
Units: meters

Maximum overland mixing height (ZIMAX) Default: 3000. ! ZIMAX = 3000. !
Units: meters

Minimum overwater mixing height (ZIMINW) -- (Not used if observed overwater mixing hts. are used) Default: 50. ! ZIMINW = 50. !
Units: meters

Maximum overwater mixing height (ZIMAXW) -- (Not used if observed overwater mixing hts. are used) Default: 3000. ! ZIMAXW = 3000. !
Units: meters

TEMPERATURE PARAMETERS

3D temperature from observations or from prognostic data? (ITPROG) Default:0 !ITPROG = 0 !

0 = Use Surface and upper air stations
(only if NOOBS = 0)

1 = Use Surface stations (no upper air observations)
Use MM5 for upper air data
(only if NOOBS = 0,1)

2 = No surface or upper air observations
Use MM5 for surface and upper air data
(only if NOOBS = 0,1,2)

Interpolation type
(1 = 1/R ; 2 = 1/R**2) Default:1 ! IRAD = 1 !

Radius of influence for temperature interpolation (TRADKM) Default: 500. ! TRADKM = 500. !
Units: km

Maximum Number of stations to include in temperature interpolation (NUMTS) Default: 5 ! NUMTS = 5 !

Conduct spatial averaging of temperatures (IAVET) (0=no, 1=yes) Default: 1 ! IAVET = 1 !
(will use mixing ht MNMDAV,HAFANG so make sure they are correct)

Default temperature gradient below the mixing height over water (K/m) (TGDEFB) Default: -.0098 ! TGDEFB = -0.0098 !

Default temperature gradient above the mixing height over water (K/m) (TGDEFA) Default: -.0045 ! TGDEFA = -0.0045 !

Beginning (JWAT1) and ending (JWAT2) land use categories for temperature interpolation over water -- Make bigger than largest land use to disable ! JWAT1 = 999 !
! JWAT2 = 999 !

PRECIP INTERPOLATION PARAMETERS

Method of interpolation (NFLAGP) Default = 2 ! NFLAGP = 2 !
(1=1/R,2=1/R**2,3=EXP/R**2)

Radius of Influence (km) (SIGMAP) Default = 100.0 ! SIGMAP = 50. !
(0.0 => use half dist. btwn nearest stns w & w/out precip when NFLAGP = 3)

Minimum Precip. Rate Cutoff (mm/hr) Default = 0.01 ! CUTP = 0.01 !
(values < CUTP = 0.0 mm/hr)

!END!

Far-Field Air Quality Impact Assessment

INPUT GROUP: 7 -- Surface meteorological station parameters

SURFACE STATION VARIABLES
(One record per station -- 78 records in all)

	1	2				
	Name	ID	X coord. (km)	Y coord. (km)	Time zone	Anem. Ht. (m)
!	SS1	'Amoc'	01001	-188.837	-117.73	7. 10. !
!	SS2	'Exxo'	01002	-128.247	-75.08	7. 10. !
!	SS3	'GenC'	01003	-97.396	-102.53	7. 10. !
!	SS4	'Naug'	01004	-163.727	-82.89	7. 10. !
!	SS5	'OCI'	01005	-89.941	-87.57	7. 10. !
!	SS6	'TG S'	01006	-107.679	-91.60	7. 10. !
!	SS7	'Ande'	02001	-31.013	-12.05	7. 10. !
!	SS8	'Burr'	02002	-141.055	140.20	7. 10. !
!	SS9	'Camp'	02003	79.256	-21.46	7. 10. !
!	SS10	'Cow'	02004	78.342	-137.15	7. 10. !
!	SS11	'Elkh'	02005	-82.435	121.92	7. 10. !
!	SS12	'Getc'	02006	-213.753	-23.29	7. 10. !
!	SS13	'Grac'	02007	-261.735	4.03	7. 10. !
!	SS14	'Gran'	02008	-167.686	128.38	7. 10. !
!	SS15	'Pole'	02009	-259.041	42.35	7. 10. !
!	SS16	'Rasp'	02010	-114.350	100.16	7. 10. !
!	SS17	'Rile'	02011	-152.455	-5.34	7. 10. !
!	SS18	'Snid'	02012	-156.708	-4.43	7. 10. !
!	SS19	'Wind'	02013	-44.560	46.20	7. 10. !
!	SS20	'Bea'	03001	20.818	4.01	7. 10. !
!	SS21	'Bit'	03002	-2.654	-97.24	7. 10. !
!	SS22	'Con'	03003	68.278	-89.45	7. 10. !
!	SS23	'Fir'	03004	-179.798	-132.42	7. 10. !
!	SS24	'Hil'	03005	96.447	59.00	7. 10. !
!	SS25	'Pat'	03006	134.381	2.50	7. 10. !
!	SS26	'Bag'	04001	74.785	-166.36	7. 10. !
!	SS27	'Cra'	04002	78.747	-225.58	7. 10. !
!	SS28	'Jun'	04003	42.655	-225.92	7. 10. !
!	SS29	'Pine'	05001	-97.579	41.61	7. 10. !
!	SS30	'Cent'	05002	194.065	-130.50	7. 10. !
!	SS31	'Denv'	06001	335.813	-324.41	7. 10. !
!	SS32	'Denv'	06002	335.813	-324.41	7. 10. !
!	SS33	'Gran'	06003	18.459	-376.04	7. 10. !
!	SS34	'Chey'	06004	302.347	-143.59	7. 10. !
!	SS35	'Land'	06005	-14.192	29.04	7. 10. !
!	SS36	'Rock'	06006	-41.850	-102.05	7. 10. !
!	SS37	'Casp'	06007	163.698	41.90	7. 10. !
!	SS38	'Salt'	06008	-247.589	-219.23	7. 10. !
!	SS39	'Pocc'	06009	-318.637	47.83	7. 10. !
!	SS40	'Evan'	07001	-200.631	-133.53	7. 10. !
!	SS41	'Hayd'	07002	115.118	-241.22	7. 10. !
!	SS42	'Ogde'	07003	-245.962	-154.60	7. 10. !
!	SS43	'Jack'	07004	-169.576	115.15	7. 10. !
!	SS44	'Rive'	07005	3.930	48.37	7. 10. !
!	SS45	'Rawl'	07006	108.284	-79.76	7. 10. !
!	SS46	'Soda'	07007	-222.333	-13.32	7. 10. !
!	SS47	'Vern'	07008	-62.525	-245.16	7. 10. !
!	SS48	'Worl'	07009	46.380	152.76	7. 10. !
!	SS49	'Shdn'	24029	121.441	207.368	7. 10. !
!	SS50	'BPny'	26710	-123.085	3.340	7. 10. !
!	SS51	'Cody'	26700	-36.095	211.642	7. 10. !
!	SS52	'Gill'	26650	232.566	197.675	7. 10. !
!	SS53	'Lvng'	26798	-142.899	339.888	7. 10. !
!	SS54	'WYel'	26763	-195.360	228.602	7. 10. !
!	SS55	'Bigh'	00141	50.303	271.136	7. 10. !
!	SS56	'Brad'	00145	197.903	272.207	7. 10. !
!	SS57	'Pryr'	00158	4.479	299.284	7. 10. !
!	SS58	'SBrg'	00161	-18.361	284.492	7. 10. !
!	SS59	'Wild'	00165	16.409	281.267	7. 10. !
!	SS60	'WMtn'	00166	104.363	297.557	7. 10. !
!	SS61	'Fish'	00168	-77.155	312.715	7. 10. !
!	SS62	'Eche'	00203	207.810	209.321	7. 10. !
!	SS63	'Mill'	00208	84.571	205.200	7. 10. !
!	SS64	'Quad'	00210	-186.049	258.111	7. 10. !
!	SS65	'Rttl'	00211	-54.582	217.563	7. 10. !
!	SS66	'Schl'	00214	120.866	189.790	7. 10. !
!	SS67	'Splt'	00217	89.990	109.184	7. 10. !
!	SS68	'Cran'	00220	-81.041	247.524	7. 10. !
!	SS69	'Thor'	00302	-118.495	173.848	7. 10. !
!	SS70	'GCrk'	00304	-23.723	144.340	7. 10. !
!	SS71	'Brit'	00305	15.360	262.391	7. 10. !

Far-Field Air Quality Impact Assessment

```

! SS72 ='Hyat' 00306      80.409      188.564   7.    10. !
! SS73 ='SLck' 00307      92.075      167.374   7.    10. !
! SS74 ='Pokr' 00308     123.604     109.848   7.    10. !
! SS75 ='Sher' 00309     192.419      99.085   7.    10. !
! SS76 ='FHow' 00310     180.928     297.629   7.    10. !
! SS77 ='Cspr' 00311     174.575      19.920   7.    10. !
! SS78 ='Burg' 00312      77.609      240.502   7.    10. !

```

```

-----
1
  Four character string for station name
  (MUST START IN COLUMN 9)

2
  Five digit integer for station ID

!END!

```

```

-----
INPUT GROUP: 8 -- Upper air meteorological station parameters
-----

```

```

UPPER AIR STATION VARIABLES
(One record per station -- 4 records in all)

```

	1	2			
	Name	ID	X coord. (km)	Y coord. (km)	Time zone
! US1	'DENV'	23062	305.400	-292.700	7 !
! US2	'GRJT'	23066	1.400	-369.900	7 !
! US3	'LAND'	24021	-14.429	28.720	7 !
! US4	'SLCY'	24127	-277.300	-184.300	7 !

```

-----
1
  Four character string for station name
  (MUST START IN COLUMN 9)

2
  Five digit integer for station ID

!END!

```

```

-----
INPUT GROUP: 9 -- Precipitation station parameters
-----

```

```

PRECIPITATION STATION VARIABLES
(One record per station -- 67 records in all)
(NOT INCLUDED IF NPSTA = 0)

```

	1	2			
	Name	Station Code	X coord. (km)	Y coord. (km)	
! PS1	'AFTO'	0027	-188.157	22.51	!
! PS2	'ALTA'	0140	-192.552	135.52	!
! PS3	'BAGG'	0484	73.119	-162.79	!
! PS4	'BEDF'	0603	-186.424	36.80	!
! PS5	'BIG '	0695	-124.084	1.21	!
! PS6	'BIG '	0696	-109.529	2.74	!
! PS7	'BITT'	0761	2.681	-103.99	!
! PS8	'BLAC'	0778	63.481	118.54	!
! PS9	'BOND'	0865	-144.904	71.54	!
! PS10	'BOUL'	0951	-89.507	18.55	!
! PS11	'BOYS'	1000	28.619	93.22	!
! PS12	'BURR'	1284	-57.277	88.04	!
! PS13	'CHUR'	1736	-123.808	-122.53	!
! PS14	'CORA'	2054	-114.096	42.24	!
! PS15	'DANI'	2242	-124.619	40.65	!
! PS16	'DARW'	2375	-126.163	94.42	!
! PS17	'DIVE'	2595	-30.008	73.52	!
! PS18	'EVAN'	3100	-194.204	-135.16	!
! PS19	'FARS'	3170	-71.727	-39.03	!
! PS20	'FONT'	3396	-121.279	-59.80	!
! PS21	'GAS '	3801	84.081	31.02	!
! PS22	'GREE'	4065	-72.533	-110.75	!

! PS23 = 'JACK'	4910	-172.777	102.70	!
! PS24 = 'JEFF'	4925	56.815	-5.12	!
! PS25 = 'KEMM'	5105	-159.027	-76.90	!
! PS26 = 'LA B'	5252	-131.308	-29.11	!
! PS27 = 'LAND'	5390	-14.453	28.69	!
! PS28 = 'LONE'	5703	-129.911	-158.31	!
! PS29 = 'MOOS'	6428	-168.396	120.49	!
! PS30 = 'MORA'	6440	-157.485	141.70	!
! PS31 = 'MOUN'	6555	-144.311	-136.46	!
! PS32 = 'MUDD'	6595	87.395	-19.11	!
! PS33 = 'PAVI'	7115	-10.432	75.25	!
! PS34 = 'PINE'	7260	-103.726	34.90	!
! PS35 = 'RAWL'	7533	108.284	-79.76	!
! PS36 = 'RIVE'	7760	13.096	51.97	!
! PS37 = 'ROCK'	7845	-41.585	-102.06	!
! PS38 = 'SAGE'	7955	-196.273	-70.49	!
! PS39 = 'SHOS'	8209	22.205	66.33	!
! PS40 = 'SOUT'	8385	-19.829	-8.92	!
! PS41 = 'TEN '	8858	91.710	136.80	!
! PS42 = 'THR1'	8875	27.206	118.27	!
! PS43 = 'THR2'	8884	27.206	118.27	!
! PS44 = 'THR3'	8888	-11.646	125.39	!
! PS45 = 'WAMS'	9459	46.893	-94.84	!
! PS46 = 'WORL'	9785	45.092	152.40	!
! PS47 = 'COOK'	241995	-107.849	265.801	!
! PS48 = 'HEBG'	244038	-212.420	252.439	!
! PS49 = 'LODG'	245106	88.428	292.324	!
! PS50 = 'YELT'	249240	46.700	297.227	!
! PS51 = 'BUFF'	481165	142.487	194.934	!
! PS52 = 'LYEL'	485345	-141.950	218.185	!
! PS53 = 'POWL'	487388	-16.563	239.824	!
! PS54 = 'RECL'	487545	216.741	238.271	!
! PS55 = 'SHDR'	488155	121.067	239.210	!
! PS56 = 'STRY'	488626	126.569	219.639	!
! PS57 = 'TENS'	488852	87.725	163.494	!

1
Four character string for station name
(MUST START IN COLUMN 9)

2
Six digit station code composed of state
code (first 2 digits) and station ID (last
4 digits)

!END!

EXHIBIT 2
EXAMPLE CALPUFF INPUT FILE

Example CALPUFF Control File

CALPUFF Modeling for Wind River EIS -- January 1 - 31, 1995
 Project As Proposed Only; Part 1 -- 928 Sensitive Receptors
 Using CALMET Winds, 4km grid cells (108 x 88 grid)
 ----- Run title (3 lines) -----

CALPUFF MODEL CONTROL FILE

INPUT GROUP: 0 -- Input and Output File Names

```

-----
Default Name  Type      File Name
-----
CALMET.DAT   input    ! METDAT =C:\CALMET\WNRDVR\RESULTS\WRCALM01.DAT  !
or
ISCMET.DAT   input    * ISCDAT =
or
PLMMET.DAT   input    * PLMDAT =
or
PROFILE.DAT   input    * PRFDAT =
SURFACE.DAT   input    * SFCDAT =
RESTARTB.DAT input    * RSTARTB=
-----
CALPUFF.LST  output   ! PUFLST =C:\CALPUFF\WNRDVR\WRPP\P101WRPP.LST  !
CONC.DAT     output   ! CONDAT =C:\CALPUFF\WNRDVR\WRPP\C101WRPP.CON  !
DFLX.DAT     output   ! DFDAT =C:\CALPUFF\WNRDVR\WRPP\D101WRPP.DRY  !
WFLX.DAT     output   ! WFDAT =C:\CALPUFF\WNRDVR\WRPP\W101WRPP.WET  !

VISB.DAT     output   ! VISDAT =C:\CALPUFF\WNRDVR\WRPP\V101WRPP.VIS  !
RESTARTE.DAT output   ! RSTARTE=C:\CALPUFF\WNRDVR\WRPP\R101WRPP.RSE  !
-----
    
```

Emission Files

```

-----
PTEMARB.DAT  input    * PTDAT =
VOLEMARB.DAT input    * VOLDAT =
BAEMARB.DAT  input    * ARDAT =
LNEMARB.DAT  input    * LNDAT =
-----
    
```

Other Files

```

-----
OZONE.DAT    input    ! OZDAT =C:\CALPUFF\WNRDVR\WRPP\OZONE.DAT  !
VD.DAT       input    * VDDAT =
CHEM.DAT     input    * CHEMDAT=
H2O2.DAT     input    * H2O2DAT=
HILL.DAT     input    * HILDAT=
HILLRCT.DAT  input    * RCTDAT=
COASTLN.DAT  input    * CSTDAT=
FLUXBDY.DAT  input    * BDYDAT=
BCON.DAT     input    * BCNDAT=
DEBUG.DAT    output   * DEBUG =
MASSFLX.DAT  output   * FLXDAT=
MASSBAL.DAT  output   * BALDAT=
FOG.DAT      output   * FOGDAT=
-----
    
```

All file names will be converted to lower case if LCFILES = T
 Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
 T = lower case ! LCFILES = T !
 F = UPPER CASE

NOTE: (1) file/path names can be up to 70 characters in length

Provision for multiple input files

```

-----
Number of CALMET.DAT files for run (NMETDAT)
Default: 1           ! NMETDAT = 1  !

Number of PTEMARB.DAT files for run (NPTDAT)
Default: 0           ! NPTDAT = 0  !
    
```

Far-Field Air Quality Impact Assessment

```
Number of BAEMARB.DAT files for run (NARDAT)
          Default: 0          ! NARDAT = 0 !

Number of VOLEMARB.DAT files for run (NVOLDAT)
          Default: 0          ! NVOLDAT = 0 !
```

!END!

Subgroup (0a)

The following CALMET.DAT filenames are processed in sequence if NMETDAT>1

Default Name	Type	File Name
none	input	* METDAT= * *END*

INPUT GROUP: 1 -- General run control parameters

Option to run all periods found
in the met. file (METRUN) Default: 0 ! METRUN = 0 !

METRUN = 0 - Run period explicitly defined below
METRUN = 1 - Run all periods in met. file

Starting date: Year (IBYR) -- No default ! IBYR = 1995 !
(used only if Month (IBMO) -- No default ! IBMO = 1 !
METRUN = 0) Day (IBDY) -- No default ! IDBY = 1 !
Hour (IBHR) -- No default ! IBHR = 0 !

Base time zone (XBTZ) -- No default ! XBTZ = 7.0 !
PST = 8., MST = 7.
CST = 6., EST = 5.

Length of run (hours) (IRLG) -- No default ! IRLG = 744 !

Number of chemical species (NSPEC)
Default: 5 ! NSPEC = 8 !

Number of chemical species
to be emitted (NSE) Default: 3 ! NSE = 5 !

Flag to stop run after
SETUP phase (ITEST) Default: 2 ! ITEST = 2 !
(Used to allow checking
of the model inputs, files, etc.)
ITEST = 1 - STOPS program after SETUP phase
ITEST = 2 - Continues with execution of program
after SETUP

Restart Configuration:

Control flag (MRESTART) Default: 0 ! MRESTART = 2 !

0 = Do not read or write a restart file
1 = Read a restart file at the beginning of
the run
2 = Write a restart file during run
3 = Read a restart file at beginning of run
and write a restart file during run

Number of periods in Restart
output cycle (NRESPD) Default: 0 ! NRESPD = 0 !

0 = File written only at last period
>0 = File updated every NRESPD periods

Meteorological Data Format (METFM)

Far-Field Air Quality Impact Assessment

```

                                Default: 1      ! METFM = 1  !
METFM = 1 - CALMET binary file (CALMET.MET)
METFM = 2 - ISC ASCII file (ISCMET.MET)
METFM = 3 - AUSPLUME ASCII file (PLMMET.MET)
METFM = 4 - CTDM plus tower file (PROFILE.DAT) and
            surface parameters file (SURFACE.DAT)

PG sigma-y is adjusted by the factor (AVET/PGTIME)**0.2
Averaging Time (minutes) (AVET)
                                Default: 60.0   ! AVET = 60. !
PG Averaging Time (minutes) (PGTIME)
                                Default: 60.0   ! PGTIME = 60. !

!END!

-----

INPUT GROUP: 2 -- Technical options
-----

Vertical distribution used in the
near field (MGAUSS)                Default: 1      ! MGAUSS = 1  !
    0 = uniform
    1 = Gaussian

Terrain adjustment method
(MCTADJ)                            Default: 3      ! MCTADJ = 3  !
    0 = no adjustment
    1 = ISC-type of terrain adjustment
    2 = simple, CALPUFF-type of terrain
        adjustment
    3 = partial plume path adjustment

Subgrid-scale complex terrain
flag (MCTSG)                        Default: 0      ! MCTSG = 0  !
    0 = not modeled
    1 = modeled

Near-field puffs modeled as
elongated 0 (MSLUG)                 Default: 0      ! MSLUG = 0  !
    0 = no
    1 = yes (slug model used)

Transitional plume rise modeled ?
(MTRANS)                            Default: 1      ! MTRANS = 1  !
    0 = no (i.e., final rise only)
    1 = yes (i.e., transitional rise computed)

Stack tip downwash? (MTIP)          Default: 1      ! MTIP = 1  !
    0 = no (i.e., no stack tip downwash)
    1 = yes (i.e., use stack tip downwash)

Method used to simulate building
downwash? (MBDW)                   Default: 1      ! MBDW = 1  !
    1 = ISC method
    2 = PRIME method

Vertical wind shear modeled above
stack top? (MSHEAR)                Default: 0      ! MSHEAR = 0  !
    0 = no (i.e., vertical wind shear not modeled)
    1 = yes (i.e., vertical wind shear modeled)

Puff splitting allowed? (MSPLIT)    Default: 0      ! MSPLIT = 0  !
    0 = no (i.e., puffs not split)
    1 = yes (i.e., puffs are split)

Chemical mechanism flag (MCHEM)     Default: 1      ! MCHEM = 3  !
    0 = chemical transformation not
        modeled
    1 = transformation rates computed
```

```

internally (MESOPUFF II scheme)
2 = user-specified transformation
rates used
3 = transformation rates computed
internally (RIVAD/ARM3 scheme)
4 = secondary organic aerosol formation
computed (MESOPUFF II scheme for OH)

Aqueous phase transformation flag (MAQCHEM)
(Used only if MCHEM = 1, or 3)      Default: 0      ! MAQCHEM = 0  !
0 = aqueous phase transformation
not modeled
1 = transformation rates adjusted
for aqueous phase reactions

Wet removal modeled ? (MWET)      Default: 1      ! MWET = 1  !
0 = no
1 = yes

Dry deposition modeled ? (MDRY)    Default: 1      ! MDRY = 1  !
0 = no
1 = yes
(dry deposition method specified
for each species in Input Group 3)

Method used to compute dispersion
coefficients (MDISP)               Default: 3      ! MDISP = 3  !

1 = dispersion coefficients computed from measured values
of turbulence, sigma v, sigma w
2 = dispersion coefficients from internally calculated
sigma v, sigma w using micrometeorological variables
(u*, w*, L, etc.)
3 = PG dispersion coefficients for RURAL areas (computed using
the ISCST multi-segment approximation) and MP coefficients in
urban areas
4 = same as 3 except PG coefficients computed using
the MESOPUFF II eqns.
5 = CTDM sigmas used for stable and neutral conditions.
For unstable conditions, sigmas are computed as in
MDISP = 3, described above. MDISP = 5 assumes that
measured values are read

Sigma-v/sigma-theta, sigma-w measurements used? (MTURBVW)
(Used only if MDISP = 1 or 5)      Default: 3      ! MTURBVW = 3  !
1 = use sigma-v or sigma-theta measurements
from PROFILE.DAT to compute sigma-y
(valid for METFM = 1, 2, 3, 4)
2 = use sigma-w measurements
from PROFILE.DAT to compute sigma-z
(valid for METFM = 1, 2, 3, 4)
3 = use both sigma-(v/theta) and sigma-w
from PROFILE.DAT to compute sigma-y and sigma-z
(valid for METFM = 1, 2, 3, 4)
4 = use sigma-theta measurements
from PLMMET.DAT to compute sigma-y
(valid only if METFM = 3)

Back-up method used to compute dispersion
when measured turbulence data are
missing (MDISP2)                   Default: 3      ! MDISP2 = 3  !
(used only if MDISP = 1 or 5)
2 = dispersion coefficients from internally calculated
sigma v, sigma w using micrometeorological variables
(u*, w*, L, etc.)
3 = PG dispersion coefficients for RURAL areas (computed using
the ISCST multi-segment approximation) and MP coefficients in
urban areas
4 = same as 3 except PG coefficients computed using
the MESOPUFF II eqns.

PG sigma-y,z adj. for roughness?   Default: 0      ! MROUGH = 0  !
(MROUGH)
0 = no

```

```

1 = yes

Partial plume penetration of          Default: 1      ! MPARTL = 1  !
elevated inversion?
(MPARTL)
0 = no
1 = yes

Strength of temperature inversion     Default: 0      ! MTINV = 0  !
provided in PROFILE.DAT extended records?
(MTINV)
0 = no (computed from measured/default gradients)
1 = yes

PDF used for dispersion under convective conditions?
                                         Default: 0      ! MPDF = 0  !
(MPDF)
0 = no
1 = yes

Sub-Grid TIBL module used for shore line?
                                         Default: 0      ! MSGTIBL = 0  !
(MSGTIBL)
0 = no
1 = yes

Boundary conditions (concentration) modeled?
                                         Default: 0      ! MBCON = 0  !
(MBCON)
0 = no
1 = yes, using formatted BCON.DAT file
2 = yes, using unformatted CONC.DAT file

Analyses of fogging and icing impacts due to emissions from
arrays of mechanically-forced cooling towers can be performed
using CALPUFF in conjunction with a cooling tower emissions
processor (CTEMISS) and its associated postprocessors. Hourly
emissions of water vapor and temperature from each cooling tower
cell are computed for the current cell configuration and ambient
conditions by CTEMISS. CALPUFF models the dispersion of these
emissions and provides cloud information in a specialized format
for further analysis. Output to FOG.DAT is provided in either
'plume mode' or 'receptor mode' format.

Configure for FOG Model output?
                                         Default: 0      ! MFOG = 0  !
(MFOG)
0 = no
1 = yes - report results in PLUME Mode format
2 = yes - report results in RECEPTOR Mode format

Test options specified to see if
they conform to regulatory
values? (MREG)                          Default: 1      ! MREG = 0  !

0 = NO checks are made
1 = Technical options must conform to USEPA
   Long Range Transport (LRT) guidance
       METFM  1 or 2
       AVET   60. (min)
       PGTIME 60. (min)
       MGAUSS 1
       MCTADJ 3
       MTRANS 1
       MTIP   1
       MCHEM  1 or 3 (if modeling SOx, NOx)
       MWET   1
       MDRY   1
       MDISP  2 or 3
       MPDF   0 if MDISP=3
              1 if MDISP=2
       MROUGH 0

```

```
MPARTL 1
SYTDEP 550. (m)
MHFTSZ 0
```

!END!

INPUT GROUP: 3a, 3b -- Species list

Subgroup (3a)

The following species are modeled:

```
! CSPEC =      SO2 !      !END!
! CSPEC =      SO4 !      !END!
! CSPEC =      NO  !      !END!
! CSPEC =      NO2 !      !END!
! CSPEC =      HNO3 !     !END!
! CSPEC =      NO3 !      !END!
! CSPEC =      PM10 !     !END!
! CSPEC =      PM25 !     !END!
```

SPECIES NAME (Limit: 12 Characters in length)	MODELED (0=NO, 1=YES)	EMITTED (0=NO, 1=YES)	Dry DEPOSITED (0=NO, 1=COMPUTED-GAS 2=COMPUTED-PARTICLE 3=USER-SPECIFIED)	OUTPUT GROUP NUMBER (0=NONE, 1=1st CGRUP, 2=2nd CGRUP, 3= etc.)
! SO2 =	1,	1,	1,	0 !
! SO4 =	1,	0,	2,	0 !
! NO =	1,	1,	1,	0 !
! NO2 =	1,	1,	1,	0 !
! HNO3 =	1,	0,	1,	0 !
! NO3 =	1,	0,	2,	0 !
! PM10 =	1,	1,	2,	0 !
! PM25 =	1,	1,	2,	0 !

!END!

Subgroup (3b)

The following names are used for Species-Groups in which results for certain species are combined (added) prior to output. The CGRUP name will be used as the species name in output files. Use this feature to model specific particle-size distributions by treating each size-range as a separate species. Order must be consistent with 3(a) above.

INPUT GROUP: 4 -- Map Projection and Grid control parameters

Projection for all (X,Y):

```
Map projection
(PMAP)                      Default: UTM    ! PMAP = LCC  !
```

```
UTM : Universal Transverse Mercator
TTM : Tangential Transverse Mercator
LCC : Lambert Conformal Conic
PS  : Polar Stereographic
```

```

EM : Equatorial Mercator
LAZA : Lambert Azimuthal Equal Area

False Easting and Northing (km) at the projection origin
(Used only if PMAP= TTM, LCC, or LAZA)
(FEAST)                Default=0.0      ! FEAST = 0.000 !
(FNORTH)               Default=0.0      ! FNORTH = 0.000 !

UTM zone (1 to 60)
(Used only if PMAP=UTM)
(IUTMZN)                No Default      ! IUTMZN = 12  !

Hemisphere for UTM projection?
(Used only if PMAP=UTM)
(UTMHEM)                Default: N      ! UTMHEM = N  !
N : Northern hemisphere projection
S : Southern hemisphere projection

Latitude and Longitude (decimal degrees) of projection origin
(Used only if PMAP= TTM, LCC, PS, EM, or LAZA)
(RLAT0)                 No Default      ! RLAT0 = 42.550N !
(RLON0)                 No Default      ! RLON0 = 108.550W !

TTM : RLON0 identifies central (true N/S) meridian of projection
      RLAT0 selected for convenience
LCC : RLON0 identifies central (true N/S) meridian of projection
      RLAT0 selected for convenience
PS  : RLON0 identifies central (grid N/S) meridian of projection
      RLAT0 selected for convenience
EM  : RLON0 identifies central meridian of projection
      RLAT0 is REPLACED by 0.0N (Equator)
LAZA: RLON0 identifies longitude of tangent-point of mapping plane
      RLAT0 identifies latitude of tangent-point of mapping plane

Matching parallel(s) of latitude (decimal degrees) for projection
(Used only if PMAP= LCC or PS)
(XLAT1)                 No Default      ! XLAT1 = 30N  !
(XLAT2)                 No Default      ! XLAT2 = 60N  !

LCC : Projection cone slices through Earth's surface at XLAT1 and XLAT2
PS  : Projection plane slices through Earth at XLAT1
      (XLAT2 is not used)

-----
Note: Latitudes and longitudes should be positive, and include a
      letter N,S,E, or W indicating north or south latitude, and
      east or west longitude. For example,
      35.9 N Latitude = 35.9N
      118.7 E Longitude = 118.7E

Datum-region
-----

The Datum-Region for the coordinates is identified by a character
string. Many mapping products currently available use the model of the
Earth known as the World Geodetic System 1984 (WGS-G ). Other local
models may be in use, and their selection in CALMET will make its output
consistent with local mapping products. The list of Datum-Regions with
official transformation parameters is provided by the National Imagery and
Mapping Agency (NIMA).

NIMA Datum - Regions(Examples)
-----
WGS-G    WGS-84 GRS 80 Spheroid, Global coverage (WGS84)
NAS-C    NORTH AMERICAN 1927 Clarke 1866 Spheroid, MEAN FOR CONUS (NAD27)
NWS-27   NWS 6370KM Radius, Sphere
NWS-84   NWS 6370KM Radius, Sphere
ESR-S    ESRI REFERENCE 6371KM Radius, Sphere

Datum-region for output coordinates
(DATUM)                Default: WGS-G      ! DATUM = NAS-C  !

```

METEOROLOGICAL Grid:

Rectangular grid defined for projection PMAP,
with X the Easting and Y the Northing coordinate

No. X grid cells (NX)	No default	! NX = 108 !
No. Y grid cells (NY)	No default	! NY = 88 !
No. vertical layers (NZ)	No default	! NZ = 10 !
 Grid spacing (DGRIDKM)	 No default	 ! DGRIDKM = 4. !
	Units: km	
 Cell face heights (ZFACE(nz+1))	 No defaults	
	Units: m	
! ZFACE = 0., 20., 40., 80., 160., 300., 600., 1000., 1500., 2200., 3000. !		
 Reference Coordinates of SOUTHWEST corner of grid cell(1, 1):		
X coordinate (XORIGKM)	No default	! XORIGKM = -230. !
Y coordinate (YORIGKM)	No default	! YORIGKM = -32. !
	Units: km	

COMPUTATIONAL Grid:

The computational grid is identical to or a subset of the MET. grid. The lower left (LL) corner of the computational grid is at grid point (IBCOMP, JBCOMP) of the MET. grid. The upper right (UR) corner of the computational grid is at grid point (IECOMP, JECOMP) of the MET. grid. The grid spacing of the computational grid is the same as the MET. grid.

X index of LL corner (IBCOMP) (1 <= IBCOMP <= NX)	No default	! IBCOMP = 1 !
Y index of LL corner (JBCOMP) (1 <= JBCOMP <= NY)	No default	! JBCOMP = 1 !
 X index of UR corner (IECOMP) (1 <= IECOMP <= NX)	 No default	 ! IECOMP = 108 !
Y index of UR corner (JECOMP) (1 <= JECOMP <= NY)	No default	! JECOMP = 88 !

SAMPLING Grid (GRIDDED RECEPTORS):

The lower left (LL) corner of the sampling grid is at grid point (IBSAMP, JBSAMP) of the MET. grid. The upper right (UR) corner of the sampling grid is at grid point (IESAMP, JESAMP) of the MET. grid. The sampling grid must be identical to or a subset of the computational grid. It may be a nested grid inside the computational grid. The grid spacing of the sampling grid is DGRIDKM/MESH DN.

Logical flag indicating if gridded receptors are used (LSAMP) (T=yes, F=no)	Default: T	! LSAMP = F !
X index of LL corner (IBSAMP) (IBCOMP <= IBSAMP <= IECOMP)	No default	! IBSAMP = 0 !
Y index of LL corner (JBSAMP) (JBCOMP <= JBSAMP <= JECOMP)	No default	! JBSAMP = 0 !
 X index of UR corner (IESAMP) (IBCOMP <= IESAMP <= IECOMP)	 No default	 ! IESAMP = 0 !
Y index of UR corner (JESAMP)	No default	! JESAMP = 0 !

(JBCOMP <= JESAMP <= JECOMP)

Nesting factor of the sampling
 grid (MESH DN) Default: 1 ! MESH DN = 1 !
 (MESH DN is an integer >= 1)

!END!

 INPUT GROUP: 5 -- Output Options

FILE	* DEFAULT VALUE	* VALUE THIS RUN
----	-----	-----
Concentrations (ICON)	1	! ICON = 1 !
Dry Fluxes (IDRY)	1	! IDRY = 1 !
Wet Fluxes (IWET)	1	! IWET = 1 !
Relative Humidity (IVIS) (relative humidity file is required for visibility analysis)	1	! IVIS = 1 !
Use data compression option in output file? (LCOMPRS)	Default: T	! LCOMPRS = T !

*
 0 = Do not create file, 1 = create file

DIAGNOSTIC MASS FLUX OUTPUT OPTIONS:

Mass flux across specified boundaries
 for selected species reported hourly?
 (IMFLX) Default: 0 ! IMFLX = 0 !
 0 = no
 1 = yes (FLUXBDY.DAT and MASSFLX.DAT filenames
 are specified in Input Group 0)

Mass balance for each species
 reported hourly?
 (IMBAL) Default: 0 ! IMBAL = 0 !
 0 = no
 1 = yes (MASSBAL.DAT filename is
 specified in Input Group 0)

LINE PRINTER OUTPUT OPTIONS:

Print concentrations (ICPRT) Default: 0 ! ICPRT = 0 !
 Print dry fluxes (IDPRT) Default: 0 ! IDPRT = 0 !
 Print wet fluxes (IWPRT) Default: 0 ! IWPRT = 0 !
 (0 = Do not print, 1 = Print)

Concentration print interval
 (ICFRQ) in hours Default: 1 ! ICFRQ = 1 !
 Dry flux print interval
 (IDFRQ) in hours Default: 1 ! IDFRQ = 1 !
 Wet flux print interval
 (IWFRQ) in hours Default: 1 ! IWFRQ = 1 !

Units for Line Printer Output
 (IPRTU) Default: 1 ! IPRTU = 3 !

	for	for
	Concentration	Deposition
1 =	g/m**3	g/m**2/s
2 =	mg/m**3	mg/m**2/s
3 =	ug/m**3	ug/m**2/s
4 =	ng/m**3	ng/m**2/s
5 =	Odour Units	

Far-Field Air Quality Impact Assessment

Messages tracking progress of run
written to the screen ?

```
(IMESG)                      Default: 2          ! IMESG = 2  !
  0 = no
  1 = yes (advection step, puff ID)
  2 = yes (YYYYJJJHH, # old puffs, # emitted puffs)
```

SPECIES (or GROUP for combined species) LIST FOR OUTPUT OPTIONS

-- MASS FLUX -- SPECIES /GROUP SAVED ON DISK?	---- CONCENTRATIONS ----	----- DRY FLUXES -----	----- WET FLUXES -----
	PRINTED? SAVED ON DISK?	PRINTED? SAVED ON DISK?	PRINTED? SAVED ON DISK?
-----	-----	-----	-----
! SO2 =	0, 1,	0, 1,	0, 1,
0 !			
! SO4 =	0, 1,	0, 1,	0, 1,
0 !			
! NO =	0, 1,	0, 1,	0, 1,
0 !			
! NO2 =	0, 1,	0, 1,	0, 1,
0 !			
! HNO3 =	0, 1,	0, 1,	0, 1,
0 !			
! NO3 =	0, 1,	0, 1,	0, 1,
0 !			
! PM10 =	0, 1,	0, 1,	0, 1,
0 !			
! PM25 =	0, 1,	0, 1,	0, 1,
0 !			

OPTIONS FOR PRINTING "DEBUG" QUANTITIES (much output)

```
Logical for debug output
(LDEBUG)                      Default: F      ! LDEBUG = F !

First puff to track
(IPFDEB)                      Default: 1      ! IPFDEB = 1 !

Number of puffs to track
(NPFDEB)                      Default: 1      ! NPFDEB = 1 !

Met. period to start output
(NN1)                        Default: 1      ! NN1 = 1  !

Met. period to end output
(NN2)                        Default: 10     ! NN2 = 10 !
```

!END!

INPUT GROUP: 6a, 6b, & 6c -- Subgrid scale complex terrain inputs

Subgroup (6a)

```
Number of terrain features (NHILL)      Default: 0      ! NHILL = 0  !

Number of special complex terrain
receptors (NCTREC)                    Default: 0      ! NCTREC = 0  !

Terrain and CTSG Receptor data for
CTSG hills input in CTDM format ?
(MHILL)                                No Default     ! MHILL = 0  !
1 = Hill and Receptor data created
  by CTDM processors & read from
  HILL.DAT and HILLRCT.DAT files
```

Far-Field Air Quality Impact Assessment

2 = Hill data created by OPTHILL &
input below in Subgroup (6b);
Receptor data in Subgroup (6c)

Factor to convert horizontal dimensions Default: 1.0 ! XHILL2M = 1. !
to meters (MHILL=1)

Factor to convert vertical dimensions Default: 1.0 ! ZHILL2M = 1. !
to meters (MHILL=1)

X-origin of CTDM system relative to No Default ! XCTDMKM = 0.0E00 !
CALPUFF coordinate system, in Kilometers (MHILL=1)

Y-origin of CTDM system relative to No Default ! YCTDMKM = 0.0E00 !
CALPUFF coordinate system, in Kilometers (MHILL=1)

! END !

Subgroup (6b)

1 **
HILL information

HILL AMAX1 NO. (m)	XC AMAX2 (km) (m)	YC (km)	THETAH (deg.)	ZGRID (m)	RELIEF (m)	EXPO 1 (m)	EXPO 2 (m)	SCALE 1 (m)	SCALE 2 (m)
----	----	----	-----	-----	-----	-----	-----	-----	-----

Subgroup (6c)

COMPLEX TERRAIN RECEPTOR INFORMATION

XRCT (km)	YRCT (km)	ZRCT (m)	XHH
-----	-----	-----	-----

1

Description of Complex Terrain Variables:
XC, YC = Coordinates of center of hill
THETAH = Orientation of major axis of hill (clockwise from North)
ZGRID = Height of the 0 of the grid above mean sea level
RELIEF = Height of the crest of the hill above the grid elevation
EXPO 1 = Hill-shape exponent for the major axis
EXPO 2 = Hill-shape exponent for the major axis
SCALE 1 = Horizontal length scale along the major axis
SCALE 2 = Horizontal length scale along the minor axis
AMAX = Maximum allowed axis length for the major axis
BMAX = Maximum allowed axis length for the major axis

XRCT, YRCT = Coordinates of the complex terrain receptors
ZRCT = Height of the ground (MSL) at the complex terrain Receptor
XHH = Hill number associated with each complex terrain receptor
(NOTE: MUST BE ENTERED AS A REAL NUMBER)

**
NOTE: DATA for each hill and CTSG receptor are treated as a separate
input subgroup and therefore must end with an input group terminator.

Far-Field Air Quality Impact Assessment

```

-----
          SPECIES          DIFFUSIVITY      ALPHA STAR      REACTIVITY      MESOPHYLL RESISTANCE      HENRY'S
LAW COEFFICIENT          (cm**2/s)                                     (s/cm)
NAME                                     (dimensionless)
-----
!          SO2 =          0.1509,          1000.,          8.,          0.,
0.04 !
!          NO =          0.1345,          1.,          2.,          25.,
18. !
!          NO2 =          0.1656,          1.,          8.,          5.,
3.5 !
!          HNO3 =          0.1628,          1.,          180.,          0.,
0.00000008 !
!END!

```

INPUT GROUP: 8 -- Size parameters for dry deposition of particles

For SINGLE SPECIES, the mean and standard deviation are used to compute a deposition velocity for NINT (see group 9) size-ranges, and these are then averaged to obtain a mean deposition velocity.

For GROUPED SPECIES, the size distribution should be explicitly specified (by the 'species' in the group), and the standard deviation for each should be entered as 0. The model will then use the deposition velocity for the stated mean diameter.

```

          SPECIES          GEOMETRIC MASS MEAN          GEOMETRIC STANDARD
          NAME          DIAMETER          DEVIATION
          (microns)          (microns)
-----
!          SO4 =          0.48,          2. !
!          NO3 =          0.48,          2. !
!          PM10 =          10.,          0. !
!          PM25 =          2.5,          0. !
!END!

```

INPUT GROUP: 9 -- Miscellaneous dry deposition parameters

```

Reference cuticle resistance (s/cm)
(RCUTR)          Default: 30 ! RCUTR = 30.0 !
Reference ground resistance (s/cm)
(RGR)          Default: 10 ! RGR = 10.0 !
Reference pollutant reactivity
(REACTR)          Default: 8 ! REACTR = 8.0 !

Number of particle-size intervals used to
evaluate effective particle deposition velocity
(NINT)          Default: 9 ! NINT = 9 !

Vegetation state in unirrigated areas
(IVEG)          Default: 1 ! IVEG = 1 !
IVEG=1 for active and unstressed vegetation
IVEG=2 for active and stressed vegetation
IVEG=3 for inactive vegetation

```

!END!

INPUT GROUP: 10 -- Wet Deposition Parameters

Scavenging Coefficient -- Units: (sec)**(-1)

Pollutant	Liquid Precip.	Frozen Precip.
-----	-----	-----
! SO2 =	3.0E-05,	0.0E00 !
! SO4 =	1.0E-04,	3.0E-05 !
! HNO3 =	6.0E-05,	0.0E00 !
! NO3 =	1.0E-04,	3.0E-05 !
! PM10 =	1.0E-04,	3.0E-05 !
! PM25 =	1.0E-04,	3.0E-05 !

!END!

INPUT GROUP: 11 -- Chemistry Parameters

Ozone data input option (MOZ) Default: 1 ! MOZ = 1 !
(Used only if MCHEM = 1, 3, or 4)
0 = use a monthly background ozone value
1 = read hourly ozone concentrations from
the OZONE.DAT data file

Monthly ozone concentrations
(Used only if MCHEM = 1, 3, or 4 and
MOZ = 0 or MOZ = 1 and all hourly O3 data missing)
(BCKO3) in ppb Default: 12*80.
! BCKO3 = 39.80, 43.00, 49.10, 48.30, 47.90, 44.10, 45.30, 47.80, 41.60, 40.10, 38.00,
40.30 !

Monthly ammonia concentrations
(Used only if MCHEM = 1, or 3)
(BCKNH3) in ppb Default: 12*10.
! BCKNH3 = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !

Nighttime SO2 loss rate (RNITE1)
in percent/hour Default: 0.2 ! RNITE1 = .2 !

Nighttime NOx loss rate (RNITE2)
in percent/hour Default: 2.0 ! RNITE2 = 2.0 !

Nighttime HNO3 formation rate (RNITE3)
in percent/hour Default: 2.0 ! RNITE3 = 2.0 !

H2O2 data input option (MH2O2) Default: 1 ! MH2O2 = 0 !
(Used only if MAQCHEM = 1)
0 = use a monthly background H2O2 value
1 = read hourly H2O2 concentrations from
the H2O2.DAT data file

Monthly H2O2 concentrations
(Used only if MQACHEM = 1 and
MH2O2 = 0 or MH2O2 = 1 and all hourly H2O2 data missing)
(BCKH2O2) in ppb Default: 12*1.
! BCKH2O2 = 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00 !

--- Data for SECONDARY ORGANIC AEROSOL (SOA) Option
(used only if MCHEM = 4)

The SOA module uses monthly values of:
Fine particulate concentration in ug/m^3 (BCKPMF)
Organic fraction of fine particulate (OFrac)
VOC / NOX ratio (after reaction) (VCNX)

Far-Field Air Quality Impact Assessment

to characterize the air mass when computing the formation of SOA from VOC emissions. Typical values for several distinct air mass types are:

Month	1	2	3	4	5	6	7	8	9	10	11	12
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Clean Continental												
BCKPMF	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
OFRAC	.15	.15	.20	.20	.20	.20	.20	.20	.20	.20	.20	.15
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
Clean Marine (surface)												
BCKPMF	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
OFRAC	.25	.25	.30	.30	.30	.30	.30	.30	.30	.30	.30	.25
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
Urban - low biogenic (controls present)												
BCKPMF	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.
OFRAC	.20	.20	.25	.25	.25	.25	.25	.25	.20	.20	.20	.20
VCNX	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
Urban - high biogenic (controls present)												
BCKPMF	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.
OFRAC	.25	.25	.30	.30	.30	.55	.55	.55	.35	.35	.35	.25
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
Regional Plume												
BCKPMF	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
OFRAC	.20	.20	.25	.35	.25	.40	.40	.40	.30	.30	.30	.20
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
Urban - no controls present												
BCKPMF	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
OFRAC	.30	.30	.35	.35	.35	.55	.55	.55	.35	.35	.35	.30
VCNX	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.

Default: Clean Continental

! BCKPMF = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !
 ! OFRAC = 0.15, 0.15, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.15 !
 ! VCNX = 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00,
 50.00 !

!END!

 INPUT GROUP: 12 -- Misc. Dispersion and Computational Parameters

Horizontal size of puff (m) beyond which time-dependent dispersion equations (Heffter) are used to determine sigma-y and sigma-z (SYTDEP) Default: 550. ! SYTDEP = 5.5E02 !

Switch for using Heffter equation for sigma z as above (0 = Not use Heffter; 1 = use Heffter (MHFTSZ) Default: 0 ! MHFTSZ = 0 !

Stability class used to determine plume growth rates for puffs above the boundary layer (JSUP) Default: 5 ! JSUP = 5 !

Vertical dispersion constant for stable conditions (k1 in Eqn. 2.7-3) (CONK1) Default: 0.01 ! CONK1 = .01 !

Vertical dispersion constant for neutral/unstable conditions (k2 in Eqn. 2.7-4) (CONK2) Default: 0.1 ! CONK2 = .1 !

Factor for determining Transition-point from

Far-Field Air Quality Impact Assessment

Schulman-Scire to Huber-Snyder Building Downwash
scheme (SS used for $H_s < H_b + TBD * HL$)
(TBD) Default: 0.5 ! TBD = .5 !
TBD < 0 ==> always use Huber-Snyder
TBD = 1.5 ==> always use Schulman-Scire
TBD = 0.5 ==> ISC Transition-point

Range of land use categories for which
urban dispersion is assumed
(IURB1, IURB2) Default: 10 ! IURB1 = 10 !
19 ! IURB2 = 19 !

Site characterization parameters for single-point Met data files -----
(needed for METFM = 2,3,4)

Land use category for modeling domain
(ILANDUIN) Default: 20 ! ILANDUIN = 20 !

Roughness length (m) for modeling domain
(Z0IN) Default: 0.25 ! Z0IN = .25 !

Leaf area index for modeling domain
(XLAIIN) Default: 3.0 ! XLAIIN = 3.0 !

Elevation above sea level (m)
(ELEVIN) Default: 0.0 ! ELEVIN = .0 !

Latitude (degrees) for met location
(XLATIN) Default: -999. ! XLATIN = .0 !

Longitude (degrees) for met location
(XLONIN) Default: -999. ! XLONIN = .0 !

Specialized information for interpreting single-point Met data files -----

Anemometer height (m) (Used only if METFM = 2,3)
(ANEMHT) Default: 10. ! ANEMHT = 10.0 !

Form of lateral turbulence data in PROFILE.DAT file
(Used only if METFM = 4 or MTURBVW = 1 or 3)
(ISIGMAV) Default: 1 ! ISIGMAV = 1 !
0 = read sigma-theta
1 = read sigma-v

Choice of mixing heights (Used only if METFM = 4)
(IMIXCTDM) Default: 0 ! IMIXCTDM = 0 !
0 = read PREDICTED mixing heights
1 = read OBSERVED mixing heights

Maximum length of a slug (met. grid units)
(MXMLEN) Default: 1.0 ! MXMLEN = 1.0 !

Maximum travel distance of a puff/slug (in
grid units) during one sampling step
(XSAMLEN) Default: 1.0 ! XSAMLEN = 1.0 !

Maximum Number of slugs/puffs release from
one source during one time step
(MXNEW) Default: 99 ! MXNEW = 99 !

Maximum Number of sampling steps for
one puff/slug during one time step
(MXSAM) Default: 99 ! MXSAM = 99 !

Number of iterations used when computing
the transport wind for a sampling step
that includes gradual rise (for CALMET
and PROFILE winds)
(NCOUNT) Default: 2 ! NCOUNT = 2 !

Minimum sigma y for a new puff/slug (m)
(SYMIN) Default: 1.0 ! SYMIN = 1.0 !

Minimum sigma z for a new puff/slug (m)

Far-Field Air Quality Impact Assessment

```

(SZMIN)                                Default: 1.0    ! SZMIN = 1.0  !

Default minimum turbulence velocities
sigma-v and sigma-w for each
stability class (m/s)
(SVMIN(6) and SWMIN(6))    Default SVMIN : .50, .50, .50, .50, .50, .50
                          Default SWMIN : .20, .12, .08, .06, .03, .016

                          Stability Class :  A      B      C      D      E      F
                          ---      ---      ---      ---      ---      ---
                          ! SVMIN = 0.500, 0.500, 0.500, 0.500, 0.500, 0.500!
                          ! SWMIN = 0.200, 0.120, 0.080, 0.060, 0.030, 0.016!

Divergence criterion for dw/dz across puff
used to initiate adjustment for horizontal
convergence (1/s)
Partial adjustment starts at CDIV(1), and
full adjustment is reached at CDIV(2)
(CDIV(2))                                Default: 0.0,0.0 ! CDIV = .0, .0 !

Minimum wind speed (m/s) allowed for
non-calm conditions. Also used as minimum
speed returned when using power-law
extrapolation toward surface
(WSCALM)                                Default: 0.5    ! WSCALM = .5 !

Maximum mixing height (m)
(XMAXZI)                                Default: 3000.  ! XMAXZI = 3000.0 !

Minimum mixing height (m)
(XMINZI)                                Default: 50.    ! XMINZI = 20.0 !

Default wind speed classes --
5 upper bounds (m/s) are entered;
the 6th class has no upper limit
(WSCAT(5))    Default      :
              ISC RURAL : 1.54, 3.09, 5.14, 8.23, 10.8 (10.8+)

              Wind Speed Class :  1      2      3      4      5
              ---      ---      ---      ---      ---
              ! WSCAT = 1.54, 3.09, 5.14, 8.23, 10.80 !

Default wind speed profile power-law
exponents for stabilities 1-6
(PLX0(6))    Default      : ISC RURAL values
              ISC RURAL : .07, .07, .10, .15, .35, .55
              ISC URBAN : .15, .15, .20, .25, .30, .30

              Stability Class :  A      B      C      D      E      F
              ---      ---      ---      ---      ---      ---
              ! PLX0 = 0.07, 0.07, 0.10, 0.15, 0.35, 0.55 !

Default potential temperature gradient
for stable classes E, F (degK/m)
(PTG0(2))    Default: 0.020, 0.035
              ! PTG0 = 0.020, 0.035 !

Default plume path coefficients for
each stability class (used when option
for partial plume height terrain adjustment
is selected -- MCTADJ=3)
(PPC(6))    Stability Class :  A      B      C      D      E      F
              Default PPC : .50, .50, .50, .50, .35, .35
              ---      ---      ---      ---      ---      ---
              ! PPC = 0.50, 0.50, 0.50, 0.50, 0.35, 0.35 !

Slug-to-puff transition criterion factor
equal to sigma-y/length of slug
(SL2PF)                                Default: 10.    ! SL2PF = 10.0 !

Puff-splitting control variables -----
VERTICAL SPLIT
-----

```


Number of puffs that result every time a puff is split - nsplit=2 means that 1 puff splits into 2
(NSPLIT) Default: 3 ! NSPLIT = 3 !

Time(s) of a day when split puffs are eligible to be split once again; this is typically set once per day, around sunset before nocturnal shear develops.
24 values: 0 is midnight (00:00) and 23 is 11 PM (23:00)
0=do not re-split 1=eligible for re-split
(IRESPLIT(24)) Default: Hour 17 = 1
! IRESPLIT = 0,0 !

Split is allowed only if last hour's mixing height (m) exceeds a minimum value
(ZISPLIT) Default: 100. ! ZISPLIT = 100.0 !

Split is allowed only if ratio of last hour's mixing ht to the maximum mixing ht experienced by the puff is less than a maximum value (this postpones a split until a nocturnal layer develops)
(ROLDMAX) Default: 0.25 ! ROLDMAX = 0.25 !

HORIZONTAL SPLIT -----

Number of puffs that result every time a puff is split - nsplith=5 means that 1 puff splits into 5
(NSPLITH) Default: 5 ! NSPLITH = 5 !

Minimum sigma-y (Grid Cells Units) of puff before it may be split
(SYSPLITH) Default: 1.0 ! SYSPLITH = 1.0 !

Minimum puff elongation rate (SYSPLITH/hr) due to wind shear, before it may be split
(SHSPLITH) Default: 2. ! SHSPLITH = 2.0 !

Minimum concentration (g/m³) of each species in puff before it may be split
Enter array of NSPEC values; if a single value is entered, it will be used for ALL species
(CNSPLITH) Default: 1.0E-07 ! CNSPLITH = 1.0E-07 !

Integration control variables -----

Fractional convergence criterion for numerical SLUG sampling integration
(EPSSLUG) Default: 1.0e-04 ! EPSSLUG = 1.0E-04 !

Fractional convergence criterion for numerical AREA source integration
(EPSAREA) Default: 1.0e-06 ! EPSAREA = 1.0E-06 !

Trajectory step-length (m) used for numerical rise integration
(DSRISE) Default: 1.0 ! DSRISE = 1.0 !

Boundary Condition (BC) Puff control variables -----

Minimum height (m) to which BC puffs are mixed as they are emitted (MBCON=2 ONLY). Actual height is reset to the current mixing height at the release point if greater than this minimum.
(HTMINBC) Default: 500. ! HTMINBC = 500.0 !

Search radius (in BC segment lengths) about a receptor for sampling nearest BC puff. BC puffs are emitted with a spacing of one segment length, so the search radius should be greater than 1.
(RSAMPBC) Default: 4. ! RSAMPBC = 10.0 !

Near-Surface depletion adjustment to concentration profile used when

Far-Field Air Quality Impact Assessment

```

sampling BC puffs?
(MDEPBC)                               Default: 1      ! MDEPBC = 1  !
0 = Concentration is NOT adjusted for depletion
1 = Adjust Concentration for depletion
    
```

!END!

INPUT GROUPS: 13a, 13b, 13c, 13d -- Point source parameters

Subgroup (13a)

```

Number of point sources with
parameters provided below      (NPT1) No default ! NPT1 = 8  !
    
```

```

Units used for point source
emissions below                (IPTU) Default: 1 ! IPTU = 4  !
1 =          g/s
2 =          kg/hr
3 =          lb/hr
4 =          tons/yr
5 =          Odour Unit * m**3/s (vol. flux of odour compound)
6 =          Odour Unit * m**3/min
7 =          metric tons/yr
    
```

```

Number of source-species
combinations with variable
emissions scaling factors
provided below in (13d)        (NSPT1) Default: 0 ! NSPT1 = 0  !
    
```

```

Number of point sources with
variable emission parameters
provided in external file      (NPT2) No default ! NPT2 = 0  !
    
```

```

(If NPT2 > 0, these point
source emissions are read from
the file: PTEMARB.DAT)
    
```

!END!

Subgroup (13b)

a
POINT SOURCE: CONSTANT DATA

Source No.	X Coordinate (km)	Y Coordinate (km)	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Vel. (m/s)	Exit Temp. (deg. K)	b		c
								Bldg. Dwash	Emission Rates	
1 ! SRCNAM = S_PAVILN !										
1 ! X =	-2.236,	74.561,	9.144,1615.1,		.3048,	35.0,	811.0,	.0,	0.0E00,	0.0E00,
1.8703E01,										
	3.187E00,	0.0E00,	0.0E00,	2.246E00,	2.246E00 !					
1 ! FMFAC =	1.0 !	!END!								
2 ! SRCNAM = PAVILN_PLNT !										
2 ! X =	.564,	76.065,	9.144,1613.9,		.3048,	35.0,	811.0,	.0,	0.0E00,	0.0E00,
9.635E00,										
	1.642E00,	0.0E00,	0.0E00,	1.157E00,	1.157E00 !					
2 ! FMFAC =	1.0 !	!END!								
3 ! SRCNAM = MUDDY_RDG !										
3 ! X =	-.807,	78.764,	9.144,1654.8,		.3048,	35.0,	811.0,	.0,	0.0E00,	0.0E00,
2.564E01,										
	4.368E00,	0.0E00,	0.0E00,	3.081E00,	3.081E00 !					
3 ! FMFAC =	1.0 !	!END!								
4 ! SRCNAM = HDN_VALLEY !										

Far-Field Air Quality Impact Assessment

```

4 ! X = 22.114, 65.718, 9.144,1549.0, .3048, 35.0, 811.0, .0, 0.0E00, 0.0E00,
9.635E00,
1.642E00, 0.0E00, 0.0E00, 1.157E00, 1.157E00 !
4 ! FMFAC = 1.0 ! !END!
5 ! SRCNAM = SHOSH_BSTR !
5 ! X = 34.644, 71.009, 9.144,1499.0, .3048, 35.0, 811.0, .0, 0.0E00, 0.0E00,
2.1576E01,
3.676E00, 0.0E00, 0.0E00, 2.592E00, 2.592E00 !
5 ! FMFAC = 1.0 ! !END!
6 ! SRCNAM = SND_MESA !
6 ! X = 16.692, 81.201, 9.144,1514.9, .3048, 35.0, 811.0, .0, 0.0E00, 0.0E00,
5.8757E01,
1.001E01, 0.0E00, 0.0E00, 7.061E00, 7.061E00 !
6 ! FMFAC = 1.0 ! !END!
7 ! SRCNAM = SND_MESA_S !
7 ! X = 15.8, 78.78, 9.144,1501.2, .3048, 35.0, 811.0, .0, 0.0E00, 0.0E00,
2.7417E01,
4.671E00, 0.0E00, 0.0E00, 3.295E00, 3.295E00 !
7 ! FMFAC = 1.0 ! !END!
8 ! SRCNAM = CSTL_EXT !
8 ! X = 7.078, 83.0, 9.144,1550.2, .3048, 35.0, 811.0, .0, 0.0E00, 0.0E00,
1.547E01,
2.636E00, 0.0E00, 0.0E00, 1.86E00, 1.86E00 !
8 ! FMFAC = 1.0 ! !END!

```

a

Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

```

SRCNAM is a 12-character name for a source
        (No default)
X       is an array holding the source data listed by the column headings
        (No default)
SIGYZI is an array holding the initial sigma-y and sigma-z (m)
        (Default: 0.,0.)
FMFAC  is a vertical momentum flux factor (0. or 1.0) used to represent
        the effect of rain-caps or other physical configurations that
        reduce momentum rise associated with the actual exit velocity.
        (Default: 1.0 -- full momentum used)

```

b

0. = No building downwash modeled, 1. = downwash modeled
NOTE: must be entered as a REAL number (i.e., with decimal point)

c

An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IPTU (e.g. 1 for g/s).

Subgroup (13c)

BUILDING DIMENSION DATA FOR SOURCES SUBJECT TO DOWNWASH

```

Source          a
No.             Effective building height, width, length and X/Y offset (in meters)
                every 10 degrees.  LENGTH, XBADJ, and YBADJ are only needed for
                MBDW=2 (PRIME downwash option)
-----

```

a

Building height, width, length, and X/Y offset from the source are treated as a separate input subgroup for each source and therefore must end with an input group terminator. The X/Y offset is the position, relative to the stack, of the center of the upwind face of the projected building, with the x-axis pointing along the flow direction.

 Subgroup (13d)

a
 POINT SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 13b. Factors entered multiply the rates in 13b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use PTEMARB.DAT and NPT2 > 0.

IVARY determines the type of variation, and is source-specific:
 (IVARY) Default: 0

0 =	Constant
1 =	Diurnal cycle (24 scaling factors: hours 1-24)
2 =	Monthly cycle (12 scaling factors: months 1-12)
3 =	Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 =	Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
5 =	Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

 a
 Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 14a, 14b, 14c, 14d -- Area source parameters

 Subgroup (14a)

Number of polygon area sources with parameters specified below (NAR1) No default ! NAR1 = 10 !

Units used for area source emissions below (IARU) Default: 1 ! IARU = 1 !

1 =	g/m**2/s
2 =	kg/m**2/hr
3 =	lb/m**2/hr
4 =	tons/m**2/yr
5 =	Odour Unit * m/s (vol. flux/m**2 of odour compound)
6 =	Odour Unit * m/min
7 =	metric tons/m**2/yr

Number of source-species combinations with variable emissions scaling factors provided below in (14d) (NSAR1) Default: 0 ! NSAR1 = 10 !

Number of buoyant polygon area sources with variable location and emission parameters (NAR2) No default ! NAR2 = 0 !
 (If NAR2 > 0, ALL parameter data for these sources are read from the file: BAEMARB.DAT)

!END!

 Subgroup (14b)

Far-Field Air Quality Impact Assessment

```

-----
                                a
AREA SOURCE: CONSTANT DATA
-----
                                b
Source      Effect.   Base      Initial   Emission
No.         Height    Elevation Sigma z    Rates
           (m)      (m)      (m)
-----
1! SRCNAM = PAVILLION !
1! X =      4.0, 1643.0,      1.86, 1.5609E-10, 0.0E00, 3.8321E-09,
6.5288E-10, 0.0E00, 0.0E00, 5.513E-08, 8.9598E-09 !
!END!
2! SRCNAM = MUDDY_RDG !
2! X =      4.0, 1653.0,      1.86, 1.1514E-09, 0.0E00, 3.8065E-08,
6.4852E-09, 0.0E00, 0.0E00, 2.2298E-07, 3.4954E-08 !
!END!
3! SRCNAM = SAND_MESA !
3! X =      4.0, 1504.0,      1.86, 9.7975E-10, 0.0E00, 3.3001E-08,
5.6225E-09, 0.0E00, 0.0E00, 1.4158E-07, 2.2294E-08 !
!END!
4! SRCNAM = SND_MESA_S !
4! X =      4.0, 1491.0,      1.86, 9.1606E-10, 0.0E00, 3.0942E-08,
5.2716E-09, 0.0E00, 0.0E00, 1.3403E-07, 2.126E-08 !
!END!
5! SRCNAM = CSTL_EXT !
5! X =      4.0, 1554.0,      1.86, 2.2452E-10, 0.0E00, 7.5738E-09,
1.2904E-09, 0.0E00, 0.0E00, 3.31E-08, 5.3387E-09 !
!END!
6! SRCNAM = PAVIL_HTR !
6! X =      4.0, 1643.0,      1.86, 0.0E00, 0.0E00, 6.4325E-09,
1.0959E-09, 0.0E00, 0.0E00, 0.0E00, 0.0E00 !
!END!
7! SRCNAM = MUDDY_HTR !
7! X =      4.0, 1653.0,      1.86, 0.0E00, 0.0E00, 4.854E-09,
8.2697E-10, 0.0E00, 0.0E00, 0.0E00, 0.0E00 !
!END!
8! SRCNAM = SAND_HTR !
8! X =      4.0, 1504.0,      1.86, 0.0E00, 0.0E00, 5.1174E-09,
8.7185E-10, 0.0E00, 0.0E00, 0.0E00, 0.0E00 !
!END!
9! SRCNAM = SND_S_HTR !
9! X =      4.0, 1491.0,      1.86, 0.0E00, 0.0E00, 1.5368E-09,
2.6182E-10, 0.0E00, 0.0E00, 0.0E00, 0.0E00 !
!END!
10! SRCNAM = CSTL_HTR !
10! X =     4.0, 1554.0,      1.86, 0.0E00, 0.0E00, 7.5201E-10,
1.2812E-10, 0.0E00, 0.0E00, 0.0E00, 0.0E00 !
!END!
-----

```

```

-----
a
Data for each source are treated as a separate input subgroup
and therefore must end with an input group terminator.
b
An emission rate must be entered for every pollutant modeled.
Enter emission rate of zero for secondary pollutants that are
modeled, but not emitted. Units are specified by IARU
(e.g. 1 for g/m**2/s).
-----

```

Subgroup (14c)

```

-----
COORDINATES (km) FOR EACH VERTEX(4) OF EACH POLYGON
-----
Source      a
No.         Ordered list of X followed by list of Y, grouped by source
-----
1          ! SRCNAM = PAVILLION !
1          ! XVERT = -8.393, .931, -1.387, -7.815!
1          ! YVERT = 79.913, 77.586, 72.954, 73.555!
-----

```

```

!END!
2 ! SRCNAM = MUDDY_RDG !
2 ! XVERT = -3.748, -.685, -.633, -3.732!
2 ! YVERT = 86.852, 86.835, 77.568, 77.574!
!END!
3 ! SRCNAM = SAND_MESA !
3 ! XVERT = 14.449, 19.445, 21.427, 13.278!
3 ! YVERT = 85.518, 85.554, 80.075, 80.009!
!END!
4 ! SRCNAM = SND_MESA_S !
4 ! XVERT = 21.051, 21.023, 14.825, 14.892!
4 ! YVERT = 80.086, 77.699, 77.71, 79.997!
!END!
5 ! SRCNAM = CSTL_EXT !
5 ! XVERT = 4.01, 10.211, 10.206, 4.047!
5 ! YVERT = 85.452, 85.487, 82.345, 82.229!
!END!
6 ! SRCNAM = PAVIL_HTR !
6 ! XVERT = -8.393, .931, -1.387, -7.815!
6 ! YVERT = 79.913, 77.586, 72.954, 73.555!
!END!
7 ! SRCNAM = MUDDY_HTR !
7 ! XVERT = -3.748, -.685, -.633, -3.732!
7 ! YVERT = 86.852, 86.835, 77.568, 77.574!
!END!
8 ! SRCNAM = SAND_HTR !
8 ! XVERT = 14.449, 19.445, 21.427, 13.278!
8 ! YVERT = 85.518, 85.554, 80.075, 80.009!
!END!
9 ! SRCNAM = SND_S_HTR !
9 ! XVERT = 21.051, 21.023, 14.825, 14.892!
9 ! YVERT = 80.086, 77.699, 77.71, 79.997!
!END!
10 ! SRCNAM = CSTL_HTR !
10 ! XVERT = 4.01, 10.211, 10.206, 4.047!
10 ! YVERT = 85.452, 85.487, 82.345, 82.229!
!END!

```

a
Data for each source are treated as a separate input subgroup
and therefore must end with an input group terminator.

Subgroup (14d)

a
AREA SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission
rates given in 14b. Factors entered multiply the rates in 14b.
Skip sources here that have constant emissions. For more elaborate
variation in source parameters, use BAEMARB.DAT and NAR2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors,
where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where
first group is Stability Class A,
and the speed classes have upper
bounds (m/s) defined in Group 12)
- 5 = Temperature (12 scaling factors, where temperature
classes have upper bounds (C) of:
0, 5, 10, 15, 20, 25, 30, 35, 40,
45, 50, 50+)

6 ! SRCNAM = PAVIL_HTR !

```

6 ! IVARY = 2 ! (12 Months)
6 ! NO = 1,1,1,1,0,0,
      0,0,0,0,1,1 !
!END!
6 ! SRCNAM = PAVIL_HTR !
6 ! IVARY = 2 ! (12 Months)
6 ! NO2 = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
7 ! SRCNAM = MUDDY_HTR !
7 ! IVARY = 2 ! (12 Months)
7 ! NO = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
7 ! SRCNAM = MUDDY_HTR !
7 ! IVARY = 2 ! (12 Months)
7 ! NO2 = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
8 ! SRCNAM = SAND_HTR !
8 ! IVARY = 2 ! (12 Months)
8 ! NO = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
8 ! SRCNAM = SAND_HTR !
8 ! IVARY = 2 ! (12 Months)
8 ! NO2 = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
9 ! SRCNAM = SND_S_HTR !
9 ! IVARY = 2 ! (12 Months)
9 ! NO = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
9 ! SRCNAM = SND_S_HTR !
9 ! IVARY = 2 ! (12 Months)
9 ! NO2 = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
10 ! SRCNAM = CSTL_HTR !
10 ! IVARY = 2 ! (12 Months)
10 ! NO = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!
10 ! SRCNAM = CSTL_HTR !
10 ! IVARY = 2 ! (12 Months)
10 ! NO2 = 1,1,1,1,0,0,
        0,0,0,0,1,1 !
!END!

```

a

Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 15a, 15b, 15c -- Line source parameters

Subgroup (15a)

Number of buoyant line sources
with variable location and emission
parameters (NLN2)

No default ! NLN2 = 0 !

(If NLN2 > 0, ALL parameter data for
these sources are read from the file: LNEARB.DAT)

Number of buoyant line sources (NLINES)

No default ! NLINES = 0 !

Far-Field Air Quality Impact Assessment

Units used for line source emissions below (ILNU) Default: 1 ! ILNU = 1 !

1 =	g/s	
2 =	kg/hr	
3 =	lb/hr	
4 =	tons/yr	
5 =	Odour Unit * m**3/s (vol. flux of odour compound)	
6 =	Odour Unit * m**3/min	
7 =	metric tons/yr	

Number of source-species combinations with variable emissions scaling factors provided below in (15c) (NSLN1) Default: 0 ! NSLN1 = 0 !

Maximum number of segments used to model each line (MXNSEG) Default: 7 ! MXNSEG = 7 !

The following variables are required only if NLINES > 0. They are used in the buoyant line source plume rise calculations.

Number of distances at which transitional rise is computed	Default: 6 ! NLRISE = 6 !
Average building length (XL)	No default ! XL = .0 ! (in meters)
Average building height (HBL)	No default ! HBL = .0 ! (in meters)
Average building width (WBL)	No default ! WBL = .0 ! (in meters)
Average line source width (WML)	No default ! WML = .0 ! (in meters)
Average separation between buildings (DXL)	No default ! DXL = .0 ! (in meters)
Average buoyancy parameter (FPRIMEL)	No default ! FPRIMEL = .0 ! (in m**4/s**3)

!END!

Subgroup (15b)

BUOYANT LINE SOURCE: CONSTANT DATA

Source No.	Beg. X Coordinate (km)	Beg. Y Coordinate (km)	End. X Coordinate (km)	End. Y Coordinate (km)	Release Height (m)	Base Elevation (m)	Emission Rates
-----	-----	-----	-----	-----	-----	-----	-----

a
Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by ILNTU (e.g. 1 for g/s).

Subgroup (15c)

BUOYANT LINE SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 15b. Factors entered multiply the rates in 15b. Skip sources here that have constant emissions.

IVARY determines the type of variation, and is source-specific:
 (IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

 a
 Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 16a, 16b, 16c -- Volume source parameters

 Subgroup (16a)

Number of volume sources with parameters provided in 16b,c (NVL1) No default ! NVL1 = 0 !

Units used for volume source emissions below in 16b (IVLU) Default: 1 ! IVLU = 1 !

- 1 = g/s
- 2 = kg/hr
- 3 = lb/hr
- 4 = tons/yr
- 5 = Odour Unit * m**3/s (vol. flux of odour compound)
- 6 = Odour Unit * m**3/min
- 7 = metric tons/yr

Number of source-species combinations with variable emissions scaling factors provided below in (16c) (NSVL1) Default: 0 ! NSVL1 = 0 !

Number of volume sources with variable location and emission parameters (NVL2) No default ! NVL2 = 0 !

(If NVL2 > 0, ALL parameter data for these sources are read from the VOLEMARB.DAT file(s))

!END!

 Subgroup (16b)

a
 VOLUME SOURCE: CONSTANT DATA

X	Y	Effect.	Base	Initial	Initial	Emission	b		

Far-Field Air Quality Impact Assessment

Coordinate (km)	Coordinate (km)	Height (m)	Elevation (m)	Sigma y (m)	Sigma z (m)	Rates

a
Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IVLU (e.g. 1 for g/s).

Subgroup (16c)

a
VOLUME SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 16b. Factors entered multiply the rates in 16b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use VOLEMARB.DAT and NVL2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

0 =	Constant
1 =	Diurnal cycle (24 scaling factors: hours 1-24)
2 =	Monthly cycle (12 scaling factors: months 1-12)
3 =	Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 =	Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
5 =	Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 17a & 17b -- Non-gridded (discrete) receptor information

Subgroup (17a)

Number of non-gridded receptors (NREC) No default ! NREC = 928 !

!END!

Subgroup (17b)

a
NON-GRIDDED (DISCRETE) RECEPTOR DATA

Receptor	X Coordinate	Y Coordinate	Ground Elevation	Height Above Ground	b
----------	-----------------	-----------------	---------------------	------------------------	---

Far-Field Air Quality Impact Assessment

No.	(km)	(km)	(m)	(m)	
1 ! X =	-116.131,	267.629,	2637.800,	0.000!	!END!
2 ! X =	-119.985,	267.629,	2815.200,	0.000!	!END!
3 ! X =	-124.135,	267.827,	2072.000,	0.000!	!END!
4 ! X =	-128.088,	267.827,	2736.600,	0.000!	!END!
5 ! X =	-132.041,	267.926,	2448.600,	0.000!	!END!
6 ! X =	-135.993,	267.827,	2632.200,	0.000!	!END!
7 ! X =	-140.045,	268.123,	2498.300,	0.000!	!END!
8 ! X =	-144.097,	268.222,	2068.500,	0.000!	!END!
9 ! X =	-148.049,	268.321,	2619.500,	0.000!	!END!
10 ! X =	-152.2,	268.42,	2266.400,	0.000!	!END!
11 ! X =	-156.054,	268.42,	2374.000,	0.000!	!END!
12 ! X =	-160.105,	268.617,	1693.000,	0.000!	!END!
13 ! X =	-164.058,	268.914,	1645.900,	0.000!	!END!
14 ! X =	-168.11,	271.384,	1585.000,	0.000!	!END!
15 ! X =	-112.87,	269.894,	2895.400,	0.000!	!END!
16 ! X =	-111.992,	270.377,	2724.000,	0.000!	!END!
17 ! X =	-111.069,	269.982,	3034.100,	0.000!	!END!
18 ! X =	-110.235,	269.323,	2900.300,	0.000!	!END!
19 ! X =	-110.323,	266.161,	2773.800,	0.000!	!END!
20 ! X =	-172.054,	271.563,	2106.500,	0.000!	!END!
21 ! X =	-174.426,	268.928,	2768.400,	0.000!	!END!
22 ! X =	-166.037,	270.113,	1585.000,	0.000!	!END!
23 ! X =	-174.031,	269.85,	2748.400,	0.000!	!END!
24 ! X =	-169.068,	272.617,	1585.000,	0.000!	!END!
25 ! X =	-175.984,	268.928,	2319.100,	0.000!	!END!
26 ! X =	-179.849,	268.972,	2710.100,	0.000!	!END!
27 ! X =	-180.288,	271.08,	2613.600,	0.000!	!END!
28 ! X =	-181.913,	273.978,	2852.100,	0.000!	!END!
29 ! X =	-183.984,	274.87,	2747.500,	0.000!	!END!
30 ! X =	-188.069,	274.782,	2813.900,	0.000!	!END!
31 ! X =	-190.352,	273.244,	2958.900,	0.000!	!END!
32 ! X =	-192.021,	275.748,	2704.500,	0.000!	!END!
33 ! X =	-194.502,	277.988,	2544.100,	0.000!	!END!
34 ! X =	-197.093,	274.035,	2252.500,	0.000!	!END!
35 ! X =	-195.995,	277.417,	2530.500,	0.000!	!END!
36 ! X =	-195.424,	269.95,	2072.300,	0.000!	!END!
37 ! X =	-193.975,	266.085,	2492.400,	0.000!	!END!
38 ! X =	-194.063,	262.045,	2686.900,	0.000!	!END!
39 ! X =	-194.194,	258.084,	2453.000,	0.000!	!END!
40 ! X =	-194.282,	253.911,	2504.100,	0.000!	!END!
41 ! X =	-194.326,	250.003,	2376.600,	0.000!	!END!
42 ! X =	-194.458,	246.094,	2073.000,	0.000!	!END!
43 ! X =	-194.678,	242.028,	2005.700,	0.000!	!END!
44 ! X =	-194.765,	237.987,	2016.900,	0.000!	!END!
45 ! X =	-194.721,	233.99,	2006.200,	0.000!	!END!
46 ! X =	-194.809,	230.056,	2044.100,	0.000!	!END!
47 ! X =	-194.985,	225.972,	2066.800,	0.000!	!END!
48 ! X =	-195.117,	222.019,	2372.300,	0.000!	!END!
49 ! X =	-195.292,	218.072,	2274.000,	0.000!	!END!
50 ! X =	-195.424,	214.031,	2440.900,	0.000!	!END!
51 ! X =	-195.6,	209.947,	2454.700,	0.000!	!END!
52 ! X =	-195.732,	205.994,	2466.900,	0.000!	!END!
53 ! X =	-196.434,	186.003,	2265.400,	0.000!	!END!
54 ! X =	-196.522,	182.007,	2072.000,	0.000!	!END!
55 ! X =	-196.654,	178.054,	1954.800,	0.000!	!END!
56 ! X =	-196.83,	174.013,	1953.900,	0.000!	!END!
57 ! X =	-196.039,	173.354,	1921.500,	0.000!	!END!
58 ! X =	-192.042,	173.223,	1948.300,	0.000!	!END!
911 ! X =	-90.0,	242.0,	2236.600,	0.000!	!END!
912 ! X =	-106.0,	246.0,	2954.700,	0.000!	!END!
913 ! X =	-102.0,	246.0,	2760.300,	0.000!	!END!
914 ! X =	-98.0,	246.0,	2383.100,	0.000!	!END!
915 ! X =	-94.0,	246.0,	2969.800,	0.000!	!END!
916 ! X =	-90.0,	246.0,	2238.800,	0.000!	!END!
917 ! X =	-106.0,	250.0,	3214.900,	0.000!	!END!
918 ! X =	-102.0,	250.0,	3230.000,	0.000!	!END!
919 ! X =	-98.0,	250.0,	2653.400,	0.000!	!END!
920 ! X =	-94.0,	250.0,	2326.000,	0.000!	!END!
921 ! X =	-90.0,	250.0,	2532.400,	0.000!	!END!
922 ! X =	-102.0,	254.0,	2765.300,	0.000!	!END!
923 ! X =	-98.0,	254.0,	2723.400,	0.000!	!END!
924 ! X =	-106.0,	258.0,	2869.800,	0.000!	!END!

Far-Field Air Quality Impact Assessment

```
925 ! X =      -102.0,      258.0,      2646.900,      0.000!      !END!  
926 ! X =      -110.0,      262.0,      2681.600,      0.000!      !END!  
927 ! X =      -106.0,      262.0,      2560.900,      0.000!      !END!  
928 ! X =      -102.0,      262.0,      3130.300,      0.000!      !END!
```

a

Data for each receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

b

Receptor height above ground is optional. If no value is entered, the receptor is placed on the ground.

APPENDIX A
CALPUFF RESULTS

APPENDIX A-1
PROPOSED ACTION

APPENDIX A-2
ALTERNATIVE A

APPENDIX A-3
ALTERNATIVE B

APPENDIX A-4
NO ACTION ALTERNATIVE

APPENDIX A-5

PROPOSED ACTION POST-CONSTRUCTION

APPENDIX A-6
EXISTING PROJECT SOURCES

APPENDIX A-7

OPERATIONAL PERMITTED SOURCES

APPENDIX A-8

PERMITTED SOURCES NOT YET OPERATIONAL

APPENDIX A-9

REASONABLE FORESEEABLE DEVELOPMENT

APPENDIX A-10

NON-PROJECT WELL EMISSIONS

APPENDIX A-11
CUMULATIVE SOURCES

APPENDIX A-12

CUMULATIVE PLUS ALTERNATIVE A SOURCES

APPENDIX A-13

CUMULATIVE PLUS ALTERNATIVE B SOURCES

APPENDIX A-14

CUMULATIVE PLUS NO ACTION SOURCES

APPENDIX A-15

CUMULATIVE PLUS PROPOSED ACTION SOURCES

APPENDIX A-16

CUMULATIVE PLUS POST-CONSTRUCTION SOURCES

**Appendix A1
Summary of Results
Proposed Action**

BRIDGER		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	2.32E-03	552	-36.775	8.558
SO2	3-hour	1.66E-03	552	-36.775	8.558
	24-hour	5.63E-04	552	-36.775	8.558
	Annual	1.76E-05	552	-36.775	8.558
PM10	24-hour	6.51E-02	552	-36.775	8.558
	Annual	1.42E-03	552	-36.775	8.558
PM25	24-hour	3.76E-02	552	-36.775	8.558
	Annual	1.05E-03	552	-36.775	8.558
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	6.30E-06	552	-36.775	8.558
S	Annual	3.72E-08	552	-36.775	8.558
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.192	0.177		
	Day of Largest delta dV	179	179		
	Largest delta dV Receptor	563	563		
	Total dV	4.626	5.434		
	dV Background	4.434	5.257		
	% Ext by SO4	0.19	0.19		
	% Ext by NO3	89.98	89.98		
	% Ext by PM10	4.77	4.77		
	% Ext by PM2.5	5.06	5.06		
CLOUD PEAK		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	4.39E-03	970	91.692	194.842
SO2	3-hour	1.96E-03	970	91.692	194.842
	24-hour	7.11E-04	970	91.692	194.842
	Annual	3.22E-05	970	91.692	194.842
PM10	24-hour	5.18E-02	970	91.692	194.842
	Annual	2.17E-03	970	91.692	194.842
PM25	24-hour	4.41E-02	970	91.692	194.842
	Annual	1.90E-03	970	91.692	194.842
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	8.12E-06	980	107.363	178.642
S	Annual	5.38E-08	980	107.363	178.642
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.173	0.193		
	Day of Largest delta dV	25	25		
	Largest delta dV Receptor	953	953		
	Total dV	4.836	3.781		
	dV Background	4.662	3.588		
	% Ext by SO4	0.31	0.31		
	% Ext by NO3	77.11	77.11		
	% Ext by PM10	8.33	8.33		
	% Ext by PM2.5	14.26	14.26		

**Appendix A1
Summary of Results
Proposed Action**

FITZPATRICK		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	1.03E-03	727	-71.232	89.283
SO2	3-hour	1.76E-03	726	-71.161	86.048
	24-hour	6.40E-04	726	-71.161	86.048
	Annual	8.37E-06	723	-71.232	73.900
PM10	24-hour	6.77E-02	722	-71.304	70.023
	Annual	6.22E-04	723	-71.232	73.900
PM25	24-hour	4.30E-02	726	-71.161	86.048
	Annual	5.43E-04	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	3.01E-06	716	-71.592	46.301
S	Annual	1.70E-08	722	-71.304	70.023
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.126	0.114		
	Day of Largest delta dV	145	145		
	Largest delta dV Receptor	722	722		
	Total dV	4.675	5.673		
	dV Background	4.549	5.559		
	% Ext by SO4	0.27	0.27		
	% Ext by NO3	67.95	67.95		
	% Ext by PM10	20.26	20.26		
	% Ext by PM2.5	11.52	11.52		
NORTH ABSAROKA		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	1.78E-04	807	-75.265	208.495
SO2	3-hour	3.19E-04	807	-75.265	208.495
	24-hour	7.12E-05	807	-75.265	208.495
	Annual	1.85E-06	807	-75.265	208.495
PM10	24-hour	6.47E-03	843	-120.223	208.073
	Annual	1.79E-04	807	-75.265	208.495
PM25	24-hour	4.29E-03	807	-75.265	208.495
	Annual	1.33E-04	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	8.37E-07	807	-75.265	208.495
S	Annual	5.12E-09	807	-75.265	208.495
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.054	0.052		
	Day of Largest delta dV	118	118		
	Largest delta dV Receptor	883	833		
	Total dV	4.602	4.987		
	dV Background	4.549	4.935		
	% Ext by SO4	0.23	0.23		
	% Ext by NO3	95.08	95.08		
	% Ext by PM10	1.64	1.64		
	% Ext by PM2.5	3.05	3.05		

**Appendix A1
Summary of Results
Proposed Action**

OWL CREEK		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	3.97E-02	1107	6.423	97.676
SO2	3-hour	3.19E-02	1107	6.423	97.676
	24-hour	1.12E-02	1107	6.423	97.676
PM10	Annual	3.68E-04	1107	6.423	97.676
	24-hour	8.16E-01	1107	6.423	97.676
PM25	Annual	3.61E-02	1107	6.423	97.676
	24-hour	4.47E-01	1107	6.423	97.676
	Annual	1.70E-02	1107	6.423	97.676
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	2.64E-05	1107	6.423	97.676
S	Annual	2.98E-07	1107	6.423	97.676
VISIBILITY		FLAG		IMPROVE	
	Days delta dV >0.50	3		3	
	Days delta dV >1.00	0		1	
	Largest delta dV	0.930		1.071	
	Day of Largest delta dV	24		24	
	Largest delta dV Receptor	1107		1107	
	Total dV	5.630		4.279	
	dV Background	4.700		3.207	
	% Ext by SO4	0.09		0.09	
	% Ext by NO3	72.58		72.58	
	% Ext by PM10	13.82		13.82	
	% Ext by PM2.5	13.51		13.51	
POPO AGIE		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	3.83E-03	890	-29.797	13.249
SO2	3-hour	4.00E-03	893	-28.587	7.395
	24-hour	7.63E-04	889	-30.862	15.475
PM10	Annual	2.85E-05	890	-29.797	13.249
	24-hour	8.28E-02	889	-30.862	15.475
PM25	Annual	2.34E-03	890	-29.797	13.249
	24-hour	5.38E-02	886	-33.377	20.749
	Annual	1.72E-03	890	-29.797	13.249
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	9.16E-06	886	-33.377	20.749
S	Annual	5.76E-08	886	-33.377	20.749
VISIBILITY		FLAG		IMPROVE	
	Days delta dV >0.50	0		0	
	Days delta dV >1.00	0		0	
	Largest delta dV	0.201		0.219	
	Day of Largest delta dV	179		305	
	Largest delta dV Receptor	879		890	
	Total dV	4.635		3.798	
	dV Background	4.434		3.579	
	% Ext by SO4	0.18		0.20	
	% Ext by NO3	86.31		68.28	
	% Ext by PM10	6.96		15.38	
	% Ext by PM2.5	6.55		16.14	

**Appendix A1
Summary of Results
Proposed Action**

PHLOX MOUNTAIN		PP - Proposed Action																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	3.09E-03	1140	-17.128	113.192															
SO2	3-hour	3.09E-03	1140	-17.128	113.192															
	24-hour	8.63E-04	1140	-17.128	113.192															
PM10	Annual	2.70E-05	1140	-17.128	113.192															
	24-hour	6.30E-02	1140	-17.128	113.192															
PM25	Annual	2.72E-03	1140	-17.128	113.192															
	24-hour	3.98E-02	1140	-17.128	113.192															
	Annual	1.52E-03	1140	-17.128	113.192															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	5.23E-06	1140	-17.128	113.192															
S	Annual	3.56E-08	1140	-17.128	113.192															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.169	0.197																	
	Day of Largest delta dV	42	42																	
	Largest delta dV Receptor	1140	1140																	
	Total dV	4.794	3.281																	
	dV Background	4.625	3.084																	
	% Ext by SO4	0.20	0.20																	
	% Ext by NO3	78.54	78.53																	
	% Ext by PM10	10.28	10.28																	
	% Ext by PM2.5	10.98	10.98																	
TETON NATIONAL PARK		PP - Proposed Action																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	7.88E-05	664	-146.201	133.488															
SO2	3-hour	1.53E-04	665	-149.999	133.564															
	24-hour	5.73E-05	665	-149.999	133.564															
PM10	Annual	8.65E-07	664	-146.201	133.488															
	24-hour	4.01E-03	748	-146.000	140.000															
PM25	Annual	6.95E-05	664	-146.201	133.488															
	24-hour	2.61E-03	748	-146.000	140.000															
	Annual	5.47E-05	739	-146.000	136.000															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	6.39E-07	678	-171.607	111.139															
S	Annual	3.43E-09	678	-171.607	111.139															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.023	0.021																	
	Day of Largest delta dV	107	107																	
	Largest delta dV Receptor	748	748																	
	Total dV	4.572	5.723																	
	dV Background	4.549	5.703																	
	% Ext by SO4	0.22	0.22																	
	% Ext by NO3	96.97	96.96																	
	% Ext by PM10	1.09	1.09																	
	% Ext by PM2.5	1.71	1.71																	

**Appendix A1
Summary of Results
Proposed Action**

TETON WILDERNESS AREA		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.04E-04	57	-91.325	162.181
SO2	3-hour	1.93E-04	206	-94.000	178.000
	24-hour	7.54E-05	50	-98.438	141.823
	Annual	1.99E-06	57	-91.325	162.181
PM10	24-hour	1.11E-02	50	-98.438	141.823
	Annual	1.96E-04	57	-91.325	162.181
PM25	24-hour	6.51E-03	50	-98.438	141.823
	Annual	1.47E-04	57	-91.325	162.181
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	8.89E-07	50	-98.438	141.823
S	Annual	4.83E-09	57	-91.325	162.181
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.037	0.037		
	Day of Largest delta dV	43	43		
	Largest delta dV Receptor	206	206		
	Total dV	4.661	4.459		
	dV Background	4.625	4.422		
	% Ext by SO4	0.03	0.25		
	% Ext by NO3	87.30	87.30		
	% Ext by PM10	5.58	5.58		
	% Ext by PM2.5	6.86	6.86		
WASHAKIE		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.98E-04	294	-47.084	127.086
SO2	3-hour	6.80E-04	293	-48.044	127.086
	24-hour	2.77E-04	294	-47.084	127.086
	Annual	6.66E-06	294	-47.084	127.086
PM10	24-hour	2.04E-02	338	-60.000	126.000
	Annual	6.10E-04	298	-40.129	137.459
PM25	24-hour	1.76E-02	294	-47.084	127.086
	Annual	4.40E-04	294	-47.084	127.086
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.40E-06	294	-47.084	127.086
S	Annual	1.38E-08	298	-40.129	137.459
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.097	0.094		
	Day of Largest delta dV	117	117		
	Largest delta dV Receptor	298	298		
	Total dV	4.646	5.029		
	dV Background	4.549	4.935		
	% Ext by SO4	0.27	0.27		
	% Ext by NO3	91.91	91.91		
	% Ext by PM10	3.71	3.71		
	% Ext by PM2.5	4.11	4.11		

**Appendix A1
Summary of Results
Proposed Action**

WIND RIVER CANYON		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.10E-01	1077	29.190	92.365
	3-hour	4.88E-02	1076	27.022	94.149
	24-hour	2.02E-02	1076	27.022	94.149
PM10	Annual	1.41E-03	1077	29.190	92.365
	24-hour	1.51E+00	1076	27.022	94.149
	Annual	1.31E-01	1077	29.190	92.365
PM25	24-hour	8.14E-01	1076	27.022	94.149
	Annual	5.81E-02	1077	29.190	92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	9.99E-05	1076	27.022	94.149
	Annual	1.26E-06	1077	29.190	92.365
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	3	19		
Days delta dV >1.00	2	2			
Largest delta dV	1.710	1.960			
Day of Largest delta dV	4	4			
Largest delta dV Receptor	1076	1076			
Total dV	6.410	5.167			
dV Background	4.700	3.207			
% Ext by SO4	0.15	0.15			
% Ext by NO3	42.22	42.22			
% Ext by PM10	30.36	30.36			
% Ext by PM2.5	27.27	27.27			
WIND RIVER ROADLESS		PP - Proposed Action			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.14E-03	821	-40.795	43.233
	3-hour	4.86E-03	820	-40.723	41.939
	24-hour	8.41E-04	791	-57.904	66.236
PM10	Annual	2.48E-05	820	-40.723	41.939
	24-hour	1.02E-01	791	-57.904	66.236
	Annual	2.03E-03	820	-40.723	41.939
PM25	24-hour	4.65E-02	868	-68.000	78.000
	Annual	1.47E-03	820	-40.723	41.939
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	7.61E-06	818	-40.580	34.535
	Annual	4.27E-08	818	-40.580	34.535
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
Days delta dV >1.00	0	0			
Largest delta dV	0.188	0.173			
Day of Largest delta dV	179	179			
Largest delta dV Receptor	818	818			
Total dV	4.622	5.430			
dV Background	4.434	5.257			
% Ext by SO4	0.18	0.18			
% Ext by NO3	84.93	84.93			
% Ext by PM10	8.01	8.01			
% Ext by PM2.5	6.87	6.88			

**Appendix A1
Summary of Results
Proposed Action**

YELLOWSTONE NATL PARK		PP - Proposed Action											
Pollutant Concentrations		(ug/m3)	Receptor										
NO2	Annual	1.22E-04	109	-112.113	171.051								
SO2	3-hour	1.66E-04	97	-97.734	233.934								
	24-hour	6.05E-05	95	-99.051	230.053								
	Annual	1.27E-06	109	-112.113	171.051								
PM10	24-hour	8.61E-03	109	-112.113	171.051								
	Annual	1.24E-04	109	-112.113	171.051								
PM25	24-hour	5.15E-03	109	-112.113	171.051								
	Annual	9.44E-05	109	-112.113	171.051								
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor										
N	Annual	6.83E-07	94	-100.017	229.175								
S	Annual	4.30E-09	94	-100.017	229.175								
VISIBILITY		FLAG	IMPROVE										
	Days delta dV >0.50	0	0										
	Days delta dV >1.00	0	0										
	Largest delta dV	0.015	0.046										
	Day of Largest delta dV	118	118										
	Largest delta dV Receptor	97	97										
	Total dV	4.600	5.748										
	dV Background	4.549	5.703										
	% Ext by SO4	0.23	0.23										
	% Ext by NO3	94.91	94.90										
	% Ext by PM10	1.65	4.65										
	% Ext by PM2.5	3.21	3.21										

**Appendix A1
Summary of Results
Proposed Action**

<u>Visibility Summary</u>		PP - Proposed Action				
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	0	0	0.19	0	0	0.18
Cloud Peak	0	0	0.17	0	0	0.19
Fitzpatrick	0	0	0.13	0	0	0.11
North Absaroka	0	0	0.05	0	0	0.05
Owl Creek	3	0	0.93	3	1	1.07
Popo Agie	0	0	0.20	0	0	0.22
Phlox Mountain	0	0	0.17	0	0	0.20
Teton NP	0	0	0.02	0	0	0.02
Teton Wilderness	0	0	0.04	0	0	0.04
Washakie	0	0	0.10	0	0	0.09
Wind River Canyon	3	2	1.71	19	2	1.96
Wind River Roadless	0	0	0.19	0	0	0.17
Yellowstone NP	0	0	0.02	0	0	0.05
Total Days / Max Δ dV	6	2	1.71	22	3	1.96

**Appendix A1
Summary of Results
Proposed Action**

LAKES		PP - Proposed Action											
<i>Black Joe</i>		ug/m**2/sec											
	Total Deposition												
	N	4.93E-06	1141	-49.183	20.543								
	S	2.60E-08	1141	-49.183	20.543								
<i>Deep Lake</i>		ug/m**2/sec											
	Total Deposition												
	N	4.85E-06	1142	-49.178	18.394								
	S	2.57E-08	1142	-49.178	18.394								
<i>Emerald Lake</i>		ug/m**2/sec											
	Total Deposition												
	N	5.86E-06	1143	95.779	205.602								
	S	3.94E-08	1143	95.779	205.602								
<i>Florence Lake</i>		ug/m**2/sec											
	Total Deposition												
	N	6.60E-06	1144	105.440	193.981								
	S	4.21E-08	1144	105.440	193.981								
<i>Hobbs</i>		ug/m**2/sec											
	Total Deposition												
	N	2.13E-06	1145	-88.417	52.778								
	S	1.23E-08	1145	-88.417	52.778								
<i>Lower Saddlebag</i>		ug/m**2/sec											
	Total Deposition												
	N	6.50E-06	1146	-35.219	7.97								
	S	3.90E-08	1146	-35.219	7.97								
<i>Ross Lake</i>		ug/m**2/sec											
	Total Deposition												
	N	1.79E-06	1147	-86.813	89.541								
	S	9.67E-09	1147	-86.813	89.541								
<i>Upper Frozen</i>		ug/m**2/sec											
	Total Deposition												
	N	4.83E-06	1148	-48.413	14.897								
	S	2.60E-08	1148	-48.413	14.897								
<i>Stepping Stone</i>		ug/m**2/sec											
	Total Deposition												
	N	3.74E-07	1149	-96.935	275.159								
	S	2.36E-09	1149	-96.935	275.159								
<i>Twin Island</i>		ug/m**2/sec											
	Total Deposition												
	N	3.96E-07	1150	-95.471	271.528								
	S	2.51E-09	1150	-95.471	271.528								

**Appendix A1
Summary of Results
Proposed Action**

ANC Impacts to High Elevation Lakes		PP - Proposed Action										
High Elevation		Inputs						Results				
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)							
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition Rate							
	ANC (A)	(P)	Area	Rate	Rate							
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)							
Black Joe Lake	67.0	0.925	890	4.93E-06	2.60E-08							
Deep Lake	59.9	0.925	205	4.85E-06	2.57E-08							
Emerald Lake	69.8	0.780	293	5.86E-06	3.94E-08							
Florence Lake	33.0	0.780	417	6.60E-06	4.21E-08							
Hobbs Lake	69.9	1.080	293	2.13E-06	1.23E-08							
Lower Saddlebag	55.5	1.000	155	6.50E-06	3.90E-08							
Ross Lake	53.5	1.080	4455	1.79E-06	9.67E-09							
Stepping Stone Lake	19.9	1.460	26	3.74E-07	2.36E-09							
Twin Island Lake	17.6	1.300	45	3.96E-07	2.51E-09							
Upper Frozen Lake	5.0	0.925	65	4.83E-06	2.60E-08							
High Elevation		Intermediate Calculated Values					Results					
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent				
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC				
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change				
Black Joe Lake	1.55E-03	8.19E-06	3.70E+05	1.11E-05	5.12E-08	9.93E+01	0.02	0.03%				
Deep Lake	1.53E-03	8.10E-06	7.61E+04	1.09E-05	5.06E-08	2.25E+01	0.02	0.03%				
Emerald Lake	1.85E-03	1.24E-05	1.07E+05	1.32E-05	7.76E-08	3.89E+01	0.03	0.04%				
Florence Lake	2.08E-03	1.33E-05	7.19E+04	1.49E-05	8.31E-08	6.24E+01	0.03	0.09%				
Hobbs Lake	6.72E-04	3.88E-06	1.48E+05	4.80E-06	2.43E-08	1.41E+01	0.01	0.01%				
Lower Saddlebag	2.05E-03	1.23E-05	5.76E+04	1.46E-05	7.66E-08	2.28E+01	0.02	0.04%				
Ross Lake	5.64E-04	3.05E-06	1.72E+06	4.03E-06	1.91E-08	1.80E+02	0.01	0.01%				
Stepping Stone Lake	1.18E-04	7.46E-07	5.14E+03	8.42E-07	4.66E-09	2.24E-01	0.00	0.00%				
Twin Island Lake	1.25E-04	7.93E-07	6.88E+03	8.92E-07	4.95E-09	4.03E-01	0.00	0.01%				
Upper Frozen Lake	1.52E-03	8.19E-06	2.01E+03	1.09E-05	5.12E-08	7.08E+00	0.02	0.35%				
Maximum							0.03	0.35%				
NOTE: Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.												
Baseline ANC values calculated from summarized data provided by the Forest Service.												
ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.												
Annual precipitation and watershed catchments values provided by the Forest Service.												

**Appendix A1
Summary of Results
Proposed Action**

Terrrestrial Acid Deposition Summary								PP - Proposed Action	
Incremental Analysis									
Area of Special Concern	Nitrogen (N) Deposition (ug/m²/sec)	Sulfur (S) Deposition (ug/m²/sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT		
Bridger	6.30E-06	3.72E-08	0.00199	0.00001	0.005	39.7%	0.2%		
Cloud Peak	8.12E-06	5.38E-08	0.00256	0.00002	0.005	51.2%	0.3%		
Fitzpatrick	3.01E-06	1.70E-08	0.00095	0.00001	0.005	19.0%	0.1%		
North Absaroka	8.37E-07	5.12E-09	0.00026	0.00000	0.005	5.3%	0.0%		
Owl Creek Range	2.64E-05	2.98E-07	0.00833	0.00009	0.005	166.5%	1.9%		
Popo Agie	9.16E-06	5.76E-08	0.00289	0.00002	0.005	57.8%	0.4%		
Phlox Mountain	5.23E-06	3.56E-08	0.00165	0.00001	0.005	33.0%	0.2%		
Teton NP	6.39E-07	3.43E-09	0.00020	0.00000	0.005	4.0%	0.0%		
Teton Wilderness	8.89E-07	4.83E-09	0.00028	0.00000	0.005	5.6%	0.0%		
Washakie Wilderness	2.40E-06	1.38E-08	0.00076	0.00000	0.005	15.1%	0.1%		
Wind River Canyon	9.99E-05	1.25E-06	0.03150	0.00039	0.005	630.0%	7.9%		
Wind River Roadless	7.61E-06	4.27E-08	0.00240	0.00001	0.005	48.0%	0.3%		
Yellowstone NP	6.83E-07	4.30E-09	0.00022	0.00000	0.005	4.3%	0.0%		
Maximum	9.99E-05	1.25E-06	0.03150	0.00039	0.005	630.0%	7.9%		
NOTE: DAT for Western Class I areas from National Park Service (2003).									
Cumulative Analysis									
Nitrogen Deposition									
Area of Special Concern	Predicted Nitrogen (N) Deposition (ug/m²/sec)		Background Nitrogen (N) Deposition (kg/ha/yr)	Total Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Impacts		
							Percent of "Green Line"	Percent of "Red Line"	
Bridger	6.30E-06	0.00199	1.3	1.3	3.0	10.0	43.4%	13.0%	
Cloud Peak	8.12E-06	0.00256	1.3	1.3	3.0	10.0	43.4%	13.0%	
Fitzpatrick	3.01E-06	0.00095	1.3	1.3	3.0	10.0	43.4%	13.0%	
North Absaroka	8.37E-07	0.00026	1.1	1.1	3.0	10.0	36.7%	11.0%	
Owl Creek Range	2.64E-05	0.00833	1.3	1.3	3.0	10.0	43.6%	13.1%	
Popo Agie	9.16E-06	0.00289	1.3	1.3	3.0	10.0	43.4%	13.0%	
Phlox Mountain	5.23E-06	0.00165	1.3	1.3	3.0	10.0	43.4%	13.0%	
Teton NP	6.39E-07	0.00020	1.1	1.1	3.0	10.0	36.7%	11.0%	
Teton Wilderness	8.89E-07	0.00028	1.1	1.1	3.0	10.0	36.7%	11.0%	
Washakie Wilderness	2.40E-06	0.00076	1.1	1.1	3.0	10.0	36.7%	11.0%	
Wind River Canyon	9.99E-05	0.03150	1.3	1.3	3.0	10.0	44.4%	13.3%	
Wind River Roadless	7.61E-06	0.00240	1.3	1.3	3.0	10.0	43.4%	13.0%	
Yellowstone NP	6.83E-07	0.00022	1.1	1.1	3.0	10.0	36.7%	11.0%	
Maximum	9.99E-05	0.03150	1.3	1.3	3.0	10.0	44.4%	13.3%	
Sulfur Deposition									
Area of Special Concern	Predicted Sulfur (S) Deposition (ug/m²/sec)		Background Sulfur (S) Deposition (kg/ha/yr)	Total Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Impacts		
							Percent of "Green Line"	Percent of "Red Line"	
Bridger	3.72E-08	0.00001	1.1	1.1	5.0	20.0	22.0%	5.5%	
Cloud Peak	5.38E-08	0.00002	1.1	1.1	5.0	20.0	22.0%	5.5%	
Fitzpatrick	1.70E-08	0.00001	1.1	1.1	5.0	20.0	22.0%	5.5%	
North Absaroka	5.12E-09	0.00000	0.9	0.9	5.0	20.0	18.0%	4.5%	
Owl Creek Range	2.98E-07	0.00009	1.1	1.1	5.0	20.0	22.0%	5.5%	
Popo Agie	5.76E-08	0.00002	1.1	1.1	5.0	20.0	22.0%	5.5%	
Phlox Mountain	3.56E-08	0.00001	1.1	1.1	5.0	20.0	22.0%	5.5%	
Teton NP	3.43E-09	0.00000	0.9	0.9	5.0	20.0	18.0%	4.5%	
Teton Wilderness	4.83E-09	0.00000	0.9	0.9	5.0	20.0	18.0%	4.5%	
Washakie Wilderness	1.38E-08	0.00000	0.9	0.9	5.0	20.0	18.0%	4.5%	
Wind River Canyon	1.25E-06	0.00039	1.1	1.1	5.0	20.0	22.0%	5.5%	
Wind River Roadless	4.27E-08	0.00001	1.1	1.1	5.0	20.0	22.0%	5.5%	
Yellowstone NP	4.30E-09	0.00000	0.9	0.9	5.0	20.0	18.0%	4.5%	
Maximum	1.25E-06	0.00039	1.1	1.1	5.0	20.0	22.0%	5.5%	
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.									
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.									
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).									

**Appendix A1
Summary of Results
Proposed Action**

Ambient Impact Summary		PP - Proposed Action							
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQs Standard (ug/m3)	Impact % of WAAQS/NAAQs
NO2	Annual	0.21	WIND RIVER CANYON	2.5	8.41%	3.4	3.61	100	3.61%
SO2	3-hour	0.05	WIND RIVER CANYON	25	0.20%	132	132.05	1300	10.16%
	24-hour	0.02	WIND RIVER CANYON	5	0.40%	43	43.02	260	16.55%
	Annual	0.00	WIND RIVER CANYON	2	0.07%	9	9.00	60	15.00%
PM10	24-hour	1.51	WIND RIVER CANYON	8	18.87%	61	62.51	150	41.67%
	Annual	0.13	WIND RIVER CANYON	4	3.26%	22	22.13	50	44.26%
PM25	24-hour	0.81	WIND RIVER CANYON	n.a.	n.a.	35	35.81	65	55.10%
	Annual	0.06	WIND RIVER CANYON	n.a.	n.a.	10	10.06	15	67.05%
Maximum					18.87%				67.05%

**Appendix A2
Summary of Results
Alternative A**

BRIDGER		AA - Alternative A (Increased Development)																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.98E-03	552	-36.775	8.558															
SO2	3-hour	1.79E-03	552	-36.775	8.558															
	24-hour	6.06E-04	552	-36.775	8.558															
	Annual	1.86E-05	552	-36.775	8.558															
PM10	24-hour	6.89E-02	552	-36.775	8.558															
	Annual	1.50E-03	552	-36.775	8.558															
PM25	24-hour	4.17E-02	552	-36.775	8.558															
	Annual	1.15E-03	552	-36.775	8.558															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	8.13E-06	552	-36.775	8.558															
S	Annual	3.91E-08	552	-36.775	8.558															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.244	0.225																	
	Day of Largest delta dV	179	179																	
	Largest delta dV Receptor	563	563																	
	Total dV	4.678	5.482																	
	dV Background	4.434	5.257																	
	% Ext by SO4	0.16	0.16																	
	% Ext by NO3	91.35	91.35																	
	% Ext by PM10	4.02	4.02																	
	% Ext by PM2.5	4.47	4.47																	
CLOUD PEAK		AA - Alternative A (Increased Development)																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	5.66E-03	970	91.692	194.842															
SO2	3-hour	2.08E-03	970	91.692	194.842															
	24-hour	7.51E-04	970	91.692	194.842															
	Annual	3.41E-05	970	91.692	194.842															
PM10	24-hour	5.52E-02	970	91.692	194.842															
	Annual	2.31E-03	970	91.692	194.842															
PM25	24-hour	4.95E-02	970	91.692	194.842															
	Annual	2.12E-03	970	91.692	194.842															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.05E-05	980	107.363	178.642															
S	Annual	5.68E-08	980	107.363	178.642															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.218	0.243																	
	Day of Largest delta dV	25	25																	
	Largest delta dV Receptor	953	953																	
	Total dV	4.881	3.831																	
	dV Background	4.662	3.588																	
	% Ext by SO4	0.26	0.26																	
	% Ext by NO3	80.00	80.01																	
	% Ext by PM10	7.04	7.04																	
	% Ext by PM2.5	12.69	12.69																	

**Appendix A2
Summary of Results
Alternative A**

FITZPATRICK		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.31E-03	727	-71.232	89.283
SO2	3-hour	1.86E-03	726	-71.161	86.048
	24-hour	6.76E-04	726	-71.161	86.048
PM10	Annual	8.87E-06	723	-71.232	73.900
	24-hour	7.12E-02	722	-71.304	70.023
PM25	Annual	6.61E-04	723	-71.232	73.900
	24-hour	4.66E-02	726	-71.161	86.048
	Annual	5.98E-04	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.86E-06	716	-71.592	46.301
S	Annual	1.79E-08	722	-71.304	70.023
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.146	0.132		
Day of Largest delta dV		145	145		
Largest delta dV Receptor		722	722		
Total dV		4.695	5.691		
dV Background		4.549	5.559		
% Ext by SO4		0.24	0.24		
% Ext by NO3		70.47	70.47		
% Ext by PM10		18.43	18.43		
% Ext by PM2.5		10.87	10.87		
NORTH ABSAROKA		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.31E-04	807	-75.265	208.495
SO2	3-hour	3.42E-04	807	-75.265	208.495
	24-hour	7.56E-05	807	-75.265	208.495
PM10	Annual	1.96E-06	807	-75.265	208.495
	24-hour	6.89E-03	807	-75.265	208.495
PM25	Annual	1.91E-04	807	-75.265	208.495
	24-hour	4.83E-03	807	-75.265	208.495
Annual	1.48E-04	807	-75.265	208.495	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.09E-06	807	-75.265	208.495
S	Annual	5.43E-09	807	-75.265	208.495
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.069	0.067		
Day of Largest delta dV		118	118		
Largest delta dV Receptor		833	833		
Total dV		4.618	5.002		
dV Background		4.549	4.935		
% Ext by SO4		0.19	0.19		
% Ext by NO3		95.82	95.82		
% Ext by PM10		1.36	1.36		
% Ext by PM2.5		2.64	2.64		

**Appendix A2
Summary of Results
Alternative A**

OWL CREEK		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	4.93E-02	1107	6.423	97.676
SO2	3-hour	3.65E-02	1107	6.423	97.676
	24-hour	1.27E-02	1107	6.423	97.676
	Annual	3.97E-04	1107	6.423	97.676
PM10	24-hour	9.72E-01	1107	6.423	97.676
	Annual	3.90E-02	1107	6.423	97.676
PM25	24-hour	4.99E-01	1107	6.423	97.676
	Annual	1.86E-02	1107	6.423	97.676
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.36E-05	1107	6.423	97.676
S	Annual	3.20E-07	1107	6.423	97.676
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	4	4		
	Days delta dV >1.00	1	2		
	Largest delta dV	1.088	1.252		
	Day of Largest delta dV	24	24		
	Largest delta dV Receptor	1107	1107		
	Total dV	5.788	4.459		
	dV Background	4.700	3.207		
	% Ext by SO4	0.08	0.08		
	% Ext by NO3	73.71	73.71		
	% Ext by PM10	12.83	12.83		
	% Ext by PM2.5	13.38	13.38		
POPO AGIE		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	4.90E-03	890	-29.797	13.249
SO2	3-hour	4.04E-03	893	-28.587	7.395
	24-hour	8.21E-04	889	-30.862	15.475
	Annual	3.01E-05	890	-29.797	13.249
PM10	24-hour	8.78E-02	889	-30.862	15.475
	Annual	2.47E-03	890	-29.797	13.249
PM25	24-hour	5.92E-02	887	-32.313	17.943
	Annual	1.90E-03	890	-29.797	13.249
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.18E-05	886	-33.377	20.749
S	Annual	6.04E-08	886	-33.377	20.749
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.253	0.270		
	Day of Largest delta dV	179	305		
	Largest delta dV Receptor	879	890		
	Total dV	4.687	3.849		
	dV Background	4.434	3.579		
	% Ext by SO4	0.16	0.17		
	% Ext by NO3	88.16	71.94		
	% Ext by PM10	5.89	13.26		
	% Ext by PM2.5	5.80	14.63		

**Appendix A2
Summary of Results
Alternative A**

PHLOX MOUNTAIN		AA - Alternative A (Increased Development)																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	3.91E-03	1140	-17.128	113.192															
SO2	3-hour	3.40E-03	1140	-17.128	113.192															
	24-hour	9.41E-04	1140	-17.128	113.192															
	Annual	2.86E-05	1140	-17.128	113.192															
PM10	24-hour	7.05E-02	1140	-17.128	113.192															
	Annual	2.89E-03	1140	-17.128	113.192															
PM25	24-hour	4.28E-02	1140	-17.128	113.192															
	Annual	1.67E-03	1140	-17.128	113.192															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	6.72E-06	1140	-17.128	113.192															
S	Annual	3.76E-08	1140	-17.128	113.192															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.213	0.248																	
	Day of Largest delta dV	42	42																	
	Largest delta dV Receptor	1140	1140																	
	Total dV	4.838	3.332																	
	dV Background	4.625	3.084																	
	% Ext by SO4	0.17	0.17																	
	% Ext by NO3	81.40	81.40																	
	% Ext by PM10	8.76	8.76																	
	% Ext by PM2.5	9.67	9.67																	
TETON NATIONAL PARK		AA - Alternative A (Increased Development)																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.02E-04	664	-146.201	133.488															
SO2	3-hour	1.66E-04	665	-149.999	133.564															
	24-hour	6.09E-05	665	-149.999	133.564															
	Annual	9.14E-07	664	-146.201	133.488															
PM10	24-hour	4.28E-03	748	-146.000	140.000															
	Annual	7.38E-05	664	-146.201	133.488															
PM25	24-hour	2.92E-03	748	-146.000	140.000															
	Annual	6.08E-05	739	-146.000	136.000															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	8.24E-07	678	-171.607	111.139															
S	Annual	3.64E-09	678	-171.607	111.139															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.030	0.027																	
	Day of Largest delta dV	107	107																	
	Largest delta dV Receptor	748	748																	
	Total dV	4.579	5.729																	
	dV Background	4.549	5.703																	
	% Ext by SO4	0.18	0.18																	
	% Ext by NO3	97.41	97.41																	
	% Ext by PM10	0.90	0.90																	
	% Ext by PM2.5	1.51	1.51																	

**Appendix A2
Summary of Results
Alternative A**

TETON WILDERNESS AREA		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.65E-04	57	-91.325	162.181
SO2	3-hour	2.06E-04	206	-94.000	178.000
	24-hour	7.99E-05	50	-98.438	141.823
	Annual	2.10E-06	57	-91.325	162.181
PM10	24-hour	1.19E-02	50	-98.438	141.823
	Annual	2.08E-04	57	-91.325	162.181
PM25	24-hour	7.26E-03	50	-98.438	141.823
	Annual	1.64E-04	57	-91.325	162.181
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.16E-06	50	-98.438	141.823
S	Annual	5.10E-09	57	-91.325	162.181
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.047	0.048		
	Day of Largest delta dV	43	43		
	Largest delta dV Receptor	206	206		
	Total dV	4.672	4.469		
	dV Background	4.625	4.422		
	% Ext by SO4	0.21	0.21		
	% Ext by NO3	89.02	89.02		
	% Ext by PM10	4.71	4.71		
	% Ext by PM2.5	6.06	6.06		
WASHAKIE		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	8.93E-04	294	-47.084	127.086
SO2	3-hour	7.21E-04	293	-48.044	127.086
	24-hour	2.93E-04	294	-47.084	127.086
	Annual	7.04E-06	294	-47.084	127.086
PM10	24-hour	2.18E-02	338	-60.000	126.000
	Annual	6.50E-04	298	-40.129	137.459
PM25	24-hour	1.92E-02	294	-47.084	127.086
	Annual	4.86E-04	294	-47.084	127.086
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.11E-06	294	-47.084	127.086
S	Annual	1.46E-08	298	-40.129	137.459
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.125	0.120		
	Day of Largest delta dV	117	117		
	Largest delta dV Receptor	298	298		
	Total dV	4.673	5.055		
	dV Background	4.549	4.935		
	% Ext by SO4	0.22	0.22		
	% Ext by NO3	93.12	93.12		
	% Ext by PM10	3.08	3.08		
	% Ext by PM2.5	3.58	3.58		

**Appendix A2
Summary of Results
Alternative A**

WIND RIVER CANYON		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.66E-01	1077	29.190	92.365
SO2	3-hour	5.14E-02	1076	27.022	94.149
	24-hour	2.11E-02	1076	27.022	94.149
PM10	Annual	1.48E-03	1077	29.190	92.365
	24-hour	1.63E+00	1076	27.022	94.149
PM25	Annual	1.39E-01	1077	29.190	92.365
	24-hour	8.89E-01	1076	27.022	94.149
	Annual	6.45E-02	1077	29.190	92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.29E-04	1076	27.022	94.149
S	Annual	1.32E-06	1077	29.190	92.365
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	26	31		
	Days delta dV >1.00	3	4		
	Largest delta dV	1.938	2.218		
	Day of Largest delta dV	4	4		
	Largest delta dV Receptor	1076	1076		
	Total dV	6.639	5.425		
	dV Background	4.700	3.207		
	% Ext by SO4	0.14	0.14		
	% Ext by NO3	45.26	45.26		
	% Ext by PM10	28.63	28.63		
	% Ext by PM2.5	25.97	25.97		
WIND RIVER ROADLESS		AA - Alternative A (Increased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	4.01E-03	821	-40.795	43.233
SO2	3-hour	5.27E-03	820	-40.723	41.939
	24-hour	8.88E-04	791	-57.904	66.236
PM10	Annual	2.61E-05	820	-40.723	41.939
	24-hour	1.08E-01	791	-57.904	66.236
PM25	Annual	2.14E-03	820	-40.723	41.939
	24-hour	5.05E-02	868	-68.000	78.000
	Annual	1.62E-03	820	-40.723	41.939
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	9.78E-06	818	-40.580	34.535
S	Annual	4.51E-08	818	-40.580	34.535
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.236	0.217		
	Day of Largest delta dV	179	179		
	Largest delta dV Receptor	818	818		
	Total dV	4.670	5.474		
	dV Background	4.434	5.257		
	% Ext by SO4	0.16	0.16		
	% Ext by NO3	86.94	86.94		
	% Ext by PM10	6.81	6.81		
	% Ext by PM2.5	6.10	6.10		

**Appendix A2
Summary of Results
Alternative A**

YELLOWSTONE NATL PARK		AA - Alternative A (Increased Development)									
Pollutant Concentrations		(ug/m3)	Receptor								
NO2	Annual	1.59E-04	109	-112.113	171.051						
SO2	3-hour	1.77E-04	97	-97.734	233.934						
	24-hour	6.43E-05	95	-99.051	230.053						
PM10	Annual	1.34E-06	109	-112.113	171.051						
	24-hour	9.19E-03	109	-112.113	171.051						
PM25	Annual	1.32E-04	109	-112.113	171.051						
	24-hour	5.76E-03	109	-112.113	171.051						
	Annual	1.05E-04	109	-112.113	171.051						
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor								
N	Annual	8.86E-07	94	-100.017	229.175						
S	Annual	4.56E-09	94	-100.017	229.175						
VISIBILITY		FLAG	IMPROVE								
	Days delta dV >0.50		0	0							
	Days delta dV >1.00		0	0							
	Largest delta dV		0.067	0.059							
	Day of Largest delta dV		118	118							
	Largest delta dV Receptor		97	97							
	Total dV		4.616	5.762							
	dV Background		4.549	5.703							
	% Ext by SO4		0.19	0.19							
	% Ext by NO3		95.67	95.67							
	% Ext by PM10		1.37	1.37							
	% Ext by PM2.5		2.78	2.78							

**Appendix A2
Summary of Results
Alternative A**

<i>Visibility Summary</i>		AA - Alternative A (Increased Development)								
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions						
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV				
Bridger	0	0	0.24	0	0	0.23				
Cloud Peak	0	0	0.22	0	0	0.24				
Fitzpatrick	0	0	0.15	0	0	0.13				
North Absaroka	0	0	0.07	0	0	0.07				
Owl Creek	4	1	1.09	4	2	1.25				
Popo Agie	0	0	0.25	0	0	0.27				
Phlox Mountain	0	0	0.21	0	0	0.25				
Teton NP	0	0	0.03	0	0	0.03				
Teton Wilderness	0	0	0.05	0	0	0.05				
Washakie	0	0	0.13	0	0	0.12				
Wind River Canyon	26	3	1.94	31	4	2.22				
Wind River Roadless	0	0	0.24	0	0	0.22				
Yellowstone NP	0	0	0.07	0	0	0.06				
Total Days / Max Δ dV	30	4	1.94	35	6	2.22				

**Appendix A2
Summary of Results
Alternative A**

LAKES		AA - Alternative A (Increased Development)																	
<i>Black Joe</i>		ug/m**2/sec																	
	Total Deposition																		
	N	6.35E-06	1141	-49.183	20.543														
	S	2.73E-08	1141	-49.183	20.543														
<i>Deep Lake</i>		ug/m**2/sec																	
	Total Deposition																		
	N	6.25E-06	1142	-49.178	18.394														
	S	2.70E-08	1142	-49.178	18.394														
<i>Emerald Lake</i>		ug/m**2/sec																	
	Total Deposition																		
	N	7.59E-06	1143	95.779	205.602														
	S	4.16E-08	1143	95.779	205.602														
<i>Florence Lake</i>		ug/m**2/sec																	
	Total Deposition																		
	N	8.56E-06	1144	105.440	193.981														
	S	4.45E-08	1144	105.440	193.981														
<i>Hobbs</i>		ug/m**2/sec																	
	Total Deposition																		
	N	2.71E-06	1145	-88.417	52.778														
	S	1.30E-08	1145	-88.417	52.778														
<i>Lower Saddlebag</i>		ug/m**2/sec																	
	Total Deposition																		
	N	8.40E-06	1146	-35.219	7.97														
	S	4.09E-08	1146	-35.219	7.97														
<i>Ross Lake</i>		ug/m**2/sec																	
	Total Deposition																		
	N	2.31E-06	1147	-86.813	89.541														
	S	1.02E-08	1147	-86.813	89.541														
<i>Upper Frozen</i>		ug/m**2/sec																	
	Total Deposition																		
	N	6.23E-06	1148	-48.413	14.897														
	S	2.73E-08	1148	-48.413	14.897														
<i>Stepping Stone</i>		ug/m**2/sec																	
	Total Deposition																		
	N	4.87E-07	1149	-96.935	275.159														
	S	2.51E-09	1149	-96.935	275.159														
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																	
	Total Deposition																		
	N	5.16E-07	1150	-95.471	271.528														
	S	2.67E-09	1150	-95.471	271.528														

**Appendix A2
Summary of Results
Alternative A**

ANC Impacts to High Elevation Lakes		AA - Alternative A (Increased Development)										
High Elevation		Inputs										
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)							
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition							
	ANC (A)	(P)	Area	Rate	Rate							
	(µeq/l)	(meters)	(hectares)	(µg/m²/sec)	(µg/m²/sec)							
Black Joe Lake	67.0	0.925	890	6.35E-06	2.73E-08							
Deep Lake	59.9	0.925	205	6.25E-06	2.70E-08							
Emerald Lake	69.8	0.780	293	7.59E-06	4.16E-08							
Florence Lake	33.0	0.780	417	8.56E-06	4.45E-08							
Hobbs Lake	69.9	1.080	293	2.71E-06	1.30E-08							
Lower Saddlebag	55.5	1.000	155	8.40E-06	4.09E-08							
Ross Lake	53.5	1.080	4455	2.31E-06	1.02E-08							
Stepping Stone Lake	19.9	1.460	26	4.87E-07	2.51E-09							
Twin Island Lake	17.6	1.300	45	5.16E-07	2.67E-09							
Upper Frozen Lake	5.0	0.925	65	6.23E-06	2.73E-08							
High Elevation		Intermediate Calculated Values					Results					
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent				
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC				
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m²/yr)	(eq/m²/yr)	(eq)	(µeq/l)	Change				
Black Joe Lake	2.00E-03	8.62E-06	3.70E+05	1.43E-05	5.39E-08	1.28E+02	0.02	0.03%				
Deep Lake	1.97E-03	8.52E-06	7.61E+04	1.41E-05	5.32E-08	2.89E+01	0.02	0.04%				
Emerald Lake	2.39E-03	1.31E-05	1.07E+05	1.71E-05	8.21E-08	5.04E+01	0.03	0.05%				
Florence Lake	2.70E-03	1.40E-05	7.19E+04	1.93E-05	8.78E-08	8.08E+01	0.04	0.11%				
Hobbs Lake	8.53E-04	4.11E-06	1.48E+05	6.10E-06	2.57E-08	1.79E+01	0.01	0.01%				
Lower Saddlebag	2.65E-03	1.29E-05	5.76E+04	1.89E-05	8.07E-08	2.95E+01	0.03	0.05%				
Ross Lake	7.28E-04	3.22E-06	1.72E+06	5.20E-06	2.01E-08	2.32E+02	0.01	0.01%				
Stepping Stone Lake	1.54E-04	7.91E-07	5.14E+03	1.10E-06	4.94E-09	2.91E-01	0.00	0.01%				
Twin Island Lake	1.63E-04	8.41E-07	6.88E+03	1.16E-06	5.26E-09	5.24E-01	0.00	0.01%				
Upper Frozen Lake	1.96E-03	8.60E-06	2.01E+03	1.40E-05	5.37E-08	9.13E+00	0.02	0.45%				
Maximum							0.04	0.45%				
NOTE:	Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.											
	Baseline ANC values calculated from summarized data provided by the Forest Service. ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.											
	Annual precipitation and watershed catchments values provided by the Forest Service.											

**Appendix A2
Summary of Results
Alternative A**

Terrestrial Acid Deposition Summary		AA - Alternative A (Increased Development)											
Incremental Analysis													
Area of Special Concern	Nitrogen (N) Deposition (ug/m²/sec)	Sulfur (S) Deposition (ug/m²/sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT						
Bridger	8.13E-06	3.91E-08	0.00256	0.00001	0.005	51.3%	0.2%						
Cloud Peak	1.05E-05	5.68E-08	0.00332	0.00002	0.005	66.4%	0.4%						
Fitzpatrick	3.86E-06	1.79E-08	0.00122	0.00001	0.005	24.4%	0.1%						
North Absaroka	1.09E-06	5.43E-09	0.00034	0.00000	0.005	6.9%	0.0%						
Owl Creek Range	3.36E-05	3.20E-07	0.01059	0.00010	0.005	211.8%	2.0%						
Popo Agie	1.18E-05	6.04E-08	0.00372	0.00002	0.005	74.4%	0.4%						
Phlox Mountain	6.72E-06	3.76E-08	0.00212	0.00001	0.005	42.4%	0.2%						
Teton NP	8.24E-07	3.64E-09	0.00026	0.00000	0.005	5.2%	0.0%						
Teton Wilderness	1.16E-06	5.10E-09	0.00037	0.00000	0.005	7.3%	0.0%						
Washakie Wilderness	3.11E-06	1.46E-08	0.00098	0.00000	0.005	19.6%	0.1%						
Wind River Canyon	1.29E-04	1.32E-06	0.04063	0.00042	0.005	812.6%	8.3%						
Wind River Roadless	9.78E-06	4.51E-08	0.00308	0.00001	0.005	61.7%	0.3%						
Yellowstone NP	8.86E-07	4.56E-09	0.00028	0.00000	0.005	5.6%	0.0%						
Maximum	1.29E-04	1.32E-06	0.04063	0.00042	0.005	812.6%	8.3%						
NOTE: DAT for Western Class I areas from National Park Service (2003).													
Cumulative Analysis													
Nitrogen Deposition													
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts								
	Nitrogen (N) Deposition (ug/m²/sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"					
Bridger	8.13E-06	2.56E-03	1.3	1.3	3.0	10.0	43.4%	13.0%					
Cloud Peak	1.05E-05	3.32E-03	1.3	1.3	3.0	10.0	43.4%	13.0%					
Fitzpatrick	3.86E-06	1.22E-03	1.3	1.3	3.0	10.0	43.4%	13.0%					
North Absaroka	1.09E-06	3.43E-04	1.1	1.1	3.0	10.0	36.7%	11.0%					
Owl Creek Range	3.36E-05	1.06E-02	1.3	1.3	3.0	10.0	43.7%	13.1%					
Popo Agie	1.18E-05	3.72E-03	1.3	1.3	3.0	10.0	43.5%	13.0%					
Phlox Mountain	6.72E-06	2.12E-03	1.3	1.3	3.0	10.0	43.4%	13.0%					
Teton NP	8.24E-07	2.60E-04	1.1	1.1	3.0	10.0	36.7%	11.0%					
Teton Wilderness	1.16E-06	3.66E-04	1.1	1.1	3.0	10.0	36.7%	11.0%					
Washakie Wilderness	3.11E-06	9.80E-04	1.1	1.1	3.0	10.0	36.7%	11.0%					
Wind River Canyon	1.29E-04	4.06E-02	1.3	1.3	3.0	10.0	44.7%	13.4%					
Wind River Roadless	9.78E-06	3.08E-03	1.3	1.3	3.0	10.0	43.4%	13.0%					
Yellowstone NP	8.86E-07	2.79E-04	1.1	1.1	3.0	10.0	36.7%	11.0%					
Maximum	1.29E-04	4.06E-02	1.3	1.3	3.0	10.0	44.7%	13.4%					
Sulfur Deposition													
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts								
	Sulfur (S) Deposition (ug/m²/sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"					
Bridger	3.91E-08	1.23E-05	1.1	1.1	5.0	20.0	22.0%	5.5%					
Cloud Peak	5.68E-08	1.79E-05	1.1	1.1	5.0	20.0	22.0%	5.5%					
Fitzpatrick	1.79E-08	5.64E-06	1.1	1.1	5.0	20.0	22.0%	5.5%					
North Absaroka	5.43E-09	1.71E-06	0.9	0.9	5.0	20.0	18.0%	4.5%					
Owl Creek Range	3.20E-07	1.01E-04	1.1	1.1	5.0	20.0	22.0%	5.5%					
Popo Agie	6.04E-08	1.90E-05	1.1	1.1	5.0	20.0	22.0%	5.5%					
Phlox Mountain	3.76E-08	1.18E-05	1.1	1.1	5.0	20.0	22.0%	5.5%					
Teton NP	3.64E-09	1.15E-06	0.9	0.9	5.0	20.0	18.0%	4.5%					
Teton Wilderness	5.10E-09	1.61E-06	0.9	0.9	5.0	20.0	18.0%	4.5%					
Washakie Wilderness	1.46E-08	4.60E-06	0.9	0.9	5.0	20.0	18.0%	4.5%					
Wind River Canyon	1.32E-06	4.16E-04	1.1	1.1	5.0	20.0	22.0%	5.5%					
Wind River Roadless	4.51E-08	1.42E-05	1.1	1.1	5.0	20.0	22.0%	5.5%					
Yellowstone NP	4.56E-09	1.44E-06	0.9	0.9	5.0	20.0	18.0%	4.5%					
Maximum	1.32E-06	4.16E-04	1.1	1.1	5.0	20.0	22.0%	5.5%					
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.													
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.													

**Appendix A2
Summary of Results
Alternative A**

Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).				
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**Appendix A2
Summary of Results
Alternative A**

Ambient Impact Summary		AA - Alternative A (Increased Development)							
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQS Standard (ug/m3)	Impact % of WAAQS/NAAQS
NO2	Annual	0.27	WIND RIVER CANYON	2.5	10.63%	3.4	3.67	100	3.67%
SO2	3-hour	0.05	WIND RIVER CANYON	25	0.21%	132	132.05	1300	10.16%
	24-hour	0.02	WIND RIVER CANYON	5	0.42%	43	43.02	260	16.55%
	Annual	0.00	WIND RIVER CANYON	2	0.07%	9	9.00	60	15.00%
PM10	24-hour	1.63	WIND RIVER CANYON	8	20.41%	61	62.63	150	41.76%
	Annual	0.14	WIND RIVER CANYON	4	3.49%	22	22.14	50	44.28%
PM25	24-hour	0.89	WIND RIVER CANYON	n.a.	n.a.	35	35.89	65	55.21%
	Annual	0.06	WIND RIVER CANYON	n.a.	n.a.	10	10.06	15	67.10%
Maximum					20.41%				67.10%

**Appendix A3
Summary of Results
Alternative B**

BRIDGER		AB - Alternative B (Decreased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.85E-03	552	-36.775	8.558
SO2	3-hour	1.64E-03	552	-36.775	8.558
	24-hour	5.58E-04	552	-36.775	8.558
	Annual	1.75E-05	552	-36.775	8.558
PM10	24-hour	6.43E-02	552	-36.775	8.558
	Annual	1.39E-03	552	-36.775	8.558
PM25	24-hour	3.55E-02	552	-36.775	8.558
	Annual	9.84E-04	552	-36.775	8.558
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.97E-06	552	-36.775	8.558
	S	3.70E-08	552	-36.775	8.558
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.156	0.144		
	Day of Largest delta dV	179	179		
	Largest delta dV Receptor	563	563		
	Total dV	4.590	5.401		
	dV Background	4.434	5.257		
	% Ext by SO4	0.23	0.23		
	% Ext by NO3	88.17	88.17		
	% Ext by PM10	5.77	5.77		
	% Ext by PM2.5	5.83	5.83		
CLOUD PEAK		AB - Alternative B (Decreased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.49E-03	970	91.692	194.842
SO2	3-hour	1.95E-03	970	91.692	194.842
	24-hour	7.08E-04	970	91.692	194.842
	Annual	3.21E-05	970	91.692	194.842
PM10	24-hour	5.09E-02	970	91.692	194.842
	Annual	2.12E-03	970	91.692	194.842
PM25	24-hour	4.09E-02	970	91.692	194.842
	Annual	1.77E-03	970	91.692	194.842
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.40E-06	980	107.363	178.642
	S	5.35E-08	980	107.363	178.642
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.142	0.158		
	Day of Largest delta dV	25	25		
	Largest delta dV Receptor	953	953		
	Total dV	4.804	3.746		
	dV Background	4.662	3.588		
	% Ext by SO4	0.38	0.38		
	% Ext by NO3	73.44	73.44		
	% Ext by PM10	9.98	9.98		
	% Ext by PM2.5	16.21	16.21		

**Appendix A3
Summary of Results
Alternative B**

FITZPATRICK		AB - Alternative B (Decreased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	8.28E-04	727	-71.232	89.283
SO2	3-hour	1.75E-03	726	-71.161	86.048
	24-hour	6.36E-04	726	-71.161	86.048
	Annual	8.32E-06	723	-71.232	73.900
PM10	24-hour	6.70E-02	722	-71.304	70.023
	Annual	6.13E-04	723	-71.232	73.900
PM25	24-hour	4.12E-02	726	-71.161	86.048
	Annual	5.14E-04	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.41E-06	716	-71.592	46.301
S	Annual	1.69E-08	722	-71.304	70.023
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.115	0.104		
	Day of Largest delta dV	145	145		
	Largest delta dV Receptor	722	722		
	Total dV	4.664	5.663		
	dV Background	4.549	5.559		
	% Ext by SO4	0.29	0.29		
	% Ext by NO3	65.54	65.54		
	% Ext by PM10	22.05	22.05		
	% Ext by PM2.5	12.12	12.12		
NORTH ABSAROKA		AB - Alternative B (Decreased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.39E-04	807	-75.265	208.495
SO2	3-hour	3.18E-04	807	-75.265	208.495
	24-hour	7.09E-05	807	-75.265	208.495
	Annual	1.84E-06	807	-75.265	208.495
PM10	24-hour	6.35E-03	843	-120.223	208.073
	Annual	1.75E-04	807	-75.265	208.495
PM25	24-hour	3.99E-03	807	-75.265	208.495
	Annual	1.24E-04	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.58E-07	807	-75.265	208.495
S	Annual	5.09E-09	807	-75.265	208.495
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.043	0.041		
	Day of Largest delta dV	125	125		
	Largest delta dV Receptor	807	807		
	Total dV	4.592	4.976		
	dV Background	4.549	4.935		
	% Ext by SO4	0.38	0.38		
	% Ext by NO3	89.43	89.43		
	% Ext by PM10	5.22	5.22		
	% Ext by PM2.5	4.97	4.97		

**Appendix A3
Summary of Results
Alternative B**

OWL CREEK		AB - Alternative B (Decreased Development)		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	3.34E-02	1107	6.423 97.676
SO2	3-hour	3.19E-02	1107	6.423 97.676
	24-hour	1.12E-02	1107	6.423 97.676
	Annual	3.66E-04	1107	6.423 97.676
PM10	24-hour	8.10E-01	1107	6.423 97.676
	Annual	3.56E-02	1107	6.423 97.676
PM25	24-hour	4.39E-01	1107	6.423 97.676
	Annual	1.63E-02	1107	6.423 97.676
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	2.15E-05	1107	6.423 97.676
S	Annual	2.96E-07	1107	6.423 97.676
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	3	3	
	Days delta dV >1.00	0	0	
	Largest delta dV	0.800	0.923	
	Day of Largest delta dV	24	24	
	Largest delta dV Receptor	1107	1107	
	Total dV	5.500	4.130	
	dV Background	4.700	3.207	
	% Ext by SO4	0.11	0.11	
	% Ext by NO3	69.97	69.97	
	% Ext by PM10	15.62	15.62	
	% Ext by PM2.5	14.30	14.30	
POPO AGIE		AB - Alternative B (Decreased Development)		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	3.06E-03	890	-29.797 13.249
SO2	3-hour	3.97E-03	893	-28.587 7.395
	24-hour	7.57E-04	889	-30.862 15.475
	Annual	2.83E-05	890	-29.797 13.249
PM10	24-hour	8.18E-02	889	-30.862 15.475
	Annual	2.31E-03	890	-29.797 13.249
PM25	24-hour	5.10E-02	886	-33.377 20.749
	Annual	1.62E-03	890	-29.797 13.249
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	7.24E-06	886	-33.377 20.749
S	Annual	5.73E-08	886	-33.377 20.749
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	0	0	
	Days delta dV >1.00	0	0	
	Largest delta dV	0.166	0.185	
	Day of Largest delta dV	305	305	
	Largest delta dV Receptor	890	890	
	Total dV	4.858	3.764	
	dV Background	4.692	3.579	
	% Ext by SO4	0.23	0.23	
	% Ext by NO3	63.83	63.83	
	% Ext by PM10	17.96	17.96	
	% Ext by PM2.5	17.98	17.98	

**Appendix A3
Summary of Results
Alternative B**

PHLOX MOUNTAIN		AB - Alternative B (Decreased Development)		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	2.52E-03	1140	-17.128 113.192
SO2	3-hour	3.09E-03	1140	-17.128 113.192
	24-hour	8.60E-04	1140	-17.128 113.192
	Annual	2.68E-05	1140	-17.128 113.192
PM10	24-hour	6.27E-02	1140	-17.128 113.192
	Annual	2.68E-03	1140	-17.128 113.192
PM25	24-hour	3.91E-02	1140	-17.128 113.192
	Annual	1.44E-03	1140	-17.128 113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	4.17E-06	1140	-17.128 113.192
S	Annual	3.54E-08	1140	-17.128 113.192
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	0	0	
	Days delta dV >1.00	0	0	
	Largest delta dV	0.139	0.162	
	Day of Largest delta dV	42	42	
	Largest delta dV Receptor	1140	1140	
	Total dV	4.763	3.245	
	dV Background	4.625	3.084	
	% Ext by SO4	0.24	0.24	
	% Ext by NO3	74.79	74.79	
	% Ext by PM10	12.33	12.33	
	% Ext by PM2.5	12.64	12.64	
TETON NATIONAL PARK		AB - Alternative B (Decreased Development)		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	6.22E-05	664	-146.201 133.488
SO2	3-hour	1.52E-04	665	-149.999 133.564
	24-hour	5.71E-05	665	-149.999 133.564
	Annual	8.60E-07	664	-146.201 133.488
PM10	24-hour	3.93E-03	748	-146.000 140.000
	Annual	6.83E-05	664	-146.201 133.488
PM25	24-hour	2.43E-03	748	-146.000 140.000
	Annual	5.12E-05	739	-146.000 136.000
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	5.09E-07	678	-171.607 111.139
S	Annual	3.42E-09	678	-171.607 111.139
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	0	0	
	Days delta dV >1.00	0	0	
	Largest delta dV	0.018	0.016	
	Day of Largest delta dV	107	107	
	Largest delta dV Receptor	748	748	
	Total dV	4.567	5.719	
	dV Background	4.549	5.703	
	% Ext by SO4	0.28	0.28	
	% Ext by NO3	96.37	96.35	
	% Ext by PM10	1.36	1.35	
	% Ext by PM2.5	2.00	2.00	

**Appendix A3
Summary of Results
Alternative B**

TETON WILDERNESS AREA		AB - Alternative B (Decreased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.60E-04	57	-91.325	162.181
	3-hour	1.93E-04	206	-94.000	178.000
	24-hour	7.50E-05	50	-98.438	141.823
SO2	Annual	1.98E-06	57	-91.325	162.181
	24-hour	1.09E-02	50	-98.438	141.823
PM10	Annual	1.92E-04	57	-91.325	162.181
	24-hour	6.08E-03	50	-98.438	141.823
PM25	Annual	1.38E-04	57	-91.325	162.181
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.96E-07	50	-98.438	141.823
	S	Annual	4.81E-09	57	-91.325
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.030	0.030		
Day of Largest delta dV		43	43		
Largest delta dV Receptor		206	206		
Total dV		4.654	4.452		
dV Background		4.625	4.422		
% Ext by SO4		0.31	0.31		
% Ext by NO3		85.02	85.01		
% Ext by PM10		6.78	6.78		
% Ext by PM2.5		7.90	7.90		
WASHAKIE		AB - Alternative B (Decreased Development)			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	5.59E-04	294	-47.084	127.086
	3-hour	6.76E-04	293	-48.044	127.086
	24-hour	2.76E-04	294	-47.084	127.086
SO2	Annual	6.63E-06	294	-47.084	127.086
	24-hour	2.00E-02	338	-60.000	126.000
PM10	Annual	6.00E-04	298	-40.129	137.459
	24-hour	1.68E-02	294	-47.084	127.086
PM25	Annual	4.15E-04	294	-47.084	127.086
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.89E-06	294	-47.084	127.086
	S	Annual	1.37E-08	298	-40.129
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.078	0.075		
Day of Largest delta dV		117	117		
Largest delta dV Receptor		298	298		
Total dV		4.627	5.010		
dV Background		4.549	4.935		
% Ext by SO4		0.34	0.34		
% Ext by NO3		90.28	90.28		
% Ext by PM10		4.56	4.56		
% Ext by PM2.5		4.82	4.82		

**Appendix A3
Summary of Results
Alternative B**

WIND RIVER CANYON		AB - Alternative B (Decreased Development)		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	1.72E-01	1077	29.190 92.365
SO2	3-hour	4.87E-02	1076	27.022 94.149
	24-hour	2.02E-02	1076	27.022 94.149
	Annual	1.41E-03	1077	29.190 92.365
PM10	24-hour	1.48E+00	1076	27.022 94.149
	Annual	1.28E-01	1077	29.190 92.365
PM25	24-hour	7.72E-01	1076	27.022 94.149
	Annual	5.45E-02	1077	29.190 92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	7.96E-05	1076	27.022 94.149
S	Annual	1.25E-06	1077	29.190 92.365
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	9	11	
	Days delta dV >1.00	1	1	
	Largest delta dV	1.551	1.780	
	Day of Largest delta dV	4	4	
	Largest delta dV Receptor	1076	1076	
	Total dV	6.251	4.987	
	dV Background	4.700	3.207	
	% Ext by SO4	0.17	0.17	
	% Ext by NO3	38.10	38.10	
	% Ext by PM10	32.99	32.99	
	% Ext by PM2.5	28.75	28.75	
WIND RIVER ROADLESS		AB - Alternative B (Decreased Development)		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	2.52E-03	820	-40.723 41.939
SO2	3-hour	4.85E-03	820	-40.723 41.939
	24-hour	8.37E-04	791	-57.904 66.236
	Annual	2.46E-05	820	-40.723 41.939
PM10	24-hour	1.00E-01	791	-57.904 66.236
	Annual	2.00E-03	820	-40.723 41.939
PM25	24-hour	4.45E-02	868	-68.000 78.000
	Annual	1.39E-03	820	-40.723 41.939
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	6.06E-06	818	-40.580 34.535
S	Annual	4.25E-08	818	-40.580 34.535
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	0	0	
	Days delta dV >1.00	0	0	
	Largest delta dV	0.172	0.156	
	Day of Largest delta dV	145	145	
	Largest delta dV Receptor	794	794	
	Total dV	4.721	5.715	
	dV Background	4.549	5.559	
	% Ext by SO4	0.31	0.31	
	% Ext by NO3	66.96	66.96	
	% Ext by PM10	21.58	21.58	
	% Ext by PM2.5	11.15	11.15	

**Appendix A3
Summary of Results
Alternative B**

YELLOWSTONE NATL PARK		AB - Alternative B (Decreased Development)																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	9.58E-05	109	-112.113	171.051														
SO2	3-hour	1.66E-04	97	-97.734	233.934														
	24-hour	6.02E-05	95	-99.051	230.053														
	Annual	1.26E-06	109	-112.113	171.051														
PM10	24-hour	8.44E-03	109	-112.113	171.051														
	Annual	1.22E-04	109	-112.113	171.051														
PM25	24-hour	4.81E-03	109	-112.113	171.051														
	Annual	8.82E-05	109	-112.113	171.051														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	5.39E-07	94	-100.017	229.175														
S	Annual	4.28E-09	94	-100.017	229.175														
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50	0	0																
	Days delta dV >1.00	0	0																
	Largest delta dV	0.014	0.036																
	Day of Largest delta dV	118	118																
	Largest delta dV Receptor	97	97																
	Total dV	4.589	5.739																
	dV Background	4.549	5.703																
	% Ext by SO4	0.30	0.30																
	% Ext by NO3	93.88	93.86																
	% Ext by PM10	2.05	2.05																
	% Ext by PM2.5	3.78	3.78																

**Appendix A3
Summary of Results
Alternative B**

<i>Visibility Summary</i>		AB - Alternative B (Decreased Development)													
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions											
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV									
Bridger	0	0	0.16	0	0	0.14									
Cloud Peak	0	0	0.14	0	0	0.16									
Fitzpatrick	0	0	0.12	0	0	0.10									
North Absaroka	0	0	0.04	0	0	0.04									
Owl Creek	3	0	0.80	3	0	0.82									
Popo Agie	0	0	0.17	0	0	0.19									
Phlox Mountain	0	0	0.14	0	0	0.16									
Teton NP	0	0	0.02	0	0	0.02									
Teton Wilderness	0	0	0.03	0	0	0.03									
Washakie	0	0	0.08	0	0	0.08									
Wind River Canyon	9	1	1.55	11	1	1.78									
Wind River Roadless	0	0	0.17	0	0	0.16									
Yellowstone NP	0	0	0.01	0	0	0.04									
Total Days / Max Δ dV	12	1	1.55	14	1	1.78									

**Appendix A3
Summary of Results
Alternative B**

LAKES		AB - Alternative B (Decreased Development)																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.91E-06	1141	-49.183	20.543															
	S	2.58E-08	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.84E-06	1142	-49.178	18.394															
	S	2.55E-08	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.62E-06	1143	95.779	205.602															
	S	3.92E-08	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	5.20E-06	1144	105.440	193.981															
	S	4.20E-08	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.73E-06	1145	-88.417	52.778															
	S	1.23E-08	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	5.13E-06	1146	-35.219	7.97															
	S	3.87E-08	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.41E-06	1147	-86.813	89.541															
	S	9.62E-09	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.82E-06	1148	-48.413	14.897															
	S	2.58E-08	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.93E-07	1149	-96.935	275.159															
	S	2.35E-09	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	3.11E-07	1150	-95.471	271.528															
	S	2.50E-09	1150	-95.471	271.528															

**Appendix A3
Summary of Results
Alternative B**

ANC Impacts to High Elevation Lakes		AB - Alternative B (Decreased Development)																	
High Elevation		Inputs																	
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)														
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition Rate														
	ANC (A)	(P)	Area	Rate	Rate														
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)														
Black Joe Lake	67.0	0.925	890	3.91E-06	2.58E-08														
Deep Lake	59.9	0.925	205	3.84E-06	2.55E-08														
Emerald Lake	69.8	0.780	293	4.62E-06	3.92E-08														
Florence Lake	33.0	0.780	417	5.20E-06	4.20E-08														
Hobbs Lake	69.9	1.080	293	1.73E-06	1.23E-08														
Lower Saddlebag	55.5	1.000	155	5.13E-06	3.87E-08														
Ross Lake	53.5	1.080	4455	1.41E-06	9.62E-09														
Stepping Stone Lake	19.9	1.460	26	2.93E-07	2.35E-09														
Twin Island Lake	17.6	1.300	45	3.11E-07	2.50E-09														
Upper Frozen Lake	5.0	0.925	65	3.82E-06	2.58E-08														
High Elevation		Intermediate Calculated Values					Results												
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent											
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC											
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change											
Black Joe Lake	1.23E-03	8.14E-06	3.70E+05	8.80E-06	5.09E-08	7.88E+01	0.01	0.02%											
Deep Lake	1.21E-03	8.05E-06	7.61E+04	8.65E-06	5.03E-08	1.78E+01	0.01	0.02%											
Emerald Lake	1.46E-03	1.24E-05	1.07E+05	1.04E-05	7.73E-08	3.07E+01	0.02	0.03%											
Florence Lake	1.64E-03	1.32E-05	7.19E+04	1.17E-05	8.27E-08	4.92E+01	0.02	0.07%											
Hobbs Lake	5.44E-04	3.86E-06	1.48E+05	3.89E-06	2.41E-08	1.15E+01	0.01	0.01%											
Lower Saddlebag	1.62E-03	1.22E-05	5.76E+04	1.16E-05	7.63E-08	1.80E+01	0.02	0.03%											
Ross Lake	4.46E-04	3.04E-06	1.72E+06	3.19E-06	1.90E-08	1.43E+02	0.00	0.01%											
Stepping Stone Lake	9.25E-05	7.42E-07	5.14E+03	6.61E-07	4.64E-09	1.76E-01	0.00	0.00%											
Twin Island Lake	9.81E-05	7.89E-07	6.88E+03	7.00E-07	4.93E-09	3.17E-01	0.00	0.00%											
Upper Frozen Lake	1.20E-03	8.14E-06	2.01E+03	8.60E-06	5.09E-08	5.61E+00	0.01	0.28%											
Maximum							0.02	0.28%											
NOTE:		Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.																	
		Baseline ANC values calculated from summarized data provided by the Forest Service.																	
		ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																	
		Annual precipitation and watershed catchments values provided by the Forest Service.																	

**Appendix A3
Summary of Results
Alternative B**

Terrestrial Acid Deposition Summary			AB - Alternative B (Decreased Development)																	
Incremental Analysis																				
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT													
Bridger	4.97E-06	3.70E-08	0.00157	0.00001	0.005	31.3%	0.2%													
Cloud Peak	6.40E-06	5.35E-08	0.00202	0.00002	0.005	40.4%	0.3%													
Fitzpatrick	2.41E-06	1.69E-08	0.00076	0.00001	0.005	15.2%	0.1%													
North Absaroka	6.58E-07	5.09E-09	0.00021	0.00000	0.005	4.1%	0.0%													
Owl Creek Range	2.15E-05	2.96E-07	0.00678	0.00009	0.005	135.6%	1.9%													
Popo Agie	7.24E-06	5.73E-08	0.00228	0.00002	0.005	45.7%	0.4%													
Phlox Mountain	4.17E-06	3.54E-08	0.00131	0.00001	0.005	26.3%	0.2%													
Teton NP	5.09E-07	3.42E-09	0.00016	0.00000	0.005	3.2%	0.0%													
Teton Wilderness	6.96E-07	4.81E-09	0.00022	0.00000	0.005	4.4%	0.0%													
Washakie Wilderness	1.89E-06	1.37E-08	0.00060	0.00000	0.005	11.9%	0.1%													
Wind River Canyon	7.96E-05	1.25E-06	0.02511	0.00039	0.005	502.2%	7.9%													
Wind River Roadless	6.06E-06	4.25E-08	0.00191	0.00001	0.005	38.2%	0.3%													
Yellowstone NP	5.39E-07	4.28E-09	0.00017	0.00000	0.005	3.4%	0.0%													
Maximum	7.96E-05	1.25E-06	0.02511	0.00039	0.005	502.2%	7.9%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts															
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"												
Bridger	4.97E-06	1.57E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Cloud Peak	6.40E-06	2.02E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Fitzpatrick	2.41E-06	7.61E-04	1.3	1.3	3.0	10.0	43.4%	13.0%												
North Absaroka	6.58E-07	2.07E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Owl Creek Range	2.15E-05	6.78E-03	1.3	1.3	3.0	10.0	43.6%	13.1%												
Popo Agie	7.24E-06	2.28E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Phlox Mountain	4.17E-06	1.31E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Teton NP	5.09E-07	1.60E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Teton Wilderness	6.96E-07	2.19E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Washakie Wilderness	1.89E-06	5.97E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Wind River Canyon	7.96E-05	2.51E-02	1.3	1.3	3.0	10.0	44.2%	13.3%												
Wind River Roadless	6.06E-06	1.91E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Yellowstone NP	5.39E-07	1.70E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Maximum	7.96E-05	2.51E-02	1.3	1.3	3.0	10.0	44.2%	13.3%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts															
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"												
Bridger	3.70E-08	1.17E-05	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	5.35E-08	1.69E-05	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	1.69E-08	5.32E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absaroka	5.09E-09	1.61E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	2.96E-07	9.35E-05	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	5.73E-08	1.81E-05	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	3.54E-08	1.12E-05	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	3.42E-09	1.08E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Teton Wilderness	4.81E-09	1.52E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	1.37E-08	4.33E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	1.25E-06	3.94E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	4.25E-08	1.34E-05	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	4.28E-09	1.35E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	1.25E-06	3.94E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																				
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																				

**Appendix A3
Summary of Results
Alternative B**

Ambient Impact Summary		AB - Alternative B (Decreased Development)													
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQs Standard (ug/m3)	Impact % of WAAQS/NAAQs						
NO2	Annual	0.17	WIND RIVER CANYON	2.5	6.87%	3.4	3.57	100	3.57%						
SO2	3-hour	0.05	WIND RIVER CANYON	25	0.19%	132	132.05	1300	10.16%						
	24-hour	0.02	WIND RIVER CANYON	5	0.40%	43	43.02	260	16.55%						
	Annual	0.00	WIND RIVER CANYON	2	0.07%	9	9.00	60	15.00%						
PM10	24-hour	1.48	WIND RIVER CANYON	8	18.45%	61	62.48	150	41.65%						
	Annual	0.13	WIND RIVER CANYON	4	3.20%	22	22.13	50	44.26%						
PM25	24-hour	0.77	WIND RIVER CANYON	n.a.	n.a.	35	35.77	65	55.03%						
	Annual	0.05	WIND RIVER CANYON	n.a.	n.a.	10	10.05	15	67.03%						
Maximum					18.45%				67.03%						

**Appendix A4
Summary of Results
No Action Alternative**

BRIDGER		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.03E-04	552	-36.775	8.558
SO2	3-hour	3.54E-04	551	-37.071	6.367
	24-hour	6.72E-05	552	-36.775	8.558
	Annual	1.68E-06	552	-36.775	8.558
PM10	24-hour	1.96E-02	552	-36.775	8.558
	Annual	3.98E-04	552	-36.775	8.558
PM25	24-hour	9.08E-03	553	-38.374	9.861
	Annual	2.12E-04	552	-36.775	8.558
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.86E-07	552	-36.775	8.558
S	Annual	3.23E-09	552	-36.775	8.558
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.025	0.027		
	Day of Largest delta dV	305	305		
	Largest delta dV Receptor	552	552		
	Total dV	4.717	3.607		
	dV Background	4.692	3.579		
	% Ext by SO4	0.12	0.12		
	% Ext by NO3	46.83	46.83		
	% Ext by PM10	29.97	29.97		
	% Ext by PM2.5	23.09	23.09		
CLOUD PEAK		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.79E-04	970	91.692	194.842
SO2	3-hour	1.19E-04	980	107.363	178.642
	24-hour	3.82E-05	978	104.140	182.143
	Annual	1.83E-06	970	91.692	194.842
PM10	24-hour	8.03E-03	970	91.692	194.842
	Annual	3.93E-04	970	91.692	194.842
PM25	24-hour	5.53E-03	970	91.692	194.842
	Annual	2.52E-04	970	91.692	194.842
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	8.57E-07	980	107.363	178.642
S	Annual	2.94E-09	980	107.363	178.642
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.017	0.019		
	Day of Largest delta dV	25	25		
	Largest delta dV Receptor	964	964		
	Total dV	4.679	3.607		
	dV Background	4.662	3.588		
	% Ext by SO4	0.21	0.21		
	% Ext by NO3	63.55	63.55		
	% Ext by PM10	16.66	16.66		
	% Ext by PM2.5	19.57	19.57		

**Appendix A4
Summary of Results
No Action Alternative**

FITZPATRICK		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	1.07E-04	726	-71.161	86.048
SO2	3-hour	1.38E-04	727	-71.232	89.283
	24-hour	5.62E-05	727	-71.232	89.283
	Annual	6.68E-07	726	-71.161	86.048
PM10	24-hour	1.11E-02	722	-71.304	70.023
	Annual	1.45E-04	726	-71.161	86.048
PM25	24-hour	8.58E-03	726	-71.161	86.048
	Annual	9.54E-05	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	2.89E-07	716	-71.592	46.301
S	Annual	1.30E-09	722	-71.304	70.023
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.013	0.015		
	Day of Largest delta dV	42	42		
	Largest delta dV Receptor	727	727		
	Total dV	4.638	3.099		
	dV Background	4.625	3.084		
	% Ext by SO4	0.19	0.19		
	% Ext by NO3	33.23	33.22		
	% Ext by PM10	25.81	25.81		
	% Ext by PM2.5	40.78	40.77		
NORTH ABSAROKA		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	1.61E-05	807	-75.265	208.495
SO2	3-hour	2.05E-05	800	-90.088	208.083
	24-hour	4.14E-06	807	-75.265	208.495
	Annual	1.35E-07	807	-75.265	208.495
PM10	24-hour	1.25E-03	843	-120.223	208.073
	Annual	3.76E-05	807	-75.265	208.495
PM25	24-hour	6.01E-04	925	-102.000	258.000
	Annual	2.07E-05	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	6.48E-08	807	-75.265	208.495
S	Annual	3.57E-10	807	-75.265	208.495
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.006	0.005		
	Day of Largest delta dV	107	118		
	Largest delta dV Receptor	807	833		
	Total dV	4.555	4.941		
	dV Background	4.549	4.935		
	% Ext by SO4	0.14	0.15		
	% Ext by NO3	94.68	92.80		
	% Ext by PM10	2.27	3.00		
	% Ext by PM2.5	2.95	4.01		

**Appendix A4
Summary of Results
No Action Alternative**

OWL CREEK		NA - No Action Alternative		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	2.93E-03	1107	6.423 97.676
SO2	3-hour	1.01E-03	1108	3.634 96.926
	24-hour	2.82E-04	1108	3.634 96.926
PM10	Annual	1.79E-05	1107	6.423 97.676
	24-hour	8.62E-02	1108	3.634 96.926
PM25	Annual	5.50E-03	1107	6.423 97.676
	24-hour	3.32E-02	1108	3.634 96.926
	Annual	1.92E-03	1107	6.423 97.676
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	1.99E-06	1107	6.423 97.676
S	Annual	1.57E-08	1107	6.423 97.676
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	0	0	
	Days delta dV >1.00	0	0	
	Largest delta dV	0.064	0.074	
	Day of Largest delta dV	25	25	
	Largest delta dV Receptor	1107	1107	
	Total dV	4.764	3.281	
	dV Background	4.700	3.207	
	% Ext by SO4	0.06	0.06	
	% Ext by NO3	20.91	20.91	
	% Ext by PM10	49.16	49.16	
	% Ext by PM2.5	29.87	29.87	
POPO AGIE		NA - No Action Alternative		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	5.01E-04	889	-30.862 15.475
SO2	3-hour	5.21E-04	920	-32.000 10.000
	24-hour	9.01E-05	887	-32.313 17.943
PM10	Annual	2.80E-06	886	-33.377 20.749
	24-hour	2.47E-02	887	-32.313 17.943
PM25	Annual	6.82E-04	886	-33.377 20.749
	24-hour	1.36E-02	886	-33.377 20.749
	Annual	3.64E-04	886	-33.377 20.749
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	1.03E-06	889	-30.862 15.475
S	Annual	5.45E-09	886	-33.377 20.749
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	0	0	
	Days delta dV >1.00	0	0	
	Largest delta dV	0.033	0.037	
	Day of Largest delta dV	305	305	
	Largest delta dV Receptor	887	887	
	Total dV	4.725	3.616	
	dV Background	4.692	3.579	
	% Ext by SO4	0.11	0.11	
	% Ext by NO3	46.42	46.42	
	% Ext by PM10	28.29	28.29	
	% Ext by PM2.5	25.19	25.19	

**Appendix A4
Summary of Results
No Action Alternative**

PHLOX MOUNTAIN		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.73E-04	1140	-17.128	113.192
SO2	3-hour	1.62E-04	1140	-17.128	113.192
	24-hour	2.80E-05	1140	-17.128	113.192
PM10	Annual	1.81E-06	1140	-17.128	113.192
	24-hour	1.07E-02	1140	-17.128	113.192
PM25	Annual	5.63E-04	1140	-17.128	113.192
	24-hour	3.67E-03	1140	-17.128	113.192
	Annual	2.30E-04	1140	-17.128	113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.89E-07	1140	-17.128	113.192
S	Annual	2.49E-09	1140	-17.128	113.192
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.026	0.023		
	Day of Largest delta dV	119	119		
	Largest delta dV Receptor	1140	1140		
	Total dV	4.575	5.582		
	dV Background	4.549	5.559		
	% Ext by SO4	0.13	0.13		
	% Ext by NO3	83.08	83.08		
	% Ext by PM10	11.32	11.31		
	% Ext by PM2.5	5.48	5.48		
TETON NATIONAL PARK		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	7.89E-06	664	-146.201	133.488
SO2	3-hour	1.26E-05	673	-162.075	117.006
	24-hour	3.33E-06	664	-146.201	133.488
PM10	Annual	6.36E-08	664	-146.201	133.488
	24-hour	8.46E-04	658	-148.897	150.012
PM25	Annual	1.56E-05	748	-146.000	140.000
	24-hour	5.75E-04	664	-146.201	133.488
	Annual	9.18E-06	739	-146.000	136.000
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.93E-08	675	-170.050	111.556
S	Annual	2.14E-10	690	-186.077	118.430
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.003	0.002		
	Day of Largest delta dV	107	107		
	Largest delta dV Receptor	658	658		
	Total dV	4.552	5.705		
	dV Background	4.459	5.703		
	% Ext by SO4	0.18	0.18		
	% Ext by NO3	94.63	94.41		
	% Ext by PM10	2.43	2.42		
	% Ext by PM2.5	2.86	2.85		

**Appendix A4
Summary of Results
No Action Alternative**

TETON WILDERNESS AREA		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.10E-05	57	-91.325	162.181
SO2	3-hour	2.74E-05	56	-94.105	159.156
	24-hour	5.71E-06	51	-98.520	144.030
PM10	Annual	1.66E-07	57	-91.325	162.181
	24-hour	2.45E-03	50	-98.438	141.823
PM25	Annual	4.61E-05	57	-91.325	162.181
	24-hour	9.98E-04	50	-98.438	141.823
	Annual	2.52E-05	57	-91.325	162.181
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	7.30E-08	50	-98.438	141.823
S	Annual	3.38E-10	206	-94.000	178.000
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.005	0.005		
	Day of Largest delta dV	107	107		
	Largest delta dV Receptor	206	206		
	Total dV	4.554	5.707		
	dV Background	4.549	5.703		
	% Ext by SO4	0.17	0.17		
	% Ext by NO3	93.62	93.56		
	% Ext by PM10	2.87	2.87		
	% Ext by PM2.5	3.35	3.35		
WASHAKIE		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.72E-05	294	-47.084	127.086
SO2	3-hour	5.24E-05	338	-60.000	126.000
	24-hour	2.08E-05	294	-47.084	127.086
PM10	Annual	4.76E-07	294	-47.084	127.086
	24-hour	4.22E-03	294	-47.084	127.086
PM25	Annual	1.31E-04	294	-47.084	127.086
	24-hour	2.97E-03	294	-47.084	127.086
	Annual	6.96E-05	294	-47.084	127.086
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.03E-07	294	-47.084	127.086
S	Annual	8.78E-10	294	-47.084	127.086
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.012	0.011		
	Day of Largest delta dV	117	117		
	Largest delta dV Receptor	298	298		
	Total dV	4.560	4.964		
	dV Background	4.549	4.935		
	% Ext by SO4	0.18	0.18		
	% Ext by NO3	87.23	87.21		
	% Ext by PM10	7.38	7.38		
	% Ext by PM2.5	5.22	5.22		

**Appendix A4
Summary of Results
No Action Alternative**

WIND RIVER CANYON		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	8.53E-03	1076	27.022	94.149
SO2	3-hour	4.19E-03	1076	27.022	94.149
	24-hour	5.98E-04	1076	27.022	94.149
	Annual	3.85E-05	1076	27.022	94.149
PM10	24-hour	2.16E-01	1076	27.022	94.149
	Annual	1.20E-02	1076	27.022	94.149
PM25	24-hour	5.25E-02	1076	27.022	94.149
	Annual	4.11E-03	1076	27.022	94.149
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.72E-06	1078	31.661	93.381
S	Annual	3.42E-08	1076	27.022	94.149
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.122	0.137		
	Day of Largest delta dV	350	350		
	Largest delta dV Receptor	1076	1076		
	Total dV	4.785	3.665		
	dV Background	4.662	3.528		
	% Ext by SO4	0.04	0.04		
	% Ext by NO3	7.13	7.13		
	% Ext by PM10	66.05	66.09		
	% Ext by PM2.5	26.78	26.78		
WIND RIVER ROADLESS		NA - No Action Alternative			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.88E-04	821	-40.795	43.233
SO2	3-hour	2.94E-04	786	-49.853	59.119
	24-hour	7.89E-05	786	-49.853	59.119
	Annual	2.34E-06	820	-40.723	41.939
PM10	24-hour	2.67E-02	786	-49.853	59.119
	Annual	5.73E-04	821	-40.795	43.233
PM25	24-hour	9.05E-03	818	-40.580	34.535
	Annual	2.99E-04	820	-40.723	41.939
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	7.93E-07	819	-40.580	37.986
S	Annual	3.76E-09	819	-40.580	37.986
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.023	0.021		
	Day of Largest delta dV	145	145		
	Largest delta dV Receptor	786	786		
	Total dV	4.572	5.580		
	dV Background	4.549	5.559		
	% Ext by SO4	0.08	0.08		
	% Ext by NO3	33.82	33.81		
	% Ext by PM10	43.24	43.23		
	% Ext by PM2.5	22.87	22.87		

**Appendix A4
Summary of Results
No Action Alternative**

YELLOWSTONE NATL PARK		NA - No Action Alternative																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	1.25E-05	109	-112.113	171.051																
	3-hour	2.81E-05	280	-116.000	202.000																
	24-hour	5.43E-06	280	-116.000	202.000																
PM10	Annual	1.08E-07	81	-111.735	191.428																
	24-hour	1.82E-03	109	-112.113	171.051																
	Annual	2.90E-05	109	-112.113	171.051																
PM25	24-hour	7.59E-04	109	-112.113	171.051																
	Annual	1.60E-05	81	-111.735	191.428																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	5.25E-08	109	-112.113	171.051																
S	Annual	3.24E-10	84	-111.530	206.041																
VISIBILITY		FLAG	IMPROVE																		
	Days delta dV >0.50	0	0																		
	Days delta dV >1.00	0	0																		
	Largest delta dV	0.005	0.005																		
	Day of Largest delta dV	118	118																		
	Largest delta dV Receptor	97	23																		
	Total dV	4.554	5.707																		
	dV Background	4.549	5.703																		
	% Ext by SO4	0.15	0.15																		
	% Ext by NO3	92.65	92.61																		
	% Ext by PM10	2.99	2.99																		
	% Ext by PM2.5	4.22	4.22																		

**Appendix A4
Summary of Results
No Action Alternative**

<i>Visibility Summary</i>		NA - No Action Alternative													
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions											
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV									
Bridger	0	0	0.03	0	0	0.03									
Cloud Peak	0	0	0.02	0	0	0.02									
Fitzpatrick	0	0	0.01	0	0	0.02									
North Absaroka	0	0	0.01	0	0	0.01									
Owl Creek	0	0	0.06	0	0	0.07									
Popo Agie	0	0	0.03	0	0	0.04									
Phlox Mountain	0	0	0.03	0	0	0.02									
Teton NP	0	0	0.00	0	0	0.00									
Teton Wilderness	0	0	0.01	0	0	0.01									
Washakie	0	0	0.01	0	0	0.01									
Wind River Canyon	0	0	0.12	0	0	0.14									
Wind River Roadless	0	0	0.02	0	0	0.02									
Yellowstone NP	0	0	0.01	0	0	0.01									
Total Days / Max Δ dV	0	0	0.12	0	0	0.14									

**Appendix A4
Summary of Results
No Action Alternative**

LAKES		NA - No Action Alternative																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.98E-07	1141	-49.183	20.543															
	S	2.20E-09	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.92E-07	1142	-49.178	18.394															
	S	2.16E-09	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.72E-07	1143	95.779	205.602															
	S	2.23E-09	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	5.32E-07	1144	105.440	193.981															
	S	2.35E-09	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.79E-07	1145	-88.417	52.778															
	S	8.28E-10	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.16E-07	1146	-35.219	7.97															
	S	3.40E-09	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.55E-07	1147	-86.813	89.541															
	S	6.61E-10	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.95E-07	1148	-48.413	14.897															
	S	2.15E-09	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.92E-08	1149	-96.935	275.159															
	S	1.61E-10	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	3.06E-08	1150	-95.471	271.528															
	S	1.70E-10	1150	-95.471	271.528															

**Appendix A4
Summary of Results
No Action Alternative**

ANC Impacts to High Elevation Lakes		NA - No Action Alternative																			
High Elevation		Inputs																			
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)																
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition Rate																
	ANC (A)	(P)	Area	Rate	Rate																
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)																
Black Joe Lake	67.0	0.925	890	4.98E-07	2.20E-09																
Deep Lake	59.9	0.925	205	4.92E-07	2.16E-09																
Emerald Lake	69.8	0.780	293	4.72E-07	2.23E-09																
Florence Lake	33.0	0.780	417	5.32E-07	2.35E-09																
Hobbs Lake	69.9	1.080	293	1.79E-07	8.28E-10																
Lower Saddlebag	55.5	1.000	155	7.16E-07	3.40E-09																
Ross Lake	53.5	1.080	4455	1.55E-07	6.61E-10																
Stepping Stone Lake	19.9	1.460	26	2.92E-08	1.61E-10																
Twin Island Lake	17.6	1.300	45	3.06E-08	1.70E-10																
Upper Frozen Lake	5.0	0.925	65	4.95E-07	2.15E-09																
High Elevation		Intermediate Calculated Values					Results														
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent													
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC													
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change													
Black Joe Lake	1.57E-04	6.93E-07	3.70E+05	1.12E-06	4.33E-09	1.00E+01	0.002	0.00%													
Deep Lake	1.55E-04	6.82E-07	7.61E+04	1.11E-06	4.26E-09	2.28E+00	0.002	0.00%													
Emerald Lake	1.49E-04	7.04E-07	1.07E+05	1.06E-06	4.40E-09	3.13E+00	0.002	0.00%													
Florence Lake	1.68E-04	7.41E-07	7.19E+04	1.20E-06	4.63E-09	5.01E+00	0.002	0.01%													
Hobbs Lake	5.66E-05	2.61E-07	1.48E+05	4.04E-07	1.63E-09	1.19E+00	0.001	0.00%													
Lower Saddlebag	2.26E-04	1.07E-06	5.76E+04	1.61E-06	6.70E-09	2.51E+00	0.002	0.00%													
Ross Lake	4.89E-05	2.08E-07	1.72E+06	3.49E-07	1.30E-09	1.56E+01	0.000	0.00%													
Stepping Stone Lake	9.22E-06	5.08E-08	5.14E+03	6.59E-08	3.17E-10	1.75E-02	0.000	0.00%													
Twin Island Lake	9.66E-06	5.35E-08	6.88E+03	6.90E-08	3.35E-10	3.11E-02	0.000	0.00%													
Upper Frozen Lake	1.56E-04	6.79E-07	2.01E+03	1.11E-06	4.24E-09	7.25E-01	0.002	0.04%													
Maximum							0.002	0.04%													
NOTE: Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.																					
Baseline ANC values calculated from summarized data provided by the Forest Service.																					
ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																					
Annual precipitation and watershed catchments values provided by the Forest Service.																					

**Appendix A4
Summary of Results
No Action Alternative**

Terrestrial Acid Deposition Summary		NA - No Action Alternative						
Incremental Analysis								
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT	
Bridger	6.86E-07	3.23E-09	0.00022	0.00000	0.005	4.3%	0.0%	
Cloud Peak	6.57E-07	2.94E-09	0.00021	0.00000	0.005	4.1%	0.0%	
Fitzpatrick	2.89E-07	1.30E-09	0.00009	0.00000	0.005	1.8%	0.0%	
North Absaroka	6.48E-08	3.57E-10	0.00002	0.00000	0.005	0.4%	0.0%	
Owl Creek Range	1.99E-06	1.57E-08	0.00063	0.00000	0.005	12.6%	0.1%	
Popo Agie	1.03E-06	5.45E-09	0.00032	0.00000	0.005	6.5%	0.0%	
Phlox Mountain	4.89E-07	2.49E-09	0.00015	0.00000	0.005	3.1%	0.0%	
Teton NP	4.93E-08	2.14E-10	0.00002	0.00000	0.005	0.3%	0.0%	
Teton Wilderness	7.30E-08	3.38E-10	0.00002	0.00000	0.005	0.5%	0.0%	
Washakie Wilderness	2.03E-07	8.78E-10	0.00006	0.00000	0.005	1.3%	0.0%	
Wind River Canyon	4.72E-06	3.42E-08	0.00149	0.00001	0.005	29.8%	0.2%	
Wind River Roadless	7.93E-07	3.76E-09	0.00025	0.00000	0.005	5.0%	0.0%	
Yellowstone NP	5.25E-08	3.24E-10	0.00002	0.00000	0.005	0.3%	0.0%	
Maximum	4.72E-06	3.42E-08	0.00149	0.00001	0.005	29.8%	0.2%	
NOTE: DAT for Western Class I areas from National Park Service (2003).								
Cumulative Analysis								
Nitrogen Deposition								
Area of Special Concern	Predicted		Background Nitrogen (N) Deposition (kg/ha/yr)	Total Nitrogen (N) Deposition (kg/ha/yr)	Total Nitrogen (N) Impacts			
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)			Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"
Bridger	6.86E-07	2.16E-04	1.3	1.3	3.0	10.0	43.3%	13.0%
Cloud Peak	6.57E-07	2.07E-04	1.3	1.3	3.0	10.0	43.3%	13.0%
Fitzpatrick	2.89E-07	9.11E-05	1.3	1.3	3.0	10.0	43.3%	13.0%
North Absaroka	6.48E-08	2.04E-05	1.1	1.1	3.0	10.0	36.7%	11.0%
Owl Creek Range	1.99E-06	6.28E-04	1.3	1.3	3.0	10.0	43.4%	13.0%
Popo Agie	1.03E-06	3.25E-04	1.3	1.3	3.0	10.0	43.3%	13.0%
Phlox Mountain	4.89E-07	1.54E-04	1.3	1.3	3.0	10.0	43.3%	13.0%
Teton NP	4.93E-08	1.55E-05	1.1	1.1	3.0	10.0	36.7%	11.0%
Teton Wilderness	7.30E-08	2.30E-05	1.1	1.1	3.0	10.0	36.7%	11.0%
Washakie Wilderness	2.03E-07	6.39E-05	1.1	1.1	3.0	10.0	36.7%	11.0%
Wind River Canyon	4.72E-06	1.49E-03	1.3	1.3	3.0	10.0	43.4%	13.0%
Wind River Roadless	7.93E-07	2.50E-04	1.3	1.3	3.0	10.0	43.3%	13.0%
Yellowstone NP	5.25E-08	1.66E-05	1.1	1.1	3.0	10.0	36.7%	11.0%
Maximum	4.72E-06	1.49E-03	1.3	1.3	3.0	10.0	43.4%	13.0%
Sulfur Deposition								
Area of Special Concern	Predicted		Background Sulfur (S) Deposition (kg/ha/yr)	Total Sulfur (S) Deposition (kg/ha/yr)	Total Sulfur (S) Impacts			
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)			Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"
Bridger	3.23E-09	1.02E-06	1.1	1.1	5.0	20.0	22.0%	5.5%
Cloud Peak	2.94E-09	9.26E-07	1.1	1.1	5.0	20.0	22.0%	5.5%
Fitzpatrick	1.30E-09	4.09E-07	1.1	1.1	5.0	20.0	22.0%	5.5%
North Absaroka	3.57E-10	1.13E-07	0.9	0.9	5.0	20.0	18.0%	4.5%
Owl Creek Range	1.57E-08	4.96E-06	1.1	1.1	5.0	20.0	22.0%	5.5%
Popo Agie	5.45E-09	1.72E-06	1.1	1.1	5.0	20.0	22.0%	5.5%
Phlox Mountain	2.49E-09	7.86E-07	1.1	1.1	5.0	20.0	22.0%	5.5%
Teton NP	2.14E-10	6.75E-08	0.9	0.9	5.0	20.0	18.0%	4.5%
Teton Wilderness	3.38E-10	1.07E-07	0.9	0.9	5.0	20.0	18.0%	4.5%
Washakie Wilderness	8.78E-10	2.77E-07	0.9	0.9	5.0	20.0	18.0%	4.5%
Wind River Canyon	3.42E-08	1.08E-05	1.1	1.1	5.0	20.0	22.0%	5.5%
Wind River Roadless	3.76E-09	1.19E-06	1.1	1.1	5.0	20.0	22.0%	5.5%
Yellowstone NP	3.24E-10	1.02E-07	0.9	0.9	5.0	20.0	18.0%	4.5%
Maximum	3.42E-08	1.08E-05	1.1	1.1	5.0	20.0	22.0%	5.5%
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.								
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.								
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).								

**Appendix A4
Summary of Results
No Action Alternative**

Ambient Impact Summary		NA - No Action Alternative													
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQs Standard (ug/m3)	Impact % of WAAQS/NAAQs						
NO2	Annual	0.01	WIND RIVER CANYON	2.5	0.34%	3.4	3.41	100	3.41%						
SO2	3-hour	0.00	WIND RIVER CANYON	25	0.02%	132	132.00	1300	10.15%						
	24-hour	0.00	WIND RIVER CANYON	5	0.01%	43	43.00	260	16.54%						
	Annual	0.00	WIND RIVER CANYON	2	0.00%	9	9.00	60	15.00%						
PM10	24-hour	0.22	WIND RIVER CANYON	8	2.70%	61	61.22	150	40.81%						
	Annual	0.01	WIND RIVER CANYON	4	0.30%	22	22.01	50	44.02%						
PM25	24-hour	0.05	WIND RIVER CANYON	n.a.	n.a.	35	35.05	65	53.93%						
	Annual	0.00	WIND RIVER CANYON	n.a.	n.a.	10	10.00	15	66.69%						
Maximum					2.70%				66.69%						

**Appendix A5
Summary of Results
Proposed Action Post Construction**

BRIDGER		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.53E-03	552	-36.775	8.558
	3-hour	4.05E-05	551	-37.071	6.367
	24-hour	1.02E-05	552	-36.775	8.558
PM10	Annual	2.68E-07	552	-36.775	8.558
	24-hour	2.51E-03	552	-36.775	8.558
PM25	Annual	7.11E-05	552	-36.775	8.558
	24-hour	6.66E-03	552	-36.775	8.558
	Annual	1.94E-04	552	-36.775	8.558
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.30E-06	552	-36.775	8.558
	Annual	5.31E-10	552	-36.775	8.558
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.118	0.108		
	Day of Largest delta dV	179	179		
	Largest delta dV Receptor	563	563		
	Total dV	4.552	5.365		
	dV Background	4.434	5.257		
	% Ext by SO4	0.00	0.00		
	% Ext by NO3	97.79	97.79		
	% Ext by PM10	0.44	0.44		
	% Ext by PM2.5	1.76	1.76		
CLOUD PEAK		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.95E-03	970	91.692	194.842
	3-hour	2.04E-05	970	91.692	194.842
	24-hour	7.43E-06	970	91.692	194.842
PM10	Annual	3.54E-07	970	91.692	194.842
	24-hour	3.37E-03	970	91.692	194.842
PM25	Annual	1.34E-04	970	91.692	194.842
	24-hour	9.98E-03	970	91.692	194.842
	Annual	3.99E-04	970	91.692	194.842
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	5.55E-06	980	107.363	178.642
	Annual	5.76E-10	980	107.363	178.642
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.103	0.114		
	Day of Largest delta dV	25	25		
	Largest delta dV Receptor	953	953		
	Total dV	4.765	3.703		
	dV Background	4.662	3.588		
	% Ext by SO4	0.01	0.01		
	% Ext by NO3	93.66	93.66		
	% Ext by PM10	0.94	0.94		
	% Ext by PM2.5	5.40	5.40		

**Appendix A5
Summary of Results
Proposed Action Post Construction**

FITZPATRICK		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.40E-04	727	-71.232	89.283
	3-hour	2.35E-05	726	-71.161	86.048
	24-hour	9.19E-06	727	-71.232	89.283
SO2	Annual	1.13E-07	726	-71.161	86.048
	24-hour	2.04E-03	722	-71.304	70.023
PM10	Annual	2.94E-05	727	-71.232	89.283
	24-hour	5.50E-03	726	-71.161	86.048
PM25	Annual	9.26E-05	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.92E-06	716	-71.592	46.301
	Annual	2.24E-10	722	-71.304	70.023
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.061	0.057		
	Day of Largest delta dV	179	179		
	Largest delta dV Receptor	719	719		
	Total dV	4.495	5.313		
	dV Background	4.434	5.257		
	% Ext by SO4	0.00	0.00		
	% Ext by NO3	98.22	98.22		
	% Ext by PM10	0.37	0.37		
	% Ext by PM2.5	1.41	1.41		
NORTH ABSAROKA		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.21E-04	807	-75.265	208.495
	3-hour	3.65E-06	801	-85.971	207.754
	24-hour	7.89E-07	807	-75.265	208.495
SO2	Annual	2.36E-08	807	-75.265	208.495
	24-hour	4.12E-04	807	-75.265	208.495
PM10	Annual	1.07E-05	807	-75.265	208.495
	24-hour	9.52E-04	807	-75.265	208.495
PM25	Annual	2.73E-05	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	5.67E-07	807	-75.265	208.495
	Annual	6.35E-11	807	-75.265	208.495
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.037	0.036		
	Day of Largest delta dV	118	118		
	Largest delta dV Receptor	833	833		
	Total dV	4.586	4.971		
	dV Background	4.549	4.935		
	% Ext by SO4	0.00	0.00		
	% Ext by NO3	98.84	98.84		
	% Ext by PM10	0.16	0.16		
	% Ext by PM2.5	1.00	1.00		

**Appendix A5
Summary of Results
Proposed Action Post Construction**

OWL CREEK		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.09E-02	1107	6.423	97.676
	3-hour	1.79E-04	1107	6.423	97.676
	24-hour	6.71E-05	1107	6.423	97.676
SO2	Annual	3.86E-06	1107	6.423	97.676
	24-hour	3.74E-02	1107	6.423	97.676
PM10	Annual	1.29E-03	1107	6.423	97.676
	24-hour	6.31E-02	1107	6.423	97.676
PM25	Annual	2.00E-03	1107	6.423	97.676
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.59E-05	1107	6.423	97.676
	S	3.25E-09	1107	6.423	97.676
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	1	1		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.656	0.758		
	Day of Largest delta dV	24	24		
	Largest delta dV Receptor	1107	1107		
	Total dV	5.356	3.965		
	dV Background	4.700	3.207		
	% Ext by SO4	0.00	0.00		
	% Ext by NO3	92.11	92.11		
	% Ext by PM10	2.07	2.07		
	% Ext by PM2.5	5.82	5.82		
POPO AGIE		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.51E-03	890	-29.797	13.249
	3-hour	7.11E-05	893	-28.587	7.395
	24-hour	1.36E-05	887	-32.313	17.943
SO2	Annual	4.40E-07	886	-33.377	20.749
	24-hour	3.48E-03	890	-29.797	13.249
PM10	Annual	1.16E-04	889	-30.862	15.475
	24-hour	9.67E-03	890	-29.797	13.249
PM25	Annual	3.16E-04	889	-30.862	15.475
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.19E-06	886	-33.377	20.749
	S	8.71E-10	886	-33.377	20.749
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.128	0.116		
	Day of Largest delta dV	106	106		
	Largest delta dV Receptor	889	889		
	Total dV	4.677	5.675		
	dV Background	4.549	5.559		
	% Ext by SO4	0.00	0.00		
	% Ext by NO3	97.81	97.81		
	% Ext by PM10	0.53	0.53		
	% Ext by PM2.5	1.66	1.66		

**Appendix A5
Summary of Results
Proposed Action Post Construction**

PHLOX MOUNTAIN		PC - Proposed Action Post Construction																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	1.87E-03	1140	-17.128	113.192																
	3-hour	1.97E-05	1140	-17.128	113.192																
	24-hour	6.46E-06	1140	-17.128	113.192																
PM10	Annual	3.31E-07	1140	-17.128	113.192																
	24-hour	2.82E-03	1140	-17.128	113.192																
PM25	Annual	1.26E-04	1140	-17.128	113.192																
	24-hour	5.45E-03	1140	-17.128	113.192																
	Annual	2.42E-04	1140	-17.128	113.192																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	3.41E-06	1140	-17.128	113.192																
	S	Annual	4.48E-10	1140	-17.128	113.192															
VISIBILITY		FLAG	IMPROVE																		
	Days delta dV >0.50	0	0																		
	Days delta dV >1.00	0	0																		
	Largest delta dV	0.105	0.116																		
	Day of Largest delta dV	117	42																		
	Largest delta dV Receptor	1140	1140																		
	Total dV	4.654	3.199																		
	dV Background	4.549	3.084																		
	% Ext by SO4	0.01	0.00																		
	% Ext by NO3	97.55	95.50																		
	% Ext by PM10	0.69	1.06																		
	% Ext by PM2.5	1.76	3.43																		
TETON NATIONAL PARK		PC - Proposed Action Post Construction																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	5.22E-05	664	-146.201	133.488																
	3-hour	1.85E-06	672	-158.695	119.057																
	24-hour	5.44E-07	671	-158.847	122.893																
PM10	Annual	1.11E-08	664	-146.201	133.488																
	24-hour	2.41E-04	748	-146.000	140.000																
PM25	Annual	3.73E-06	739	-146.000	136.000																
	24-hour	5.73E-04	748	-146.000	140.000																
	Annual	1.11E-05	748	-146.000	140.000																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	4.12E-07	678	-171.607	111.139																
	S	Annual	3.97E-11	678	-171.607	111.139															
VISIBILITY		FLAG	IMPROVE																		
	Days delta dV >0.50	0	0																		
	Days delta dV >1.00	0	0																		
	Largest delta dV	0.016	0.014																		
	Day of Largest delta dV	107	107																		
	Largest delta dV Receptor	748	748																		
	Total dV	4.565	5.717																		
	dV Background	4.549	5.703																		
	% Ext by SO4	0.00	0.00																		
	% Ext by NO3	99.18	99.16																		
	% Ext by PM10	0.14	0.14																		
	% Ext by PM2.5	0.68	0.68																		

**Appendix A5
Summary of Results
Proposed Action Post Construction**

TETON WILDERNESS AREA		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.39E-04	57	-91.325	162.181
	3-hour	3.74E-06	56	-94.105	159.156
	24-hour	9.65E-07	50	-98.438	141.823
SO2	Annual	2.76E-08	57	-91.325	162.181
	24-hour	6.94E-04	50	-98.438	141.823
PM10	Annual	1.15E-05	57	-91.325	162.181
	24-hour	1.35E-03	50	-98.438	141.823
PM25	Annual	3.03E-05	57	-91.325	162.181
	24-hour				
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.11E-07	50	-98.438	141.823
	Annual	5.92E-11	57	-91.325	162.181
S	Annual				
	Annual				
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.023	0.024		
	Day of Largest delta dV	43	43		
	Largest delta dV Receptor	206	206		
	Total dV	4.648	4.445		
	dV Background	4.625	4.422		
	% Ext by SO4	0.00	0.00		
	% Ext by NO3	96.96	96.95		
	% Ext by PM10	0.58	0.58		
	% Ext by PM2.5	2.46	2.46		
WASHAKIE		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	4.44E-04	294	-47.084	127.086
	3-hour	9.05E-06	293	-48.044	127.086
	24-hour	3.62E-06	294	-47.084	127.086
SO2	Annual	8.43E-08	294	-47.084	127.086
	24-hour	1.38E-03	293	-48.044	127.086
PM10	Annual	3.30E-05	298	-40.129	137.459
	24-hour	2.50E-03	294	-47.084	127.086
PM25	Annual	7.79E-05	294	-47.084	127.086
	24-hour				
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.62E-06	294	-47.084	127.086
	Annual	1.62E-10	298	-40.129	137.459
S	Annual				
	Annual				
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.064	0.062		
	Day of Largest delta dV	117	117		
	Largest delta dV Receptor	298	298		
	Total dV	4.613	4.997		
	dV Background	4.549	4.935		
	% Ext by SO4	0.01	0.01		
	% Ext by NO3	98.41	98.40		
	% Ext by PM10	0.32	0.32		
	% Ext by PM2.5	1.27	1.27		

**Appendix A5
Summary of Results
Proposed Action Post Construction**

WIND RIVER CANYON		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.29E-01	1077	29.190	92.365
	3-hour	5.10E-04	1076	27.022	94.149
	24-hour	1.06E-04	1076	27.022	94.149
SO2	Annual	1.08E-05	1076	27.022	94.149
	24-hour	9.99E-02	1076	27.022	94.149
PM10	Annual	7.28E-03	1077	29.190	92.365
	24-hour	1.24E-01	1076	27.022	94.149
PM25	Annual	1.10E-02	1077	29.190	92.365
	24-hour	1.10E-02	1077	29.190	92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.75E-05	1078	31.661	93.381
	Annual	9.32E-09	1076	27.022	94.149
S	Annual	9.32E-09	1076	27.022	94.149
	Annual	9.32E-09	1076	27.022	94.149
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		3	4		
Days delta dV >1.00		0	0		
Largest delta dV		0.671	0.775		
Day of Largest delta dV		4	4		
Largest delta dV Receptor		1076	1076		
Total dV		5.371	3.982		
dV Background		4.700	3.207		
% Ext by SO4		0.00	0.00		
% Ext by NO3		83.44	83.44		
% Ext by PM10		5.40	5.40		
% Ext by PM2.5		11.16	11.16		
WIND RIVER ROADLESS		PC - Proposed Action Post Construction			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.00E-03	821	-40.795	43.233
	3-hour	4.28E-05	819	-40.580	37.986
	24-hour	1.20E-05	786	-49.853	59.119
SO2	Annual	3.77E-07	820	-40.723	41.939
	24-hour	5.82E-03	786	-49.853	59.119
PM10	Annual	1.00E-04	821	-40.795	43.233
	24-hour	8.38E-03	821	-40.795	43.233
PM25	Annual	2.57E-04	821	-40.795	43.233
	24-hour	2.57E-04	821	-40.795	43.233
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	5.01E-06	818	-40.580	34.535
	Annual	6.18E-10	818	-40.580	34.535
S	Annual	6.18E-10	818	-40.580	34.535
	Annual	6.18E-10	818	-40.580	34.535
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.109	0.101		
Day of Largest delta dV		179	179		
Largest delta dV Receptor		814	814		
Total dV		4.543	5.357		
dV Background		4.434	5.257		
% Ext by SO4		0.00	0.00		
% Ext by NO3		97.89	97.89		
% Ext by PM10		0.45	0.45		
% Ext by PM2.5		1.66	1.66		

**Appendix A5
Summary of Results
Proposed Action Post Construction**

YELLOWSTONE NATL PARK		PC - Proposed Action Post Construction																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	8.38E-05	109	-112.113	171.051														
	3-hour	3.17E-06	280	-116.000	202.000														
	24-hour	7.15E-07	109	-112.113	171.051														
SO2	Annual	1.76E-08	81	-111.735	191.428														
	24-hour	5.29E-04	109	-112.113	171.051														
PM10	Annual	7.23E-06	109	-112.113	171.051														
	24-hour	1.08E-03	109	-112.113	171.051														
PM25	Annual	1.97E-05	109	-112.113	171.051														
	24-hour																		
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	4.56E-07	94	-100.017	229.175														
S	Annual	5.44E-11	84	-111.530	206.041														
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50	0	0																
	Days delta dV >1.00	0	0																
	Largest delta dV	0.036	0.032																
	Day of Largest delta dV	118	118																
	Largest delta dV Receptor	97	97																
	Total dV	4.584	5.734																
	dV Background	4.549	5.703																
	% Ext by SO4	0.00	0.00																
	% Ext by NO3	98.79	98.79																
	% Ext by PM10	0.16	0.16																
	% Ext by PM2.5	1.05	1.05																

**Appendix A5
Summary of Results
Proposed Action Post Construction**

<i>Visibility Summary</i>		PC - Proposed Action Post Construction																
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions														
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV												
Bridger	0	0	0.12	0	0	0.11												
Cloud Peak	0	0	0.10	0	0	0.11												
Fitzpatrick	0	0	0.06	0	0	0.06												
North Absaroka	0	0	0.04	0	0	0.04												
Owl Creek	1	0	0.66	1	0	0.76												
Popo Agie	0	0	0.13	0	0	0.12												
Phlox Mountain	0	0	0.11	0	0	0.12												
Teton NP	0	0	0.02	0	0	0.01												
Teton Wilderness	0	0	0.02	0	0	0.02												
Washakie	0	0	0.06	0	0	0.06												
Wind River Canyon	3	0	0.67	4	0	0.78												
Wind River Roadless	0	0	0.11	0	0	0.10												
Yellowstone NP	0	0	0.04	0	0	0.03												
Total Days / Max Δ dV	4	0	0.67	5	0	0.78												

**Appendix A5
Summary of Results
Proposed Action Post Construction**

LAKES		PC - Proposed Action Post Construction																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.30E-06	1141	-49.183	20.543															
	S	3.65E-10	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.25E-06	1142	-49.178	18.394															
	S	3.59E-10	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.00E-06	1143	95.779	205.602															
	S	4.32E-10	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.53E-06	1144	105.440	193.981															
	S	4.57E-10	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.30E-06	1145	-88.417	52.778															
	S	1.52E-10	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.44E-06	1146	-35.219	7.97															
	S	5.57E-10	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.19E-06	1147	-86.813	89.541															
	S	1.19E-10	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.26E-06	1148	-48.413	14.897															
	S	3.59E-10	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.52E-07	1149	-96.935	275.159															
	S	2.89E-11	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	2.67E-07	1150	-95.471	271.528															
	S	3.06E-11	1150	-95.471	271.528															

**Appendix A5
Summary of Results
Proposed Action Post Construction**

ANC Impacts to High Elevation Lakes		PC - Proposed Action Post Construction																		
High Elevation		Inputs																		
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)															
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition Rate															
	ANC (A)	(P)	Area	Rate	Rate															
	(µg/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)															
Black Joe Lake	67.0	0.925	890	3.30E-06	3.65E-10															
Deep Lake	59.9	0.925	205	3.25E-06	3.59E-10															
Emerald Lake	69.8	0.780	293	4.00E-06	4.32E-10															
Florence Lake	33.0	0.780	417	4.53E-06	4.57E-10															
Hobbs Lake	69.9	1.080	293	1.30E-06	1.52E-10															
Lower Saddlebag	55.5	1.000	155	4.44E-06	5.57E-10															
Ross Lake	53.5	1.080	4455	1.19E-06	1.19E-10															
Stepping Stone Lake	19.9	1.460	26	2.52E-07	2.89E-11															
Twin Island Lake	17.6	1.300	45	2.67E-07	3.06E-11															
Upper Frozen Lake	5.0	0.925	65	3.26E-06	3.59E-10															
High Elevation		Intermediate Calculated Values					Results													
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent												
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC												
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change												
Black Joe Lake	1.04E-03	1.15E-07	3.70E+05	7.42E-06	7.19E-10	6.61E+01	0.01	0.02%												
Deep Lake	1.03E-03	1.13E-07	7.61E+04	7.33E-06	7.08E-10	1.50E+01	0.01	0.02%												
Emerald Lake	1.26E-03	1.36E-07	1.07E+05	9.00E-06	8.51E-10	2.64E+01	0.02	0.02%												
Florence Lake	1.43E-03	1.44E-07	7.19E+04	1.02E-05	9.00E-10	4.25E+01	0.02	0.06%												
Hobbs Lake	4.09E-04	4.79E-08	1.48E+05	2.92E-06	2.99E-10	8.57E+00	0.00	0.01%												
Lower Saddlebag	1.40E-03	1.76E-07	5.76E+04	1.00E-05	1.10E-09	1.55E+01	0.01	0.03%												
Ross Lake	3.75E-04	3.75E-08	1.72E+06	2.68E-06	2.34E-10	1.19E+02	0.00	0.01%												
Stepping Stone Lake	7.96E-05	9.11E-09	5.14E+03	5.69E-07	5.69E-11	1.50E-01	0.00	0.00%												
Twin Island Lake	8.41E-05	9.64E-09	6.88E+03	6.01E-07	6.03E-11	2.70E-01	0.00	0.00%												
Upper Frozen Lake	1.03E-03	1.13E-07	2.01E+03	7.34E-06	7.07E-10	4.76E+00	0.01	0.24%												
Maximum							0.02	0.24%												
NOTE: Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.																				
Baseline ANC values calculated from summarized data provided by the Forest Service.																				
ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																				
Annual precipitation and watershed catchments values provided by the Forest Service.																				

**Appendix A5
Summary of Results
Proposed Action Post Construction**

Terrestrial Acid Deposition Summary								PC - Proposed Action Post Construction							
Incremental Analysis															
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT								
Bridger	4.30E-06	5.31E-10	0.00135	0.00000	0.005	27.1%	0.0%								
Cloud Peak	5.55E-06	5.76E-10	0.00175	0.00000	0.005	35.0%	0.0%								
Fitzpatrick	1.92E-06	2.24E-10	0.00061	0.00000	0.005	12.1%	0.0%								
North Absaroka	5.67E-07	6.35E-11	0.00018	0.00000	0.005	3.6%	0.0%								
Owl Creek Range	1.59E-05	3.25E-09	0.00501	0.00000	0.005	100.2%	0.0%								
Popo Agie	6.19E-06	8.71E-10	0.00195	0.00000	0.005	39.0%	0.0%								
Phlox Mountain	3.41E-06	4.48E-10	0.00108	0.00000	0.005	21.5%	0.0%								
Teton NP	4.12E-07	3.97E-11	0.00013	0.00000	0.005	2.6%	0.0%								
Teton Wilderness	6.11E-07	5.92E-11	0.00019	0.00000	0.005	3.9%	0.0%								
Washakie Wilderness	1.62E-06	1.62E-10	0.00051	0.00000	0.005	10.2%	0.0%								
Wind River Canyon	6.75E-05	9.32E-09	0.02130	0.00000	0.005	426.0%	0.1%								
Wind River Roadless	5.01E-06	6.18E-10	0.00158	0.00000	0.005	31.6%	0.0%								
Yellowstone NP	4.56E-07	5.44E-11	0.00014	0.00000	0.005	2.9%	0.0%								
Maximum	6.75E-05	9.32E-09	0.02130	0.00000	0.005	426.0%	0.1%								
NOTE: DAT for Western Class I areas from National Park Service (2003).															
Cumulative Analysis															
Nitrogen Deposition															
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts										
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"							
Bridger	4.30E-06	1.35E-03	1.3	1.3	3.0	10.0	43.4%	13.0%							
Cloud Peak	5.55E-06	1.75E-03	1.3	1.3	3.0	10.0	43.4%	13.0%							
Fitzpatrick	1.92E-06	6.06E-04	1.3	1.3	3.0	10.0	43.4%	13.0%							
North Absaroka	5.67E-07	1.79E-04	1.1	1.1	3.0	10.0	36.7%	11.0%							
Owl Creek Range	1.59E-05	5.01E-03	1.3	1.3	3.0	10.0	43.5%	13.1%							
Popo Agie	6.19E-06	1.95E-03	1.3	1.3	3.0	10.0	43.4%	13.0%							
Phlox Mountain	3.41E-06	1.08E-03	1.3	1.3	3.0	10.0	43.4%	13.0%							
Teton NP	4.12E-07	1.30E-04	1.1	1.1	3.0	10.0	36.7%	11.0%							
Teton Wilderness	6.11E-07	1.93E-04	1.1	1.1	3.0	10.0	36.7%	11.0%							
Washakie Wilderness	1.62E-06	5.10E-04	1.1	1.1	3.0	10.0	36.7%	11.0%							
Wind River Canyon	6.75E-05	2.13E-02	1.3	1.3	3.0	10.0	44.0%	13.2%							
Wind River Roadless	5.01E-06	1.58E-03	1.3	1.3	3.0	10.0	43.4%	13.0%							
Yellowstone NP	4.56E-07	1.44E-04	1.1	1.1	3.0	10.0	36.7%	11.0%							
Maximum	6.75E-05	2.13E-02	1.3	1.3	3.0	10.0	44.0%	13.2%							
Sulfur Deposition															
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts										
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"							
Bridger	5.31E-10	1.67E-07	1.1	1.1	5.0	20.0	22.0%	5.5%							
Cloud Peak	5.76E-10	1.82E-07	1.1	1.1	5.0	20.0	22.0%	5.5%							
Fitzpatrick	2.24E-10	7.07E-08	1.1	1.1	5.0	20.0	22.0%	5.5%							
North Absaroka	6.35E-11	2.00E-08	0.9	0.9	5.0	20.0	18.0%	4.5%							
Owl Creek Range	3.25E-09	1.02E-06	1.1	1.1	5.0	20.0	22.0%	5.5%							
Popo Agie	8.71E-10	2.75E-07	1.1	1.1	5.0	20.0	22.0%	5.5%							
Phlox Mountain	4.48E-10	1.41E-07	1.1	1.1	5.0	20.0	22.0%	5.5%							
Teton NP	3.97E-11	1.25E-08	0.9	0.9	5.0	20.0	18.0%	4.5%							
Teton Wilderness	5.92E-11	1.87E-08	0.9	0.9	5.0	20.0	18.0%	4.5%							
Washakie Wilderness	1.62E-10	5.10E-08	0.9	0.9	5.0	20.0	18.0%	4.5%							
Wind River Canyon	9.32E-09	2.94E-06	1.1	1.1	5.0	20.0	22.0%	5.5%							
Wind River Roadless	6.18E-10	1.95E-07	1.1	1.1	5.0	20.0	22.0%	5.5%							
Yellowstone NP	5.44E-11	1.72E-08	0.9	0.9	5.0	20.0	18.0%	4.5%							
Maximum	9.32E-09	2.94E-06	1.1	1.1	5.0	20.0	22.0%	5.5%							
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.															
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.															
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).															

**Appendix A5
Summary of Results
Proposed Action Post Construction**

Ambient Impact Summary		PC - Proposed Action Post Construction												
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQs Standard (ug/m3)	Impact % of WAAQS/NAAQs					
NO2	Annual	0.13	WIND RIVER CANYON	2.5	5.14%	3.4	3.53	100	3.53%					
SO2	3-hour	0.00	WIND RIVER CANYON	25	0.00%	132	132.00	1300	10.15%					
	24-hour	0.00	WIND RIVER CANYON	5	0.00%	43	43.00	260	16.54%					
PM10	Annual	0.00	WIND RIVER CANYON	2	0.00%	9	9.00	60	15.00%					
	24-hour	0.10	WIND RIVER CANYON	8	1.25%	61	61.10	150	40.73%					
PM25	Annual	0.01	WIND RIVER CANYON	4	0.18%	22	22.01	50	44.01%					
	24-hour	0.12	WIND RIVER CANYON	n.a.	n.a.	35	35.12	65	54.04%					
Maximum	Annual	0.01	WIND RIVER CANYON	n.a.	n.a.	10	10.01	15	66.74%					
					5.14%				66.74%					

**Appendix A6
Summary of Results
Existing Project Sources**

BRIDGER		EX - Existing Project Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.40E-03	552	-36.775	8.558
	3-hour	4.87E-05	551	-37.071	6.367
	24-hour	1.42E-05	552	-36.775	8.558
SO2	Annual	3.45E-07	552	-36.775	8.558
	24-hour	2.48E-02	552	-36.775	8.558
	Annual	4.63E-04	552	-36.775	8.558
PM10	24-hour	1.07E-02	554	-40.091	11.815
	Annual	2.47E-04	552	-36.775	8.558
	Annual	2.47E-04	552	-36.775	8.558
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	8.51E-06	552	-36.775	8.558
S	Annual	6.63E-10	552	-36.775	8.558
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.224	0.250		
Day of Largest delta dV		305	305		
Largest delta dV Receptor		552	552		
Total dV		4.917	3.830		
dV Background		4.692	3.579		
% Ext by SO4		0.00	0.00		
% Ext by NO3		92.94	92.94		
% Ext by PM10		4.11	4.11		
% Ext by PM2.5		2.95	2.95		
CLOUD PEAK		EX - Existing Project Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	4.62E-03	970	91.692	194.842
	3-hour	2.62E-05	980	107.363	178.642
	24-hour	8.43E-06	970	91.692	194.842
SO2	Annual	4.15E-07	970	91.692	194.842
	24-hour	1.03E-02	970	91.692	194.842
	Annual	4.87E-04	970	91.692	194.842
PM10	24-hour	6.88E-03	970	91.692	194.842
	Annual	3.17E-04	970	91.692	194.842
	Annual	3.17E-04	970	91.692	194.842
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	8.46E-06	980	107.363	178.642
S	Annual	6.72E-10	980	107.363	178.642
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.153	0.172		
Day of Largest delta dV		46	46		
Largest delta dV Receptor		975	975		
Total dV		4.740	3.606		
dV Background		4.587	3.435		
% Ext by SO4		0.00	0.00		
% Ext by NO3		98.86	95.85		
% Ext by PM10		2.03	2.03		
% Ext by PM2.5		2.11	2.11		

**Appendix A6
Summary of Results
Existing Project Sources**

FITZPATRICK		EX - Existing Project Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	1.36E-03	727	-71.232	89.283														
	3-hour	2.99E-05	727	-71.232	89.283														
	24-hour	1.17E-05	727	-71.232	89.283														
PM10	Annual	1.43E-07	726	-71.161	86.048														
	24-hour	1.58E-02	722	-71.304	70.023														
	Annual	1.76E-04	723	-71.232	73.900														
PM25	24-hour	1.04E-02	727	-71.232	89.283														
	Annual	1.19E-04	727	-71.232	89.283														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	4.05E-06	716	-71.592	46.301														
S	Annual	2.81E-10	722	-71.304	70.023														
VISIBILITY		FLAG	IMPROVE																
Days delta dV >0.50		0	0																
Days delta dV >1.00		0	0																
Largest delta dV		0.143	0.132																
Day of Largest delta dV		179	179																
Largest delta dV Receptor		719	719																
Total dV		4.577	5.388																
dV Background		4.434	5.257																
% Ext by SO4		0.00	0.00																
% Ext by NO3		98.26	98.26																
% Ext by PM10		1.06	1.06																
% Ext by PM2.5		0.68	0.68																
NORTH ABSAROKA		EX - Existing Project Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	2.17E-04	807	-75.265	208.495														
	3-hour	4.62E-06	801	-85.971	207.754														
	24-hour	8.87E-07	807	-75.265	208.495														
PM10	Annual	2.87E-08	807	-75.265	208.495														
	24-hour	1.53E-03	843	-120.223	208.073														
	Annual	4.51E-05	807	-75.265	208.495														
PM25	24-hour	6.99E-04	843	-120.223	208.073														
	Annual	2.54E-05	807	-75.265	208.495														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	1.00E-06	806	-77.983	208.413														
S	Annual	7.67E-11	807	-75.265	208.495														
VISIBILITY		FLAG	IMPROVE																
Days delta dV >0.50		0	0																
Days delta dV >1.00		0	0																
Largest delta dV		0.059	0.057																
Day of Largest delta dV		118	118																
Largest delta dV Receptor		834	834																
Total dV		4.608	4.992																
dV Background		4.549	4.935																
% Ext by SO4		0.00	0.00																
% Ext by NO3		99.23	99.22																
% Ext by PM10		0.32	0.32																
% Ext by PM2.5		0.45	0.45																

**Appendix A6
Summary of Results
Existing Project Sources**

OWL CREEK		EX - Existing Project Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	4.17E-02	1107	6.423	97.676														
	3-hour	3.66E-04	1123	6.000	100.000														
	24-hour	1.03E-04	1108	3.634	96.926														
PM10	Annual	5.64E-06	1107	6.423	97.676														
	24-hour	1.41E-01	1108	3.634	96.926														
	Annual	9.29E-03	1107	6.423	97.676														
PM25	24-hour	6.02E-02	1108	3.634	96.926														
	Annual	3.55E-03	1107	6.423	97.676														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	3.12E-05	1107	6.423	97.676														
S	Annual	4.68E-09	1107	6.423	97.676														
VISIBILITY		FLAG	IMPROVE																
Days delta dV >0.50		1	2																
Days delta dV >1.00		0	1																
Largest delta dV		0.958	1.104																
Day of Largest delta dV		15	15																
Largest delta dV Receptor		1107	1107																
Total dV		5.658	4.311																
dV Background		4.700	3.207																
% Ext by SO4		0.00	0.00																
% Ext by NO3		92.61	92.61																
% Ext by PM10		3.77	3.77																
% Ext by PM2.5		3.62	3.62																
POPO AGIE		EX - Existing Project Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	5.62E-03	889	-30.862	15.475														
	3-hour	1.12E-04	893	-28.587	7.395														
	24-hour	1.90E-05	887	-32.313	17.943														
PM10	Annual	5.71E-07	886	-33.377	20.749														
	24-hour	3.11E-02	887	-32.313	17.943														
	Annual	7.89E-04	886	-33.377	20.749														
PM25	24-hour	1.59E-02	886	-33.377	20.749														
	Annual	4.24E-04	886	-33.377	20.749														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	1.27E-05	886	-33.377	20.749														
S	Annual	1.11E-09	886	-33.377	20.749														
VISIBILITY		FLAG	IMPROVE																
Days delta dV >0.50		0	0																
Days delta dV >1.00		0	0																
Largest delta dV		0.296	0.331																
Day of Largest delta dV		305	305																
Largest delta dV Receptor		889	889																
Total dV		4.989	3.910																
dV Background		4.692	3.579																
% Ext by SO4		0.00	0.00																
% Ext by NO3		93.18	93.18																
% Ext by PM10		3.80	3.80																
% Ext by PM2.5		3.02	3.02																

**Appendix A6
Summary of Results
Existing Project Sources**

PHLOX MOUNTAIN		EX - Existing Project Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.89E-03	1140	-17.128	113.192
	3-hour	2.51E-05	1140	-17.128	113.192
SO2	24-hour	8.93E-06	1140	-17.128	113.192
	Annual	4.30E-07	1140	-17.128	113.192
PM10	24-hour	1.33E-02	1140	-17.128	113.192
	Annual	7.44E-04	1140	-17.128	113.192
PM25	24-hour	7.54E-03	1140	-17.128	113.192
	Annual	3.19E-04	1140	-17.128	113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.86E-06	1140	-17.128	113.192
S	Annual	5.85E-10	1140	-17.128	113.192
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.212	0.219		
Day of Largest delta dV		117	42		
Largest delta dV Receptor		1140	1140		
Total dV		4.761	3.303		
dV Background		4.549	3.084		
% Ext by SO4		0.00	0.00		
% Ext by NO3		97.34	95.90		
% Ext by PM10		1.79	2.30		
% Ext by PM2.5		0.86	1.80		
JETON NATIONAL PARK		EX - Existing Project Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.13E-04	664	-146.201	133.488
	3-hour	2.34E-06	667	-156.189	132.197
SO2	24-hour	6.64E-07	671	-158.847	122.893
	Annual	1.39E-08	664	-146.201	133.488
PM10	24-hour	9.96E-04	658	-148.897	150.012
	Annual	1.89E-05	739	-146.000	136.000
PM25	24-hour	6.43E-04	664	-146.201	133.488
	Annual	1.12E-05	664	-146.201	133.488
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	7.84E-07	678	-171.607	111.139
S	Annual	4.91E-11	690	-186.077	118.430
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.031	0.027		
Day of Largest delta dV		107	107		
Largest delta dV Receptor		658	658		
Total dV		4.580	5.730		
dV Background		4.549	5.703		
% Ext by SO4		0.00	0.00		
% Ext by NO3		99.48	99.47		
% Ext by PM10		0.26	0.26		
% Ext by PM2.5		0.27	0.27		

**Appendix A6
Summary of Results
Existing Project Sources**

TETON WILDERNESS AREA		EX - Existing Project Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	2.86E-04	57	-91.325	162.181														
	3-hour	5.26E-06	56	-94.105	159.156														
	24-hour	1.17E-06	50	-98.438	141.823														
PM10	Annual	3.39E-08	57	-91.325	162.181														
	24-hour	2.93E-03	50	-98.438	141.823														
	Annual	5.43E-05	57	-91.325	162.181														
PM25	24-hour	1.24E-03	50	-98.438	141.823														
	Annual	3.00E-05	57	-91.325	162.181														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	1.01E-06	50	-98.438	141.823														
S	Annual	6.99E-11	206	-94.000	178.000														
VISIBILITY		FLAG	IMPROVE																
Days delta dV >0.50		0	0																
Days delta dV >1.00		0	0																
Largest delta dV		0.045	0.040																
Day of Largest delta dV		107	107																
Largest delta dV Receptor		206	206																
Total dV		4.594	5.743																
dV Background		4.549	5.703																
% Ext by SO4		0.00	0.00																
% Ext by NO3		99.26	99.26																
% Ext by PM10		0.35	0.35																
% Ext by PM2.5		0.38	0.38																
WASHAKIE		EX - Existing Project Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	8.57E-04	294	-47.084	127.086														
	3-hour	1.22E-05	293	-48.044	127.086														
	24-hour	4.67E-06	294	-47.084	127.086														
PM10	Annual	1.08E-07	294	-47.084	127.086														
	24-hour	5.08E-03	294	-47.084	127.086														
	Annual	1.63E-04	294	-47.084	127.086														
PM25	24-hour	3.88E-03	294	-47.084	127.086														
	Annual	9.01E-05	294	-47.084	127.086														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	2.80E-06	294	-47.084	127.086														
S	Annual	1.92E-10	298	-40.129	137.459														
VISIBILITY		FLAG	IMPROVE																
Days delta dV >0.50		0	0																
Days delta dV >1.00		0	0																
Largest delta dV		0.118	0.114																
Day of Largest delta dV		117	117																
Largest delta dV Receptor		298	298																
Total dV		4.667	5.049																
dV Background		4.549	4.935																
% Ext by SO4		0.00	0.00																
% Ext by NO3		98.46	98.46																
% Ext by PM10		0.88	0.88																
% Ext by PM2.5		0.66	0.66																

**Appendix A6
Summary of Results
Existing Project Sources**

WIND RIVER CANYON		EX - Existing Project Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.28E-01	1076	27.022	94.149
	3-hour	5.89E-04	1076	27.022	94.149
	24-hour	1.07E-04	1076	27.022	94.149
PM10	Annual	1.01E-05	1076	27.022	94.149
	24-hour	2.06E-01	1076	27.022	94.149
	Annual	1.76E-02	1076	27.022	94.149
PM25	24-hour	6.06E-02	1076	27.022	94.149
	Annual	6.06E-03	1076	27.022	94.149
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	7.70E-05	1076	27.022	94.149
S	Annual	8.86E-09	1076	27.022	94.149
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		4	8		
Days delta dV >1.00		0	0		
Largest delta dV		0.702	0.811		
Day of Largest delta dV		25	25		
Largest delta dV Receptor		1076	1076		
Total dV		5.402	4.018		
dV Background		4.700	3.207		
% Ext by SO4		0.00	0.00		
% Ext by NO3		96.67	96.67		
% Ext by PM10		1.81	1.81		
% Ext by PM2.5		1.52	1.52		
WIND RIVER ROADLESS		EX - Existing Project Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	4.47E-03	820	-40.723	41.939
	3-hour	6.37E-05	818	-40.580	34.535
	24-hour	1.30E-05	818	-40.580	34.535
PM10	Annual	4.96E-07	820	-40.723	41.939
	24-hour	2.68E-02	786	-49.853	59.119
	Annual	6.79E-04	821	-40.795	43.233
PM25	24-hour	1.06E-02	818	-40.580	34.535
	Annual	3.62E-04	820	-40.723	41.939
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.10E-05	819	-40.580	37.986
S	Annual	8.02E-10	819	-40.580	37.986
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		0	0		
Days delta dV >1.00		0	0		
Largest delta dV		0.277	0.251		
Day of Largest delta dV		142	142		
Largest delta dV Receptor		821	821		
Total dV		4.826	5.810		
dV Background		4.549	5.559		
% Ext by SO4		0.00	0.00		
% Ext by NO3		97.71	97.71		
% Ext by PM10		1.28	1.28		
% Ext by PM2.5		1.01	1.01		

**Appendix A6
Summary of Results
Existing Project Sources**

YELLOWSTONE NATL PARK		EX - Existing Project Sources																		
Pollutant Concentrations		(ug/m3)		Receptor																
NO2	Annual	1.69E-04	109	-112.113	171.051															
SO2	3-hour	3.74E-06	280	-116.000	202.000															
	24-hour	8.35E-07	109	-112.113	171.051															
	Annual	2.16E-08	109	-112.113	171.051															
PM10	24-hour	2.14E-03	109	-112.113	171.051															
	Annual	3.42E-05	109	-112.113	171.051															
PM25	24-hour	9.39E-04	109	-112.113	171.051															
	Annual	1.91E-05	109	-112.113	171.051															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor																
N	Annual	7.84E-07	84	-111.530	206.041															
S	Annual	6.53E-11	84	-111.530	206.041															
VISIBILITY		FLAG		IMPROVE																
	Days delta dV >0.50	0		0																
	Days delta dV >1.00	0		0																
	Largest delta dV	0.057		0.051																
	Day of Largest delta dV	118		118																
	Largest delta dV Receptor	104		104																
	Total dV	4.606		5.754																
	dV Background	4.549		5.703																
	% Ext by SO4	0.00		0.00																
	% Ext by NO3	99.25		99.25																
	% Ext by PM10	0.30		0.30																
	% Ext by PM2.5	0.44		0.44																

**Appendix A6
Summary of Results
Existing Project Sources**

<i>Visibility Summary</i>		EX - Existing Project Sources																
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions														
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV												
Bridger	0	0	0.224	0	0	0.250												
Cloud Peak	0	0	0.153	0	0	0.172												
Fitzpatrick	0	0	0.143	0	0	0.132												
North Absaroka	0	0	0.059	0	0	0.057												
Owl Creek	1	0	0.958	2	1	1.104												
Popo Agie	0	0	0.296	0	0	0.331												
Phlox Mountain	0	0	0.212	0	0	0.219												
Teton NP	0	0	0.031	0	0	0.027												
Teton Wilderness	0	0	0.045	0	0	0.040												
Washakie	0	0	0.118	0	0	0.114												
Wind River Canyon	4	0	0.702	8	0	0.811												
Wind River Roadless	0	0	0.277	0	0	0.251												
Yellowstone NP	0	0	0.057	0	0	0.051												
Total Days / Max Δ dV	5	0	0.958	10	1	1.104												

**Appendix A6
Summary of Results
Existing Project Sources**

LAKES		EX - Existing Project Sources																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	6.75E-06	1141	-49.183	20.543															
	S	4.55E-10	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	6.63E-06	1142	-49.178	18.394															
	S	4.45E-10	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	6.27E-06	1143	95.779	205.602															
	S	5.04E-10	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.04E-06	1144	105.440	193.981															
	S	5.31E-10	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.59E-06	1145	-88.417	52.778															
	S	2.07E-10	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	8.82E-06	1146	-35.219	7.97															
	S	6.97E-10	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.24E-06	1147	-86.813	89.541															
	S	1.47E-10	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	6.56E-06	1148	-48.413	14.897															
	S	4.40E-10	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.99E-07	1149	-96.935	275.159															
	S	3.41E-11	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	4.23E-07	1150	-95.471	271.528															
	S	3.61E-11	1150	-95.471	271.528															

**Appendix A6
Summary of Results
Existing Project Sources**

ANC Impacts to High Elevation Lakes		EX - Existing Project Sources																	
High Elevation	Inputs																		
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)														
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition Rate														
	ANC (A)	(P)	Area	Rate	Rate														
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)														
Black Joe Lake	67.0	0.925	890	6.75E-06	4.55E-10														
Deep Lake	59.9	0.925	205	6.63E-06	4.45E-10														
Emerald Lake	69.8	0.780	293	6.27E-06	5.04E-10														
Florence Lake	33.0	0.780	417	7.04E-06	5.31E-10														
Hobbs Lake	69.9	1.080	293	2.59E-06	2.07E-10														
Lower Saddlebag	55.5	1.000	155	8.82E-06	6.97E-10														
Ross Lake	53.5	1.080	4455	2.24E-06	1.47E-10														
Stepping Stone Lake	19.9	1.460	26	3.99E-07	3.41E-11														
Twin Island Lake	17.6	1.300	45	4.23E-07	3.61E-11														
Upper Frozen Lake	5.0	0.925	65	6.56E-06	4.40E-10														
High Elevation	Intermediate Calculated Values						Results												
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent											
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC											
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change											
Black Joe Lake	2.13E-03	1.44E-07	3.70E+05	1.52E-05	8.97E-10	1.35E+02	0.0245	0.04%											
Deep Lake	2.09E-03	1.40E-07	7.61E+04	1.49E-05	8.77E-10	3.06E+01	0.0241	0.04%											
Emerald Lake	1.98E-03	1.59E-07	1.07E+05	1.41E-05	9.93E-10	4.14E+01	0.0270	0.04%											
Florence Lake	2.22E-03	1.68E-07	7.19E+04	1.58E-05	1.05E-09	6.61E+01	0.0303	0.09%											
Hobbs Lake	8.16E-04	6.52E-08	1.48E+05	5.83E-06	4.08E-10	1.71E+01	0.0081	0.01%											
Lower Saddlebag	2.78E-03	2.20E-07	5.76E+04	1.99E-05	1.37E-09	3.08E+01	0.0296	0.05%											
Ross Lake	7.08E-04	4.63E-08	1.72E+06	5.06E-06	2.90E-10	2.25E+02	0.0070	0.01%											
Stepping Stone Lake	1.26E-04	1.07E-08	5.14E+03	9.00E-07	6.71E-11	2.38E-01	0.0009	0.00%											
Twin Island Lake	1.33E-04	1.14E-08	6.88E+03	9.52E-07	7.12E-11	4.27E-01	0.0011	0.01%											
Upper Frozen Lake	2.07E-03	1.39E-07	2.01E+03	1.48E-05	8.68E-10	9.59E+00	0.0239	0.48%											
Maximum							0.0303	0.48%											
NOTE: Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.																			
Baseline ANC values calculated from summarized data provided by the Forest Service. ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																			
Annual precipitation and watershed catchments values provided by the Forest Service.																			

**Appendix A6
Summary of Results
Existing Project Sources**

Terrestrial Acid Deposition Summary		EX - Existing Project Sources																		
Incremental Analysis																				
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT													
Bridger	8.51E-06	6.63E-10	2.68E-03	2.09E-07	0.005	53.7%	0.0%													
Cloud Peak	8.46E-06	6.72E-10	2.67E-03	2.12E-07	0.005	53.4%	0.0%													
Fitzpatrick	4.05E-06	2.81E-10	1.28E-03	8.86E-08	0.005	25.6%	0.0%													
North Absaroka	1.00E-06	7.67E-11	3.16E-04	2.42E-08	0.005	6.3%	0.0%													
Owl Creek Range	3.12E-05	4.68E-09	9.84E-03	1.48E-06	0.005	196.8%	0.0%													
Popo Agie	1.27E-05	1.11E-09	3.99E-03	3.49E-07	0.005	79.9%	0.0%													
Phlox Mountain	6.86E-06	5.85E-10	2.16E-03	1.84E-07	0.005	43.2%	0.0%													
Teton NP	7.84E-07	4.91E-11	2.47E-04	1.55E-08	0.005	4.9%	0.0%													
Teton Wilderness	1.01E-06	6.99E-11	3.19E-04	2.20E-08	0.005	6.4%	0.0%													
Washakie Wilderness	2.80E-06	1.92E-10	8.85E-04	6.06E-08	0.005	17.7%	0.0%													
Wind River Canyon	7.70E-05	8.86E-09	2.43E-02	2.79E-06	0.005	485.6%	0.1%													
Wind River Roadless	1.10E-05	8.02E-10	3.45E-03	2.53E-07	0.005	69.1%	0.0%													
Yellowstone NP	7.84E-07	6.53E-11	2.47E-04	2.06E-08	0.005	4.9%	0.0%													
Maximum	7.70E-05	8.86E-09	2.43E-02	2.79E-06	0.005	485.6%	0.1%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts															
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"												
Bridger	8.51E-06	2.68E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Cloud Peak	8.46E-06	2.67E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Fitzpatrick	4.05E-06	1.28E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
North Absaroka	1.00E-06	3.16E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Owl Creek Range	3.12E-05	9.84E-03	1.3	1.3	3.0	10.0	43.7%	13.1%												
Popo Agie	1.27E-05	3.99E-03	1.3	1.3	3.0	10.0	43.5%	13.0%												
Phlox Mountain	6.86E-06	2.16E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Teton NP	7.84E-07	2.47E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Teton Wilderness	1.01E-06	3.19E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Washakie Wilderness	2.80E-06	8.85E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Wind River Canyon	7.70E-05	2.43E-02	1.3	1.3	3.0	10.0	44.1%	13.2%												
Wind River Roadless	1.10E-05	3.45E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Yellowstone NP	7.84E-07	2.47E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Maximum	7.70E-05	2.43E-02	1.3	1.3	3.0	10.0	44.1%	13.2%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts															
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"												
Bridger	6.63E-10	2.09E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	6.72E-10	2.12E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	2.81E-10	8.86E-08	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absaroka	7.67E-11	2.42E-08	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	4.68E-09	1.48E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	1.11E-09	3.49E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	5.85E-10	1.84E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	4.91E-11	1.55E-08	0.9	0.9	5.0	20.0	18.0%	4.5%												
Teton Wilderness	6.99E-11	2.20E-08	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	1.92E-10	6.06E-08	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	8.86E-09	2.79E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	8.02E-10	2.53E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	6.53E-11	2.06E-08	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	8.86E-09	2.79E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness.																				

**Appendix A6
Summary of Results
Existing Project Sources**

	Washakie Wilderness, and Yellowstone NP.											
	Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).											

**Appendix A6
Summary of Results
Existing Project Sources**

<i>Ambient Impact Summary</i>		EX - Existing Project Sources																
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQs Standard (ug/m3)	Impact % of WAAQS/NAAQs									
NO2	Annual	1.28E-01	WIND RIVER CANYON	2.5	5.12%	3.4	3.53	100	3.53%									
SO2	3-hour	5.89E-04	WIND RIVER CANYON	25	0.00%	132	132.00	1300	10.15%									
	24-hour	1.07E-04	WIND RIVER CANYON	5	0.00%	43	43.00	260	16.54%									
	Annual	1.01E-05	WIND RIVER CANYON	2	0.00%	9	9.00	60	15.00%									
PM10	24-hour	2.06E-01	WIND RIVER CANYON	8	2.57%	61	61.21	150	40.80%									
	Annual	1.76E-02	WIND RIVER CANYON	4	0.44%	22	22.02	50	44.04%									
PM25	24-hour	6.06E-02	WIND RIVER CANYON	n.a.	n.a.	35	35.06	65	53.94%									
	Annual	6.06E-03	WIND RIVER CANYON	n.a.	n.a.	10	10.01	15	66.71%									
Maximum					5.12%				66.71%									

Appendix A7
Summary of Results
Operational State Permitted Sources

BRIDGER		PE - Operational Permitted Sources																		
Pollutant Concentrations		(ug/m3)		Receptor																
NO2	Annual	1.99E-02	537	-73.783	19.513															
SO2	3-hour	2.99E-02	513	-109.557	60.700															
	24-hour	9.39E-03	520	-105.116	52.648															
	Annual	3.91E-04	500	-100.556	90.129															
PM10	24-hour	4.45E-04	552	-36.775	8.558															
	Annual	4.45E-04	505	-108.905	80.477															
PM25	24-hour	8.92E-04	552	-36.775	8.558															
	Annual	3.85E-05	552	-36.775	8.558															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor																
N	Annual	1.91E-05	537	-73.783	19.513															
S	Annual	6.75E-07	500	-100.556	90.129															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
CLOUD PEAK		PE - Operational Permitted Sources																		
Pollutant Concentrations		(ug/m3)		Receptor																
NO2	Annual	1.37E-02	1004	113.032	214.097															
SO2	3-hour	1.86E-02	970	91.692	194.842															
	24-hour	5.61E-03	975	101.806	185.644															
	Annual	2.51E-04	980	107.363	178.642															
PM10	24-hour	2.79E-03	1003	112.420	211.540															
	Annual	1.37E-04	1004	113.032	214.097															
PM25	24-hour	4.12E-03	1003	112.420	211.540															
	Annual	1.75E-04	953	81.912	212.069															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor																
N	Annual	2.78E-05	983	115.088	178.587															
S	Annual	3.89E-07	980	107.363	178.642															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A7
Summary of Results
Operational State Permitted Sources**

FITZPATRICK		PE - Operational Permitted Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.29E-03	716	-71.592	46.301
SO2	3-hour	2.29E-02	782	-96.000	98.000
	24-hour	5.93E-03	782	-96.000	98.000
	Annual	4.11E-04	700	-95.817	99.004
	24-hour	3.69E-04	719	-71.376	58.090
PM10	Annual	2.87E-05	697	-85.034	102.023
	24-hour	8.79E-04	723	-71.232	73.900
	Annual	2.96E-05	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	9.24E-06	716	-71.592	46.301
S	Annual	7.36E-07	700	-95.817	99.004
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
NORTH ABSAROKA		PE - Operational Permitted Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.98E-03	815	-63.736	230.153
SO2	3-hour	2.74E-02	781	-110.264	264.328
	24-hour	7.02E-03	780	-105.982	264.246
	Annual	4.33E-04	843	-120.223	208.073
	24-hour	1.09E-02	780	-105.982	264.246
PM10	Annual	1.64E-04	842	-102.222	264.148
	24-hour	2.77E-03	815	-63.736	230.153
	Annual	7.49E-05	815	-63.736	230.153
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.18E-06	815	-63.736	230.153
S	Annual	1.13E-06	792	-124.346	213.930
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A7
Summary of Results
Operational State Permitted Sources**

OWL CREEK		PE - Operational Permitted Sources			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	4.20E-03	1105	8.130	99.924
SO2	3-hour	3.23E-02	1115	-11.478	104.794
	24-hour	1.46E-02	1094	-14.059	118.533
PM10	Annual	4.04E-04	1115	-11.478	104.794
	24-hour	1.58E-03	1107	6.423	97.676
PM25	Annual	8.44E-05	1105	8.130	99.924
	24-hour	3.71E-03	1107	6.423	97.676
	Annual	1.39E-04	1105	8.130	99.924
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	8.28E-06	1105	8.130	99.924
S	Annual	4.11E-07	1091	-27.547	117.742
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
POPO AGIE		PE - Operational Permitted Sources			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	7.25E-03	896	-34.393	5.702
SO2	3-hour	1.50E-02	886	-33.377	20.749
	24-hour	4.53E-03	872	-52.005	34.393
PM10	Annual	2.26E-04	886	-33.377	20.749
	24-hour	6.93E-04	875	-42.038	34.393
PM25	Annual	3.20E-05	886	-33.377	20.749
	24-hour	1.86E-03	875	-42.038	34.393
	Annual	5.27E-05	890	-29.797	13.249
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	1.46E-05	894	-30.281	4.879
S	Annual	3.89E-07	875	-42.038	34.393
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A7
Summary of Results
Operational State Permitted Sources**

PHLOX MOUNTAIN		PE - Operational Permitted Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.77E-03	1140	-17.128	113.192
	3-hour	2.49E-02	1140	-17.128	113.192
	24-hour	1.27E-02	1140	-17.128	113.192
SO2	Annual	3.96E-04	1140	-17.128	113.192
	24-hour	9.13E-04	1140	-17.128	113.192
	Annual	5.90E-05	1140	-17.128	113.192
PM10	Annual	1.24E-03	1140	-17.128	113.192
	24-hour	8.73E-05	1140	-17.128	113.192
	Annual	8.73E-05	1140	-17.128	113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	7.55E-06	1140	-17.128	113.192
	Annual	4.01E-07	1140	-17.128	113.192
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
% Ext by PM2.5					
TETON NATIONAL PARK		PE - Operational Permitted Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.66E-03	694	-187.064	116.152
	3-hour	3.19E-01	694	-187.064	116.152
	24-hour	5.64E-02	689	-183.418	112.810
SO2	Annual	4.53E-03	694	-187.064	116.152
	24-hour	4.72E-03	694	-187.064	116.152
	Annual	4.11E-04	694	-187.064	116.152
PM10	Annual	3.83E-04	642	-174.038	167.139
	24-hour	1.06E-05	658	-148.897	150.012
	Annual	1.06E-05	658	-148.897	150.012
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.91E-06	694	-187.064	116.152
	Annual	7.31E-06	694	-187.064	116.152
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
% Ext by PM2.5					

**Appendix A7
Summary of Results
Operational State Permitted Sources**

TETON WILDERNESS AREA		PE - Operational Permitted Sources																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	1.66E-03	25	-160.656	150.244																
	3-hour	7.70E-02	25	-160.656	150.244																
	24-hour	2.53E-02	25	-160.656	150.244																
SO2	Annual	1.40E-03	25	-160.656	150.244																
	3-hour	7.70E-02	25	-160.656	150.244																
	24-hour	2.53E-02	25	-160.656	150.244																
PM10	Annual	1.40E-03	25	-160.656	150.244																
	3-hour	7.70E-02	25	-160.656	150.244																
	24-hour	2.27E-03	25	-160.656	150.244																
PM25	Annual	9.67E-05	25	-160.656	150.244																
	3-hour	1.04E-03	51	-98.520	144.030																
	24-hour	3.26E-05	206	-94.000	178.000																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	4.84E-06	37	-130.160	140.515																
	S	3.08E-06	25	-160.656	150.244																
VISIBILITY		FLAG	IMPROVE																		
Days delta dV >0.50																					
Days delta dV >1.00																					
Largest delta dV																					
Day of Largest delta dV																					
Largest delta dV Receptor																					
Total dV																					
dV Background																					
% Ext by SO4																					
% Ext by NO3																					
% Ext by PM10																					
% Ext by PM2.5																					
WASHAKIE		PE - Operational Permitted Sources																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	1.88E-03	298	-40.129	137.459																
	3-hour	2.41E-02	464	-84.000	186.000																
	24-hour	9.53E-03	298	-40.129	137.459																
SO2	Annual	5.10E-04	261	-101.428	146.050																
	3-hour	2.41E-02	464	-84.000	186.000																
	24-hour	9.53E-03	298	-40.129	137.459																
PM10	Annual	1.63E-03	213	-70.011	197.387																
	3-hour	7.70E-02	25	-160.656	150.244																
	24-hour	2.27E-03	25	-160.656	150.244																
PM25	Annual	5.82E-05	213	-70.011	197.387																
	3-hour	3.37E-03	213	-70.011	197.387																
	24-hour	3.37E-03	213	-70.011	197.387																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	6.74E-06	294	-47.084	127.086																
	S	1.15E-06	242	-116.117	192.711																
VISIBILITY		FLAG	IMPROVE																		
Days delta dV >0.50																					
Days delta dV >1.00																					
Largest delta dV																					
Day of Largest delta dV																					
Largest delta dV Receptor																					
Total dV																					
dV Background																					
% Ext by SO4																					
% Ext by NO3																					
% Ext by PM10																					
% Ext by PM2.5																					

**Appendix A7
Summary of Results
Operational State Permitted Sources**

WIND RIVER CANYON		PE - Operational Permitted Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	5.38E-03	1079	33.939	95.192															
	3-hour	2.07E-02	1064	26.198	111.141															
	24-hour	6.97E-03	1064	26.198	111.141															
PM10	Annual	3.72E-04	1064	26.198	111.141															
	24-hour	2.92E-03	1080	34.351	96.785															
PM25	Annual	1.35E-04	1079	33.939	95.192															
	24-hour	4.81E-03	1077	29.190	92.365															
	Annual	2.36E-04	1078	31.661	93.381															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	9.06E-06	1079	33.939	95.192															
	S	4.02E-07	1075	25.786	97.388															
VISIBILITY		FLAG	IMPROVE																	
Days delta dV >0.50																				
Days delta dV >1.00																				
Largest delta dV																				
Day of Largest delta dV																				
Largest delta dV Receptor																				
Total dV																				
dV Background																				
% Ext by SO4																				
% Ext by NO3																				
% Ext by PM10																				
% Ext by PM2.5																				
WIND RIVER ROADLESS		PE - Operational Permitted Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	4.26E-03	812	-61.282	35.110															
	3-hour	2.15E-02	797	-70.914	84.782															
	24-hour	6.02E-03	789	-57.400	59.263															
PM10	Annual	2.89E-04	797	-70.914	84.782															
	24-hour	9.02E-04	821	-40.795	43.233															
PM25	Annual	3.39E-05	821	-40.795	43.233															
	24-hour	2.70E-03	821	-40.795	43.233															
	Annual	5.23E-05	821	-40.795	43.233															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.20E-05	818	-40.580	34.535															
	S	4.92E-07	861	-60.000	62.000															
VISIBILITY		FLAG	IMPROVE																	
Days delta dV >0.50																				
Days delta dV >1.00																				
Largest delta dV																				
Day of Largest delta dV																				
Largest delta dV Receptor																				
Total dV																				
dV Background																				
% Ext by SO4																				
% Ext by NO3																				
% Ext by PM10																				
% Ext by PM2.5																				

**Appendix A7
Summary of Results
Operational State Permitted Sources**

YELLOWSTONE NATL PARK		PE - Operational Permitted Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.75E-03	108	-196.891	173.293															
	3-hour	6.01E-02	108	-196.891	173.293															
SO2	24-hour	2.52E-02	108	-196.891	173.293															
	Annual	2.19E-03	108	-196.891	173.293															
PM10	24-hour	1.04E-02	18	-110.235	269.323															
	Annual	1.77E-04	18	-110.235	269.323															
PM25	24-hour	1.28E-03	97	-97.734	233.934															
	Annual	2.95E-05	97	-97.734	233.934															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	4.65E-06	57	-196.039	173.354															
S	Annual	4.85E-06	108	-196.891	173.293															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A7
Summary of Results
Operational State Permitted Sources**

<i>Visibility Summary</i>		PE - Operational Permitted Sources																		
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions																
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV														
Bridger	0	0	0.000	0	0	0.000														
Cloud Peak	0	0	0.000	0	0	0.000														
Fitzpatrick	0	0	0.000	0	0	0.000														
North Absorka	0	0	0.000	0	0	0.000														
Owl Creek	0	0	0.000	0	0	0.000														
Popo Agie	0	0	0.000	0	0	0.000														
Phlox Mountain	0	0	0.000	0	0	0.000														
Teton NP	0	0	0.000	0	0	0.000														
Teton Wilderness	0	0	0.000	0	0	0.000														
Washakie	0	0	0.000	0	0	0.000														
Wind River Canyon	0	0	0.000	0	0	0.000														
Wind River Roadless	0	0	0.000	0	0	0.000														
Yellowstone NP	0	0	0.000	0	0	0.000														
Total Days / Max Δ dV	0	0	0.000	0	0	0.000														

**Appendix A7
Summary of Results
Operational State Permitted Sources**

LAKES		PE - Operational Permitted Sources																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.14E-05	1141	-49.183	20.543															
	S	2.99E-07	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.17E-05	1142	-49.178	18.394															
	S	2.95E-07	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.84E-05	1143	95.779	205.602															
	S	3.17E-07	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.15E-05	1144	105.440	193.981															
	S	3.42E-07	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	9.36E-06	1145	-88.417	52.778															
	S	3.96E-07	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.35E-05	1146	-35.219	7.97															
	S	3.00E-07	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	6.62E-06	1147	-86.813	89.541															
	S	5.44E-07	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.24E-05	1148	-48.413	14.897															
	S	2.89E-07	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.04E-06	1149	-96.935	275.159															
	S	5.78E-07	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	4.02E-06	1150	-95.471	271.528															
	S	5.91E-07	1150	-95.471	271.528															

**Appendix A7
Summary of Results
Operational State Permitted Sources**

ANC Impacts to High Elevation Lakes		PE - Operational Permitted Sources																		
High Elevation Lake of	Baseline Lake Outlet	Annual Precipitation	Watershed (W) Catchment	Nitrogen (N) Deposition	Sulfur (S) Deposition Rate															
Special Concern	ANC (A) (µeq/l)	(P) (meters)	Area (hectares)	Rate (µg/m ² /sec)	Rate (µg/m ² /sec)															
Black Joe Lake	67.0	0.925	890	1.14E-05	2.99E-07															
Deep Lake	59.9	0.925	205	1.17E-05	2.95E-07															
Emerald Lake	69.8	0.780	293	1.84E-05	3.17E-07															
Florence Lake	33.0	0.780	417	2.15E-05	3.42E-07															
Hobbs Lake	69.9	1.080	293	9.36E-06	3.96E-07															
Lower Saddlebag	55.5	1.000	155	1.35E-05	3.00E-07															
Ross Lake	53.5	1.080	4455	6.82E-06	5.44E-07															
Stepping Stone Lake	19.9	1.460	26	4.04E-06	5.78E-07															
Twin Island Lake	17.6	1.300	45	4.02E-06	5.91E-07															
Upper Frozen Lake	5.0	0.925	65	1.24E-05	2.89E-07															
High Elevation Lake of	Nitrogen (Dn) Deposition (kg/ha/yr)	Sulfur (Ds) Deposition (kg/ha/yr)	Lake Catchment Baseline ANC(o) (eq)	Nitrogen (Hn) Deposition (eq/m ² /yr)	Sulfur (Hs) Deposition (eq/m ² /yr)	Total (Hdep) Deposition (eq)	ANC Change (µeq/l)	Percent ANC Change												
Black Joe Lake	3.59E-03	9.43E-05	3.70E+05	2.56E-05	5.90E-07	2.33E+02	0.0423	0.06%												
Deep Lake	3.69E-03	9.30E-05	7.61E+04	2.63E-05	5.81E-07	5.52E+01	0.0434	0.07%												
Emerald Lake	5.82E-03	9.99E-05	1.07E+05	4.15E-05	6.24E-07	1.24E+02	0.0807	0.12%												
Florence Lake	6.77E-03	1.08E-04	7.19E+04	4.84E-05	6.74E-07	2.05E+02	0.0939	0.28%												
Hobbs Lake	2.95E-03	1.25E-04	1.48E+05	2.11E-05	7.80E-07	6.40E+01	0.0302	0.04%												
Lower Saddlebag	4.25E-03	9.47E-05	5.76E+04	3.03E-05	5.92E-07	4.80E+01	0.0462	0.08%												
Ross Lake	2.09E-03	1.72E-04	1.72E+06	1.49E-05	1.07E-06	7.12E+02	0.0221	0.04%												
Stepping Stone Lake	1.27E-03	1.82E-04	5.14E+03	9.10E-06	1.14E-06	2.70E+00	0.0105	0.05%												
Twin Island Lake	1.27E-03	1.86E-04	6.88E+03	9.07E-06	1.16E-06	4.59E+00	0.0117	0.07%												
Upper Frozen Lake	3.90E-03	9.12E-05	2.01E+03	2.79E-05	5.70E-07	1.84E+01	0.0459	0.92%												
Maximum							0.0939	0.92%												
NOTE: Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes. USDA Forest Service, Rocky Mountain Region, January 2000.																				
Baseline ANC values calculated from summarized data provided by the Forest Service.																				
ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																				
Annual precipitation and watershed catchments values provided by the Forest Service.																				

**Appendix A7
Summary of Results
Operational State Permitted Sources**

Terrestrial Acid Deposition Summary		PE - Operational Permitted Sources																		
Incremental Analysis																				
Area of Special Concern	Nitrogen (N) Deposition (ug/m²/sec)	Sulfur (S) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT													
Bridger	1.91E-05	6.75E-07	6.03E-03	2.13E-04	0.005	120.6%	4.3%													
Cloud Peak	2.78E-05	3.89E-07	8.78E-03	1.23E-04	0.005	175.5%	2.5%													
Fitzpatrick	9.24E-06	7.36E-07	2.91E-03	2.32E-04	0.005	58.3%	4.6%													
North Absorka	4.18E-06	1.13E-06	1.32E-03	3.56E-04	0.005	26.4%	7.1%													
Owl Creek Range	8.28E-06	4.11E-07	2.61E-03	1.30E-04	0.005	52.2%	2.6%													
Popo Agie	1.46E-05	3.89E-07	4.60E-03	1.23E-04	0.005	92.1%	2.5%													
Phlox Mountain	7.55E-06	4.01E-07	2.38E-03	1.27E-04	0.005	47.6%	2.5%													
Teton NP	6.91E-06	7.31E-06	2.18E-03	2.31E-03	0.005	43.6%	46.1%													
Teton Wilderness	4.84E-06	3.08E-06	1.52E-03	9.71E-04	0.005	30.5%	19.4%													
Washakie Wilderness	6.74E-06	1.15E-06	2.13E-03	3.64E-04	0.005	42.5%	7.3%													
Wind River Canyon	9.06E-06	4.02E-07	2.86E-03	1.27E-04	0.005	57.1%	2.5%													
Wind River Roadless	1.20E-05	4.92E-07	3.78E-03	1.55E-04	0.005	75.7%	3.1%													
Yellowstone NP	4.65E-06	4.85E-06	1.47E-03	1.53E-03	0.005	29.3%	30.6%													
Maximum	2.78E-05	7.31E-06	8.78E-03	2.31E-03	0.005	175.5%	46.1%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts															
	Nitrogen (N) Deposition (ug/m²/sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"												
Bridger	1.91E-05	6.03E-03	1.3	1.3	3.0	10.0	43.5%	13.1%												
Cloud Peak	2.78E-05	8.78E-03	1.3	1.3	3.0	10.0	43.6%	13.1%												
Fitzpatrick	9.24E-06	2.91E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
North Absorka	4.18E-06	1.32E-03	1.1	1.1	3.0	10.0	36.7%	11.0%												
Owl Creek Range	8.28E-06	2.61E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Popo Agie	1.46E-05	4.60E-03	1.3	1.3	3.0	10.0	43.5%	13.0%												
Phlox Mountain	7.55E-06	2.38E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Teton NP	6.91E-06	2.18E-03	1.1	1.1	3.0	10.0	36.7%	11.0%												
Teton Wilderness	4.84E-06	1.52E-03	1.1	1.1	3.0	10.0	36.7%	11.0%												
Washakie Wilderness	6.74E-06	2.13E-03	1.1	1.1	3.0	10.0	36.7%	11.0%												
Wind River Canyon	9.06E-06	2.86E-03	1.3	1.3	3.0	10.0	43.4%	13.0%												
Wind River Roadless	1.20E-05	3.78E-03	1.3	1.3	3.0	10.0	43.5%	13.0%												
Yellowstone NP	4.65E-06	1.47E-03	1.1	1.1	3.0	10.0	36.7%	11.0%												
Maximum	2.78E-05	8.78E-03	1.3	1.3	3.0	10.0	43.6%	13.1%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts															
	Sulfur (S) Deposition (ug/m²/sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"												
Bridger	6.75E-07	2.13E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	3.89E-07	1.23E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	7.36E-07	2.32E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absorka	1.13E-06	3.56E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	4.11E-07	1.30E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	3.89E-07	1.23E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	4.01E-07	1.27E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	7.31E-06	2.31E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Teton Wilderness	3.08E-06	9.71E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	1.15E-06	3.64E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	4.02E-07	1.27E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	4.92E-07	1.55E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	4.85E-06	1.53E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	7.31E-06	2.31E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absorka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																				
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																				

**Appendix A7
Summary of Results
Operational State Permitted Sources**

Ambient Impact Summary		PE - Operational Permitted Sources															
Pollutant	Averaging Time	Maximum	Maximum	PSD Class I	Impact % of	Background	Background	WAAQS/NAAQS	Impact % of								
		Impact (ug/m3)	Impact Location	Increment (ug/m3)	PSD Class I Increment	Concentration (ug/m3)	Plus Impact (ug/m3)	Standard (ug/m3)	WAAQS/NAAQS								
NO2	Annual	1.99E-02	BRIDGER	2.5	0.80%	3.4	3.42	100	3.42%								
SO2	3-hour	3.19E-01	TETON NATIONAL PARK	25	1.28%	132	132.32	1300	10.18%								
	24-hour	5.84E-02	TETON NATIONAL PARK	5	1.13%	43	43.06	260	16.58%								
	Annual	4.53E-03	TETON NATIONAL PARK	2	0.23%	9	9.00	60	15.01%								
PM10	24-hour	1.09E-02	NORTH ABSAROKA	8	0.14%	61	61.01	150	40.67%								
	Annual	4.45E-04	BRIDGER	4	0.01%	22	22.00	50	44.00%								
PM25	24-hour	4.81E-03	WIND RIVER CANYON	n.a.	n.a.	35	35.00	65	53.85%								
	Annual	2.36E-04	WIND RIVER CANYON	n.a.	n.a.	10	10.00	15	66.67%								
Maximum					1.28%				66.67%								

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

BRIDGER		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.07E-02	537	-73.783	19.513															
SO2	3-hour	8.02E-02	530	-85.694	31.436															
	24-hour	1.92E-02	530	-85.694	31.436															
PM10	Annual	9.15E-04	537	-73.783	19.513															
	24-hour	3.82E-03	530	-85.694	31.436															
PM25	Annual	2.45E-04	537	-73.783	19.513															
	24-hour	8.61E-03	530	-85.694	31.436															
	Annual	7.14E-04	520	-105.116	52.648															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.22E-05	537	-73.783	19.513															
S	Annual	1.37E-06	520	-105.116	52.648															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
CLOUD PEAK		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	5.93E-02	1004	113.032	214.097															
SO2	3-hour	3.16E-01	1053	112.000	208.000															
	24-hour	4.47E-02	1053	112.000	208.000															
PM10	Annual	2.14E-03	980	107.363	178.642															
	24-hour	7.86E-02	995	116.255	198.926															
PM25	Annual	2.63E-03	995	116.255	198.926															
	24-hour	1.10E-01	994	115.588	197.592															
	Annual	4.41E-03	989	119.200	187.867															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.09E-04	1004	113.032	214.097															
S	Annual	5.43E-06	980	107.363	178.642															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

FITZPATRICK		RAPP - Permitted Sources Not Yet Operational			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.56E-03	716	-71.592	46.301
	3-hour	1.32E-02	727	-71.232	89.283
	24-hour	4.75E-03	727	-71.232	89.283
SO2	Annual	3.52E-04	704	-96.679	91.168
	24-hour	1.24E-03	704	-96.679	91.168
	Annual	1.27E-04	704	-96.679	91.168
PM10	Annual	4.41E-03	704	-96.679	91.168
	24-hour	4.23E-04	772	-96.000	90.000
	Annual				
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.13E-05	733	-75.330	96.112
	Annual	8.25E-07	700	-95.817	99.004
S	Annual				
	Annual				
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
NORTH ABSAROKA		RAPP - Permitted Sources Not Yet Operational			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.97E-03	815	-63.736	230.153
	3-hour	2.67E-02	810	-71.560	213.930
	24-hour	1.02E-02	815	-63.736	230.153
SO2	Annual	1.76E-04	810	-71.560	213.930
	24-hour	2.35E-03	814	-69.913	224.471
	Annual	6.32E-05	810	-71.560	213.930
PM10	Annual	5.05E-03	814	-69.913	224.471
	24-hour	2.25E-04	807	-75.265	208.495
	Annual				
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	8.18E-06	842	-102.222	264.148
	Annual	5.49E-07	843	-120.223	208.073
S	Annual				
	Annual				
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

OWL CREEK		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.99E-03	1104	7.006	104.794															
SO2	3-hour	9.68E-02	1094	-14.059	118.533															
	24-hour	3.16E-02	1095	-9.938	117.825															
PM10	Annual	1.04E-03	1104	7.006	104.794															
	24-hour	8.93E-03	1101	3.592	108.083															
PM25	Annual	2.18E-04	1103	6.007	105.710															
	24-hour	1.97E-02	1101	3.592	108.083															
	Annual	6.44E-04	1103	6.007	105.710															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.62E-05	1104	7.006	104.794															
S	Annual	1.61E-06	1101	3.592	108.083															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
POPO AGIE		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	4.51E-03	903	-43.441	10.346															
SO2	3-hour	3.75E-02	893	-28.587	7.395															
	24-hour	1.21E-02	893	-28.587	7.395															
PM10	Annual	5.55E-04	894	-30.281	4.879															
	24-hour	1.94E-03	886	-33.377	20.749															
PM25	Annual	1.12E-04	904	-45.812	13.153															
	24-hour	5.53E-03	890	-29.797	13.249															
	Annual	3.83E-04	889	-30.862	15.475															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.24E-05	889	-30.862	15.475															
S	Annual	1.11E-06	890	-29.797	13.249															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

PHLOX MOUNTAIN		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	5.22E-03	1140	-17.128	113.192															
SO2	3-hour	6.57E-02	1140	-17.128	113.192															
	24-hour	3.14E-02	1140	-17.128	113.192															
PM10	Annual	6.66E-04	1140	-17.128	113.192															
	24-hour	4.28E-03	1140	-17.128	113.192															
PM25	Annual	1.34E-04	1140	-17.128	113.192															
	24-hour	9.93E-03	1140	-17.128	113.192															
Annual		4.61E-04	1140	-17.128	113.192															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.35E-05	1140	-17.128	113.192															
S	Annual	1.15E-06	1140	-17.128	113.192															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
TETON NATIONAL PARK		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.30E-02	678	-171.607	111.139															
SO2	3-hour	3.84E-01	685	-178.064	116.341															
	24-hour	7.87E-02	685	-178.064	116.341															
PM10	Annual	5.99E-03	686	-177.304	116.038															
	24-hour	3.90E-02	685	-178.064	116.341															
PM25	Annual	3.40E-03	686	-177.304	116.038															
	24-hour	6.18E-02	680	-172.405	116.076															
Annual		6.36E-03	680	-172.405	116.076															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.40E-05	678	-171.607	111.139															
S	Annual	7.54E-06	686	-177.304	116.038															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

TETON WILDERNESS AREA		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.78E-03	32	-145.858	144.194															
	3-hour	3.83E-02	32	-145.858	144.194															
	24-hour	1.01E-02	32	-145.858	144.194															
SO2	Annual	1.10E-03	32	-145.858	144.194															
	24-hour	7.97E-03	32	-145.858	144.194															
	Annual	5.61E-04	32	-145.858	144.194															
PM10	Annual	1.70E-02	32	-145.858	144.194															
	24-hour	1.44E-03	32	-145.858	144.194															
	Annual	1.44E-03	32	-145.858	144.194															
PM25	Annual	1.44E-03	32	-145.858	144.194															
	24-hour	1.44E-03	32	-145.858	144.194															
	Annual	1.44E-03	32	-145.858	144.194															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.11E-05	50	-98.438	141.823															
	S	Annual	2.44E-06	32	-145.858	144.194														
VISIBILITY	FLAG		IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
WASHAKIE		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	3.86E-03	300	-42.708	145.073															
	3-hour	2.14E-02	294	-47.084	127.086															
	24-hour	8.13E-03	300	-42.708	145.073															
SO2	Annual	3.53E-04	294	-47.084	127.086															
	24-hour	1.56E-03	318	-66.330	177.632															
	Annual	1.24E-04	266	-101.488	139.754															
PM10	Annual	3.75E-03	318	-66.330	177.632															
	24-hour	4.06E-04	266	-101.488	139.754															
	Annual	4.06E-04	266	-101.488	139.754															
PM25	Annual	4.06E-04	266	-101.488	139.754															
	24-hour	4.06E-04	266	-101.488	139.754															
	Annual	4.06E-04	266	-101.488	139.754															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.47E-05	300	-42.708	145.073															
	S	Annual	8.32E-07	300	-42.708	145.073														
VISIBILITY	FLAG		IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

WIND RIVER CANYON		RAPP - Permitted Sources Not Yet Operational																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	7.95E-03	1064	26.198	111.141														
SO2	3-hour	1.39E-01	1085	28.586	107.490														
	24-hour	2.79E-02	1064	26.198	111.141														
PM10	Annual	1.76E-03	1064	26.198	111.141														
	24-hour	3.63E-02	1064	26.198	111.141														
PM25	Annual	1.70E-03	1064	26.198	111.141														
	24-hour	7.19E-02	1064	26.198	111.141														
	Annual	2.96E-03	1064	26.198	111.141														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	1.69E-05	1064	26.198	111.141														
	S	Annual	2.31E-06	1085	28.586	107.490													
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50																		
	Days delta dV >1.00																		
	Largest delta dV																		
	Day of Largest delta dV																		
	Largest delta dV Receptor																		
	Total dV																		
	dV Background																		
	% Ext by SO4																		
	% Ext by NO3																		
	% Ext by PM10																		
	% Ext by PM2.5																		
WIND RIVER ROADLESS		RAPP - Permitted Sources Not Yet Operational																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	3.54E-03	818	-40.580	34.535														
SO2	3-hour	2.06E-02	786	-49.853	59.119														
	24-hour	8.96E-03	786	-49.853	59.119														
PM10	Annual	4.24E-04	818	-40.580	34.535														
	24-hour	2.36E-03	821	-40.795	43.233														
PM25	Annual	9.80E-05	818	-40.580	34.535														
	24-hour	6.44E-03	821	-40.795	43.233														
	Annual	3.40E-04	818	-40.580	34.535														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	1.16E-05	818	-40.580	34.535														
	S	Annual	9.49E-07	818	-40.580	34.535													
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50																		
	Days delta dV >1.00																		
	Largest delta dV																		
	Day of Largest delta dV																		
	Largest delta dV Receptor																		
	Total dV																		
	dV Background																		
	% Ext by SO4																		
	% Ext by NO3																		
	% Ext by PM10																		
	% Ext by PM2.5																		

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

<u>YELLOWSTONE NATL PARK</u>		RAPP - Permitted Sources Not Yet Operational																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.26E-03	109	-112.113	171.051															
SO2	3-hour	1.45E-02	62	-175.968	172.705															
	24-hour	5.14E-03	63	-171.971	172.530															
	Annual	3.89E-04	65	-167.910	172.398															
PM10	24-hour	1.84E-03	62	-175.968	172.705															
	Annual	1.48E-04	66	-164.001	172.442															
PM25	24-hour	5.44E-03	67	-159.828	172.486															
	Annual	5.29E-04	66	-164.001	172.442															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	8.41E-06	109	-112.113	171.051															
S	Annual	1.02E-06	68	-156.059	172.424															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

<i>Visibility Summary</i>		RAPP - Permitted Sources Not Yet Operational												
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions										
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV								
Bridger	0	0	0.000	0	0	0.000								
Cloud Peak	0	0	0.000	0	0	0.000								
Fitzpatrick	0	0	0.000	0	0	0.000								
North Absaroka	0	0	0.000	0	0	0.000								
Owl Creek	0	0	0.000	0	0	0.000								
Popo Agie	0	0	0.000	0	0	0.000								
Phlox Mountain	0	0	0.000	0	0	0.000								
Teton NP	0	0	0.000	0	0	0.000								
Teton Wilderness	0	0	0.000	0	0	0.000								
Washakie	0	0	0.000	0	0	0.000								
Wind River Canyon	0	0	0.000	0	0	0.000								
Wind River Roadless	0	0	0.000	0	0	0.000								
Yellowstone NP	0	0	0.000	0	0	0.000								
Total Days / Max Δ dV	0	0	0.000	0	0	0.000								

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

LAKES		RAPP - Permitted Sources Not Yet Operational																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.00E-05	1141	-49.183	20.543															
	S	8.63E-07	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.01E-05	1142	-49.178	18.394															
	S	8.79E-07	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	6.32E-05	1143	95.779	205.602															
	S	3.20E-06	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	8.22E-05	1144	105.440	193.981															
	S	3.39E-06	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.96E-06	1145	-88.417	52.778															
	S	8.62E-07	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.13E-05	1146	-35.219	7.97															
	S	1.03E-06	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	9.47E-06	1147	-86.813	89.541															
	S	7.10E-07	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.03E-05	1148	-48.413	14.897															
	S	9.16E-07	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	8.90E-06	1149	-96.935	275.159															
	S	3.41E-07	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	8.83E-06	1150	-95.471	271.528															
	S	3.56E-07	1150	-95.471	271.528															

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

ANC Impacts to High Elevation Lakes		RAPP - Permitted Sources Not Yet Operational																	
High Elevation		Inputs																	
Lake of	Baseline Lake Outlet	Annual Precipitation	Watershed (W) Catchment	Nitrogen (N) Deposition	Sulfur (S) Deposition Rate														
Special Concern	ANC (A)	(P)	Area	Rate	Rate														
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)														
Black Joe Lake	67.0	0.925	890	1.00E-05	8.63E-07														
Deep Lake	59.9	0.925	205	1.01E-05	8.79E-07														
Emerald Lake	69.8	0.780	293	6.32E-05	3.20E-06														
Florence Lake	33.0	0.780	417	8.22E-05	3.39E-06														
Hobbs Lake	69.9	1.080	293	7.96E-06	8.62E-07														
Lower Saddlebag	55.5	1.000	155	1.13E-05	1.03E-06														
Ross Lake	53.5	1.080	4455	9.47E-06	7.10E-07														
Stepping Stone Lake	19.9	1.460	26	8.90E-06	3.41E-07														
Twin Island Lake	17.6	1.300	45	8.83E-06	3.56E-07														
Upper Frozen Lake	5.0	0.925	65	1.03E-05	9.16E-07														
High Elevation		Intermediate Calculated Values					Results												
Lake of	Nitrogen (Dn) Deposition	Sulfur (Ds) Deposition	Lake Catchment Baseline ANC(o)	Nitrogen (Hn) Deposition	Sulfur (Hs) Deposition	Total (Hdep) Deposition	ANC Change	Percent ANC Change											
Special Concern	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)												
Black Joe Lake	3.17E-03	2.72E-04	3.70E+05	2.26E-05	1.70E-06	2.17E+02	0.0393	0.06%											
Deep Lake	3.19E-03	2.77E-04	7.61E+04	2.28E-05	1.73E-06	5.03E+01	0.0396	0.07%											
Emerald Lake	1.99E-02	1.01E-03	1.07E+05	1.42E-04	6.31E-06	4.35E+02	0.2844	0.41%											
Florence Lake	2.59E-02	1.07E-03	7.19E+04	1.85E-04	6.68E-06	8.00E+02	0.3669	1.11%											
Hobbs Lake	2.51E-03	2.72E-04	1.48E+05	1.79E-05	1.70E-06	5.75E+01	0.0271	0.04%											
Lower Saddlebag	3.56E-03	3.26E-04	5.76E+04	2.54E-05	2.04E-06	4.26E+01	0.0410	0.07%											
Ross Lake	2.99E-03	2.24E-04	1.72E+06	2.13E-05	1.40E-06	1.01E+03	0.0314	0.06%											
Stepping Stone Lake	2.81E-03	1.07E-04	5.14E+03	2.00E-05	6.72E-07	5.47E+00	0.0212	0.11%											
Twin Island Lake	2.78E-03	1.12E-04	6.88E+03	1.99E-05	7.02E-07	9.25E+00	0.0236	0.13%											
Upper Frozen Lake	3.26E-03	2.89E-04	2.01E+03	2.33E-05	1.81E-06	1.63E+01	0.0405	0.81%											
Maximum							0.3669	1.11%											
NOTE:		Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes. USDA Forest Service, Rocky Mountain Region, January 2000.																	
		Baseline ANC values calculated from summarized data provided by the Forest Service.																	
		ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																	
		Annual precipitation and watershed catchments values provided by the Forest Service.																	

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

Terrestrial Acid Deposition Summary		RAPP - Permitted Sources Not Yet Operational																	
Incremental Analysis																			
Area of Special Concern	Nitrogen (N) Deposition	Sulfur (S) Deposition	Nitrogen (N) Deposition	Sulfur (S) Deposition	Deposition Analysis Threshold (DAT)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT												
	(ug/m ³ /sec)	(ug/m ³ /sec)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(%)	(%)											
Bridger	1.22E-05	1.37E-06	3.85E-03	4.31E-04	0.005	76.9%	8.6%												
Cloud Peak	1.09E-04	5.43E-06	3.42E-02	1.71E-03	0.005	684.6%	34.3%												
Fitzpatrick	1.13E-05	8.25E-07	3.56E-03	2.60E-04	0.005	71.2%	5.2%												
North Absaroka	8.18E-06	5.49E-07	2.58E-03	1.73E-04	0.005	51.6%	3.5%												
Owl Creek Range	1.62E-05	1.61E-06	5.11E-03	5.08E-04	0.005	102.1%	10.2%												
Popo Agie	1.24E-05	1.11E-06	3.90E-03	3.49E-04	0.005	78.1%	7.0%												
Phlox Mountain	1.35E-05	1.15E-06	4.26E-03	3.64E-04	0.005	85.2%	7.3%												
Teton NP	1.40E-05	7.54E-06	4.42E-03	2.38E-03	0.005	88.5%	47.5%												
Teton Wilderness	1.11E-05	2.44E-06	3.51E-03	7.70E-04	0.005	70.2%	15.4%												
Washakie Wilderness	1.47E-05	8.32E-07	4.64E-03	2.62E-04	0.005	92.8%	5.2%												
Wind River Canyon	1.69E-05	2.31E-06	5.34E-03	7.28E-04	0.005	106.9%	14.6%												
Wind River Roadless	1.16E-05	9.49E-07	3.67E-03	2.99E-04	0.005	73.4%	6.0%												
Yellowstone NP	8.41E-06	1.02E-06	2.65E-03	3.21E-04	0.005	53.0%	6.4%												
Maximum	1.09E-04	7.54E-06	3.42E-02	2.38E-03	0.005	684.6%	47.5%												
NOTE: DAT for Western Class I areas from National Park Service (2003).																			
Cumulative Analysis																			
Nitrogen Deposition																			
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts														
	Nitrogen (N) Deposition	Nitrogen (N) Deposition	Nitrogen (N) Deposition	Nitrogen (N) Deposition	Nitrogen (N) "Green Line"	Nitrogen (N) "Red Line"	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"											
	(ug/m ³ /sec)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(%)	(%)											
Bridger	1.22E-05	3.85E-03	1.3	1.3	3.0	10.0	43.5%	13.0%											
Cloud Peak	1.09E-04	3.42E-02	1.3	1.3	3.0	10.0	44.5%	13.3%											
Fitzpatrick	1.13E-05	3.56E-03	1.3	1.3	3.0	10.0	43.5%	13.0%											
North Absaroka	8.18E-06	2.58E-03	1.1	1.1	3.0	10.0	36.8%	11.0%											
Owl Creek Range	1.62E-05	5.11E-03	1.3	1.3	3.0	10.0	43.5%	13.1%											
Popo Agie	1.24E-05	3.90E-03	1.3	1.3	3.0	10.0	43.5%	13.0%											
Phlox Mountain	1.35E-05	4.26E-03	1.3	1.3	3.0	10.0	43.5%	13.0%											
Teton NP	1.40E-05	4.42E-03	1.1	1.1	3.0	10.0	36.8%	11.0%											
Teton Wilderness	1.11E-05	3.51E-03	1.1	1.1	3.0	10.0	36.8%	11.0%											
Washakie Wilderness	1.47E-05	4.64E-03	1.1	1.1	3.0	10.0	36.8%	11.0%											
Wind River Canyon	1.69E-05	5.34E-03	1.3	1.3	3.0	10.0	43.5%	13.1%											
Wind River Roadless	1.16E-05	3.67E-03	1.3	1.3	3.0	10.0	43.5%	13.0%											
Yellowstone NP	8.41E-06	2.65E-03	1.1	1.1	3.0	10.0	36.8%	11.0%											
Maximum	1.09E-04	3.42E-02	1.3	1.3	3.0	10.0	44.5%	13.3%											
Sulfur Deposition																			
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts														
	Sulfur (S) Deposition	Sulfur (S) Deposition	Sulfur (S) Deposition	Sulfur (S) Deposition	Sulfur (S) "Green Line"	Sulfur (S) "Red Line"	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"											
	(ug/m ³ /sec)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(kg/ha/yr)	(%)	(%)											
Bridger	1.37E-06	4.31E-04	1.1	1.1	5.0	20.0	22.0%	5.5%											
Cloud Peak	5.43E-06	1.71E-03	1.1	1.1	5.0	20.0	22.0%	5.5%											
Fitzpatrick	8.25E-07	2.60E-04	1.1	1.1	5.0	20.0	22.0%	5.5%											
North Absaroka	5.49E-07	1.73E-04	0.9	0.9	5.0	20.0	18.0%	4.5%											
Owl Creek Range	1.61E-06	5.08E-04	1.1	1.1	5.0	20.0	22.0%	5.5%											
Popo Agie	1.11E-06	3.49E-04	1.1	1.1	5.0	20.0	22.0%	5.5%											
Phlox Mountain	1.15E-06	3.64E-04	1.1	1.1	5.0	20.0	22.0%	5.5%											
Teton NP	7.54E-06	2.38E-03	0.9	0.9	5.0	20.0	18.0%	4.5%											
Teton Wilderness	2.44E-06	7.70E-04	0.9	0.9	5.0	20.0	18.0%	4.5%											
Washakie Wilderness	8.32E-07	2.62E-04	0.9	0.9	5.0	20.0	18.0%	4.5%											
Wind River Canyon	2.31E-06	7.28E-04	1.1	1.1	5.0	20.0	22.0%	5.5%											
Wind River Roadless	9.49E-07	2.99E-04	1.1	1.1	5.0	20.0	22.0%	5.5%											
Yellowstone NP	1.02E-06	3.21E-04	0.9	0.9	5.0	20.0	18.0%	4.5%											
Maximum	7.54E-06	2.38E-03	1.1	1.1	5.0	20.0	22.0%	5.5%											
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																			
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																			
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																			

**Appendix A8
Summary of Results
State Permitted Sources Not Yet Operational**

Ambient Impact Summary		RAPP - Permitted Sources Not Yet Operational												
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQ Standard (ug/m3)	Impact % of WAAQS/NAAQ					
NO2	Annual	5.93E-02	CLOUD PEAK	2.5	2.37%	3.4	3.46	100	3.46%					
SO2	3-hour	3.84E-01	TETON NATIONAL PARK	25	1.54%	132	132.38	1300	10.18%					
	24-hour	7.87E-02	TETON NATIONAL PARK	5	1.57%	43	43.08	260	18.57%					
	Annual	5.99E-03	TETON NATIONAL PARK	2	0.30%	9	9.01	60	15.01%					
PM10	24-hour	7.86E-02	CLOUD PEAK	8	0.98%	61	61.08	150	40.72%					
	Annual	3.40E-03	TETON NATIONAL PARK	4	0.08%	22	22.00	50	44.01%					
PM25	24-hour	1.10E-01	CLOUD PEAK	n.a.	n.a.	35	35.11	65	54.02%					
	Annual	6.36E-03	TETON NATIONAL PARK	n.a.	n.a.	10	10.01	15	66.71%					
Maximum					2.37%				66.71%					

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

BRIDGER		RD - Reasonably Foreseeable Development			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	3.52E-02	530	-85.694	31.436
SO2	3-hour	7.34E-04	657	-92.000	58.000
	24-hour	1.48E-04	530	-85.694	31.436
	Annual	9.95E-06	537	-73.783	19.513
PM10	24-hour	7.34E-03	530	-85.694	31.436
	Annual	5.19E-04	537	-73.783	19.513
PM25	24-hour	1.64E-02	530	-85.694	31.436
	Annual	1.14E-03	537	-73.783	19.513
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.18E-05	530	-85.694	31.436
S	Annual	1.28E-08	513	-109.557	60.700
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
CLOUD PEAK		RD - Reasonably Foreseeable Development			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.31E+00	988	120.589	185.589
SO2	3-hour	3.82E-05	970	91.692	194.842
	24-hour	1.27E-05	978	104.140	182.143
	Annual	7.45E-07	970	91.692	194.842
PM10	24-hour	6.53E-04	952	82.023	213.847
	Annual	3.02E-05	970	91.692	194.842
PM25	24-hour	1.53E-03	953	81.912	212.069
	Annual	1.01E-04	970	91.692	194.842
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.05E-03	988	120.589	185.589
S	Annual	1.48E-09	970	91.692	194.842
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

FITZPATRICK		RD - Reasonably Foreseeable Development			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.34E-03	716	-71.592	46.301
SO2	3-hour	4.97E-04	752	-88.000	70.000
	24-hour	6.44E-05	752	-88.000	70.000
	Annual	3.53E-06	715	-79.283	50.830
PM10	24-hour	4.14E-03	752	-88.000	70.000
	Annual	1.85E-04	715	-79.283	50.830
PM25	24-hour	5.80E-03	752	-88.000	70.000
	Annual	4.15E-04	716	-71.592	46.301
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.74E-05	715	-79.283	50.830
S	Annual	6.91E-09	715	-79.283	50.830
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
NORTH ABSAROKA		RD - Reasonably Foreseeable Development			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.04E-03	815	-63.736	230.153
SO2	3-hour	3.82E-05	807	-75.265	208.495
	24-hour	1.51E-05	807	-75.265	208.495
	Annual	4.23E-07	807	-75.265	208.495
PM10	24-hour	6.16E-04	807	-75.265	208.495
	Annual	1.70E-05	07	-75.265	208.495
PM25	24-hour	1.70E-03	807	-75.265	208.495
	Annual	5.71E-05	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	7.33E-06	815	-63.736	230.153
S	Annual	1.33E-09	843	-120.223	208.073
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

OWL CREEK		RD - Reasonably Foreseeable Development																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	9.07E-03	1105	8.130	99.924															
SO2	3-hour	9.95E-05	1105	8.130	99.924															
	24-hour	2.44E-05	1091	-27.547	117.742															
	Annual	1.56E-06	1108	3.634	96.926															
PM10	24-hour	9.78E-04	1091	-27.547	117.742															
	Annual	6.73E-05	1109	1.219	98.675															
PM25	24-hour	2.93E-03	1108	3.634	96.926															
	Annual	1.88E-04	1108	3.634	96.926															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.83E-05	1105	8.130	99.924															
S	Annual	2.72E-09	1108	3.634	96.926															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
POPO AGIE		RD - Reasonably Foreseeable Development																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.01E-02	896	-34.393	5.702															
SO2	3-hour	2.31E-04	903	-43.441	10.346															
	24-hour	4.81E-05	904	-45.812	13.153															
	Annual	4.87E-06	903	-43.441	10.346															
PM10	24-hour	2.23E-03	904	-45.812	13.153															
	Annual	2.15E-04	903	-43.441	10.346															
PM25	24-hour	7.33E-03	904	-45.812	13.153															
	Annual	5.47E-04	903	-43.441	10.346															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.86E-05	886	-33.377	20.749															
S	Annual	7.37E-09	903	-43.441	10.346															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

PHLOX MOUNTAIN		RD - Reasonably Foreseeable Development																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.01E-03	1140	-17.128	113.192															
	3-hour	5.79E-05	1140	-17.128	113.192															
SO2	24-hour	1.37E-06	1140	-17.128	113.192															
	Annual	1.37E-06	1140	-17.128	113.192															
PM10	24-hour	8.16E-04	1140	-17.128	113.192															
	Annual	6.04E-05	1140	-17.128	113.192															
PM25	24-hour	1.89E-03	1140	-17.128	113.192															
	Annual	1.67E-04	1140	-17.128	113.192															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.43E-05	1140	-17.128	113.192															
	S	Annual	2.45E-09	1140	-17.128	113.192														
VISIBILITY		FLAG	IMPROVE																	
Days delta dV >0.50																				
Days delta dV >1.00																				
Largest delta dV																				
Day of Largest delta dV																				
Largest delta dV Receptor																				
Total dV																				
dV Background																				
% Ext by SO4																				
% Ext by NO3																				
% Ext by PM10																				
% Ext by PM2.5																				
TETON NATIONAL PARK		RD - Reasonably Foreseeable Development																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.49E-03	675	-170.050	111.556															
	3-hour	2.80E-04	700	-180.418	139.983															
SO2	24-hour	5.00E-05	694	-187.064	116.152															
	Annual	1.55E-06	675	-170.050	111.556															
PM10	24-hour	1.55E-03	689	-183.418	112.810															
	Annual	5.85E-05	672	-158.695	119.057															
PM25	24-hour	6.71E-03	694	-187.064	116.152															
	Annual	2.01E-04	675	-170.050	111.556															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	9.36E-06	672	-158.695	119.057															
	S	Annual	4.29E-09	672	-158.695	119.057														
VISIBILITY		FLAG	IMPROVE																	
Days delta dV >0.50																				
Days delta dV >1.00																				
Largest delta dV																				
Day of Largest delta dV																				
Largest delta dV Receptor																				
Total dV																				
dV Background																				
% Ext by SO4																				
% Ext by NO3																				
% Ext by PM10																				
% Ext by PM2.5																				

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

TETON WILDERNESS AREA		RD - Reasonably Foreseeable Development																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.05E-03	48	-101.381	138.307															
SO2	3-hour	1.03E-04	206	-94.000	178.000															
	24-hour	3.00E-05	32	-145.858	144.194															
	Annual	1.12E-06	42	-116.507	132.748															
PM10	24-hour	1.01E-03	32	-145.858	144.194															
	Annual	4.67E-05	42	-116.507	132.748															
PM25	24-hour	4.41E-03	32	-145.858	144.194															
	Annual	1.47E-04	42	-116.507	132.748															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	9.72E-06	42	-116.507	132.748															
S	Annual	3.90E-09	41	-117.978	133.320															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
WASHAKIE		RD - Reasonably Foreseeable Development																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	4.46E-03	298	-40.129	137.459															
SO2	3-hour	3.11E-04	470	-92.000	190.000															
	24-hour	3.97E-05	470	-92.000	190.000															
	Annual	1.46E-06	287	-63.812	124.868															
PM10	24-hour	1.52E-03	316	-61.474	170.617															
	Annual	6.31E-05	287	-63.812	124.868															
PM25	24-hour	4.83E-03	316	-61.474	170.617															
	Annual	1.78E-04	287	-63.812	124.868															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.25E-05	294	-47.084	127.086															
S	Annual	3.67E-09	335	-92.000	126.000															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

WIND RIVER CANYON		RD - Reasonably Foreseeable Development		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	1.19E-02	1087	32.532 100.033
SO2	3-hour	8.59E-05	1064	26.198 111.141
	24-hour	1.95E-05	1064	26.198 111.141
	Annual	1.41E-06	1076	27.022 94.149
PM10	24-hour	9.44E-04	1077	29.190 92.365
	Annual	5.78E-05	1076	27.022 94.149
PM25	24-hour	3.10E-03	1077	29.190 92.365
	Annual	1.77E-04	1077	29.190 92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	2.25E-05	1080	34.351 96.785
S	Annual	2.35E-09	1075	25.786 97.388
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50			
	Days delta dV >1.00			
	Largest delta dV			
	Day of Largest delta dV			
	Largest delta dV Receptor			
	Total dV			
	dV Background			
	% Ext by SO4			
	% Ext by NO3			
	% Ext by PM10			
	% Ext by PM2.5			
WIND RIVER ROADLESS		RD - Reasonably Foreseeable Development		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	7.30E-03	812	-61.282 35.110
SO2	3-hour	3.44E-04	863	-64.000 66.000
	24-hour	4.31E-05	863	-64.000 66.000
	Annual	3.85E-06	812	-61.282 35.110
PM10	24-hour	1.83E-03	809	-66.961 42.874
	Annual	1.85E-04	812	-61.282 35.110
PM25	24-hour	5.83E-03	812	-61.282 35.110
	Annual	4.61E-04	812	-61.282 35.110
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	1.81E-05	812	-61.282 35.110
S	Annual	6.60E-09	812	-61.282 35.110
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50			
	Days delta dV >1.00			
	Largest delta dV			
	Day of Largest delta dV			
	Largest delta dV Receptor			
	Total dV			
	dV Background			
	% Ext by SO4			
	% Ext by NO3			
	% Ext by PM10			
	% Ext by PM2.5			

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

YELLOWSTONE NATL PARK		RD - Reasonably Foreseeable Development													
Pollutant Concentrations		(ug/m3)	Receptor												
NO2	Annual	1.37E-03	109	-112.113	171.051										
SO2	3-hour	6.64E-05	58	-192.042	173.223										
	24-hour	2.13E-05	108	-196.891	173.293										
	Annual	7.14E-07	66	-164.001	172.442										
PM10	24-hour	7.67E-04	62	-175.968	172.705										
	Annual	2.50E-05	68	-156.059	172.424										
PM25	24-hour	3.37E-03	108	-196.891	173.293										
	Annual	9.61E-05	66	-164.001	172.442										
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor												
N	Annual	7.46E-06	109	-112.113	171.051										
S	Annual	2.39E-09	69	-151.989	172.278										
VISIBILITY	FLAG	IMPROVE													
	Days delta dV >0.50														
	Days delta dV >1.00														
	Largest delta dV														
	Day of Largest delta dV														
	Largest delta dV Receptor														
	Total dV														
	dV Background														
	% Ext by SO4														
	% Ext by NO3														
	% Ext by PM10														
	% Ext by PM2.5														

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

<i>Visibility Summary</i>		RD - Reasonably Foreseeable Development												
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions										
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV								
Bridger	0	0	0.000	0	0	0.000								
Cloud Peak	0	0	0.000	0	0	0.000								
Fitzpatrick	0	0	0.000	0	0	0.000								
North Absaroka	0	0	0.000	0	0	0.000								
Owl Creek	0	0	0.000	0	0	0.000								
Popo Agie	0	0	0.000	0	0	0.000								
Phlox Mountain	0	0	0.000	0	0	0.000								
Teton NP	0	0	0.000	0	0	0.000								
Teton Wilderness	0	0	0.000	0	0	0.000								
Washakie	0	0	0.000	0	0	0.000								
Wind River Canyon	0	0	0.000	0	0	0.000								
Wind River Roadless	0	0	0.000	0	0	0.000								
Yellowstone NP	0	0	0.000	0	0	0.000								
Total Days / Max Δ dV	0	0	0.000	0	0	0.000								

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

LAKES		RD - Reasonably Foreseeable Development																		
<i>Black Joe</i>		ug/m**2/sec																		
Total Deposition																				
	N	1.81E-05	1141	-49.183	20.543															
	S	6.78E-09	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
Total Deposition																				
	N	1.82E-05	1142	-49.178	18.394															
	S	6.99E-09	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
Total Deposition																				
	N	4.01E-04	1143	95.779	205.602															
	S	1.37E-09	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
Total Deposition																				
	N	6.72E-04	1144	105.440	193.981															
	S	1.36E-09	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
Total Deposition																				
	N	1.88E-05	1145	-88.417	52.778															
	S	8.48E-09	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
Total Deposition																				
	N	1.81E-05	1146	-35.219	7.97															
	S	7.20E-09	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
Total Deposition																				
	N	1.43E-05	1147	-86.813	89.541															
	S	5.28E-09	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
Total Deposition																				
	N	1.83E-05	1148	-48.413	14.897															
	S	7.29E-09	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
Total Deposition																				
	N	5.90E-06	1149	-96.935	275.159															
	S	1.17E-09	1149	-96.935	275.159															
<i>Twin Island</i>		Popo Agie - 10																		
Total Deposition																				
	N	6.11E-06	1150	-95.471	271.528															
	S	1.18E-09	1150	-95.471	271.528															

**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

Terrestrial Acid Deposition Summary		RD - Reasonably Foreseeable Development																		
Incremental Analysis																				
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT													
Bridger	3.18E-05	1.28E-08	1.00E-02	4.05E-06	0.005	200.7%	0.1%													
Cloud Peak	1.05E-03	1.48E-09	3.31E-01	4.66E-07	0.005	6615.0%	0.0%													
Fitzpatrick	1.74E-05	6.91E-09	5.48E-03	2.18E-06	0.005	109.7%	0.0%													
North Absaroka	7.33E-06	1.33E-09	2.31E-03	4.20E-07	0.005	46.3%	0.0%													
Owl Creek Range	1.83E-05	2.72E-09	5.78E-03	8.59E-07	0.005	115.6%	0.0%													
Popo Agie	1.86E-05	7.37E-09	5.88E-03	2.32E-06	0.005	117.5%	0.0%													
Phlox Mountain	1.43E-05	2.45E-09	4.52E-03	7.73E-07	0.005	90.4%	0.0%													
Teton NP	9.36E-06	4.29E-09	2.95E-03	1.35E-06	0.005	59.0%	0.0%													
Teton Wilderness	9.72E-06	3.90E-09	3.06E-03	1.23E-06	0.005	61.3%	0.0%													
Washakie Wilderness	1.25E-05	3.67E-09	3.96E-03	1.16E-06	0.005	79.1%	0.0%													
Wind River Canyon	2.25E-05	2.35E-09	7.09E-03	7.42E-07	0.005	141.7%	0.0%													
Wind River Roadless	1.81E-05	6.60E-09	5.70E-03	2.08E-06	0.005	114.1%	0.0%													
Yellowstone NP	7.46E-06	2.39E-09	2.35E-03	7.54E-07	0.005	47.0%	0.0%													
Maximum	1.05E-03	1.28E-08	3.31E-01	4.05E-06	0.005	6615.0%	0.1%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts															
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) "Green Line"	Total Nitrogen (N) "Red Line"	Percent of "Green Line"	Percent of "Red Line"										
Bridger	3.18E-05	1.00E-02	1.3	1.3	3.0	10.0	43.7%	13.1%												
Cloud Peak	1.05E-03	3.31E-01	1.3	1.6	3.0	10.0	54.4%	16.3%												
Fitzpatrick	1.74E-05	5.48E-03	1.3	1.3	3.0	10.0	43.5%	13.1%												
North Absaroka	7.33E-06	2.31E-03	1.1	1.1	3.0	10.0	36.7%	11.0%												
Owl Creek Range	1.83E-05	5.78E-03	1.3	1.3	3.0	10.0	43.5%	13.1%												
Popo Agie	1.86E-05	5.88E-03	1.3	1.3	3.0	10.0	43.5%	13.1%												
Phlox Mountain	1.43E-05	4.52E-03	1.3	1.3	3.0	10.0	43.5%	13.0%												
Teton NP	9.36E-06	2.95E-03	1.1	1.1	3.0	10.0	36.8%	11.0%												
Teton Wilderness	9.72E-06	3.06E-03	1.1	1.1	3.0	10.0	36.8%	11.0%												
Washakie Wilderness	1.25E-05	3.96E-03	1.1	1.1	3.0	10.0	36.8%	11.0%												
Wind River Canyon	2.25E-05	7.09E-03	1.3	1.3	3.0	10.0	43.6%	13.1%												
Wind River Roadless	1.81E-05	5.70E-03	1.3	1.3	3.0	10.0	43.5%	13.1%												
Yellowstone NP	7.46E-06	2.35E-03	1.1	1.1	3.0	10.0	36.7%	11.0%												
Maximum	1.05E-03	3.31E-01	1.3	1.6	3.0	10.0	54.4%	16.3%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts															
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) "Green Line"	Total Sulfur (S) "Red Line"	Percent of "Green Line"	Percent of "Red Line"										
Bridger	1.28E-08	4.05E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	1.48E-09	4.66E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	6.91E-09	2.18E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absaroka	1.33E-09	4.20E-07	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	2.72E-09	8.59E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	7.37E-09	2.32E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	2.45E-09	7.73E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	4.29E-09	1.35E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Teton Wilderness	3.90E-09	1.23E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	3.67E-09	1.16E-06	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	2.35E-09	7.42E-07	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	6.60E-09	2.08E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	2.39E-09	7.54E-07	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	1.28E-08	4.05E-06	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																				

Appendix A9
Summary of Results
Reasonably Foreseeable Development

Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).							
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**Appendix A9
Summary of Results
Reasonably Foreseeable Development**

Ambient Impact Summary		RD - Reasonably Foreseeable Development											
Pollutant	Averaging Time	Maximum Impact	Maximum Impact	PSD Class I Increment	Impact % of PSD Class I Increment	Background Concentration	Background Plus Impact	WAAQS/NAAQs Standard	Impact % of WAAQS/NAAQs				
		(ug/m3)	Location	(ug/m3)		(ug/m3)	(ug/m3)	(ug/m3)					
NO2	Annual	2.31E+00	CLOUD PEAK	2.5	92.25%	3.4	5.71	100	5.71%				
SO2	3-hour	7.34E-04	BRIDGER	25	0.00%	132	132.00	1300	10.15%				
	24-hour	1.48E-04	BRIDGER	5	0.00%	43	43.00	260	16.54%				
	Annual	9.95E-06	BRIDGER	2	0.00%	9	9.00	60	15.00%				
PM10	24-hour	7.34E-03	BRIDGER	8	0.09%	61	61.01	150	40.67%				
	Annual	5.19E-04	BRIDGER	4	0.01%	22	22.00	50	44.00%				
PM25	24-hour	1.64E-02	BRIDGER	n.a.	n.a.	35	35.02	65	53.87%				
	Annual	1.14E-03	BRIDGER	n.a.	n.a.	10	10.00	15	66.67%				
Maximum					92.25%				66.67%				

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

BRIDGER		WI - Non-Project Wells Emissions			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.11E-04	530	-85.694	31.436
SO2	3-hour	0.00E+00	N/A		
	24-hour	0.00E+00	N/A		
	Annual	0.00E+00	N/A		
PM10	24-hour	0.00E+00	N/A		
	Annual	0.00E+00	N/A		
PM25	24-hour	0.00E+00	N/A		
	Annual	0.00E+00	N/A		
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.42E-07	552	-36.775	8.558
S	Annual	0.00E+00	N/A		
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
CLOUD PEAK		WI - Non-Project Wells Emissions			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.34E-04	953	81.912	212.069
SO2	3-hour	0.00E+00	N/A		
	24-hour	0.00E+00	N/A		
	Annual	0.00E+00	N/A		
PM10	24-hour	0.00E+00	N/A		
	Annual	0.00E+00	N/A		
PM25	24-hour	0.00E+00	N/A		
	Annual	0.00E+00	N/A		
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	5.34E-07	980	107.363	178.642
S	Annual	0.00E+00	N/A		
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

FITZPATRICK		WI - Non-Project Wells Emissions			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.16E-05	716	-71.592	46.301
SO2	3-hour	0.00E+00		N/A	
	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM10	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM25	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.48E-07	727	-71.232	89.283
S	Annual	0.00E+00		N/A	
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
NORTH ABSAROKA		WI - Non-Project Wells Emissions			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.38E-03	894	-66.000	226.000
SO2	3-hour	0.00E+00		N/A	
	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM10	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM25	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.91E-06	894	-66.000	226.000
S	Annual	0.00E+00		N/A	
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

OWL CREEK		WI - Non-Project Wells Emissions																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.51E-03	1096	-6.149	115.951															
SO2	3-hour	0.00E+00		N/A																
	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM10	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM25	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.65E-06	1096	-6.149	115.951															
	S	0.00E+00		N/A																
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
POPO AGIE		WI - Non-Project Wells Emissions																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.57E-04	886	-33.377	20.749															
SO2	3-hour	0.00E+00		N/A																
	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM10	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM25	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	2.96E-07	886	-33.377	20.749															
	S	0.00E+00		N/A																
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

PHLOX MOUNTAIN		WI - Non-Project Wells Emissions																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.21E-04	1140	-17.128	113.192															
SO2	3-hour	0.00E+00		N/A																
	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM10	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM25	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	5.45E-07	1140	-17.128	113.192															
	S	Annual	0.00E+00		N/A															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
TETON NATIONAL PARK		WI - Non-Project Wells Emissions																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	9.85E-06	664	-146.201	133.488															
SO2	3-hour	0.00E+00		N/A																
	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM10	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM25	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	3.93E-08	664	-146.201	133.488															
	S	Annual	0.00E+00		N/A															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

TETON WILDERNESS AREA		WI - Non-Project Wells Emissions																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	4.59E-05	206	-94.000	178.000															
SO2	3-hour	0.00E+00		N/A																
	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM10	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM25	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	8.61E-08	57	-91.325	162.181															
	S	0.00E+00		N/A																
VISIBILITY		FLAG		IMPROVE																
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			
WASHAKIE		WI - Non-Project Wells Emissions																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.89E-03	215	-69.951	201.884															
SO2	3-hour	0.00E+00		N/A																
	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM10	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
PM25	24-hour	0.00E+00		N/A																
	Annual	0.00E+00		N/A																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	3.13E-06	215	-69.951	201.884															
	S	0.00E+00		N/A																
VISIBILITY		FLAG		IMPROVE																
	Days delta dV >0.50																			
	Days delta dV >1.00																			
	Largest delta dV																			
	Day of Largest delta dV																			
	Largest delta dV Receptor																			
	Total dV																			
	dV Background																			
	% Ext by SO4																			
	% Ext by NO3																			
	% Ext by PM10																			
	% Ext by PM2.5																			

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

WIND RIVER CANYON		WI - Non-Project Wells Emissions			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.88E-03	1064	26.198	111.141
SO2	3-hour	0.00E+00		N/A	
	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM10	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM25	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.65E-06	1064	26.198	111.141
S	Annual	0.00E+00		N/A	
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				
WIND RIVER ROADLESS		WI - Non-Project Wells Emissions			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.47E-04	821	-40.795	43.233
SO2	3-hour	0.00E+00		N/A	
	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM10	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
PM25	24-hour	0.00E+00		N/A	
	Annual	0.00E+00		N/A	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.75E-07	819	-40.580	37.986
S	Annual	0.00E+00		N/A	
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50				
	Days delta dV >1.00				
	Largest delta dV				
	Day of Largest delta dV				
	Largest delta dV Receptor				
	Total dV				
	dV Background				
	% Ext by SO4				
	% Ext by NO3				
	% Ext by PM10				
	% Ext by PM2.5				

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

YELLOWSTONE NATL PARK		WI - Non-Project Wells Emissions												
Pollutant Concentrations		(ug/m3)	Receptor											
NO2	Annual	4.93E-05	97	-97.734	233.934									
SO2	3-hour	0.00E+00	N/A											
	24-hour	0.00E+00	N/A											
PM10	Annual	0.00E+00	N/A											
	24-hour	0.00E+00	N/A											
PM25	Annual	0.00E+00	N/A											
	24-hour	0.00E+00	N/A											
	Annual	0.00E+00	N/A											
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor											
N	Annual	6.28E-08	97	-97.734	233.934									
S	Annual	0.00E+00	N/A											
VISIBILITY		FLAG	IMPROVE											
	Days delta dV >0.50													
	Days delta dV >1.00													
	Largest delta dV													
	Day of Largest delta dV													
	Largest delta dV Receptor													
	Total dV													
	dV Background													
	% Ext by SO4													
	% Ext by NO3													
	% Ext by PM10													
	% Ext by PM2.5													

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

<i>Visibility Summary</i>		WI - Non-Project Wells Emissions														
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions												
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV										
Bridger	0	0	0.000	0	0	0.000										
Cloud Peak	0	0	0.000	0	0	0.000										
Fitzpatrick	0	0	0.000	0	0	0.000										
North Absaroka	0	0	0.000	0	0	0.000										
Owl Creek	0	0	0.000	0	0	0.000										
Popo Agie	0	0	0.000	0	0	0.000										
Phlox Mountain	0	0	0.000	0	0	0.000										
Teton NP	0	0	0.000	0	0	0.000										
Teton Wilderness	0	0	0.000	0	0	0.000										
Washakie	0	0	0.000	0	0	0.000										
Wind River Canyon	0	0	0.000	0	0	0.000										
Wind River Roadless	0	0	0.000	0	0	0.000										
Yellowstone NP	0	0	0.000	0	0	0.000										
Total Days / Max Δ dV	0	0	0.000	0	0	0.000										

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

LAKES		WI - Non-Project Wells Emissions																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.12E-07	1141	-49.183	20.543															
	S	0.00E+00	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.10E-07	1142	-49.178	18.394															
	S	0.00E+00	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.49E-07	1143	95.779	205.602															
	S	0.00E+00	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.61E-07	1144	105.440	193.981															
	S	0.00E+00	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	9.98E-08	1145	-88.417	52.778															
	S	0.00E+00	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.47E-07	1146	-35.219	7.97															
	S	0.00E+00	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.12E-07	1147	-86.813	89.541															
	S	0.00E+00	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	2.08E-07	1148	-48.413	14.897															
	S	0.00E+00	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.06E-08	1149	-96.935	275.159															
	S	0.00E+00	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	4.36E-08	1150	-95.471	271.528															
	S	0.00E+00	1150	-95.471	271.528															

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

ANC Impacts to High Elevation Lakes		WI - Non-Project Wells Emissions																		
High Elevation	Inputs																			
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)															
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition															
	ANC (A)	(P)	Area	Rate	Rate															
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)															
Black Joe Lake	67.0	0.925	890	2.12E-07	0.00E+00															
Deep Lake	59.9	0.925	205	2.10E-07	0.00E+00															
Emerald Lake	69.8	0.780	293	4.49E-07	0.00E+00															
Florence Lake	33.0	0.780	417	4.61E-07	0.00E+00															
Hobbs Lake	69.9	1.080	293	9.98E-08	0.00E+00															
Lower Saddlebag	55.5	1.000	155	2.47E-07	0.00E+00															
Ross Lake	53.5	1.080	4455	1.12E-07	0.00E+00															
Stepping Stone Lake	19.9	1.460	26	4.06E-08	0.00E+00															
Twin Island Lake	17.6	1.300	45	4.36E-08	0.00E+00															
Upper Frozen Lake	5.0	0.925	65	2.08E-07	0.00E+00															
High Elevation	Intermediate Calculated Values						Results													
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent												
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC												
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change												
Black Joe Lake	6.70E-05	0.00E+00	3.70E+05	4.79E-07	0.00E+00	4.26E+00	0.0008	0.00%												
Deep Lake	6.61E-05	0.00E+00	7.61E+04	4.72E-07	0.00E+00	9.69E-01	0.0008	0.00%												
Emerald Lake	1.42E-04	0.00E+00	1.07E+05	1.01E-06	0.00E+00	2.97E+00	0.0019	0.00%												
Florence Lake	1.45E-04	0.00E+00	7.19E+04	1.04E-06	0.00E+00	4.33E+00	0.0020	0.01%												
Hobbs Lake	3.15E-05	0.00E+00	1.48E+05	2.25E-07	0.00E+00	6.59E-01	0.0003	0.00%												
Lower Saddlebag	7.79E-05	0.00E+00	5.76E+04	5.56E-07	0.00E+00	8.62E-01	0.0008	0.00%												
Ross Lake	3.53E-05	0.00E+00	1.72E+06	2.52E-07	0.00E+00	1.12E+01	0.0003	0.00%												
Stepping Stone Lake	1.28E-05	0.00E+00	5.14E+03	9.15E-08	0.00E+00	2.42E-02	0.0001	0.00%												
Twin Island Lake	1.37E-05	0.00E+00	6.88E+03	9.82E-08	0.00E+00	4.41E-02	0.0001	0.00%												
Upper Frozen Lake	6.54E-05	0.00E+00	2.01E+03	4.67E-07	0.00E+00	3.03E-01	0.0008	0.02%												
Maximum							0.0020	0.02%												
NOTE:	Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes. USDA Forest Service, Rocky Mountain Region, January 2000.																			
	Baseline ANC values calculated from summarized data provided by the Forest Service.																			
	ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																			
	Annual precipitation and watershed catchments values provided by the Forest Service.																			

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

Terrestrial Acid Deposition Summary		WI - Non-Project Wells Emissions																		
Incremental Analysis																				
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT													
Bridger	2.42E-07	0.00E+00	7.64E-05	0.00E+00	0.005	1.5%	0.0%													
Cloud Peak	5.34E-07	0.00E+00	1.68E-04	0.00E+00	0.005	3.4%	0.0%													
Fitzpatrick	1.48E-07	0.00E+00	4.67E-05	0.00E+00	0.005	0.9%	0.0%													
North Absaroka	2.91E-06	0.00E+00	9.18E-04	0.00E+00	0.005	18.4%	0.0%													
Owl Creek Range	1.65E-06	0.00E+00	5.21E-04	0.00E+00	0.005	10.4%	0.0%													
Popo Agie	2.96E-07	0.00E+00	9.32E-05	0.00E+00	0.005	1.9%	0.0%													
Phlox Mountain	5.45E-07	0.00E+00	1.72E-04	0.00E+00	0.005	3.4%	0.0%													
Teton NP	3.93E-08	0.00E+00	1.24E-05	0.00E+00	0.005	0.2%	0.0%													
Teton Wilderness	8.61E-08	0.00E+00	2.72E-05	0.00E+00	0.005	0.5%	0.0%													
Washakie Wilderness	3.13E-06	0.00E+00	9.87E-04	0.00E+00	0.005	19.7%	0.0%													
Wind River Canyon	1.65E-06	0.00E+00	5.19E-04	0.00E+00	0.005	10.4%	0.0%													
Wind River Roadless	2.75E-07	0.00E+00	8.68E-05	0.00E+00	0.005	1.7%	0.0%													
Yellowstone NP	6.28E-08	0.00E+00	1.98E-05	0.00E+00	0.005	0.4%	0.0%													
Maximum	3.13E-06	0.00E+00	9.87E-04	0.00E+00	0.005	19.7%	0.0%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts															
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"												
Bridger	2.42E-07	7.64E-05	1.3	1.3	3.0	10.0	43.3%	13.0%												
Cloud Peak	5.34E-07	1.68E-04	1.3	1.3	3.0	10.0	43.3%	13.0%												
Fitzpatrick	1.48E-07	4.67E-05	1.3	1.3	3.0	10.0	43.3%	13.0%												
North Absaroka	2.91E-06	9.18E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Owl Creek Range	1.65E-06	5.21E-04	1.3	1.3	3.0	10.0	43.4%	13.0%												
Popo Agie	2.96E-07	9.32E-05	1.3	1.3	3.0	10.0	43.3%	13.0%												
Phlox Mountain	5.45E-07	1.72E-04	1.3	1.3	3.0	10.0	43.3%	13.0%												
Teton NP	3.93E-08	1.24E-05	1.1	1.1	3.0	10.0	36.7%	11.0%												
Teton Wilderness	8.61E-08	2.72E-05	1.1	1.1	3.0	10.0	36.7%	11.0%												
Washakie Wilderness	3.13E-06	9.87E-04	1.1	1.1	3.0	10.0	36.7%	11.0%												
Wind River Canyon	1.65E-06	5.19E-04	1.3	1.3	3.0	10.0	43.4%	13.0%												
Wind River Roadless	2.75E-07	8.68E-05	1.3	1.3	3.0	10.0	43.3%	13.0%												
Yellowstone NP	6.28E-08	1.98E-05	1.1	1.1	3.0	10.0	36.7%	11.0%												
Maximum	3.13E-06	9.87E-04	1.3	1.3	3.0	10.0	43.4%	13.0%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts															
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"												
Bridger	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absaroka	0.00E+00	0.00E+00	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	0.00E+00	0.00E+00	0.9	0.9	5.0	20.0	18.0%	4.5%												
Teton Wilderness	0.00E+00	0.00E+00	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	0.00E+00	0.00E+00	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	0.00E+00	0.00E+00	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	0.00E+00	0.00E+00	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																				
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																				

**Appendix A10
Summary of Results
Non-Project Wells Emissions**

Ambient Impact Summary		WI - Non-Project Wells Emissions												
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQ Standard (ug/m3)	Impact % of WAAQS/NAAQ					
NO2	Annual	6.89E-03	WASHAKIE	2.5	0.28%	3.4	3.41	100	3.41%					
SO2	3-hour	0.00E+00	BRIDGER	25	0.00%	132	132.00	1300	10.15%					
	24-hour	0.00E+00	BRIDGER	5	0.00%	43	43.00	260	16.54%					
PM10	Annual	0.00E+00	BRIDGER	2	0.00%	9	9.00	60	15.00%					
	24-hour	0.00E+00	BRIDGER	8	0.00%	61	61.00	150	40.67%					
PM25	Annual	0.00E+00	BRIDGER	4	0.00%	22	22.00	50	44.00%					
	24-hour	0.00E+00	BRIDGER	n.a.	n.a.	35	35.00	65	53.85%					
Maximum	Annual	0.00E+00	BRIDGER	n.a.	n.a.	10	10.00	15	66.67%					
					0.28%				66.67%					

**Appendix A11
Summary of Results
Cumulative Sources**

BRIDGER		CM - Cumulative Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.34E-02	537	-73.783	19.513															
	3-hour	8.08E-02	530	-85.694	31.436															
	24-hour	1.94E-02	530	-85.694	31.436															
PM10	Annual	1.16E-03	537	-73.783	19.513															
	24-hour	1.12E-02	530	-85.694	31.436															
	Annual	7.82E-04	537	-73.783	19.513															
PM25	24-hour	2.50E-02	530	-85.694	31.436															
	Annual	1.82E-03	537	-73.783	19.513															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	6.04E-05	530	-85.694	31.436															
	Annual	1.84E-06	513	-109.557	60.700															
S																				
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	5	4																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.858	0.957																	
	Day of Largest delta dV	305	60																	
	Largest delta dV Receptor	552	564																	
	Total dV	5.551	4.041																	
	dV Background	4.692	3.084																	
	% Ext by SO4	1.73	0.75																	
	% Ext by NO3	97.66	98.67																	
	% Ext by PM10	0.09	0.10																	
	% Ext by PM2.5	0.53	0.48																	
CLOUD PEAK		CM - Cumulative Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.36E+00	988	120.589	185.589															
	3-hour	3.16E-01	1053	112.000	208.000															
	24-hour	4.47E-02	1053	112.000	208.000															
PM10	Annual	2.39E-03	980	107.363	178.642															
	24-hour	7.86E-02	995	116.255	198.926															
	Annual	2.76E-03	995	116.255	198.926															
PM25	24-hour	1.12E-01	994	115.588	197.592															
	Annual	4.64E-03	989	119.200	187.867															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.18E-03	988	120.589	185.589															
	Annual	5.83E-06	980	107.363	178.642															
S																				
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	41	41																	
	Days delta dV >1.00	11	12																	
	Largest delta dV	1.708	1.648																	
	Day of Largest delta dV	119	119																	
	Largest delta dV Receptor	944	944																	
	Total dV	6.257	6.584																	
	dV Background	4.549	4.935																	
	% Ext by SO4	0.34	0.34																	
	% Ext by NO3	99.03	99.03																	
	% Ext by PM10	0.14	0.14																	
	% Ext by PM2.5	0.49	0.49																	

**Appendix A11
Summary of Results
Cumulative Sources**

FITZPATRICK		CM - Cumulative Sources																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	1.22E-02	716	-71.592	46.301																
	3-hour	2.74E-02	782	-96.000	98.000																
	24-hour	7.08E-03	720	-71.448	62.044																
SO2	Annual	7.55E-04	700	-95.817	99.004																
	24-hour	4.21E-03	752	-88.000	70.000																
PM10	Annual	2.91E-04	752	-88.000	70.000																
	24-hour	5.99E-03	752	-88.000	70.000																
PM25	24-hour	5.99E-03	752	-88.000	70.000																
	Annual	7.30E-04	772	-96.000	90.000																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	3.50E-05	716	-71.592	46.301																
	Annual	1.57E-06	700	-95.817	99.004																
S	Annual	1.57E-06	700	-95.817	99.004																
	Annual	1.57E-06	700	-95.817	99.004																
VISIBILITY		FLAG	IMPROVE																		
Days delta dV >0.50		1	1																		
Days delta dV >1.00		0	0																		
Largest delta dV		0.599	0.696																		
Day of Largest delta dV		60	60																		
Largest delta dV Receptor		716	716																		
Total dV		5.224	3.779																		
dV Background		4.625	3.084																		
% Ext by SO4		0.65	0.65																		
% Ext by NO3		98.61	98.61																		
% Ext by PM10		0.14	0.14																		
% Ext by PM2.5		0.59	0.59																		
NORTH ABSAROKA		CM - Cumulative Sources																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	1.24E-02	815	-63.736	230.153																
	3-hour	2.74E-02	781	-110.264	264.328																
	24-hour	1.36E-02	815	-63.736	230.153																
SO2	Annual	5.75E-04	843	-120.223	208.073																
	24-hour	1.09E-02	780	-105.982	264.246																
PM10	Annual	1.99E-04	842	-102.222	264.148																
	24-hour	5.87E-03	814	-69.913	224.471																
PM25	24-hour	5.87E-03	814	-69.913	224.471																
	Annual	3.36E-04	807	-75.265	208.495																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	2.16E-05	815	-63.736	230.153																
	Annual	1.66E-06	792	-124.346	213.930																
S	Annual	1.66E-06	792	-124.346	213.930																
	Annual	1.66E-06	792	-124.346	213.930																
VISIBILITY		FLAG	IMPROVE																		
Days delta dV >0.50		3	4																		
Days delta dV >1.00		0	0																		
Largest delta dV		0.752	0.725																		
Day of Largest delta dV		118	118																		
Largest delta dV Receptor		815	815																		
Total dV		5.301	5.660																		
dV Background		4.549	4.935																		
% Ext by SO4		0.59	0.59																		
% Ext by NO3		99.20	99.20																		
% Ext by PM10		0.04	0.04																		
% Ext by PM2.5		0.17	0.17																		

**Appendix A11
Summary of Results
Cumulative Sources**

OWL CREEK		CM - Cumulative Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	2.15E-02	1104	7.006	104.794														
	3-hour	9.69E-02	1094	-14.059	118.533														
	24-hour	3.45E-02	1094	-14.059	118.533														
PM10	Annual	1.44E-03	1104	7.006	104.794														
	24-hour	9.61E-03	1101	3.592	108.083														
PM25	Annual	3.64E-04	1105	8.130	99.924														
	24-hour	2.07E-02	1101	3.592	108.083														
	Annual	9.62E-04	1105	8.130	99.924														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	4.33E-05	1104	7.006	104.794														
	Annual	2.01E-06	1103	6.007	105.710														
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50	7	7																
	Days delta dV >1.00	3	3																
	Largest delta dV	1.647	1.897																
	Day of Largest delta dV	59	59																
	Largest delta dV Receptor	1107	1107																
	Total dV	6.272	4.981																
	dV Background	4.625	3.084																
	% Ext by SO4	0.80	0.80																
	% Ext by NO3	98.40	98.39																
	% Ext by PM10	0.16	0.16																
	% Ext by PM2.5	0.65	0.65																
POPO AGIE		CM - Cumulative Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	2.20E-02	896	-34.393	5.702														
	3-hour	4.04E-02	893	-28.587	7.395														
	24-hour	1.52E-02	893	-28.587	7.395														
PM10	Annual	7.73E-04	894	-30.281	4.879														
	24-hour	2.57E-03	890	-29.797	13.249														
PM25	Annual	3.50E-04	903	-43.441	10.346														
	24-hour	9.08E-03	894	-30.281	4.879														
	Annual	9.55E-04	903	-43.441	10.346														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	4.51E-05	887	-32.313	17.943														
	Annual	1.45E-06	889	-30.862	15.475														
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50	5	6																
	Days delta dV >1.00	0	3																
	Largest delta dV	0.989	1.144																
	Day of Largest delta dV	60	60																
	Largest delta dV Receptor	875	875																
	Total dV	5.613	4.228																
	dV Background	4.625	3.084																
	% Ext by SO4	0.77	0.77																
	% Ext by NO3	98.68	98.68																
	% Ext by PM10	0.09	0.09																
	% Ext by PM2.5	0.46	0.46																

**Appendix A11
Summary of Results
Cumulative Sources**

PHLOX MOUNTAIN		CM - Cumulative Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	1.46E-02	1140	-17.128	113.192														
SO2	3-hour	6.59E-02	1140	-17.128	113.192														
	24-hour	3.37E-02	1140	-17.128	113.192														
	Annual	1.06E-03	1140	-17.128	113.192														
PM10	24-hour	4.89E-03	1140	-17.128	113.192														
	Annual	2.53E-04	1140	-17.128	113.192														
PM25	24-hour	1.07E-02	1140	-17.128	113.192														
	Annual	7.14E-04	1140	-17.128	113.192														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	3.59E-05	1140	-17.128	113.192														
S	Annual	1.56E-06	1140	-17.128	113.192														
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50	4	6																
	Days delta dV >1.00	2	1																
	Largest delta dV	1.138	1.315																
	Day of Largest delta dV	59	59																
	Largest delta dV Receptor	1140	1140																
	Total dV	5.762	4.399																
	dV Background	4.625	3.084																
	% Ext by SO4	1.69	1.69																
	% Ext by NO3	97.60	97.60																
	% Ext by PM10	0.15	0.15																
	% Ext by PM2.5	0.56	0.56																
TETON NATIONAL PARK		CM - Cumulative Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	1.83E-02	678	-171.607	111.139														
SO2	3-hour	3.86E-01	685	-178.064	116.341														
	24-hour	8.02E-02	685	-178.064	116.341														
	Annual	8.83E-03	686	-177.304	116.038														
PM10	24-hour	3.92E-02	685	-178.064	116.341														
	Annual	3.70E-03	686	-177.304	116.038														
PM25	24-hour	6.18E-02	680	-172.405	116.076														
	Annual	6.56E-03	686	-177.304	116.038														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	2.91E-05	678	-171.607	111.139														
S	Annual	1.23E-05	686	-177.304	116.038														
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50	1	1																
	Days delta dV >1.00	0	0																
	Largest delta dV	0.539	0.554																
	Day of Largest delta dV	360	360																
	Largest delta dV Receptor	680	680																
	Total dV	5.239	4.981																
	dV Background	4.700	4.428																
	% Ext by SO4	84.11	84.11																
	% Ext by NO3	6.67	6.67																
	% Ext by PM10	2.24	2.24																
	% Ext by PM2.5	6.98	6.98																

**Appendix A11
Summary of Results
Cumulative Sources**

TETON WILDERNESS AREA		CM - Cumulative Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.05E-03	32	-145.858	144.194															
	3-hour	8.18E-02	25	-160.656	150.244															
	24-hour	2.69E-02	25	-160.656	150.244															
PM10	Annual	2.33E-03	25	-160.656	150.244															
	24-hour	7.99E-03	32	-145.858	144.194															
PM25	Annual	6.85E-04	32	-145.858	144.194															
	24-hour	1.70E-02	32	-145.858	144.194															
	Annual	1.60E-03	32	-145.858	144.194															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	2.52E-05	48	-101.381	138.307															
	Annual	4.98E-06	32	-145.858	144.194															
S	Annual	2.52E-05	48	-101.381	138.307															
	Annual	4.98E-06	32	-145.858	144.194															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.362	0.350																	
	Day of Largest delta dV	261	60																	
	Largest delta dV Receptor	45	57																	
	Total dV	4.796	4.702																	
	dV Background	4.434	4.352																	
	% Ext by SO4	1.43	1.95																	
	% Ext by NO3	97.92	97.46																	
	% Ext by PM10	0.11	0.10																	
	% Ext by PM2.5	0.54	0.49																	
WASHAKIE		CM - Cumulative Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.33E-02	317	-60.874	173.435															
	3-hour	2.48E-02	464	-84.000	186.000															
	24-hour	1.16E-02	298	-40.129	137.459															
PM10	Annual	8.54E-04	266	-101.488	139.754															
	24-hour	2.39E-03	213	-70.011	197.387															
PM25	Annual	2.03E-04	300	-42.708	145.073															
	24-hour	6.15E-03	316	-61.474	170.617															
	Annual	5.71E-04	298	-40.129	137.459															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	3.32E-05	298	-40.129	137.459															
	Annual	1.82E-06	266	-101.488	139.754															
S	Annual	3.32E-05	298	-40.129	137.459															
	Annual	1.82E-06	266	-101.488	139.754															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	4	4																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.923	0.890																	
	Day of Largest delta dV	118	118																	
	Largest delta dV Receptor	299	299																	
	Total dV	5.472	5.825																	
	dV Background	4.549	4.935																	
	% Ext by SO4	0.59	0.59																	
	% Ext by NO3	99.14	99.14																	
	% Ext by PM10	0.06	0.06																	
	% Ext by PM2.5	0.22	0.22																	

**Appendix A11
Summary of Results
Cumulative Sources**

WIND RIVER CANYON		CM - Cumulative Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.75E-02	1079	33.939	95.192															
	3-hour	1.39E-01	1085	28.586	107.490															
	24-hour	3.17E-02	1064	26.198	111.141															
SO2	Annual	2.13E-03	1064	26.198	111.141															
	24-hour	3.66E-02	1064	26.198	111.141															
PM10	Annual	1.85E-03	1064	26.198	111.141															
	24-hour	7.27E-02	1064	26.198	111.141															
PM25	Annual	3.28E-03	1064	26.198	111.141															
	24-hour	7.27E-02	1064	26.198	111.141															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	4.90E-05	1079	33.939	95.192															
	Annual	2.71E-06	1085	28.586	107.490															
S	Annual	4.90E-05	1079	33.939	95.192															
	Annual	2.71E-06	1085	28.586	107.490															
VISIBILITY	FLAG	IMPROVE																		
	Days delta dV >0.50	9	9																	
	Days delta dV >1.00	2	3																	
	Largest delta dV	1.761	2.027																	
	Day of Largest delta dV	59	59																	
	Largest delta dV Receptor	1077	1077																	
	Total dV	6.386	5.110																	
	dV Background	4.625	3.084																	
	% Ext by SO4	0.54	0.54																	
	% Ext by NO3	98.99	98.99																	
	% Ext by PM10	0.09	0.09																	
	% Ext by PM2.5	0.38	0.38																	
WIND RIVER ROADLESS		CM - Cumulative Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.48E-02	812	-61.282	35.110															
	3-hour	2.37E-02	786	-49.853	59.119															
	24-hour	1.32E-02	786	-49.853	59.119															
SO2	Annual	6.45E-04	818	-40.580	34.535															
	24-hour	2.85E-03	821	-40.795	43.233															
PM10	Annual	3.00E-04	812	-61.282	35.110															
	24-hour	7.83E-03	820	-40.723	41.939															
PM25	Annual	7.93E-04	812	-61.282	35.110															
	24-hour	7.93E-04	812	-61.282	35.110															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	4.20E-05	818	-40.580	34.535															
	Annual	1.39E-06	821	-40.795	43.233															
S	Annual	4.20E-05	818	-40.580	34.535															
	Annual	1.39E-06	821	-40.795	43.233															
VISIBILITY	FLAG	IMPROVE																		
	Days delta dV >0.50	5	5																	
	Days delta dV >1.00	1	2																	
	Largest delta dV	1.020	1.180																	
	Day of Largest delta dV	60	60																	
	Largest delta dV Receptor	820	820																	
	Total dV	5.645	4.264																	
	dV Background	4.625	3.084																	
	% Ext by SO4	0.75	0.75																	
	% Ext by NO3	98.70	98.70																	
	% Ext by PM10	0.08	0.08																	
	% Ext by PM2.5	0.46	0.46																	

**Appendix A11
Summary of Results
Cumulative Sources**

YELLOWSTONE NATL PARK		CM - Cumulative Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	3.69E-03	64	-167.930	172.398															
SO2	3-hour	6.03E-02	108	-196.891	173.293															
	24-hour	2.52E-02	108	-196.891	173.293															
	Annual	2.41E-03	108	-196.891	173.293															
PM10	24-hour	1.04E-02	18	-110.235	269.323															
	Annual	2.35E-04	65	-167.910	172.398															
PM25	24-hour	7.56E-03	60	-183.917	172.915															
	Annual	6.35E-04	66	-164.001	172.442															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	1.98E-05	109	-112.113	171.051															
S	Annual	5.46E-06	108	-196.891	173.293															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.466	0.416																	
	Day of Largest delta dV	145	145																	
	Largest delta dV Receptor	19	19																	
	Total dV	5.014	6.118																	
	dV Background	4.549	5.703																	
	% Ext by SO4	0.15	0.15																	
	% Ext by NO3	99.50	99.50																	
	% Ext by PM10	0.05	0.05																	
	% Ext by PM2.5	0.30	0.30																	

**Appendix A11
Summary of Results
Cumulative Sources**

<i>Visibility Summary</i>	CM - Cumulative Sources					
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions		
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV
Bridger	5	0	0.86	4	0	0.96
Cloud Peak	41	11	1.71	41	12	1.65
Fitzpatrick	1	0	0.60	1	0	0.70
North Absaroka	3	0	0.75	4	0	0.73
Owl Creek	7	3	1.65	7	3	1.90
Popo Agie	5	0	0.99	6	3	1.14
Phlox Mountain	4	2	1.14	6	1	1.32
Teton NP	1	0	0.54	1	0	0.55
Teton Wilderness	0	0	0.36	0	0	0.35
Washakie	4	0	0.92	4	0	0.89
Wind River Canyon	9	2	1.76	9	3	2.03
Wind River Roadless	5	1	1.02	5	2	1.18
Yellowstone NP	0	0	0.47	0	0	0.42
Total Days / Max Δ dV	85	19	1.76	88	24	2.03

**Appendix A11
Summary of Results
Cumulative Sources**

LAKES		CM - Cumulative Sources																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.98E-05	1141	-49.183	20.543															
	S	1.17E-06	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.02E-05	1142	-49.178	18.394															
	S	1.18E-06	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.83E-04	1143	95.779	205.602															
	S	3.52E-06	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.76E-04	1144	105.440	193.981															
	S	3.73E-06	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.62E-05	1145	-88.417	52.778															
	S	1.27E-06	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.31E-05	1146	-35.219	7.97															
	S	1.34E-06	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.05E-05	1147	-86.813	89.541															
	S	1.26E-06	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.12E-05	1148	-48.413	14.897															
	S	1.21E-06	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.89E-05	1149	-96.935	275.159															
	S	9.20E-07	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	1.90E-05	1150	-95.471	271.528															
	S	9.48E-07	1150	-95.471	271.528															

**Appendix A11
Summary of Results
Cumulative Sources**

ANC Impacts to High Elevation Lakes		CM - Cumulative Sources																	
High Elevation																			
Lake of	Inputs																		
Special Concern	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)														
	Lake Outlet	Precipitation	Catchment	Deposition	Deposition														
	ANC (A)	(P)	Area	Rate	Rate														
	(µeq/l)	(meters)	(hectares)	(µg/m²/sec)	(µg/m²/sec)														
Black Joe Lake	67.0	0.925	890	3.98E-05	1.17E-06														
Deep Lake	59.9	0.925	205	4.02E-05	1.18E-06														
Emerald Lake	69.8	0.780	293	4.83E-04	3.52E-06														
Florence Lake	33.0	0.780	417	7.76E-04	3.73E-06														
Hobbs Lake	69.9	1.080	293	3.62E-05	1.27E-06														
Lower Saddlebag	55.5	1.000	155	4.31E-05	1.34E-06														
Ross Lake	53.5	1.080	4455	3.06E-05	1.26E-06														
Stepping Stone Lake	19.9	1.460	26	1.89E-05	9.20E-07														
Twin Island Lake	17.6	1.300	45	1.90E-05	9.48E-07														
Upper Frozen Lake	5.0	0.925	65	4.12E-05	1.21E-06														
High Elevation	Intermediate Calculated Values																		
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	Results												
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	ANC	Percent											
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m²/yr)	(eq/m²/yr)	(eq)	Change	ANC											
							(µeq/l)	Change											
								Change											
Black Joe Lake	1.25E-02	3.69E-04	3.70E+05	8.95E-05	2.30E-06	8.17E+02	0.15	0.22%											
Deep Lake	1.27E-02	3.73E-04	7.61E+04	9.06E-05	2.33E-06	1.90E+02	0.15	0.25%											
Emerald Lake	1.52E-01	1.11E-03	1.07E+05	1.09E-03	6.94E-06	3.21E+03	2.09	3.00%											
Florence Lake	2.45E-01	1.18E-03	7.19E+04	1.75E-03	7.36E-06	7.32E+03	3.36	10.17%											
Hobbs Lake	1.14E-02	3.99E-04	1.48E+05	8.16E-05	2.50E-06	2.46E+02	0.12	0.17%											
Lower Saddlebag	1.36E-02	4.23E-04	5.76E+04	9.71E-05	2.65E-06	1.55E+02	0.15	0.27%											
Ross Lake	9.63E-03	3.97E-04	1.72E+06	6.88E-05	2.48E-06	3.18E+03	0.10	0.18%											
Stepping Stone Lake	5.95E-03	2.80E-04	5.14E+03	4.25E-05	1.81E-06	1.17E+01	0.05	0.23%											
Twin Island Lake	5.99E-03	2.99E-04	6.88E+03	4.26E-05	1.87E-06	2.01E+01	0.05	0.29%											
Upper Frozen Lake	1.30E-02	3.82E-04	2.01E+03	9.27E-05	2.39E-06	6.17E+01	0.15	3.07%											
Maximum							3.36	10.17%											
NOTE:	Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.																		
	Baseline ANC values calculated from summarized data provided by the Forest Service.																		
	ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																		
	Annual precipitation and watershed catchments values provided by the Forest Service.																		

**Appendix A11
Summary of Results
Cumulative Sources**

Terrestrial Acid Deposition Summary		CM - Cumulative Sources						
Incremental Analysis								
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT	
Bridger	6.04E-05	1.84E-06	1.91E-02	5.81E-04	0.005	381.0%	11.6%	
Cloud Peak	1.18E-03	5.83E-06	3.71E-01	1.84E-03	0.005	7420.4%	36.7%	
Fitzpatrick	3.50E-05	1.57E-06	1.10E-02	4.94E-04	0.005	220.9%	9.9%	
North Absaroka	2.16E-05	1.66E-06	6.80E-03	5.24E-04	0.005	136.0%	10.5%	
Owl Creek Range	4.33E-05	2.01E-06	1.37E-02	6.35E-04	0.005	273.4%	12.7%	
Popo Agie	4.51E-05	1.45E-06	1.42E-02	4.59E-04	0.005	284.5%	9.2%	
Phlox Mountain	3.59E-05	1.56E-06	1.13E-02	4.91E-04	0.005	226.6%	9.8%	
Teton NP	2.91E-05	1.23E-05	9.18E-03	3.87E-03	0.005	183.5%	77.4%	
Teton Wilderness	2.52E-05	4.98E-06	7.95E-03	1.57E-03	0.005	159.0%	31.4%	
Washakie Wilderness	3.32E-05	1.82E-06	1.05E-02	5.75E-04	0.005	209.5%	11.5%	
Wind River Canyon	4.90E-05	2.71E-06	1.54E-02	8.53E-04	0.005	308.9%	17.1%	
Wind River Roadless	4.20E-05	1.39E-06	1.32E-02	4.39E-04	0.005	264.9%	8.8%	
Yellowstone NP	1.98E-05	5.46E-06	6.24E-03	1.72E-03	0.005	124.7%	34.5%	
Maximum	1.18E-03	1.23E-05	3.71E-01	3.87E-03	0.005	7420.4%	77.4%	
NOTE: DAT for Western Class I areas from National Park Service (2003).								
Cumulative Analysis								
Nitrogen Deposition								
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts			
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"
Bridger	6.04E-05	1.91E-02	1.3	1.3	3.0	10.0	44.0%	13.2%
Cloud Peak	1.18E-03	3.71E-01	1.3	1.7	3.0	10.0	55.7%	16.7%
Fitzpatrick	3.50E-05	1.10E-02	1.3	1.3	3.0	10.0	43.7%	13.1%
North Absaroka	2.16E-05	6.80E-03	1.1	1.1	3.0	10.0	36.9%	11.1%
Owl Creek Range	4.33E-05	1.37E-02	1.3	1.3	3.0	10.0	43.8%	13.1%
Popo Agie	4.51E-05	1.42E-02	1.3	1.3	3.0	10.0	43.8%	13.1%
Phlox Mountain	3.59E-05	1.13E-02	1.3	1.3	3.0	10.0	43.7%	13.1%
Teton NP	2.91E-05	9.18E-03	1.1	1.1	3.0	10.0	37.0%	11.1%
Teton Wilderness	2.52E-05	7.95E-03	1.1	1.1	3.0	10.0	36.9%	11.1%
Washakie Wilderness	3.32E-05	1.05E-02	1.1	1.1	3.0	10.0	37.0%	11.1%
Wind River Canyon	4.90E-05	1.54E-02	1.3	1.3	3.0	10.0	43.8%	13.2%
Wind River Roadless	4.20E-05	1.32E-02	1.3	1.3	3.0	10.0	43.8%	13.1%
Yellowstone NP	1.98E-05	6.24E-03	1.1	1.1	3.0	10.0	36.9%	11.1%
Maximum	1.18E-03	3.71E-01	1.3	1.7	3.0	10.0	55.7%	16.7%
Sulfur Deposition								
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts			
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"
Bridger	1.84E-06	5.81E-04	1.1	1.1	5.0	20.0	22.0%	5.5%
Cloud Peak	5.83E-06	1.84E-03	1.1	1.1	5.0	20.0	22.0%	5.5%
Fitzpatrick	1.57E-06	4.94E-04	1.1	1.1	5.0	20.0	22.0%	5.5%
North Absaroka	1.66E-06	5.24E-04	0.9	0.9	5.0	20.0	18.0%	4.5%
Owl Creek Range	2.01E-06	6.35E-04	1.1	1.1	5.0	20.0	22.0%	5.5%
Popo Agie	1.45E-06	4.59E-04	1.1	1.1	5.0	20.0	22.0%	5.5%
Phlox Mountain	1.56E-06	4.91E-04	1.1	1.1	5.0	20.0	22.0%	5.5%
Teton NP	1.23E-05	3.87E-03	0.9	0.9	5.0	20.0	18.1%	4.5%
Teton Wilderness	4.98E-06	1.57E-03	0.9	0.9	5.0	20.0	18.0%	4.5%
Washakie Wilderness	1.82E-06	5.75E-04	0.9	0.9	5.0	20.0	18.0%	4.5%
Wind River Canyon	2.71E-06	8.53E-04	1.1	1.1	5.0	20.0	22.0%	5.5%
Wind River Roadless	1.39E-06	4.39E-04	1.1	1.1	5.0	20.0	22.0%	5.5%
Yellowstone NP	5.46E-06	1.72E-03	0.9	0.9	5.0	20.0	18.0%	4.5%
Maximum	1.23E-05	3.87E-03	1.1	1.1	5.0	20.0	22.0%	5.5%
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.								
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.								
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).								

**Appendix A11
Summary of Results
Cumulative Sources**

Ambient Impact Summary		CM - Cumulative Sources													
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQ Standard (ug/m3)	Impact % of WAAQS/NAAQ						
NO2	Annual	2.36E+00	CLOUD PEAK	2.5	94.42%	3.4	5.76	100	5.76%						
SO2	3-hour	3.86E-01	TETON NATIONAL PARK	25	1.54%	132	132.39	1300	10.18%						
	24-hour	8.02E-02	TETON NATIONAL PARK	5	1.60%	43	43.08	260	16.57%						
	Annual	8.83E-03	TETON NATIONAL PARK	2	0.44%	9	9.01	60	15.01%						
PM10	24-hour	7.86E-02	CLOUD PEAK	8	0.98%	61	61.08	150	40.72%						
	Annual	3.70E-03	TETON NATIONAL PARK	4	0.09%	22	22.00	50	44.01%						
PM25	24-hour	1.12E-01	CLOUD PEAK	n.a.	n.a.	35	35.11	65	54.02%						
	Annual	6.56E-03	TETON NATIONAL PARK	n.a.	n.a.	10	10.01	15	66.71%						
Maximum					94.42%				66.71%						

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

BRIDGER		CMAA - Cumulative + Alt. A Sources		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	6.39E-02	537	-73.783 19.513
SO2	3-hour	8.08E-02	530	-85.694 31.436
	24-hour	1.94E-02	530	-85.694 31.436
	Annual	1.17E-03	537	-73.783 19.513
PM10	24-hour	7.11E-02	552	-36.775 8.558
	Annual	1.82E-03	552	-36.775 8.558
PM25	24-hour	4.93E-02	552	-36.775 8.558
	Annual	2.07E-03	552	-36.775 8.558
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	6.37E-05	530	-85.694 31.436
S	Annual	1.85E-06	513	-109.557 60.700
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	6	5	
	Days delta dV >1.00	1	2	
	Largest delta dV	1.014	1.127	
	Day of Largest delta dV	305	305	
	Largest delta dV Receptor	552	552	
	Total dV	5.706	4.706	
	dV Background	4.692	3.579	
	% Ext by SO4	1.48	1.48	
	% Ext by NO3	93.13	93.13	
	% Ext by PM10	2.50	2.50	
	% Ext by PM2.5	2.89	2.89	
CLOUD PEAK		CMAA - Cumulative + Alt. A Sources		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	2.36E+00	988	120.589 185.589
SO2	3-hour	3.16E-01	1053	112.000 208.000
	24-hour	4.47E-02	1053	112.000 208.000
	Annual	2.42E-03	980	107.363 178.642
PM10	24-hour	8.18E-02	994	115.588 197.592
	Annual	4.12E-03	989	119.200 187.867
PM25	24-hour	1.18E-01	994	115.588 197.592
	Annual	5.90E-03	989	119.200 187.867
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	1.18E-03	988	120.589 185.589
S	Annual	5.88E-06	980	107.363 178.642
VISIBILITY		FLAG	IMPROVE	
	Days delta dV >0.50	43	42	
	Days delta dV >1.00	11	12	
	Largest delta dV	1.723	1.663	
	Day of Largest delta dV	119	119	
	Largest delta dV Receptor	944	944	
	Total dV	6.272	6.598	
	dV Background	4.549	4.935	
	% Ext by SO4	0.34	0.34	
	% Ext by NO3	99.00	99.00	
	% Ext by PM10	0.15	0.15	
	% Ext by PM2.5	0.51	0.51	

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

FITZPATRICK		CMAA - Cumulative + Alt. A Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.29E-02	716	-71.592	46.301
SO2	3-hour	2.74E-02	782	-96.000	98.000
	24-hour	7.08E-03	720	-71.448	62.044
PM10	Annual	7.58E-04	700	-95.817	99.004
	24-hour	7.14E-02	722	-71.304	70.023
PM25	Annual	8.68E-04	723	-71.232	73.900
	24-hour	4.73E-02	726	-71.161	86.048
	Annual	1.19E-03	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.89E-05	716	-71.592	46.301
S	Annual	1.57E-06	700	-95.817	99.004
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		1	2		
Days delta dV >1.00		0	0		
Largest delta dV		0.625	0.725		
Day of Largest delta dV		60	60		
Largest delta dV Receptor		716	716		
Total dV		5.250	3.809		
dV Background		4.625	3.084		
% Ext by SO4		0.63	0.63		
% Ext by NO3		98.40	98.40		
% Ext by PM10		0.25	0.25		
% Ext by PM2.5		0.71	0.71		
NORTH ABSAROKA		CMAA - Cumulative + Alt. A Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.26E-02	815	-63.736	230.153
SO2	3-hour	2.74E-02	781	-110.264	264.328
	24-hour	1.36E-02	815	-63.736	230.153
PM10	Annual	5.76E-04	843	-120.223	208.073
	24-hour	1.09E-02	780	-105.982	264.246
PM25	Annual	3.32E-04	815	-63.736	230.153
	24-hour	8.94E-03	810	-71.560	213.930
	Annual	4.83E-04	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.25E-05	815	-63.736	230.153
S	Annual	1.67E-06	792	-124.346	213.930
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		3	4		
Days delta dV >1.00		0	0		
Largest delta dV		0.799	0.770		
Day of Largest delta dV		118	118		
Largest delta dV Receptor		807	815		
Total dV		5.348	5.705		
dV Background		4.549	4.935		
% Ext by SO4		0.57	0.57		
% Ext by NO3		99.00	99.00		
% Ext by PM10		0.12	0.12		
% Ext by PM2.5		0.31	0.31		

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

OWL CREEK		CMAA - Cumulative + Alt. A Sources	
Pollutant Concentrations		(ug/m3)	Receptor
NO2	Annual	6.98E-02	1107 6.423 97.676
SO2	3-hour	9.71E-02	1094 -14.059 118.533
	24-hour	3.45E-02	1117 -16.141 107.625
PM10	Annual	1.78E-03	1107 6.423 97.676
	24-hour	9.72E-01	1107 6.423 97.676
PM25	Annual	3.94E-02	1107 6.423 97.676
	24-hour	4.99E-01	1107 6.423 97.676
	Annual	1.95E-02	1107 6.423 97.676
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor
N	Annual	7.64E-05	1107 6.423 97.676
S	Annual	2.23E-06	1107 6.423 97.676
VISIBILITY		FLAG	IMPROVE
Days delta dV >0.50		13	13
Days delta dV >1.00		4	6
Largest delta dV		1.726	1.987
Day of Largest delta dV		59	59
Largest delta dV Receptor		1107	1107
Total dV		6.351	5.070
dV Background		4.625	3.084
% Ext by SO4		0.77	0.77
% Ext by NO3		98.06	98.06
% Ext by PM10		0.31	0.31
% Ext by PM2.5		0.86	0.86
POPO AGIE		CMAA - Cumulative + Alt. A Sources	
Pollutant Concentrations		(ug/m3)	Receptor
NO2	Annual	2.54E-02	894 -30.281 4.879
SO2	3-hour	4.22E-02	893 -28.587 7.395
	24-hour	1.60E-02	893 -28.587 7.395
PM10	Annual	7.98E-04	894 -30.281 4.879
	24-hour	8.97E-02	889 -30.862 15.475
PM25	Annual	2.77E-03	890 -29.797 13.249
	24-hour	6.60E-02	889 -30.862 15.475
	Annual	2.75E-03	890 -29.797 13.249
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor
N	Annual	5.69E-05	886 -33.377 20.749
S	Annual	1.51E-06	889 -30.862 15.475
VISIBILITY		FLAG	IMPROVE
Days delta dV >0.50		8	7
Days delta dV >1.00		2	3
Largest delta dV		1.184	1.314
Day of Largest delta dV		305	305
Largest delta dV Receptor		893	893
Total dV		5.876	4.893
dV Background		4.692	3.579
% Ext by SO4		1.47	1.47
% Ext by NO3		93.10	93.10
% Ext by PM10		2.44	2.44
% Ext by PM2.5		2.99	2.99

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

PHLOX MOUNTAIN		CMAA - Cumulative + Alt. A Sources		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	1.85E-02	1140	-17.128 113.192
SO2	3-hour	6.61E-02	1140	-17.128 113.192
	24-hour	3.37E-02	1140	-17.128 113.192
PM10	Annual	1.09E-03	1140	-17.128 113.192
	24-hour	7.05E-02	1140	-17.128 113.192
PM25	Annual	3.15E-03	1140	-17.128 113.192
	24-hour	4.28E-02	1140	-17.128 113.192
	Annual	2.38E-03	1140	-17.128 113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	4.26E-05	1140	-17.128 113.192
S	Annual	1.60E-06	1140	-17.128 113.192
VISIBILITY		FLAG	IMPROVE	
Days delta dV >0.50		4	7	
Days delta dV >1.00		3	1	
Largest delta dV		1.168	1.350	
Day of Largest delta dV		59	59	
Largest delta dV Receptor		1140	1140	
Total dV		5.793	4.434	
dV Background		4.625	3.084	
% Ext by SO4		1.65	1.65	
% Ext by NO3		97.48	97.48	
% Ext by PM10		0.22	0.22	
% Ext by PM2.5		0.66	0.66	
TETON NATIONAL PARK		CMAA - Cumulative + Alt. A Sources		
Pollutant Concentrations		(ug/m3)	Receptor	
NO2	Annual	1.83E-02	678	-171.607 111.139
SO2	3-hour	3.86E-01	685	-178.064 116.341
	24-hour	8.02E-02	685	-178.064 116.341
PM10	Annual	8.83E-03	686	-177.304 116.038
	24-hour	3.92E-02	685	-178.064 116.341
PM25	Annual	3.74E-03	686	-177.304 116.038
	24-hour	6.18E-02	680	-172.405 116.076
	Annual	6.59E-03	686	-177.304 116.038
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor	
N	Annual	2.99E-05	678	-171.607 111.139
S	Annual	1.23E-05	686	-177.304 116.038
VISIBILITY		FLAG	IMPROVE	
Days delta dV >0.50		1	1	
Days delta dV >1.00		0	0	
Largest delta dV		0.539	0.554	
Day of Largest delta dV		360	360	
Largest delta dV Receptor		680	680	
Total dV		5.239	4.981	
dV Background		4.700	4.428	
% Ext by SO4		84.11	84.11	
% Ext by NO3		6.67	6.67	
% Ext by PM10		2.24	2.24	
% Ext by PM2.5		6.98	6.98	

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

WIND RIVER CANYON		CMAA - Cumulative + Alt. A Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.90E-01	1077	29.190	92.365
SO2	3-hour	1.40E-01	1085	28.586	107.490
	24-hour	3.18E-02	1064	26.198	111.141
PM10	Annual	3.06E-03	1077	29.190	92.365
	24-hour	1.63E+00	1076	27.022	94.149
PM25	Annual	1.40E-01	1077	29.190	92.365
	24-hour	8.89E-01	1076	27.022	94.149
	Annual	6.57E-02	1077	29.190	92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.77E-04	1078	31.661	93.381
S	Annual	3.54E-06	1077	29.190	92.365
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		38	42		
Days delta dV >1.00		6	8		
Largest delta dV		1.942	2.222		
Day of Largest delta dV		4	4		
Largest delta dV Receptor		1076	1076		
Total dV		6.642	5.429		
dV Background		4.700	3.207		
% Ext by SO4		0.14	0.14		
% Ext by NO3		45.35	45.35		
% Ext by PM10		28.58	28.58		
% Ext by PM2.5		25.93	25.93		
WIND RIVER ROADLESS		CMAA - Cumulative + Alt. A Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.76E-02	818	-40.580	34.535
SO2	3-hour	2.39E-02	821	-40.795	43.233
	24-hour	1.32E-02	786	-49.853	59.119
PM10	Annual	6.71E-04	821	-40.795	43.233
	24-hour	1.08E-01	791	-57.904	66.236
PM25	Annual	2.40E-03	820	-40.723	41.939
	24-hour	5.15E-02	868	-68.000	78.000
	Annual	2.34E-03	820	-40.723	41.939
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	5.18E-05	818	-40.580	34.535
S	Annual	1.44E-06	821	-40.795	43.233
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		5	6		
Days delta dV >1.00		1	2		
Largest delta dV		1.105	1.278		
Day of Largest delta dV		60	60		
Largest delta dV Receptor		820	820		
Total dV		5.730	4.361		
dV Background		4.625	3.084		
% Ext by SO4		0.71	0.71		
% Ext by NO3		96.98	96.98		
% Ext by PM10		0.87	0.87		
% Ext by PM2.5		1.44	1.44		

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

YELLOWSTONE NATL PARK		CMAA - Cumulative + Alt. A Sources																	
Pollutant Concentrations		(ug/m3)	Receptor																
NO2	Annual	3.76E-03	64	-167.930	172.398														
SO2	3-hour	6.03E-02	108	-196.891	173.293														
	24-hour	2.52E-02	108	-196.891	173.293														
	Annual	2.41E-03	108	-196.891	173.293														
PM10	24-hour	1.04E-02	18	-110.235	269.323														
	Annual	2.92E-04	18	-110.235	269.323														
PM25	24-hour	7.56E-03	60	-183.917	172.915														
	Annual	6.81E-04	66	-164.001	172.442														
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																
N	Annual	2.06E-05	109	-112.113	171.051														
S	Annual	5.46E-06	108	-196.891	173.293														
VISIBILITY		FLAG	IMPROVE																
	Days delta dV >0.50	0	0																
	Days delta dV >1.00	0	0																
	Largest delta dV	0.466	0.416																
	Day of Largest delta dV	145	145																
	Largest delta dV Receptor	19	19																
	Total dV	5.014	6.118																
	dV Background	4.549	5.703																
	% Ext by SO4	0.15	0.15																
	% Ext by NO3	99.50	99.50																
	% Ext by PM10	0.05	0.05																
	% Ext by PM2.5	0.30	0.30																

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

<i>Visibility Summary</i>		CMAA - Cumulative + Alt. A Sources													
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions											
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV									
Bridger	6	1	1.01	5	2	1.13									
Cloud Peak	43	11	1.72	42	12	1.66									
Fitzpatrick	1	0	0.63	2	0	0.73									
North Absaroka	3	0	0.80	4	0	0.77									
Owl Creek	13	4	1.73	13	6	1.99									
Popo Agie	8	2	1.18	7	3	1.31									
Phlox Mountain	4	3	1.17	7	1	1.35									
Teton NP	1	0	0.54	1	0	0.55									
Teton Wilderness	0	0	0.38	0	0	0.35									
Washakie	4	0	0.93	4	0	0.90									
Wind River Canyon	38	6	1.94	42	8	2.22									
Wind River Roadless	5	1	1.11	6	2	1.28									
Yellowstone NP	0	0	0.47	0	0	0.42									
Total Days / Max Δ dV	126	28	1.94	133	34	2.22									

**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

Terrestrial Acid Deposition Summary		CMAA - Cumulative + Alt. A Sources													
Incremental Analysis															
Area of Special Concern	Nitrogen (N) Deposition (ug/m²/sec)	Sulfur (S) Deposition (ug/m²/sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT								
Bridger	6.37E-05	1.85E-06	2.01E-02	5.84E-04	0.005	401.5%	11.7%								
Cloud Peak	1.18E-03	5.88E-06	3.73E-01	1.85E-03	0.005	7467.1%	37.1%								
Fitzpatrick	3.89E-05	1.57E-06	1.23E-02	4.97E-04	0.005	245.3%	9.9%								
North Absaroka	2.25E-05	1.67E-06	7.09E-03	5.26E-04	0.005	141.7%	10.5%								
Owl Creek Range	7.64E-05	2.23E-06	2.41E-02	7.02E-04	0.005	481.6%	14.0%								
Popo Agie	5.69E-05	1.51E-06	1.79E-02	4.78E-04	0.005	358.6%	9.6%								
Phlox Mountain	4.26E-05	1.60E-06	1.34E-02	5.03E-04	0.005	269.0%	10.1%								
Teton NP	2.99E-05	1.23E-05	9.44E-03	3.87E-03	0.005	188.7%	77.4%								
Teton Wilderness	2.63E-05	4.98E-06	8.31E-03	1.57E-03	0.005	166.1%	31.4%								
Washakie Wilderness	3.63E-05	1.83E-06	1.14E-02	5.77E-04	0.005	228.9%	11.5%								
Wind River Canyon	1.77E-04	3.54E-06	5.57E-02	1.12E-03	0.005	1113.3%	22.3%								
Wind River Roadless	5.18E-05	1.44E-06	1.63E-02	4.53E-04	0.005	326.5%	9.1%								
Yellowstone NP	2.06E-05	5.46E-06	6.49E-03	1.72E-03	0.005	129.9%	34.5%								
Maximum	1.18E-03	1.23E-05	3.73E-01	3.87E-03	0.005	7467.1%	77.4%								
NOTE: DAT for Western Class I areas from National Park Service (2003).															
Cumulative Analysis															
Nitrogen Deposition															
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts										
	Nitrogen (N) Deposition (ug/m²/sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"							
Bridger	6.37E-05	2.01E-02	1.3	1.3	3.0	10.0	44.0%	13.2%							
Cloud Peak	1.18E-03	3.73E-01	1.3	1.7	3.0	10.0	55.8%	16.7%							
Fitzpatrick	3.89E-05	1.23E-02	1.3	1.3	3.0	10.0	43.7%	13.1%							
North Absaroka	2.25E-05	7.09E-03	1.1	1.1	3.0	10.0	36.9%	11.1%							
Owl Creek Range	7.64E-05	2.41E-02	1.3	1.3	3.0	10.0	44.1%	13.2%							
Popo Agie	5.69E-05	1.79E-02	1.3	1.3	3.0	10.0	43.9%	13.2%							
Phlox Mountain	4.26E-05	1.34E-02	1.3	1.3	3.0	10.0	43.8%	13.1%							
Teton NP	2.99E-05	9.44E-03	1.1	1.1	3.0	10.0	37.0%	11.1%							
Teton Wilderness	2.63E-05	8.31E-03	1.1	1.1	3.0	10.0	36.9%	11.1%							
Washakie Wilderness	3.63E-05	1.14E-02	1.1	1.1	3.0	10.0	37.0%	11.1%							
Wind River Canyon	1.77E-04	5.57E-02	1.3	1.4	3.0	10.0	45.2%	13.6%							
Wind River Roadless	5.18E-05	1.63E-02	1.3	1.3	3.0	10.0	43.9%	13.2%							
Yellowstone NP	2.06E-05	6.49E-03	1.1	1.1	3.0	10.0	36.9%	11.1%							
Maximum	1.18E-03	3.73E-01	1.3	1.7	3.0	10.0	55.8%	16.7%							
Sulfur Deposition															
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts										
	Sulfur (S) Deposition (ug/m²/sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"							
Bridger	1.85E-06	5.84E-04	1.1	1.1	5.0	20.0	22.0%	5.5%							
Cloud Peak	5.88E-06	1.85E-03	1.1	1.1	5.0	20.0	22.0%	5.5%							
Fitzpatrick	1.57E-06	4.97E-04	1.1	1.1	5.0	20.0	22.0%	5.5%							
North Absaroka	1.67E-06	5.26E-04	0.9	0.9	5.0	20.0	18.0%	4.5%							
Owl Creek Range	2.23E-06	7.02E-04	1.1	1.1	5.0	20.0	22.0%	5.5%							
Popo Agie	1.51E-06	4.78E-04	1.1	1.1	5.0	20.0	22.0%	5.5%							
Phlox Mountain	1.60E-06	5.03E-04	1.1	1.1	5.0	20.0	22.0%	5.5%							
Teton NP	1.23E-05	3.87E-03	0.9	0.9	5.0	20.0	18.1%	4.5%							
Teton Wilderness	4.98E-06	1.57E-03	0.9	0.9	5.0	20.0	18.0%	4.5%							
Washakie Wilderness	1.83E-06	5.77E-04	0.9	0.9	5.0	20.0	18.0%	4.5%							
Wind River Canyon	3.54E-06	1.12E-03	1.1	1.1	5.0	20.0	22.0%	5.5%							
Wind River Roadless	1.44E-06	4.53E-04	1.1	1.1	5.0	20.0	22.0%	5.5%							
Yellowstone NP	5.46E-06	1.72E-03	0.9	0.9	5.0	20.0	18.0%	4.5%							
Maximum	1.23E-05	3.87E-03	1.1	1.1	5.0	20.0	22.0%	5.5%							
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.															
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.															

Appendix A12
Summary of Results
Cumulative + Alt. A Sources

Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).								
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**Appendix A12
Summary of Results
Cumulative + Alt. A Sources**

Ambient Impact Summary		CMAA - Cumulative + Alt. A Sources													
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQ Standard (ug/m3)	Impact % of WAAQS/NAAQ						
NO2	Annual	2.36E+00	CLOUD PEAK	2.5	94.54%	3.4	5.76	100	5.76%						
SO2	3-hour	3.86E-01	TETON NATIONAL PARK	25	1.54%	132	132.39	1300	10.18%						
	24-hour	8.02E-02	TETON NATIONAL PARK	5	1.60%	43	43.08	260	16.57%						
	Annual	8.83E-03	TETON NATIONAL PARK	2	0.44%	9	9.01	60	15.01%						
PM10	24-hour	1.63E+00	WIND RIVER CANYON	8	20.41%	61	62.63	150	41.76%						
	Annual	1.40E-01	WIND RIVER CANYON	4	3.50%	22	22.14	50	44.28%						
PM25	24-hour	8.89E-01	WIND RIVER CANYON	n.a.	n.a.	35	35.89	65	55.21%						
	Annual	6.57E-02	WIND RIVER CANYON	n.a.	n.a.	10	10.07	15	67.10%						
Maximum					94.54%				67.10%						

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

BRIDGER		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.37E-02	537	-73.783	19.513
	3-hour	8.08E-02	530	-85.694	31.436
	24-hour	1.94E-02	530	-85.694	31.436
PM10	Annual	1.17E-03	537	-73.783	19.513
	24-hour	6.65E-02	552	-36.775	8.558
PM25	Annual	1.72E-03	552	-36.775	8.558
	24-hour	4.30E-02	552	-36.775	8.558
	Annual	2.02E-03	537	-73.783	19.513
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.24E-05	530	-85.694	31.436
	Annual	1.85E-06	513	-109.557	60.700
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	5	5		
	Days delta dV >1.00	0	2		
	Largest delta dV	0.967	1.074		
	Day of Largest delta dV	305	305		
	Largest delta dV Receptor	552	552		
	Total dV	5.659	4.654		
	dV Background	4.692	3.579		
	% Ext by SO4	1.55	1.55		
	% Ext by NO3	93.34	93.34		
	% Ext by PM10	2.46	2.46		
% Ext by PM2.5	2.65	2.65			
CLOUD PEAK		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.36E+00	988	120.589	185.589
	3-hour	3.16E-01	1053	112.000	208.000
	24-hour	4.47E-02	1053	112.000	208.000
PM10	Annual	2.42E-03	980	107.363	178.642
	24-hour	8.13E-02	994	115.588	197.592
PM25	Annual	4.00E-03	989	119.200	187.867
	24-hour	1.17E-01	994	115.588	197.592
	Annual	5.69E-03	989	119.200	187.867
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.18E-03	988	120.589	185.589
	Annual	5.88E-06	980	107.363	178.642
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	43	42		
	Days delta dV >1.00	11	12		
	Largest delta dV	1.717	1.657		
	Day of Largest delta dV	119	119		
	Largest delta dV Receptor	944	944		
	Total dV	6.266	6.593		
	dV Background	4.549	4.935		
	% Ext by SO4	0.34	0.34		
	% Ext by NO3	99.00	99.00		
	% Ext by PM10	0.15	0.15		
% Ext by PM2.5	0.51	0.51			

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

FITZPATRICK		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.27E-02	716	-71.592	46.301
	3-hour	2.74E-02	782	-96.000	98.000
	24-hour	7.08E-03	720	-71.448	62.044
SO2	Annual	7.58E-04	700	-95.817	99.004
	24-hour	6.72E-02	722	-71.304	70.023
PM10	Annual	8.20E-04	723	-71.232	73.900
	24-hour	4.19E-02	726	-71.161	86.048
PM25	Annual	1.10E-03	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.74E-05	716	-71.592	46.301
	Annual	1.57E-06	700	-95.817	99.004
S	Annual				
	Annual				
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	1	2		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.616	0.714		
	Day of Largest delta dV	60	60		
	Largest delta dV Receptor	716	716		
	Total dV	5.240	3.798		
	dV Background	4.625	3.084		
	% Ext by SO4	0.64	0.64		
	% Ext by NO3	98.41	98.41		
	% Ext by PM10	0.25	0.25		
	% Ext by PM2.5	0.70	0.70		
NORTH ABSAROKA		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.25E-02	815	-63.736	230.153
	3-hour	2.74E-02	781	-110.264	264.328
	24-hour	1.36E-02	815	-63.736	230.153
SO2	Annual	5.76E-04	843	-120.223	208.073
	24-hour	1.09E-02	780	-105.982	264.246
PM10	Annual	3.18E-04	815	-63.736	230.153
	24-hour	8.12E-03	810	-71.560	213.930
PM25	Annual	4.60E-04	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.21E-05	815	-63.736	230.153
	Annual	1.67E-06	792	-124.346	213.930
S	Annual				
	Annual				
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	3	4		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.780	0.752		
	Day of Largest delta dV	118	118		
	Largest delta dV Receptor	815	815		
	Total dV	5.329	5.687		
	dV Background	4.549	4.935		
	% Ext by SO4	0.58	0.58		
	% Ext by NO3	99.01	99.01		
	% Ext by PM10	0.12	0.12		
	% Ext by PM2.5	0.30	0.30		

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

OWL CREEK		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	5.39E-02	1107	6.423	97.676
	3-hour	9.71E-02	1094	-14.059	118.533
	24-hour	3.45E-02	1117	-16.141	107.625
PM10	Annual	1.74E-03	1107	6.423	97.676
	24-hour	8.11E-01	1107	6.423	97.676
PM25	Annual	3.60E-02	1107	6.423	97.676
	24-hour	4.39E-01	1107	6.423	97.676
	Annual	1.73E-02	1107	6.423	97.676
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	6.43E-05	1107	6.423	97.676
	Annual	2.20E-06	1107	6.423	97.676
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	12	12		
	Days delta dV >1.00	3	3		
	Largest delta dV	1.698	1.954		
	Day of Largest delta dV	59	59		
	Largest delta dV Receptor	1107	1107		
	Total dV	6.322	5.038		
	dV Background	4.625	3.084		
	% Ext by SO4	0.78	0.78		
	% Ext by NO3	98.08	98.08		
	% Ext by PM10	0.31	0.31		
	% Ext by PM2.5	0.84	0.84		
POPO AGIE		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	2.40E-02	894	-30.281	4.879
	3-hour	4.20E-02	893	-28.587	7.395
	24-hour	1.59E-02	893	-28.587	7.395
PM10	Annual	7.96E-04	894	-30.281	4.879
	24-hour	8.37E-02	889	-30.862	15.475
PM25	Annual	2.60E-03	890	-29.797	13.249
	24-hour	5.73E-02	887	-32.313	17.943
	Annual	2.48E-03	890	-29.797	13.249
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	5.23E-05	886	-33.377	20.749
	Annual	1.51E-06	889	-30.862	15.475
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	6	6		
	Days delta dV >1.00	2	3		
	Largest delta dV	1.116	1.240		
	Day of Largest delta dV	305	305		
	Largest delta dV Receptor	893	893		
	Total dV	5.808	4.819		
	dV Background	4.692	3.579		
	% Ext by SO4	1.56	1.56		
	% Ext by NO3	93.31	93.31		
	% Ext by PM10	2.40	2.40		
	% Ext by PM2.5	2.73	2.73		

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

PHLOX MOUNTAIN		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.71E-02	1140	-17.128	113.192
	3-hour	6.61E-02	1140	-17.128	113.192
	24-hour	3.37E-02	1140	-17.128	113.192
SO2	Annual	1.09E-03	1140	-17.128	113.192
	24-hour	6.27E-02	1140	-17.128	113.192
PM10	Annual	2.93E-03	1140	-17.128	113.192
	24-hour	3.91E-02	1140	-17.128	113.192
PM25	Annual	2.16E-03	1140	-17.128	113.192
	24-hour	2.16E-03	1140	-17.128	113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.01E-05	1140	-17.128	113.192
	Annual	1.59E-06	1140	-17.128	113.192
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	4	7		
	Days delta dV >1.00	3	1		
	Largest delta dV	1.157	1.338		
	Day of Largest delta dV	59	59		
	Largest delta dV Receptor	1140	1140		
	Total dV	5.782	4.421		
	dV Background	4.625	3.084		
	% Ext by SO4	1.66	1.66		
	% Ext by NO3	97.48	97.48		
	% Ext by PM10	0.21	0.21		
	% Ext by PM2.5	0.65	0.65		
	TETON NATIONAL PARK		CMAB - Cumulative + Alt. B Sources		
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.83E-02	678	-171.607	111.139
	3-hour	3.86E-01	685	-178.064	116.341
	24-hour	8.02E-02	685	-178.064	116.341
SO2	Annual	8.83E-03	686	-177.304	116.038
	24-hour	3.92E-02	685	-178.064	116.341
PM10	Annual	3.73E-03	686	-177.304	116.038
	24-hour	6.18E-02	680	-172.405	116.076
PM25	Annual	6.59E-03	686	-177.304	116.038
	24-hour	6.59E-03	686	-177.304	116.038
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.96E-05	678	-171.607	111.139
	Annual	1.23E-05	686	-177.304	116.038
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	1	1		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.539	0.554		
	Day of Largest delta dV	360	360		
	Largest delta dV Receptor	680	680		
	Total dV	5.239	4.981		
	dV Background	4.700	4.428		
	% Ext by SO4	84.11	84.11		
	% Ext by NO3	6.67	6.67		
	% Ext by PM10	2.24	2.24		
	% Ext by PM2.5	6.98	6.98		

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

TETON WILDERNESS AREA		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	6.11E-03	32	-145.858	144.194
	3-hour	8.18E-02	25	-160.656	150.244
	24-hour	2.69E-02	25	-160.656	150.244
SO2	Annual	2.33E-03	25	-160.656	150.244
	24-hour	1.14E-02	50	-98.438	141.823
PM10	Annual	7.52E-04	32	-145.858	144.194
	24-hour	1.70E-02	32	-145.858	144.194
PM25	Annual	1.65E-03	32	-145.858	144.194
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	2.59E-05	48	-101.381	138.307
	Annual	4.98E-06	32	-145.858	144.194
S					
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	0	0		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.371	0.351		
	Day of Largest delta dV	261	60		
	Largest delta dV Receptor	45	57		
	Total dV	4.805	4.703		
	dV Background	4.434	4.352		
	% Ext by SO4	1.41	1.94		
	% Ext by NO3	97.51	97.45		
	% Ext by PM10	0.32	0.10		
	% Ext by PM2.5	0.75	0.50		
WASHAKIE		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)		Receptor	
NO2	Annual	1.35E-02	317	-60.874	173.435
	3-hour	2.48E-02	464	-84.000	186.000
	24-hour	1.16E-02	298	-40.129	137.459
SO2	Annual	8.55E-04	266	-101.488	139.754
	24-hour	2.07E-02	338	-60.000	126.000
PM10	Annual	8.02E-04	298	-40.129	137.459
	24-hour	1.73E-02	294	-47.084	127.086
PM25	Annual	9.76E-04	294	-47.084	127.086
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor	
N	Annual	3.51E-05	298	-40.129	137.459
	Annual	1.83E-06	266	-101.488	139.754
S					
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	4	4		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.928	0.894		
	Day of Largest delta dV	118	118		
	Largest delta dV Receptor	299	299		
	Total dV	5.477	5.830		
	dV Background	4.549	4.935		
	% Ext by SO4	0.59	0.59		
	% Ext by NO3	99.10	99.10		
	% Ext by PM10	0.07	0.07		
	% Ext by PM2.5	0.24	0.24		

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

WIND RIVER CANYON		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.96E-01	1077	29.190	92.365
	3-hour	1.40E-01	1085	28.586	107.490
	24-hour	3.18E-02	1064	26.198	111.141
SO2	Annual	2.98E-03	1077	29.190	92.365
	24-hour	1.48E+00	1076	27.022	94.149
PM10	Annual	1.29E-01	1077	29.190	92.365
	24-hour	7.72E-01	1076	27.022	94.149
PM25	Annual	5.57E-02	1077	29.190	92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.27E-04	1078	31.661	93.381
	S	3.47E-06	1077	29.190	92.365
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	20	21		
	Days delta dV >1.00	4	5		
	Largest delta dV	1.846	2.123		
	Day of Largest delta dV	59	59		
	Largest delta dV Receptor	1077	1077		
	Total dV	6.471	5.207		
	dV Background	4.625	3.084		
	% Ext by SO4	0.53	0.53		
	% Ext by NO3	98.26	98.26		
	% Ext by PM10	0.38	0.38		
	% Ext by PM2.5	0.84	0.84		
WIND RIVER ROADLESS		CMAB - Cumulative + Alt. B Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.63E-02	818	-40.580	34.535
	3-hour	2.38E-02	821	-40.795	43.233
	24-hour	1.32E-02	786	-49.853	59.119
SO2	Annual	6.69E-04	820	-40.723	41.939
	24-hour	1.01E-01	791	-57.904	66.236
PM10	Annual	2.26E-03	820	-40.723	41.939
	24-hour	4.54E-02	868	-68.000	78.000
PM25	Annual	2.11E-03	820	-40.723	41.939
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.81E-05	818	-40.580	34.535
	S	1.43E-06	821	-40.795	43.233
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	5	6		
	Days delta dV >1.00	1	2		
	Largest delta dV	1.077	1.245		
	Day of Largest delta dV	60	60		
	Largest delta dV Receptor	820	820		
	Total dV	5.701	4.329		
	dV Background	4.625	3.084		
	% Ext by SO4	0.73	0.73		
	% Ext by NO3	97.04	97.04		
	% Ext by PM10	0.85	0.85		
	% Ext by PM2.5	1.38	1.38		

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

YELLOWSTONE NATL PARK		CMAB - Cumulative + Alt. B Sources											
Pollutant Concentrations		(ug/m3)	Receptor										
NO2	Annual	3.73E-03	64	-167.930	172.398								
SO2	3-hour	6.03E-02	108	-196.891	173.293								
	24-hour	2.52E-02	108	-196.891	173.293								
	Annual	2.41E-03	108	-196.891	173.293								
PM10	24-hour	1.04E-02	18	-110.235	269.323								
	Annual	2.86E-04	18	-110.235	269.323								
PM25	24-hour	7.56E-03	60	-183.917	172.915								
	Annual	6.74E-04	66	-164.001	172.442								
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor										
N	Annual	2.03E-05	109	-112.113	171.051								
S	Annual	5.46E-06	108	-196.891	173.293								
VISIBILITY		FLAG	IMPROVE										
	Days delta dV >0.50	0	0										
	Days delta dV >1.00	0	0										
	Largest delta dV	0.466	0.416										
	Day of Largest delta dV	145	145										
	Largest delta dV Receptor	19	19										
	Total dV	5.014	6.118										
	dV Background	4.549	5.703										
	% Ext by SO4	0.15	0.15										
	% Ext by NO3	99.50	99.50										
	% Ext by PM10	0.05	0.05										
	% Ext by PM2.5	0.30	0.30										

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

<i>Visibility Summary</i>		CMAB - Cumulative + Alt. B Sources																	
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions															
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV													
Bridger	5	0	0.97	5	2	1.07													
Cloud Peak	43	11	1.72	42	12	1.66													
Fitzpatrick	1	0	0.62	2	0	0.71													
North Absaroka	3	0	0.78	4	0	0.75													
Owl Creek	12	3	1.70	12	3	1.95													
Popo Agie	6	2	1.12	6	3	1.24													
Phlox Mountain	4	3	1.16	7	1	1.34													
Teton NP	1	0	0.54	1	0	0.55													
Teton Wilderness	0	0	0.37	0	0	0.35													
Washakie	4	0	0.93	4	0	0.89													
Wind River Canyon	20	4	1.85	21	5	2.12													
Wind River Roadless	5	1	1.08	6	2	1.25													
Yellowstone NP	0	0	0.47	0	0	0.42													
Total Days / Max Δ dV	104	24	1.85	110	28	2.12													

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

LAKES		CMAB - Cumulative + Alt. B Sources																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.37E-05	1141	-49.183	20.543															
	S	1.19E-06	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.40E-05	1142	-49.178	18.394															
	S	1.21E-06	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.87E-04	1143	95.779	205.602															
	S	3.56E-06	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.81E-04	1144	105.440	193.981															
	S	3.78E-06	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.79E-05	1145	-88.417	52.778															
	S	1.28E-06	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.82E-05	1146	-35.219	7.97															
	S	1.38E-06	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.20E-05	1147	-86.813	89.541															
	S	1.27E-06	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.50E-05	1148	-48.413	14.897															
	S	1.24E-06	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.92E-05	1149	-96.935	275.159															
	S	9.22E-07	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	1.93E-05	1150	-95.471	271.528															
	S	9.51E-07	1150	-95.471	271.528															

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

ANC Impacts to High Elevation Lakes		CMAB - Cumulative + Alt. B Sources																	
High Elevation																			
Lake of	Inputs																		
Special Concern	Baseline Lake Outlet ANC (A) (µeq/l)	Annual Precipitation (P) (meters)	Watershed (W) Catchment Area (hectares)	Nitrogen (N) Deposition Rate (µg/m²/sec)	Sulfur (S) Deposition Rate (µg/m²/sec)														
Black Joe Lake	67.0	0.925	890	4.37E-05	1.19E-06														
Deep Lake	59.9	0.925	205	4.40E-05	1.21E-06														
Emerald Lake	69.8	0.780	293	4.87E-04	3.56E-06														
Florence Lake	33.0	0.780	417	7.81E-04	3.78E-06														
Hobbs Lake	69.9	1.080	293	3.79E-05	1.28E-06														
Lower Saddlebag	55.5	1.000	155	4.82E-05	1.38E-06														
Ross Lake	53.5	1.080	4455	3.20E-05	1.27E-06														
Stepping Stone Lake	19.9	1.460	26	1.92E-05	9.22E-07														
Twin Island Lake	17.6	1.300	45	1.93E-05	9.51E-07														
Upper Frozen Lake	5.0	0.925	65	4.50E-05	1.24E-06														
High Elevation	Intermediate Calculated Values																		
Lake of	Nitrogen (Dn) Deposition (kg/ha/yr)	Sulfur (Ds) Deposition (kg/ha/yr)	Lake Catchment Baseline ANC(o) (eq)	Nitrogen (Hn) Deposition (eq/m²/yr)	Sulfur (Hs) Deposition (eq/m²/yr)	Total (Hdep) Deposition (eq)	Results												
Special Concern	Change (µeq/l)	Change (µeq/l)	Change (µeq/l)	Change (µeq/l)	Change (µeq/l)	Change (µeq/l)	ANC Change	Percent ANC Change											
Black Joe Lake	1.38E-02	3.77E-04	3.70E+05	9.83E-05	2.36E-06	8.96E+02	0.16	0.24%											
Deep Lake	1.39E-02	3.81E-04	7.61E+04	9.92E-05	2.38E-06	2.08E+02	0.16	0.27%											
Emerald Lake	1.54E-01	1.12E-03	1.07E+05	1.10E-03	7.02E-06	3.24E+03	2.11	3.03%											
Florence Lake	2.46E-01	1.19E-03	7.19E+04	1.76E-03	7.44E-06	7.37E+03	3.38	10.24%											
Hobbs Lake	1.20E-02	4.03E-04	1.48E+05	8.55E-05	2.52E-06	2.58E+02	0.12	0.17%											
Lower Saddlebag	1.52E-02	4.36E-04	5.76E+04	1.09E-04	2.72E-06	1.73E+02	0.17	0.30%											
Ross Lake	1.01E-02	4.00E-04	1.72E+06	7.20E-05	2.50E-06	3.32E+03	0.10	0.19%											
Stepping Stone Lake	6.04E-03	2.91E-04	5.14E+03	4.32E-05	1.82E-06	1.19E+01	0.05	0.23%											
Twin Island Lake	6.09E-03	3.00E-04	6.88E+03	4.35E-05	1.87E-06	2.04E+01	0.05	0.30%											
Upper Frozen Lake	1.42E-02	3.91E-04	2.01E+03	1.01E-04	2.44E-06	6.73E+01	0.17	3.35%											
Maximum							3.38	10.24%											
NOTE:	Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.																		
	Baseline ANC values calculated from summarized data provided by the Forest Service.																		
	ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																		
	Annual precipitation and watershed catchments values provided by the Forest Service.																		

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

Terrestrial Acid Deposition Summary		CMAB - Cumulative + Alt. B Sources																		
Incremental Analysis																				
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT													
Bridger	6.24E-05	1.85E-06	1.97E-02	5.83E-04	0.005	393.9%	11.7%													
Cloud Peak	1.18E-03	5.88E-06	3.72E-01	1.85E-03	0.005	7448.8%	37.1%													
Fitzpatrick	3.74E-05	1.57E-06	1.18E-02	4.97E-04	0.005	236.1%	9.9%													
North Absaroka	2.21E-05	1.67E-06	6.97E-03	5.25E-04	0.005	139.5%	10.5%													
Owl Creek Range	6.43E-05	2.20E-06	2.03E-02	6.95E-04	0.005	405.3%	13.9%													
Popo Agie	5.23E-05	1.51E-06	1.65E-02	4.77E-04	0.005	329.9%	9.5%													
Phlox Mountain	4.01E-05	1.59E-06	1.26E-02	5.03E-04	0.005	252.9%	10.1%													
Teton NP	2.96E-05	1.23E-05	9.34E-03	3.87E-03	0.005	186.7%	77.4%													
Teton Wilderness	2.59E-05	4.98E-06	8.16E-03	1.57E-03	0.005	163.3%	31.4%													
Washakie Wilderness	3.51E-05	1.83E-06	1.11E-02	5.77E-04	0.005	221.3%	11.5%													
Wind River Canyon	1.27E-04	3.47E-06	3.99E-02	1.09E-03	0.005	798.2%	21.9%													
Wind River Roadless	4.81E-05	1.43E-06	1.52E-02	4.52E-04	0.005	303.1%	9.0%													
Yellowstone NP	2.03E-05	5.46E-06	6.39E-03	1.72E-03	0.005	127.8%	34.5%													
Maximum	1.18E-03	1.23E-05	3.72E-01	3.87E-03	0.005	7448.8%	77.4%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts															
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"												
Bridger	6.24E-05	1.97E-02	1.3	1.3	3.0	10.0	44.0%	13.2%												
Cloud Peak	1.18E-03	3.72E-01	1.3	1.7	3.0	10.0	55.7%	16.7%												
Fitzpatrick	3.74E-05	1.18E-02	1.3	1.3	3.0	10.0	43.7%	13.1%												
North Absaroka	2.21E-05	6.97E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Owl Creek Range	6.43E-05	2.03E-02	1.3	1.3	3.0	10.0	44.0%	13.2%												
Popo Agie	5.23E-05	1.65E-02	1.3	1.3	3.0	10.0	43.9%	13.2%												
Phlox Mountain	4.01E-05	1.26E-02	1.3	1.3	3.0	10.0	43.8%	13.1%												
Teton NP	2.96E-05	9.34E-03	1.1	1.1	3.0	10.0	37.0%	11.1%												
Teton Wilderness	2.59E-05	8.16E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Washakie Wilderness	3.51E-05	1.11E-02	1.1	1.1	3.0	10.0	37.0%	11.1%												
Wind River Canyon	1.27E-04	3.99E-02	1.3	1.3	3.0	10.0	44.7%	13.4%												
Wind River Roadless	4.81E-05	1.52E-02	1.3	1.3	3.0	10.0	43.8%	13.2%												
Yellowstone NP	2.03E-05	6.39E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Maximum	1.18E-03	3.72E-01	1.3	1.7	3.0	10.0	55.7%	16.7%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts															
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"												
Bridger	1.85E-06	5.83E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	5.88E-06	1.85E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	1.57E-06	4.97E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absaroka	1.67E-06	5.25E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	2.20E-06	6.95E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	1.51E-06	4.77E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	1.59E-06	5.03E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	1.23E-05	3.87E-03	0.9	0.9	5.0	20.0	18.1%	4.5%												
Teton Wilderness	4.98E-06	1.57E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	1.83E-06	5.77E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	3.47E-06	1.09E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	1.43E-06	4.52E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	5.46E-06	1.72E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	1.23E-05	3.87E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																				
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																				

**Appendix A13
Summary of Results
Cumulative + Alt. B Sources**

Ambient Impact Summary		CMAB - Cumulative + Alt. B Sources													
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQ Standard (ug/m3)	Impact % of WAAQS/NAAQ						
NO2	Annual	2.36E+00	CLOUD PEAK	2.5	94.50%	3.4	5.76	100	5.76%						
SO2	3-hour	3.86E-01	TETON NATIONAL PARK	25	1.54%	132	132.39	1300	10.18%						
	24-hour	8.02E-02	TETON NATIONAL PARK	5	1.60%	43	43.08	260	16.57%						
	Annual	8.83E-03	TETON NATIONAL PARK	2	0.44%	9	9.01	60	15.01%						
PM10	24-hour	1.48E+00	WIND RIVER CANYON	8	18.45%	61	62.48	150	41.65%						
	Annual	1.29E-01	WIND RIVER CANYON	4	3.21%	22	22.13	50	44.26%						
PM25	24-hour	7.72E-01	WIND RIVER CANYON	n.a.	n.a.	35	35.77	65	55.03%						
	Annual	5.57E-02	WIND RIVER CANYON	n.a.	n.a.	10	10.06	15	67.04%						
Maximum					94.50%				67.04%						

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

BRIDGER		CMNA - Cumulative + No Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.34E-02	537	-73.783	19.513
	3-hour	8.08E-02	530	-85.694	31.436
	24-hour	1.94E-02	530	-85.694	31.436
SO2	Annual	1.16E-03	537	-73.783	19.513
	24-hour	2.18E-02	552	-36.775	8.558
	Annual	8.54E-04	537	-73.783	19.513
PM10	24-hour	2.50E-02	530	-85.694	31.436
	Annual	1.86E-03	537	-73.783	19.513
	Annual	1.86E-03	537	-73.783	19.513
PM25	24-hour	2.50E-02	530	-85.694	31.436
	Annual	1.86E-03	537	-73.783	19.513
	Annual	1.86E-03	537	-73.783	19.513
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.06E-05	530	-85.694	31.436
	Annual	1.84E-06	513	-109.557	60.700
S	Annual	1.84E-06	513	-109.557	60.700
	Annual	1.84E-06	513	-109.557	60.700
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		5	5		
Days delta dV >1.00		0	0		
Largest delta dV		0.881	0.979		
Day of Largest delta dV		305	305		
Largest delta dV Receptor		552	552		
Total dV		5.573	4.599		
dV Background		4.692	3.579		
% Ext by SO4		1.68	1.68		
% Ext by NO3		96.30	96.30		
% Ext by PM10		0.89	0.89		
% Ext by PM2.5		1.13	1.13		
CLOUD PEAK		CMNA - Cumulative + No Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.36E+00	988	120.589	185.589
	3-hour	3.16E-01	1053	112.000	208.000
	24-hour	4.47E-02	1053	112.000	208.000
SO2	Annual	2.39E-03	980	107.363	178.642
	24-hour	7.86E-02	995	116.255	198.926
	Annual	2.98E-03	995	116.255	198.926
PM10	24-hour	1.12E-01	994	115.588	197.592
	Annual	1.12E-01	994	115.588	197.592
	Annual	4.80E-03	989	119.200	187.867
PM25	24-hour	4.80E-03	989	119.200	187.867
	Annual	4.80E-03	989	119.200	187.867
	Annual	4.80E-03	989	119.200	187.867
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.18E-03	988	120.589	185.589
	Annual	5.83E-06	980	107.363	178.642
S	Annual	5.83E-06	980	107.363	178.642
	Annual	5.83E-06	980	107.363	178.642
VISIBILITY		FLAG	IMPROVE		
Days delta dV >0.50		41	41		
Days delta dV >1.00		11	12		
Largest delta dV		1.710	1.650		
Day of Largest delta dV		117	119		
Largest delta dV Receptor		944	944		
Total dV		6.258	6.585		
dV Background		4.549	4.935		
% Ext by SO4		0.34	0.34		
% Ext by NO3		99.02	99.02		
% Ext by PM10		0.14	0.14		
% Ext by PM2.5		0.50	0.50		

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

FITZPATRICK		CMNA - Cumulative + No Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.23E-02	716	-71.592	46.301
	3-hour	2.74E-02	782	-96.000	98.000
	24-hour	7.08E-03	720	-71.448	62.044
SO2	Annual	7.55E-04	700	-95.817	99.004
	24-hour	1.13E-02	722	-71.304	70.023
PM10	Annual	3.75E-04	716	-71.592	46.301
	24-hour	9.27E-03	726	-71.161	86.048
PM25	Annual	7.62E-04	716	-71.592	46.301
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.53E-05	716	-71.592	46.301
	S	Annual	1.57E-06	700	-95.817
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	1	1		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.601	0.698		
	Day of Largest delta dV	60	60		
	Largest delta dV Receptor	716	716		
	Total dV	5.226	3.782		
	dV Background	4.625	3.084		
	% Ext by SO4	0.65	0.65		
	% Ext by NO3	98.58	98.58		
	% Ext by PM10	0.17	0.17		
% Ext by PM2.5	0.61	0.61			
NORTH ABSAROKA		CMNA - Cumulative + No Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.24E-02	815	-63.736	230.153
	3-hour	2.74E-02	781	-110.264	264.328
	24-hour	1.36E-02	815	-63.736	230.153
SO2	Annual	5.75E-04	843	-120.223	208.073
	24-hour	1.09E-02	780	-105.982	264.246
PM10	Annual	2.18E-04	842	-102.222	264.148
	24-hour	6.11E-03	814	-69.913	224.471
PM25	Annual	3.56E-04	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.16E-05	815	-63.736	230.153
	S	Annual	1.66E-06	792	-124.346
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	3	4		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.756	0.728		
	Day of Largest delta dV	118	118		
	Largest delta dV Receptor	815	815		
	Total dV	5.305	5.664		
	dV Background	4.549	4.935		
	% Ext by SO4	0.59	0.59		
	% Ext by NO3	99.17	99.17		
	% Ext by PM10	0.05	0.05		
% Ext by PM2.5	0.19	0.19			

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

PHLOX MOUNTAIN		CMNA - Cumulative + No Action Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.49E-02	1140	-17.128	113.192															
	3-hour	6.59E-02	1140	-17.128	113.192															
	24-hour	3.37E-02	1140	-17.128	113.192															
PM10	Annual	1.07E-03	1140	-17.128	113.192															
	24-hour	1.15E-02	1140	-17.128	113.192															
PM25	Annual	8.16E-04	1140	-17.128	113.192															
	24-hour	1.10E-02	1140	-17.128	113.192															
	Annual	9.44E-04	1140	-17.128	113.192															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	3.64E-05	1140	-17.128	113.192															
	S	Annual	1.56E-06	1140	-17.128	113.192														
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	4	6																	
	Days delta dV >1.00	2	1																	
	Largest delta dV	1.140	1.318																	
	Day of Largest delta dV	59	59																	
	Largest delta dV Receptor	1140	1140																	
	Total dV	5.765	4.402																	
	dV Background	4.625	3.084																	
	% Ext by SO4	1.68	1.68																	
	% Ext by NO3	97.58	97.58																	
	% Ext by PM10	0.16	0.16																	
	% Ext by PM2.5	0.57	0.57																	
TETON NATIONAL PARK		CMNA - Cumulative + No Action Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.83E-02	678	-171.607	111.139															
	3-hour	3.86E-01	685	-178.064	116.341															
	24-hour	8.02E-02	685	-178.064	116.341															
PM10	Annual	8.83E-03	686	-177.304	116.038															
	24-hour	3.92E-02	685	-178.064	116.341															
PM25	Annual	3.70E-03	686	-177.304	116.038															
	24-hour	6.18E-02	680	-172.405	116.076															
	Annual	6.56E-03	686	-177.304	116.038															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	2.91E-05	678	-171.607	111.139															
	S	Annual	1.23E-05	686	-177.304	116.038														
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	1	1																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.539	0.554																	
	Day of Largest delta dV	360	360																	
	Largest delta dV Receptor	680	680																	
	Total dV	5.239	4.981																	
	dV Background	4.700	4.428																	
	% Ext by SO4	54.11	84.11																	
	% Ext by NO3	6.67	6.67																	
	% Ext by PM10	2.24	2.24																	
	% Ext by PM2.5	6.98	6.98																	

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

TETON WILDERNESS AREA		CMNA - Cumulative + No Action Sources																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	6.06E-03	32	-145.858	144.194																
	3-hour	8.18E-02	25	-160.656	150.244																
	24-hour	2.69E-02	25	-160.656	150.244																
SO2	Annual	2.33E-03	25	-160.656	150.244																
	24-hour	7.99E-03	32	-145.858	144.194																
PM10	Annual	7.01E-04	32	-145.858	144.194																
	24-hour	1.70E-02	32	-145.858	144.194																
PM25	Annual	1.61E-03	32	-145.858	144.194																
	24-hour	1.61E-03	32	-145.858	144.194																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	2.53E-05	48	-101.381	138.307																
	S	Annual	4.98E-06	32	-145.858	144.194															
VISIBILITY		FLAG	IMPROVE																		
Days delta dV >0.50		0	0																		
Days delta dV >1.00		0	0																		
Largest delta dV		0.363	0.350																		
Day of Largest delta dV		261	60																		
Largest delta dV Receptor		45	57																		
Total dV		4.797	4.702																		
dV Background		4.434	4.352																		
% Ext by SO4		1.43	1.95																		
% Ext by NO3		97.84	97.46																		
% Ext by PM10		0.16	0.10																		
% Ext by PM2.5		0.57	0.49																		
WASHAKIE		CMNA - Cumulative + No Action Sources																			
Pollutant Concentrations		(ug/m3)	Receptor																		
NO2	Annual	1.33E-02	317	-60.874	173.435																
	3-hour	2.48E-02	464	-84.000	186.000																
	24-hour	1.16E-02	298	-40.129	137.459																
SO2	Annual	8.54E-04	266	-101.488	139.754																
	24-hour	4.63E-03	338	-60.000	126.000																
PM10	Annual	3.31E-04	298	-40.129	137.459																
	24-hour	6.17E-03	316	-61.474	170.617																
PM25	Annual	6.37E-04	298	-40.129	137.459																
	24-hour	6.37E-04	298	-40.129	137.459																
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																		
N	Annual	3.34E-05	298	-40.129	137.459																
	S	Annual	1.82E-06	266	-101.488	139.754															
VISIBILITY		FLAG	IMPROVE																		
Days delta dV >0.50		4	4																		
Days delta dV >1.00		0	0																		
Largest delta dV		0.924	0.890																		
Day of Largest delta dV		118	118																		
Largest delta dV Receptor		299	299																		
Total dV		5.473	5.825																		
dV Background		4.549	4.935																		
% Ext by SO4		0.59	0.59																		
% Ext by NO3		99.13	99.13																		
% Ext by PM10		0.06	0.06																		
% Ext by PM2.5		0.22	0.22																		

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

WIND RIVER CANYON		CMNA - Cumulative + No Action Sources																				
Pollutant Concentrations		(ug/m3)	Receptor																			
NO2	Annual	3.53E-02	1078	31.661	93.381																	
	3-hour	1.39E-01	1085	28.586	107.490																	
	24-hour	3.17E-02	1064	26.198	111.141																	
PM10	Annual	2.14E-03	1064	26.198	111.141																	
	24-hour	2.17E-01	1076	27.022	94.149																	
PM25	Annual	1.25E-02	1076	27.022	94.149																	
	24-hour	7.27E-02	1064	26.198	111.141																	
	Annual	5.35E-03	1076	27.022	94.149																	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																			
N	Annual	5.34E-05	1079	33.939	95.192																	
	S	Annual	2.72E-06	1085	28.586	107.490																
VISIBILITY		FLAG	IMPROVE																			
Days delta dV >0.50		9	9																			
Days delta dV >1.00		2	3																			
Largest delta dV		1.772	2.039																			
Day of Largest delta dV		59	59																			
Largest delta dV Receptor		1077	1077																			
Total dV		6.397	5.122																			
dV Background		4.625	3.084																			
% Ext by SO4		0.54	0.54																			
% Ext by NO3		98.86	98.86																			
% Ext by PM10		0.15	0.15																			
% Ext by PM2.5		0.45	0.45																			
WIND RIVER ROADLESS		CMNA - Cumulative + No Action Sources																				
Pollutant Concentrations		(ug/m3)	Receptor																			
NO2	Annual	1.49E-02	812	-61.282	35.110																	
	3-hour	2.37E-02	786	-49.853	59.119																	
	24-hour	1.32E-02	786	-49.853	59.119																	
PM10	Annual	6.47E-04	818	-40.580	34.535																	
	24-hour	2.71E-02	786	-49.853	59.119																	
PM25	Annual	8.28E-04	821	-40.795	43.233																	
	24-hour	1.16E-02	818	-40.580	34.535																	
	Annual	1.03E-03	819	-40.580	37.986																	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																			
N	Annual	4.28E-05	818	-40.580	34.535																	
	S	Annual	1.40E-06	821	-40.795	43.233																
VISIBILITY		FLAG	IMPROVE																			
Days delta dV >0.50		5	5																			
Days delta dV >1.00		1	2																			
Largest delta dV		1.029	1.191																			
Day of Largest delta dV		60	60																			
Largest delta dV Receptor		820	820																			
Total dV		5.654	4.274																			
dV Background		4.625	3.084																			
% Ext by SO4		0.75	0.75																			
% Ext by NO3		98.30	98.30																			
% Ext by PM10		0.30	0.30																			
% Ext by PM2.5		0.65	0.65																			

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

YELLOWSTONE NATL PARK		CMNA - Cumulative + No Action Sources												
Pollutant Concentrations		(ug/m3)	Receptor											
NO2	Annual	3.69E-03	64	-167.930	173.398									
	3-hour	6.03E-02	108	-196.891	173.293									
	24-hour	2.52E-02	108	-196.891	173.293									
PM10	Annual	2.41E-03	108	-196.891	173.293									
	24-hour	1.04E-02	18	-110.235	269.323									
PM25	Annual	2.47E-04	66	-164.001	172.442									
	24-hour	7.56E-03	60	-183.917	172.915									
	Annual	6.42E-04	66	-164.001	172.442									
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor											
N	Annual	1.98E-05	109	-112.113	171.051									
S	Annual	5.46E-06	108	-196.891	173.293									
VISIBILITY		FLAG	IMPROVE											
	Days delta dV >0.50	0	0											
	Days delta dV >1.00	0	0											
	Largest delta dV	0.466	0.416											
	Day of Largest delta dV	145	145											
	Largest delta dV Receptor	19	19											
	Total dV	5.014	6.118											
	dV Background	4.549	5.703											
	% Ext by SO4	0.15	0.15											
	% Ext by NO3	99.50	99.50											
	% Ext by PM10	0.05	0.05											
	% Ext by PM2.5	0.30	0.30											

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

<i>Visibility Summary</i>		CMNA - Cumulative + No Action Sources																	
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions															
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV													
Bridger	5	0	0.88	5	0	0.98													
Cloud Peak	41	11	1.71	41	12	1.65													
Fitzpatrick	1	0	0.60	1	0	0.70													
North Absaroka	3	0	0.76	4	0	0.73													
Owl Creek	8	3	1.65	7	3	1.90													
Popo Agie	5	0	1.00	6	3	1.15													
Phlox Mountain	4	2	1.14	6	1	1.32													
Teton NP	1	0	0.54	1	0	0.55													
Teton Wilderness	0	0	0.36	0	0	0.35													
Washakie	4	0	0.92	4	0	0.89													
Wind River Canyon	9	2	1.77	9	3	2.04													
Wind River Roadless	5	1	1.03	5	2	1.19													
Yellowstone NP	0	0	0.47	0	0	0.42													
Total Days / Max Δ dV	86	19	1.77	89	24	2.04													

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

LAKES		CMNA - Cumulative + No Action Sources																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.02E-05	1141	-49.183	20.543															
	S	1.17E-06	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.07E-05	1142	-49.178	18.394															
	S	1.18E-06	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.83E-04	1143	95.779	205.602															
	S	3.52E-06	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.76E-04	1144	105.440	193.981															
	S	3.74E-06	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.64E-05	1145	-88.417	52.778															
	S	1.27E-06	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.38E-05	1146	-35.219	7.97															
	S	1.35E-06	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.07E-05	1147	-86.813	89.541															
	S	1.26E-06	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.17E-05	1148	-48.413	14.897															
	S	1.21E-06	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.89E-05	1149	-96.935	275.159															
	S	9.20E-07	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	1.90E-05	1150	-95.471	271.528															
	S	9.48E-07	1150	-95.471	271.528															

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

Terrestrial Acid Deposition Summary		CMNA - Cumulative + No Action Sources																			
Incremental Analysis																					
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT														
Bridger	6.06E-05	1.84E-06	1.91E-02	5.81E-04	0.005	382.5%	11.6%														
Cloud Peak	1.18E-03	5.83E-06	3.71E-01	1.84E-03	0.005	7423.6%	36.8%														
Fitzpatrick	3.53E-05	1.57E-06	1.11E-02	4.94E-04	0.005	222.7%	9.9%														
North Absaroka	2.16E-05	1.66E-06	6.82E-03	5.24E-04	0.005	136.3%	10.5%														
Owl Creek Range	4.50E-05	2.02E-06	1.42E-02	6.38E-04	0.005	283.7%	12.8%														
Popo Agie	4.61E-05	1.46E-06	1.45E-02	4.60E-04	0.005	290.9%	9.2%														
Phlox Mountain	3.64E-05	1.56E-06	1.15E-02	4.92E-04	0.005	229.7%	9.8%														
Teton NP	2.91E-05	1.23E-05	9.19E-03	3.87E-03	0.005	183.8%	77.4%														
Teton Wilderness	2.53E-05	4.98E-06	7.97E-03	1.57E-03	0.005	159.5%	31.4%														
Washakie Wilderness	3.34E-05	1.82E-06	1.05E-02	5.75E-04	0.005	210.6%	11.5%														
Wind River Canyon	5.34E-05	2.72E-06	1.68E-02	8.57E-04	0.005	336.9%	17.1%														
Wind River Roadless	4.28E-05	1.40E-06	1.35E-02	4.40E-04	0.005	269.8%	8.8%														
Yellowstone NP	1.98E-05	5.46E-06	6.25E-03	1.72E-03	0.005	125.0%	34.5%														
Maximum	1.18E-03	1.23E-05	3.71E-01	3.87E-03	0.005	7423.6%	77.4%														
NOTE: DAT for Western Class I areas from National Park Service (2003).																					
Cumulative Analysis																					
Nitrogen Deposition																					
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts																
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Percent of "Green Line"	Percent of "Red Line"													
Bridger	6.06E-05	1.91E-02	1.3	1.3	3.0	10.0	44.0%	13.2%													
Cloud Peak	1.18E-03	3.71E-01	1.3	1.7	3.0	10.0	55.7%	16.7%													
Fitzpatrick	3.53E-05	1.11E-02	1.3	1.3	3.0	10.0	43.7%	13.1%													
North Absaroka	2.16E-05	6.82E-03	1.1	1.1	3.0	10.0	36.9%	11.1%													
Owl Creek Range	4.50E-05	1.42E-02	1.3	1.3	3.0	10.0	43.8%	13.1%													
Popo Agie	4.61E-05	1.45E-02	1.3	1.3	3.0	10.0	43.8%	13.1%													
Phlox Mountain	3.64E-05	1.15E-02	1.3	1.3	3.0	10.0	43.7%	13.1%													
Teton NP	2.91E-05	9.19E-03	1.1	1.1	3.0	10.0	37.0%	11.1%													
Teton Wilderness	2.53E-05	7.97E-03	1.1	1.1	3.0	10.0	36.9%	11.1%													
Washakie Wilderness	3.34E-05	1.05E-02	1.1	1.1	3.0	10.0	37.0%	11.1%													
Wind River Canyon	5.34E-05	1.68E-02	1.3	1.3	3.0	10.0	43.9%	13.2%													
Wind River Roadless	4.28E-05	1.35E-02	1.3	1.3	3.0	10.0	43.8%	13.1%													
Yellowstone NP	1.98E-05	6.25E-03	1.1	1.1	3.0	10.0	36.9%	11.1%													
Maximum	1.18E-03	3.71E-01	1.3	1.7	3.0	10.0	55.7%	16.7%													
Sulfur Deposition																					
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts																
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Percent of "Green Line"	Percent of "Red Line"													
Bridger	1.84E-06	5.81E-04	1.1	1.1	5.0	20.0	22.0%	5.5%													
Cloud Peak	5.83E-06	1.84E-03	1.1	1.1	5.0	20.0	22.0%	5.5%													
Fitzpatrick	1.57E-06	4.94E-04	1.1	1.1	5.0	20.0	22.0%	5.5%													
North Absaroka	1.66E-06	5.24E-04	0.9	0.9	5.0	20.0	18.0%	4.5%													
Owl Creek Range	2.02E-06	6.38E-04	1.1	1.1	5.0	20.0	22.0%	5.5%													
Popo Agie	1.46E-06	4.60E-04	1.1	1.1	5.0	20.0	22.0%	5.5%													
Phlox Mountain	1.56E-06	4.92E-04	1.1	1.1	5.0	20.0	22.0%	5.5%													
Teton NP	1.23E-05	3.87E-03	0.9	0.9	5.0	20.0	18.1%	4.5%													
Teton Wilderness	4.98E-06	1.57E-03	0.9	0.9	5.0	20.0	18.0%	4.5%													
Washakie Wilderness	1.82E-06	5.75E-04	0.9	0.9	5.0	20.0	18.0%	4.5%													
Wind River Canyon	2.72E-06	8.57E-04	1.1	1.1	5.0	20.0	22.0%	5.5%													
Wind River Roadless	1.40E-06	4.40E-04	1.1	1.1	5.0	20.0	22.0%	5.5%													
Yellowstone NP	5.46E-06	1.72E-03	0.9	0.9	5.0	20.0	18.0%	4.5%													
Maximum	1.23E-05	3.87E-03	1.1	1.1	5.0	20.0	22.0%	5.5%													
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																					
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																					
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																					

**Appendix A14
Summary of Results
Cumulative + No Action Sources**

Ambient Impact Summary		CMNA - Cumulative + No Action Sources													
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQ Standard (ug/m3)	Impact % of WAAQS/NAAQ						
NO2	Annual	2.36E+00	CLOUD PEAK	2.5	94.43%	3.4	5.76	100	5.76%						
SO2	3-hour	3.86E-01	TETON NATIONAL PARK	25	1.54%	132	132.39	1300	10.18%						
	24-hour	8.02E-02	TETON NATIONAL PARK	5	1.60%	43	43.08	260	16.57%						
	Annual	8.83E-03	TETON NATIONAL PARK	2	0.44%	9	9.01	60	15.01%						
PM10	24-hour	2.17E-01	WIND RIVER CANYON	8	2.71%	61	61.22	150	40.81%						
	Annual	1.25E-02	WIND RIVER CANYON	4	0.31%	22	22.01	50	44.03%						
PM25	24-hour	1.12E-01	CLOUD PEAK	n.a.	n.a.	35	35.11	65	54.02%						
	Annual	6.56E-03	TETON NATIONAL PARK	n.a.	n.a.	10	10.01	15	66.71%						
Maximum					94.43%				66.71%						

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

BRIDGER		CMPP - Cumulative + Proposed Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	6.38E-02	537	-73.783	19.513
SO2	3-hour	8.08E-02	530	-85.694	31.436
	24-hour	1.94E-02	530	-85.694	31.436
PM10	Annual	1.17E-03	537	-73.783	19.513
	24-hour	6.72E-02	552	-36.775	8.558
PM25	Annual	1.74E-03	552	-36.775	8.558
	24-hour	4.51E-02	552	-36.775	8.558
	Annual	2.03E-03	537	-73.783	19.513
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	6.29E-05	530	-85.694	31.436
	Annual	1.85E-06	513	-109.557	60.700
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	5	5		
	Days delta dV >1.00	0	2		
	Largest delta dV	0.985	1.095		
	Day of Largest delta dV	305	305		
	Largest delta dV Receptor	552	552		
	Total dV	5.678	4.675		
	dV Background	4.692	3.579		
	% Ext by SO4	1.52	1.52		
	% Ext by NO3	93.32	93.32		
	% Ext by PM10	2.44	2.44		
% Ext by PM2.5	2.72	2.72			
CLOUD PEAK		CMPP - Cumulative + Proposed Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	2.36E+00	988	120.589	185.589
SO2	3-hour	3.16E-01	1053	112.000	208.000
	24-hour	4.47E-02	1053	112.000	208.000
PM10	Annual	2.42E-03	980	107.363	178.642
	24-hour	8.14E-02	994	115.588	197.592
PM25	Annual	4.03E-03	989	119.200	187.867
	24-hour	1.17E-01	994	115.588	197.592
	Annual	5.77E-03	989	119.200	187.867
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.18E-03	988	120.589	185.589
	Annual	5.88E-06	980	107.363	178.642
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	43	42		
	Days delta dV >1.00	11	12		
	Largest delta dV	1.720	1.660		
	Day of Largest delta dV	119	119		
	Largest delta dV Receptor	944	944		
	Total dV	6.269	6.595		
	dV Background	4.549	4.935		
	% Ext by SO4	0.34	0.34		
	% Ext by NO3	99.00	99.00		
	% Ext by PM10	0.15	0.15		
% Ext by PM2.5	0.51	0.51			

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

FITZPATRICK		CMPP - Cumulative + Proposed Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.28E-02	716	-71.592	46.301
SO2	3-hour	2.74E-02	782	-96.000	98.000
	24-hour	7.08E-03	720	-71.448	62.044
PM10	Annual	7.58E-04	700	-95.817	99.004
	24-hour	6.79E-02	722	-71.304	70.023
PM25	Annual	8.29E-04	723	-71.232	73.900
	24-hour	4.37E-02	726	-71.161	86.048
	Annual	1.13E-03	727	-71.232	89.283
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.80E-05	716	-71.592	46.301
S	Annual	1.57E-06	700	-95.817	99.004
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	1	2		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.619	0.719		
	Day of Largest delta dV	60	60		
	Largest delta dV Receptor	716	716		
	Total dV	5.244	3.803		
	dV Background	4.625	3.084		
	% Ext by SO4	0.64	0.64		
	% Ext by NO3	98.41	98.41		
	% Ext by PM10	0.25	0.25		
	% Ext by PM2.5	0.70	0.70		
NORTH ABSAROKA		CMPP - Cumulative + Proposed Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.25E-02	815	-63.736	230.153
SO2	3-hour	2.74E-02	781	-110.264	264.328
	24-hour	1.36E-02	815	-63.736	230.153
PM10	Annual	5.76E-04	843	-120.223	208.073
	24-hour	1.09E-02	780	-105.982	264.246
PM25	Annual	3.21E-04	815	-63.736	230.153
	24-hour	8.41E-03	810	-71.560	213.930
	Annual	4.68E-04	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.23E-05	815	-63.736	230.153
S	Annual	1.67E-06	792	-124.346	213.930
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	3	4		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.788	0.759		
	Day of Largest delta dV	118	118		
	Largest delta dV Receptor	815	815		
	Total dV	5.337	5.695		
	dV Background	4.549	4.935		
	% Ext by SO4	0.57	0.57		
	% Ext by NO3	99.01	99.01		
	% Ext by PM10	0.12	0.12		
	% Ext by PM2.5	0.30	0.30		

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

OWL CREEK		CMPP - Cumulative + Proposed Action Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.02E-02	1107	6.423	97.676															
SO2	3-hour	9.71E-02	1094	-14.059	118.533															
	24-hour	3.45E-02	1117	-16.141	107.625															
PM10	Annual	1.75E-03	1107	6.423	97.676															
	24-hour	8.16E-01	1107	6.423	97.676															
PM25	Annual	3.64E-02	1107	6.423	97.676															
	24-hour	4.47E-01	1107	6.423	97.676															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
	N	Annual	6.92E-05	1107	6.423	97.676														
S	Annual	2.20E-06	1107	6.423	97.676															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	12	12																	
	Days delta dV >1.00	3	4																	
	Largest delta dV	1.709	1.968																	
	Day of Largest delta dV	59	59																	
	Largest delta dV Receptor	1107	1107																	
	Total dV	6.334	5.051																	
	dV Background	4.625	3.084																	
	% Ext by SO4	0.77	0.77																	
	% Ext by NO3	98.07	98.07																	
	% Ext by PM10	0.31	0.31																	
	% Ext by PM2.5	0.85	0.85																	
POPO AGIE		CMPP - Cumulative + Proposed Action Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	2.46E-02	894	-30.281	4.879															
SO2	3-hour	4.21E-02	893	-28.587	7.395															
	24-hour	1.59E-02	893	-28.587	7.395															
PM10	Annual	7.96E-04	894	-30.281	4.879															
	24-hour	8.47E-02	889	-30.862	15.475															
PM25	Annual	2.64E-03	890	-29.797	13.249															
	24-hour	6.02E-02	887	-32.313	17.943															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
	N	Annual	5.42E-05	886	-33.377	20.749														
S	Annual	1.51E-06	889	-30.862	15.475															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	8	6																	
	Days delta dV >1.00	2	3																	
	Largest delta dV	1.143	1.269																	
	Day of Largest delta dV	305	305																	
	Largest delta dV Receptor	893	893																	
	Total dV	5.835	4.849																	
	dV Background	4.692	3.579																	
	% Ext by SO4	1.52	1.52																	
	% Ext by NO3	93.30	93.30																	
	% Ext by PM10	2.37	2.37																	
	% Ext by PM2.5	2.81	2.81																	

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

PHLOX MOUNTAIN		CMPP - Cumulative + Proposed Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.77E-02	1140	-17.128	113.192
SO2	3-hour	6.61E-02	1140	-17.128	113.192
	24-hour	3.37E-02	1140	-17.128	113.192
PM10	Annual	1.09E-03	1140	-17.128	113.192
	24-hour	6.30E-02	1140	-17.128	113.192
PM25	Annual	2.97E-03	1140	-17.128	113.192
	24-hour	3.98E-02	1140	-17.128	113.192
Annual		2.24E-03	1140	-17.128	113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.12E-05	1140	-17.128	113.192
S	Annual	1.59E-06	1140	-17.128	113.192
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	4	7		
	Days delta dV >1.00	3	1		
	Largest delta dV	1.162	1.343		
	Day of Largest delta dV	59	59		
	Largest delta dV Receptor	1140	1140		
	Total dV	5.787	4.426		
	dV Background	4.625	3.084		
	% Ext by SO4	1.66	1.66		
	% Ext by NO3	97.48	97.48		
	% Ext by PM10	0.21	0.21		
	% Ext by PM2.5	0.65	0.65		
TETON NATIONAL PARK		CMPP - Cumulative + Proposed Action Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.83E-02	678	-171.607	111.139
SO2	3-hour	3.86E-01	685	-178.064	116.341
	24-hour	8.02E-02	685	-178.064	116.341
PM10	Annual	8.83E-03	686	-177.304	116.038
	24-hour	3.92E-02	685	-178.064	116.341
PM25	Annual	3.73E-03	686	-177.304	116.038
	24-hour	6.18E-02	680	-172.405	116.076
Annual		6.59E-03	686	-177.304	116.038
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.97E-05	678	-171.607	111.139
S	Annual	1.23E-05	686	-177.304	116.038
VISIBILITY		FLAG	IMPROVE		
	Days delta dV >0.50	1	1		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.539	0.554		
	Day of Largest delta dV	360	360		
	Largest delta dV Receptor	680	680		
	Total dV	5.239	4.981		
	dV Background	4.700	4.428		
	% Ext by SO4	84.11	84.11		
	% Ext by NO3	6.67	6.67		
	% Ext by PM10	2.24	2.24		
	% Ext by PM2.5	6.98	6.98		

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

TETON WILDERNESS AREA		CMPP - Cumulative + Proposed Action Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	6.13E-03	32	-145.858	144.194															
	3-hour	8.18E-02	25	-160.656	150.244															
	24-hour	2.69E-02	25	-160.656	150.244															
PM10	Annual	2.33E-03	25	-160.656	150.244															
	24-hour	1.16E-02	50	-98.438	141.823															
PM25	Annual	7.53E-04	32	-145.858	144.194															
	24-hour	1.70E-02	32	-145.858	144.194															
	Annual	1.65E-03	32	-145.858	144.194															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	2.61E-05	48	-101.381	138.307															
	Annual	4.98E-06	32	-145.858	144.194															
VISIBILITY	FLAG	IMPROVE																		
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.373	0.351																	
	Day of Largest delta dV	261	60																	
	Largest delta dV Receptor	45	57																	
	Total dV	4.807	4.703																	
	dV Background	4.434	4.352																	
	% Ext by SO4	1.41	1.94																	
	% Ext by NO3	97.50	97.45																	
	% Ext by PM10	0.32	0.10																	
% Ext by PM2.5	0.77	0.51																		
WASHAKIE		CMPP - Cumulative + Proposed Action Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	1.36E-02	317	-60.874	173.435															
	3-hour	2.48E-02	464	-84.000	186.000															
	24-hour	1.16E-02	298	-40.129	137.459															
PM10	Annual	8.55E-04	266	-101.488	139.754															
	24-hour	2.11E-02	338	-60.000	126.000															
PM25	Annual	8.13E-04	298	-40.129	137.459															
	24-hour	1.81E-02	294	-47.084	127.086															
	Annual	1.00E-03	294	-47.084	127.086															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	3.56E-05	298	-40.129	137.459															
	Annual	1.83E-06	266	-101.488	139.754															
VISIBILITY	FLAG	IMPROVE																		
	Days delta dV >0.50	4	4																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.929	0.896																	
	Day of Largest delta dV	118	118																	
	Largest delta dV Receptor	299	299																	
	Total dV	5.478	5.831																	
	dV Background	4.549	4.935																	
	% Ext by SO4	0.59	0.59																	
	% Ext by NO3	99.10	99.10																	
	% Ext by PM10	0.07	0.07																	
% Ext by PM2.5	0.24	0.24																		

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

WIND RIVER CANYON		CMPP - Cumulative + Proposed Action Sources																		
Pollutant Concentrations		(ug/m3)		Receptor																
NO2	Annual	2.35E-01	1077	29.190	92.365															
SO2	3-hour	1.40E-01	1085	28.586	107.490															
	24-hour	3.18E-02	1064	26.198	111.141															
PM10	Annual	2.99E-03	1077	29.190	92.365															
	24-hour	1.51E+00	1076	27.022	94.149															
PM25	Annual	1.31E-01	1077	29.190	92.365															
	24-hour	8.14E-01	1076	27.022	94.149															
	Annual	5.93E-02	1077	29.190	92.365															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor																
N	Annual	1.47E-04	1078	31.661	93.381															
	Annual	3.47E-06	1077	29.190	92.365															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	27	30																	
	Days delta dV >1.00	5	6																	
	Largest delta dV	1.866	2.146																	
	Day of Largest delta dV	59	59																	
	Largest delta dV Receptor	1077	1077																	
	Total dV	6.491	5.229																	
	dV Background	4.625	3.084																	
	% Ext by SO4	0.52	0.52																	
	% Ext by NO3	98.24	98.24																	
	% Ext by PM10	0.38	0.38																	
	% Ext by PM2.5	0.86	0.86																	
	WIND RIVER ROADLESS		CMPP - Cumulative + Proposed Action Sources																	
Pollutant Concentrations		(ug/m3)		Receptor																
NO2	Annual	1.68E-02	818	-40.580	34.535															
SO2	3-hour	2.38E-02	821	-40.795	43.233															
	24-hour	1.32E-02	786	-49.853	59.119															
PM10	Annual	6.69E-04	820	-40.723	41.939															
	24-hour	1.02E-01	791	-57.904	66.236															
PM25	Annual	2.29E-03	820	-40.723	41.939															
	24-hour	4.74E-02	868	-68.000	78.000															
	Annual	2.19E-03	820	-40.723	41.939															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor																
N	Annual	4.96E-05	818	-40.580	34.535															
	Annual	1.43E-06	821	-40.795	43.233															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	5	6																	
	Days delta dV >1.00	1	2																	
	Largest delta dV	1.088	1.259																	
	Day of Largest delta dV	60	60																	
	Largest delta dV Receptor	820	820																	
	Total dV	5.713	4.342																	
	dV Background	4.625	3.084																	
	% Ext by SO4	0.72	0.72																	
	% Ext by NO3	97.03	97.03																	
	% Ext by PM10	0.85	0.85																	
	% Ext by PM2.5	1.40	1.40																	

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

YELLOWSTONE NATL PARK		CMPP - Cumulative + Proposed Action Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	3.74E-03	64	-167.930	173.398															
SO2	3-hour	6.03E-02	108	-196.891	173.293															
	24-hour	2.52E-02	108	-196.891	173.293															
	Annual	2.41E-03	108	-196.891	173.293															
PM10	24-hour	1.04E-02	18	-110.235	269.323															
	Annual	2.87E-04	18	-110.235	269.323															
PM25	24-hour	7.56E-03	60	-183.917	172.915															
	Annual	6.76E-04	66	-164.001	172.442															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	2.04E-05	109	-112.113	171.051															
S	Annual	5.46E-06	108	-196.891	173.293															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.466	0.416																	
	Day of Largest delta dV	145	145																	
	Largest delta dV Receptor	19	19																	
	Total dV	5.014	6.118																	
	dV Background	4.549	5.703																	
	% Ext by SO4	0.15	0.15																	
	% Ext by NO3	99.50	99.50																	
	% Ext by PM10	0.05	0.05																	
	% Ext by PM2.5	0.30	0.30																	

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

<i>Visibility Summary</i>		CMPP - Cumulative + Proposed Action Sources												
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions										
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV								
Bridger	5	0	0.99	5	2	1.10								
Cloud Peak	43	11	1.72	42	12	1.66								
Fitzpatrick	1	0	0.62	2	0	0.72								
North Absaroka	3	0	0.79	4	0	0.76								
Owl Creek	12	3	1.71	12	4	1.97								
Popo Agie	8	2	1.14	6	3	1.27								
Phlox Mountain	4	3	1.16	7	1	1.34								
Teton NP	1	0	0.54	1	0	0.55								
Teton Wilderness	0	0	0.37	0	0	0.35								
Washakie	4	0	0.93	4	0	0.90								
Wind River Canyon	27	5	1.87	30	6	2.15								
Wind River Roadless	5	1	1.09	6	2	1.26								
Yellowstone NP	0	0	0.47	0	0	0.42								
Total Days / Max Δ dV	113	25	1.87	119	30	2.15								

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

LAKES		CMPP - Cumulative + Proposed Action Sources																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.47E-05	1141	-49.183	20.543															
	S	1.20E-06	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.47E-05	1142	-49.178	18.394															
	S	1.21E-06	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.88E-04	1143	95.779	205.602															
	S	3.56E-06	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.82E-04	1144	105.440	193.981															
	S	3.78E-06	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.84E-05	1145	-88.417	52.778															
	S	1.28E-06	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.96E-05	1146	-35.219	7.97															
	S	1.38E-06	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.23E-05	1147	-86.813	89.541															
	S	1.27E-06	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.60E-05	1148	-48.413	14.897															
	S	1.24E-06	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.92E-05	1149	-96.935	275.159															
	S	9.22E-07	1149	-96.935	275.159															
<i>Twin Island</i>	<i>Popo Agie - 10</i>	ug/m**2/sec																		
	Total Deposition																			
	N	1.94E-05	1150	-95.471	271.528															
	S	9.51E-07	1150	-95.471	271.528															

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

ANC Impacts to High Elevation Lakes		CMPP - Cumulative + Proposed Action Sources																
High Elevation	Inputs																	
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)													
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition													
	ANC (A)	(P)	Area	Rate	Rate													
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)													
Black Joe Lake	67.0	0.925	890	4.47E-05	1.20E-06													
Deep Lake	59.9	0.925	205	4.47E-05	1.21E-06													
Emerald Lake	69.8	0.780	293	4.88E-04	3.56E-06													
Florence Lake	33.0	0.780	417	7.82E-04	3.78E-06													
Hobbs Lake	69.9	1.080	293	3.84E-05	1.28E-06													
Lower Saddlebag	55.5	1.000	155	4.96E-05	1.38E-06													
Ross Lake	53.5	1.080	4455	3.23E-05	1.27E-06													
Stepping Stone Lake	19.9	1.460	26	1.92E-05	9.22E-07													
Twin Island Lake	17.6	1.300	45	1.94E-05	9.51E-07													
Upper Frozen Lake	5.0	0.925	65	4.60E-05	1.24E-06													
High Elevation	Intermediate Calculated Values						Results											
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent										
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC										
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change										
Black Joe Lake	1.41E-02	3.77E-04	3.70E+05	1.01E-04	2.36E-06	9.17E+02	0.17	0.25%										
Deep Lake	1.41E-02	3.81E-04	7.61E+04	1.01E-04	2.38E-06	2.11E+02	0.17	0.28%										
Emerald Lake	1.54E-01	1.12E-03	1.07E+05	1.10E-03	7.02E-06	3.24E+03	2.12	3.04%										
Florence Lake	2.47E-01	1.19E-03	7.19E+04	1.78E-03	7.44E-06	7.38E+03	3.39	10.26%										
Hobbs Lake	1.21E-02	4.03E-04	1.48E+05	8.64E-05	2.52E-06	2.61E+02	0.12	0.18%										
Lower Saddlebag	1.56E-02	4.36E-04	5.76E+04	1.12E-04	2.72E-06	1.77E+02	0.17	0.31%										
Ross Lake	1.02E-02	4.00E-04	1.72E+06	7.28E-05	2.50E-06	3.36E+03	0.10	0.19%										
Stepping Stone Lake	6.07E-03	2.91E-04	5.14E+03	4.34E-05	1.82E-06	1.19E+01	0.05	0.23%										
Twin Island Lake	6.12E-03	3.00E-04	6.88E+03	4.37E-05	1.87E-06	2.05E+01	0.05	0.30%										
Upper Frozen Lake	1.45E-02	3.91E-04	2.01E+03	1.04E-04	2.44E-06	6.88E+01	0.17	3.42%										
Maximum							3.39	10.26%										
NOTE:	Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes. USDA Forest Service, Rocky Mountain Region, January 2000.																	
	Baseline ANC values calculated from summarized data provided by the Forest Service.																	
	ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																	
	Annual precipitation and watershed catchments values provided by the Forest Service.																	

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

Terrestrial Acid Deposition Summary		CMPP - Cumulative + Proposed Action Sources																		
Incremental Analysis																				
Area of Special Concern	Nitrogen (N) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Deposition Analysis Threshold (DAT) (kg/ha/yr)	Nitrogen (N) Percent of DAT	Sulfur (S) Percent of DAT													
Bridger	6.29E-05	1.85E-06	1.99E-02	5.83E-04	0.005	397.0%	11.7%													
Cloud Peak	1.18E-03	5.88E-06	3.73E-01	1.85E-03	0.005	7456.4%	37.1%													
Fitzpatrick	3.80E-05	1.57E-06	1.20E-02	4.97E-04	0.005	239.9%	9.9%													
North Absaroka	2.23E-05	1.67E-06	7.02E-03	5.25E-04	0.005	140.4%	10.5%													
Owl Creek Range	6.92E-05	2.20E-06	2.18E-02	6.95E-04	0.005	436.2%	13.9%													
Popo Agie	5.42E-05	1.51E-06	1.71E-02	4.77E-04	0.005	342.0%	9.5%													
Phlox Mountain	4.12E-05	1.59E-06	1.30E-02	5.03E-04	0.005	259.6%	10.1%													
Teton NP	2.97E-05	1.23E-05	9.38E-03	3.87E-03	0.005	187.5%	77.4%													
Teton Wilderness	2.61E-05	4.98E-06	8.22E-03	1.57E-03	0.005	164.5%	31.4%													
Washakie Wilderness	3.56E-05	1.83E-06	1.12E-02	5.77E-04	0.005	224.5%	11.5%													
Wind River Canyon	1.47E-04	3.47E-06	4.64E-02	1.10E-03	0.005	928.8%	21.9%													
Wind River Roadless	4.96E-05	1.43E-06	1.56E-02	4.52E-04	0.005	312.8%	9.0%													
Yellowstone NP	2.04E-05	5.46E-06	6.43E-03	1.72E-03	0.005	128.6%	34.5%													
Maximum	1.18E-03	1.23E-05	3.73E-01	3.87E-03	0.005	7456.4%	77.4%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Nitrogen (N) Impacts															
	Nitrogen (N) Deposition (ug/m ² /sec)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) Deposition (kg/ha/yr)	Nitrogen (N) "Green Line" (kg/ha/yr)	Nitrogen (N) "Red Line" (kg/ha/yr)	Total Nitrogen (N) Percent of "Green Line"	Total Nitrogen (N) Percent of "Red Line"												
Bridger	6.29E-05	1.99E-02	1.3	1.3	3.0	10.0	44.0%	13.2%												
Cloud Peak	1.18E-03	3.73E-01	1.3	1.7	3.0	10.0	55.8%	16.7%												
Fitzpatrick	3.80E-05	1.20E-02	1.3	1.3	3.0	10.0	43.7%	13.1%												
North Absaroka	2.23E-05	7.02E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Owl Creek Range	6.92E-05	2.18E-02	1.3	1.3	3.0	10.0	44.1%	13.2%												
Popo Agie	5.42E-05	1.71E-02	1.3	1.3	3.0	10.0	43.9%	13.2%												
Phlox Mountain	4.12E-05	1.30E-02	1.3	1.3	3.0	10.0	43.8%	13.1%												
Teton NP	2.97E-05	9.38E-03	1.1	1.1	3.0	10.0	37.0%	11.1%												
Teton Wilderness	2.61E-05	8.22E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Washakie Wilderness	3.56E-05	1.12E-02	1.1	1.1	3.0	10.0	37.0%	11.1%												
Wind River Canyon	1.47E-04	4.64E-02	1.3	1.3	3.0	10.0	44.9%	13.5%												
Wind River Roadless	4.96E-05	1.56E-02	1.3	1.3	3.0	10.0	43.9%	13.2%												
Yellowstone NP	2.04E-05	6.43E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Maximum	1.18E-03	3.73E-01	1.3	1.7	3.0	10.0	55.8%	16.7%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background	Total	Total Sulfur (S) Impacts															
	Sulfur (S) Deposition (ug/m ² /sec)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) Deposition (kg/ha/yr)	Sulfur (S) "Green Line" (kg/ha/yr)	Sulfur (S) "Red Line" (kg/ha/yr)	Total Sulfur (S) Percent of "Green Line"	Total Sulfur (S) Percent of "Red Line"												
Bridger	1.85E-06	5.83E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	5.88E-06	1.85E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	1.57E-06	4.97E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absaroka	1.67E-06	5.25E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	2.20E-06	6.95E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	1.51E-06	4.77E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	1.59E-06	5.03E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	1.23E-05	3.87E-03	0.9	0.9	5.0	20.0	18.1%	4.5%												
Teton Wilderness	4.98E-06	1.57E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	1.83E-06	5.77E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	3.47E-06	1.10E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	1.43E-06	4.52E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	5.46E-06	1.72E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	1.23E-05	3.87E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedate CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																				
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																				

**Appendix A15
Summary of Results
Cumulative + Proposed Action Sources**

Ambient Impact Summary		CMPP - Cumulative + Proposed Action Sources													
Pollutant	Averaging Time	Maximum	Maximum	PSD Class I	Impact % of	Background	Background	WAAQS/NAAQs	Impact % of						
		Impact (ug/m3)	Impact Location	Increment (ug/m3)	PSD Class I Increment	Concentration (ug/m3)	Plus Impact (ug/m3)	Standard (ug/m3)	WAAQS/NAAQs						
NO2	Annual	2.36E+00	CLOUD PEAK	2.5	94.52%	3.4	5.76	100	5.76%						
SO2	3-hour	3.86E-01	TETON NATIONAL PARK	25	1.54%	132	132.39	1300	10.18%						
	24-hour	8.02E-02	TETON NATIONAL PARK	5	1.60%	43	43.08	260	16.57%						
	Annual	8.83E-03	TETON NATIONAL PARK	2	0.44%	9	9.01	60	15.01%						
PM10	24-hour	1.51E+00	WIND RIVER CANYON	8	18.87%	61	62.51	150	41.67%						
	Annual	1.31E-01	WIND RIVER CANYON	4	3.28%	22	22.13	50	44.26%						
PM25	24-hour	8.14E-01	WIND RIVER CANYON	n.a.	n.a.	35	35.81	65	55.10%						
	Annual	5.93E-02	WIND RIVER CANYON	n.a.	n.a.	10	10.06	15	67.06%						
Maximum					94.52%				67.06%						

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

BRIDGER		CMPC - Cumulative + Post Construction Sources				
Pollutant Concentrations		(ug/m3)	Receptor			
NO2	Annual	6.36E-02	537	-73.783	19.513	
	SO2	3-hour	8.08E-02	530	-85.694	31.436
		24-hour	1.94E-02	530	-85.694	31.436
PM10	Annual	1.16E-03	537	-73.783	19.513	
	24-hour	1.12E-02	530	-85.694	31.436	
PM25	Annual	7.96E-04	537	-73.783	19.513	
	24-hour	2.50E-02	530	-85.694	31.436	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor			
	N	Annual	6.20E-05	530	-85.694	31.436
	S	Annual	1.84E-06	513	-109.557	60.700
VISIBILITY		FLAG	IMPROVE			
	Days delta dV >0.50	5	5			
	Days delta dV >1.00	0	1			
	Largest delta dV	0.918	1.021			
	Day of Largest delta dV	305	305			
	Largest delta dV Receptor	552	552			
	Total dV	5.610	4.600			
	dV Background	4.692	3.579			
	% Ext by SO4	1.61	1.61			
	% Ext by NO3	97.28	97.28			
	% Ext by PM10	0.18	0.18			
% Ext by PM2.5	0.92	0.92				
CLOUD PEAK		CMPC - Cumulative + Post Construction Sources				
Pollutant Concentrations		(ug/m3)	Receptor			
NO2	Annual	2.36E+00	988	120.589	185.589	
	SO2	3-hour	3.16E-01	1053	112.000	208.000
		24-hour	4.47E-02	1053	112.000	208.000
PM10	Annual	2.39E-03	980	107.363	178.642	
	24-hour	7.86E-02	995	116.255	198.926	
PM25	Annual	2.83E-03	995	116.255	198.926	
	24-hour	1.13E-01	994	115.588	197.592	
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor			
	N	Annual	1.18E-03	988	120.589	185.589
	S	Annual	5.83E-06	980	107.363	178.642
VISIBILITY		FLAG	IMPROVE			
	Days delta dV >0.50	43	42			
	Days delta dV >1.00	11	12			
	Largest delta dV	1.716	1.656			
	Day of Largest delta dV	119	119			
	Largest delta dV Receptor	944	944			
	Total dV	6.265	6.591			
	dV Background	4.549	4.935			
	% Ext by SO4	0.34	0.34			
	% Ext by NO3	99.03	99.03			
	% Ext by PM10	0.14	0.14			
% Ext by PM2.5	0.49	0.49				

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

FITZPATRICK		CMPC - Cumulative + Post Construction Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.26E-02	716	-71.592	46.301
	3-hour	2.74E-02	782	-96.000	98.000
	24-hour	7.08E-03	720	-71.448	62.044
SO2	Annual	7.55E-04	700	-95.817	99.004
	24-hour	4.21E-03	752	-88.000	70.000
PM10	Annual	3.06E-04	715	-79.283	50.830
	24-hour	6.19E-03	726	-71.161	86.048
PM25	Annual	7.63E-04	716	-71.592	46.301
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.69E-05	716	-71.592	46.301
	Annual	1.57E-06	700	-95.817	99.004
S					
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	1	2		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.612	0.710		
	Day of Largest delta dV	60	30		
	Largest delta dV Receptor	716	716		
	Total dV	5.237	3.749		
	dV Background	4.625	3.084		
	% Ext by SO4	364.00	0.64		
	% Ext by NO3	98.61	98.61		
	% Ext by PM10	0.15	0.15		
	% Ext by PM2.5	0.60	0.60		
	NORTH ABSAROKA		CMPC - Cumulative + Post Construction Sources		
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.25E-02	815	-63.736	230.153
	3-hour	2.74E-02	781	-110.264	264.328
	24-hour	1.36E-02	815	-63.736	230.153
SO2	Annual	5.75E-04	843	-120.223	208.073
	24-hour	1.09E-02	780	-105.982	264.246
PM10	Annual	2.04E-04	842	-102.222	264.148
	24-hour	5.91E-03	814	-69.913	224.471
PM25	Annual	3.63E-04	807	-75.265	208.495
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.20E-05	815	-63.736	230.153
	Annual	1.66E-06	792	-124.346	213.930
S					
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	3	4		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.777	0.749		
	Day of Largest delta dV	118	118		
	Largest delta dV Receptor	815	815		
	Total dV	5.326	5.684		
	dV Background	4.549	4.935		
	% Ext by SO4	0.57	0.57		
	% Ext by NO3	99.18	99.18		
	% Ext by PM10	0.04	0.04		
	% Ext by PM2.5	0.20	0.20		

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

PHLOX MOUNTAIN		CMPC - Cumulative + Post Construction Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.65E-02	1140	-17.128	113.192
SO2	3-hour	6.59E-02	1140	-17.128	113.192
	24-hour	3.37E-02	1140	-17.128	113.192
	Annual	1.06E-03	1140	-17.128	113.192
PM10	24-hour	5.00E-03	1140	-17.128	113.192
	Annual	3.79E-04	1140	-17.128	113.192
PM25	24-hour	1.11E-02	1140	-17.128	113.192
	Annual	9.56E-04	1140	-17.128	113.192
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	3.93E-05	1140	-17.128	113.192
	Annual	1.56E-06	1140	-17.128	113.192
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	4	7		
	Days delta dV >1.00	3	1		
	Largest delta dV	1.153	1.332		
	Day of Largest delta dV	59	59		
	Largest delta dV Receptor	1140	1140		
	Total dV	5.777	4.416		
	dV Background	4.625	3.084		
	% Ext by SO4	1.66	1.66		
	% Ext by NO3	97.61	97.61		
	% Ext by PM10	0.15	0.15		
	% Ext by PM2.5	0.57	0.57		
	TETON NATIONAL PARK		CMPC - Cumulative + Post Construction Sources		
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.83E-02	678	-171.607	111.139
SO2	3-hour	3.86E-01	685	-178.064	116.341
	24-hour	8.02E-02	685	-178.064	116.341
	Annual	8.83E-03	686	-177.304	116.038
PM10	24-hour	3.92E-02	685	-178.064	116.341
	Annual	3.70E-03	686	-177.304	116.038
PM25	24-hour	6.18E-02	680	-172.405	116.076
	Annual	6.56E-03	686	-177.304	116.038
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	2.95E-05	678	-171.607	111.139
	Annual	1.23E-05	686	-177.304	116.038
VISIBILITY	FLAG	IMPROVE			
	Days delta dV >0.50	1	1		
	Days delta dV >1.00	0	0		
	Largest delta dV	0.539	0.554		
	Day of Largest delta dV	360	360		
	Largest delta dV Receptor	680	680		
	Total dV	5.239	4.981		
	dV Background	4.700	4.428		
	% Ext by SO4	84.11	84.11		
	% Ext by NO3	6.67	6.67		
	% Ext by PM10	2.24	2.24		
	% Ext by PM2.5	6.98	6.98		

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

TETON WILDERNESS AREA		CMPC - Cumulative + Post Construction Sources																		
Pollutant Concentrations		(ug/m3)		Receptor																
NO2	Annual	6.11E-03	32	-145.858	144.194															
SO2	3-hour	8.18E-02	25	-160.656	150.244															
	24-hour	2.69E-02	25	-160.656	150.244															
	Annual	2.33E-03	25	-160.656	150.244															
PM10	24-hour	7.99E-03	32	-145.858	144.194															
	Annual	6.89E-04	32	-145.858	144.194															
PM25	24-hour	1.70E-02	32	-145.858	144.194															
	Annual	1.61E-03	32	-145.858	144.194															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor																
N	Annual	2.58E-05	48	-101.381	138.307															
S	Annual	4.98E-06	32	-145.858	144.194															
VISIBILITY		FLAG		IMPROVE																
Days delta dV >0.50		0		0																
Days delta dV >1.00		0		0																
Largest delta dV		0.368		0.351																
Day of Largest delta dV		261		60																
Largest delta dV Receptor		45		57																
Total dV		4.802		4.703																
dV Background		4.434		4.352																
% Ext by SO4		1.40		1.94																
% Ext by NO3		97.89		97.47																
% Ext by PM10		0.12		0.10																
% Ext by PM2.5		0.58		0.49																
WASHAKIE		CMPC - Cumulative + Post Construction Sources																		
Pollutant Concentrations		(ug/m3)		Receptor																
NO2	Annual	1.35E-02	317	-60.874	173.435															
SO2	3-hour	2.48E-02	464	-84.000	186.000															
	24-hour	1.16E-02	298	-40.129	137.459															
	Annual	8.54E-04	266	-101.488	139.754															
PM10	24-hour	2.81E-03	213	-70.011	197.387															
	Annual	2.36E-04	298	-40.129	137.459															
PM25	24-hour	6.19E-03	316	-61.474	170.617															
	Annual	6.49E-04	298	-40.129	137.459															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)		Receptor																
N	Annual	3.48E-05	298	-40.129	137.459															
S	Annual	1.82E-06	266	-101.488	139.754															
VISIBILITY		FLAG		IMPROVE																
Days delta dV >0.50		4		4																
Days delta dV >1.00		0		0																
Largest delta dV		0.927		0.894																
Day of Largest delta dV		118		118																
Largest delta dV Receptor		299		299																
Total dV		5.476		5.829																
dV Background		4.549		4.935																
% Ext by SO4		0.58		0.58																
% Ext by NO3		99.13		99.13																
% Ext by PM10		0.06		0.06																
% Ext by PM2.5		0.22		0.22																

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

WIND RIVER CANYON		CMPC - Cumulative + Post Construction Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.53E-01	1077	29.190	92.365
	3-hour	1.39E-01	1085	28.586	107.490
	24-hour	3.17E-02	1064	26.198	111.141
SO2	Annual	2.13E-03	1064	26.198	111.141
	24-hour	9.99E-02	1076	27.022	94.149
PM10	Annual	7.74E-03	1077	29.190	92.365
	24-hour	1.24E-01	1076	27.022	94.149
PM25	Annual	1.21E-02	1077	29.190	92.365
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	1.16E-04	1078	31.661	93.381
	Annual	2.71E-06	1085	28.586	107.490
S					
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	12	13		
	Days delta dV >1.00	3	3		
	Largest delta dV	1.826	2.101		
	Day of Largest delta dV	59	59		
	Largest delta dV Receptor	1077	1077		
	Total dV	6.451	5.184		
	dV Background	4.625	3.084		
	% Ext by SO4	0.52	0.52		
	% Ext by NO3	98.90	98.90		
	% Ext by PM10	0.11	0.11		
	% Ext by PM2.5	0.48	0.48		
WIND RIVER ROADLESS		CMPC - Cumulative + Post Construction Sources			
Pollutant Concentrations		(ug/m3)	Receptor		
NO2	Annual	1.58E-02	818	-40.580	34.535
	3-hour	2.37E-02	786	-49.853	59.119
	24-hour	1.32E-02	786	-49.853	59.119
SO2	Annual	6.45E-04	818	-40.580	34.535
	24-hour	6.24E-03	786	-49.853	59.119
PM10	Annual	3.56E-04	820	-40.723	41.939
	24-hour	1.01E-02	819	-40.580	37.986
PM25	Annual	9.75E-04	819	-40.580	37.986
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor		
N	Annual	4.70E-05	818	-40.580	34.535
	Annual	1.39E-06	821	-40.795	43.233
S					
VISIBILITY	FLAG		IMPROVE		
	Days delta dV >0.50	5	6		
	Days delta dV >1.00	1	2		
	Largest delta dV	1.057	1.223		
	Day of Largest delta dV	60	60		
	Largest delta dV Receptor	820	820		
	Total dV	5.682	4.307		
	dV Background	4.625	3.084		
	% Ext by SO4	0.73	0.73		
	% Ext by NO3	98.61	98.61		
	% Ext by PM10	0.11	0.11		
	% Ext by PM2.5	0.56	0.56		

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

YELLOWSTONE NATL PARK		CMPC - Cumulative + Post Construction Sources																		
Pollutant Concentrations		(ug/m3)	Receptor																	
NO2	Annual	3.72E-03	64	-167.930	172.398															
	3-hour	6.03E-02	108	-196.891	173.293															
	24-hour	2.52E-02	108	-196.891	173.293															
PM10	Annual	2.41E-03	108	-196.891	173.293															
	24-hour	1.04E-02	18	-110.235	269.323															
PM25	Annual	2.38E-04	65	-167.910	172.398															
	24-hour	7.56E-03	60	-183.917	172.915															
	Annual	6.44E-04	66	-164.001	172.442															
Deposition Flux (Total Wet + Dry)		(ug/m3/sec)	Receptor																	
N	Annual	2.02E-05	109	-112.113	171.051															
S	Annual	5.46E-06	108	-196.891	173.293															
VISIBILITY		FLAG	IMPROVE																	
	Days delta dV >0.50	0	0																	
	Days delta dV >1.00	0	0																	
	Largest delta dV	0.466	0.416																	
	Day of Largest delta dV	145	145																	
	Largest delta dV Receptor	19	19																	
	Total dV	5.014	6.118																	
	dV Background	4.549	5.703																	
	% Ext by SO4	0.15	0.15																	
	% Ext by NO3	99.50	99.50																	
	% Ext by PM10	0.05	0.05																	
	% Ext by PM2.5	0.30	0.30																	

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

<i>Visibility Summary</i>		CMPC - Cumulative + Post Construction Sources																		
Area of Concern	FLAG Background Conditions			IMPROVE Background Conditions																
	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV	Days Δ dV >0.5	Days Δ dV >1.0	Largest Δ dV														
Bridger	5	0	0.92	5	1	1.02														
Cloud Peak	43	11	1.72	42	12	1.66														
Fitzpatrick	1	0	0.61	2	0	0.71														
North Absaroka	3	0	0.78	4	0	0.75														
Owl Creek	9	3	1.69	10	3	1.94														
Popo Agie	6	2	1.06	6	3	1.19														
Phlox Mountain	4	3	1.15	7	1	1.33														
Teton NP	1	0	0.54	1	0	0.55														
Teton Wilderness	0	0	0.37	0	0	0.35														
Washakie	4	0	0.93	4	0	0.89														
Wind River Canyon	12	3	1.83	13	3	2.10														
Wind River Roadless	5	1	1.06	6	2	1.22														
Yellowstone NP	0	0	0.47	0	0	0.42														
Total Days / Max Δ dV	93	23	1.83	100	25	2.10														

Appendix A16
Summary of Results
Cumulative + Post Construction Sources

LAKES		CMPC - Cumulative + Post Construction Sources																		
<i>Black Joe</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.30E-05	1141	-49.183	20.543															
	S	1.17E-06	1141	-49.183	20.543															
<i>Deep Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.35E-05	1142	-49.178	18.394															
	S	1.18E-06	1142	-49.178	18.394															
<i>Emerald Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.87E-04	1143	95.779	205.602															
	S	3.52E-06	1143	95.779	205.602															
<i>Florence Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	7.80E-04	1144	105.440	193.981															
	S	3.74E-06	1144	105.440	193.981															
<i>Hobbs</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.75E-05	1145	-88.417	52.778															
	S	1.27E-06	1145	-88.417	52.778															
<i>Lower Saddlebag</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.76E-05	1146	-35.219	7.97															
	S	1.34E-06	1146	-35.219	7.97															
<i>Ross Lake</i>		ug/m**2/sec																		
	Total Deposition																			
	N	3.17E-05	1147	-86.813	89.541															
	S	1.26E-06	1147	-86.813	89.541															
<i>Upper Frozen</i>		ug/m**2/sec																		
	Total Deposition																			
	N	4.44E-05	1148	-48.413	14.897															
	S	1.21E-06	1148	-48.413	14.897															
<i>Stepping Stone</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.91E-05	1149	-96.935	275.159															
	S	9.20E-07	1149	-96.935	275.159															
<i>Twin Island</i>		ug/m**2/sec																		
	Total Deposition																			
	N	1.93E-05	1150	-95.471	271.528															
	S	9.48E-07	1150	-95.471	271.528															

Appendix A16
Summary of Results
Cumulative + Post Construction Sources

ANC Impacts to High Elevation Lakes		CMPC - Cumulative + Post Construction Sources																	
High Elevation	Inputs																		
Lake of	Baseline	Annual	Watershed (W)	Nitrogen (N)	Sulfur (S)														
Special Concern	Lake Outlet	Precipitation	Catchment	Deposition	Deposition														
	ANC (A)	(P)	Area	Rate	Rate														
	(µeq/l)	(meters)	(hectares)	(µg/m ² /sec)	(µg/m ² /sec)														
Black Joe Lake	67.0	0.925	890	4.30E-05	1.17E-06														
Deep Lake	59.9	0.925	205	4.35E-05	1.18E-06														
Emerald Lake	69.8	0.780	293	4.87E-04	3.52E-06														
Florence Lake	33.0	0.780	417	7.80E-04	3.74E-06														
Hobbs Lake	69.9	1.080	293	3.75E-05	1.27E-06														
Lower Saddlebag	55.5	1.000	155	4.76E-05	1.34E-06														
Ross Lake	53.5	1.080	4455	3.17E-05	1.26E-06														
Stepping Stone Lake	19.9	1.460	26	1.91E-05	9.20E-07														
Twin Island Lake	17.6	1.300	45	1.93E-05	9.48E-07														
Upper Frozen Lake	5.0	0.925	65	4.44E-05	1.21E-06														
High Elevation	Intermediate Calculated Values						Results												
Lake of	Nitrogen (Dn)	Sulfur (Ds)	Lake Catchment	Nitrogen (Hn)	Sulfur (Hs)	Total (Hdep)	ANC	Percent											
Special Concern	Deposition	Deposition	Baseline ANC(o)	Deposition	Deposition	Deposition	Change	ANC											
	(kg/ha/yr)	(kg/ha/yr)	(eq)	(eq/m ² /yr)	(eq/m ² /yr)	(eq)	(µeq/l)	Change											
Black Joe Lake	1.36E-02	3.69E-04	3.70E+05	9.70E-05	2.31E-06	8.83E+02	0.16	0.24%											
Deep Lake	1.37E-02	3.73E-04	7.61E+04	9.79E-05	2.33E-06	2.05E+02	0.16	0.27%											
Emerald Lake	1.53E-01	1.11E-03	1.07E+05	1.10E-03	6.94E-06	3.23E+03	2.11	3.02%											
Florence Lake	2.46E-01	1.18E-03	7.19E+04	1.76E-03	7.36E-06	7.36E+03	3.38	10.23%											
Hobbs Lake	1.18E-02	3.99E-04	1.48E+05	8.45E-05	2.50E-06	2.55E+02	0.12	0.17%											
Lower Saddlebag	1.50E-02	4.23E-04	5.76E+04	1.07E-04	2.65E-06	1.70E+02	0.16	0.30%											
Ross Lake	1.00E-02	3.97E-04	1.72E+06	7.15E-05	2.48E-06	3.29E+03	0.10	0.19%											
Stepping Stone Lake	6.03E-03	2.90E-04	5.14E+03	4.31E-05	1.81E-06	1.19E+01	0.05	0.23%											
Twin Island Lake	6.08E-03	2.99E-04	6.88E+03	4.34E-05	1.87E-06	2.03E+01	0.05	0.30%											
Upper Frozen Lake	1.40E-02	3.82E-04	2.01E+03	1.00E-04	2.39E-06	6.64E+01	0.17	3.31%											
Maximum							3.38	10.23%											
NOTE: Performed in accordance with Screening Methodology for Calculating ANC Change to High Elevation Lakes, USDA Forest Service, Rocky Mountain Region, January 2000.																			
Baseline ANC values calculated from summarized data provided by the Forest Service.																			
ANC baseline values represent the 10th percentile of all valid measurements at the lake outlet.																			
Annual precipitation and watershed catchments values provided by the Forest Service.																			

Appendix A16
Summary of Results
Cumulative + Post Construction Sources

Terrestrial Acid Deposition Summary		CMPC - Cumulative + Post Construction Sources																		
Incremental Analysis																				
Area of Special Concern	Nitrogen (N)		Sulfur (S)		Nitrogen (N)		Sulfur (S)		Deposition Analysis	Nitrogen (N)		Sulfur (S)								
	Deposition		Deposition		Deposition		Deposition		Threshold (DAT)	Percent of		Percent of								
	(ug/m ² /sec)		(ug/m ² /sec)		(kg/ha/yr)		(kg/ha/yr)		(kg/ha/yr)	DAT		DAT								
Bridger	6.20E-05	1.84E-06	1.96E-02	5.81E-04	0.005	391.2%	11.6%													
Cloud Peak	1.18E-03	5.83E-06	3.72E-01	1.84E-03	0.005	7445.0%	36.7%													
Fitzpatrick	3.69E-05	1.57E-06	1.17E-02	4.94E-04	0.005	233.0%	9.9%													
North Absaroka	2.20E-05	1.66E-06	6.95E-03	5.24E-04	0.005	138.9%	10.5%													
Owl Creek Range	5.86E-05	2.02E-06	1.85E-02	6.36E-04	0.005	369.9%	12.7%													
Popo Agie	5.13E-05	1.46E-06	1.62E-02	4.59E-04	0.005	323.3%	9.2%													
Phlox Mountain	3.93E-05	1.56E-06	1.24E-02	4.92E-04	0.005	248.2%	9.8%													
Teton NP	2.95E-05	1.23E-05	9.31E-03	3.87E-03	0.005	186.1%	77.4%													
Teton Wilderness	2.58E-05	4.98E-06	8.14E-03	1.57E-03	0.005	162.8%	31.4%													
Washakie Wilderness	3.48E-05	1.82E-06	1.10E-02	5.75E-04	0.005	219.5%	11.5%													
Wind River Canyon	1.16E-04	2.71E-06	3.66E-02	8.54E-04	0.005	731.0%	17.1%													
Wind River Roadless	4.70E-05	1.39E-06	1.48E-02	4.39E-04	0.005	296.5%	8.8%													
Yellowstone NP	2.02E-05	5.46E-06	6.37E-03	1.72E-03	0.005	127.4%	34.5%													
Maximum	1.18E-03	1.23E-05	3.72E-01	3.87E-03	0.005	7445.0%	77.4%													
NOTE: DAT for Western Class I areas from National Park Service (2003).																				
Cumulative Analysis																				
Nitrogen Deposition																				
Area of Special Concern	Predicted		Background		Total		Total Nitrogen (N) Impacts													
	Nitrogen (N)		Nitrogen (N)		Nitrogen (N)		Nitrogen (N)		Total Nitrogen (N)		Total Nitrogen (N)									
	Deposition		Deposition		Deposition		"Green Line"		"Red Line"		Percent of		Percent of							
(ug/m ² /sec)		(kg/ha/yr)		(kg/ha/yr)		(kg/ha/yr)		(kg/ha/yr)		"Green Line"		"Red Line"								
Bridger	6.20E-05	1.96E-02	1.3	1.3	3.0	10.0	44.0%	13.2%												
Cloud Peak	1.18E-03	3.72E-01	1.3	1.7	3.0	10.0	55.7%	16.7%												
Fitzpatrick	3.69E-05	1.17E-02	1.3	1.3	3.0	10.0	43.7%	13.1%												
North Absaroka	2.20E-05	6.95E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Owl Creek Range	5.86E-05	1.85E-02	1.3	1.3	3.0	10.0	43.9%	13.2%												
Popo Agie	5.13E-05	1.62E-02	1.3	1.3	3.0	10.0	43.9%	13.2%												
Phlox Mountain	3.93E-05	1.24E-02	1.3	1.3	3.0	10.0	43.7%	13.1%												
Teton NP	2.95E-05	9.31E-03	1.1	1.1	3.0	10.0	37.0%	11.1%												
Teton Wilderness	2.58E-05	8.14E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Washakie Wilderness	3.48E-05	1.10E-02	1.1	1.1	3.0	10.0	37.0%	11.1%												
Wind River Canyon	1.16E-04	3.66E-02	1.3	1.3	3.0	10.0	44.6%	13.4%												
Wind River Roadless	4.70E-05	1.48E-02	1.3	1.3	3.0	10.0	43.8%	13.1%												
Yellowstone NP	2.02E-05	6.37E-03	1.1	1.1	3.0	10.0	36.9%	11.1%												
Maximum	1.18E-03	3.72E-01	1.3	1.7	3.0	10.0	55.7%	16.7%												
Sulfur Deposition																				
Area of Special Concern	Predicted		Background		Total		Total Sulfur (S) Impacts													
	Sulfur (S)		Sulfur (S)		Sulfur (S)		Sulfur (S)		Total Sulfur (S)		Total Sulfur (S)									
	Deposition		Deposition		Deposition		"Green Line"		"Red Line"		Percent of		Percent of							
(ug/m ² /sec)		(kg/ha/yr)		(kg/ha/yr)		(kg/ha/yr)		(kg/ha/yr)		"Green Line"		"Red Line"								
Bridger	1.84E-06	5.81E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Cloud Peak	5.83E-06	1.84E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
Fitzpatrick	1.57E-06	4.94E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
North Absaroka	1.66E-06	5.24E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Owl Creek Range	2.02E-06	6.36E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Popo Agie	1.46E-06	4.59E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Phlox Mountain	1.56E-06	4.92E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Teton NP	1.23E-05	3.87E-03	0.9	0.9	5.0	20.0	18.1%	4.5%												
Teton Wilderness	4.98E-06	1.57E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Washakie Wilderness	1.82E-06	5.75E-04	0.9	0.9	5.0	20.0	18.0%	4.5%												
Wind River Canyon	2.71E-06	8.54E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Wind River Roadless	1.39E-06	4.39E-04	1.1	1.1	5.0	20.0	22.0%	5.5%												
Yellowstone NP	5.46E-06	1.72E-03	0.9	0.9	5.0	20.0	18.0%	4.5%												
Maximum	1.23E-05	3.87E-03	1.1	1.1	5.0	20.0	22.0%	5.5%												
NOTES: Pinedale CASTNet (PND165) and NADP (WY06) dry plus wet N and S deposition assumed as background for Bridger, Cloud Peak, Fitzpatrick, Owl Creek Range, Popo Agie, Phlox Mountain, Wind River Canyon, and Wind River Roadless.																				
Yellowstone CASTNet (YEL408) and NADP (WY08) dry plus wet N and S deposition assumed as background for North Absaroka, Teton NP, Teton Wilderness, Washakie Wilderness, and Yellowstone NP.																				
Bridger N and S "Red Line" and "Green Line" applied for all areas of special concern (Fox et al 1989).																				

**Appendix A16
Summary of Results
Cumulative + Post Construction Sources**

Ambient Impact Summary		CMPC - Cumulative + Post Construction Sources													
Pollutant	Averaging Time	Maximum Impact (ug/m3)	Maximum Impact Location	PSD Class I Increment (ug/m3)	Impact % of PSD Class I Increment	Background Concentration (ug/m3)	Background Plus Impact (ug/m3)	WAAQS/NAAQs Standard (ug/m3)	Impact % of WAAQS/NAAQs						
NO2	Annual	2.36E+00	CLOUD PEAK	2.5	94.48%	3.4	5.76	100	5.76%						
SO2	3-hour	3.86E-01	TETON NATIONAL PARK	25	1.54%	132	132.39	1300	10.18%						
	24-hour	8.02E-02	TETON NATIONAL PARK	5	1.60%	43	43.08	260	16.57%						
	Annual	8.83E-03	TETON NATIONAL PARK	2	0.44%	9	9.01	60	15.01%						
PM10	24-hour	9.99E-02	WIND RIVER CANYON	8	1.25%	61	61.10	150	40.73%						
	Annual	7.74E-03	WIND RIVER CANYON	4	0.19%	22	22.01	50	44.02%						
PM25	24-hour	1.24E-01	WIND RIVER CANYON	n.a.	n.a.	35	35.12	65	54.04%						
	Annual	1.21E-02	WIND RIVER CANYON	n.a.	n.a.	10	10.01	15	66.75%						
Maximum					94.48%				66.75%						

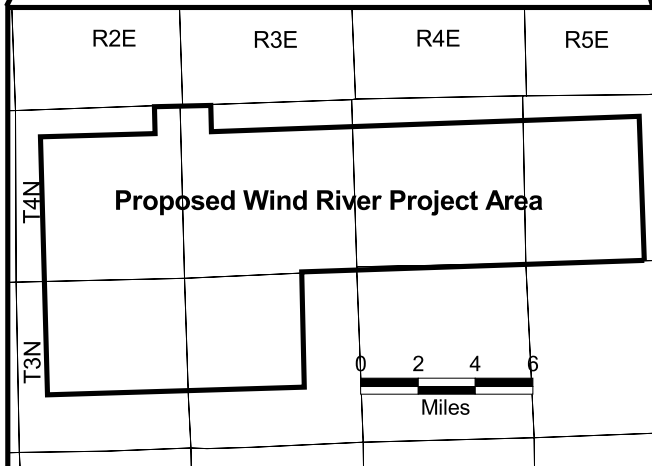
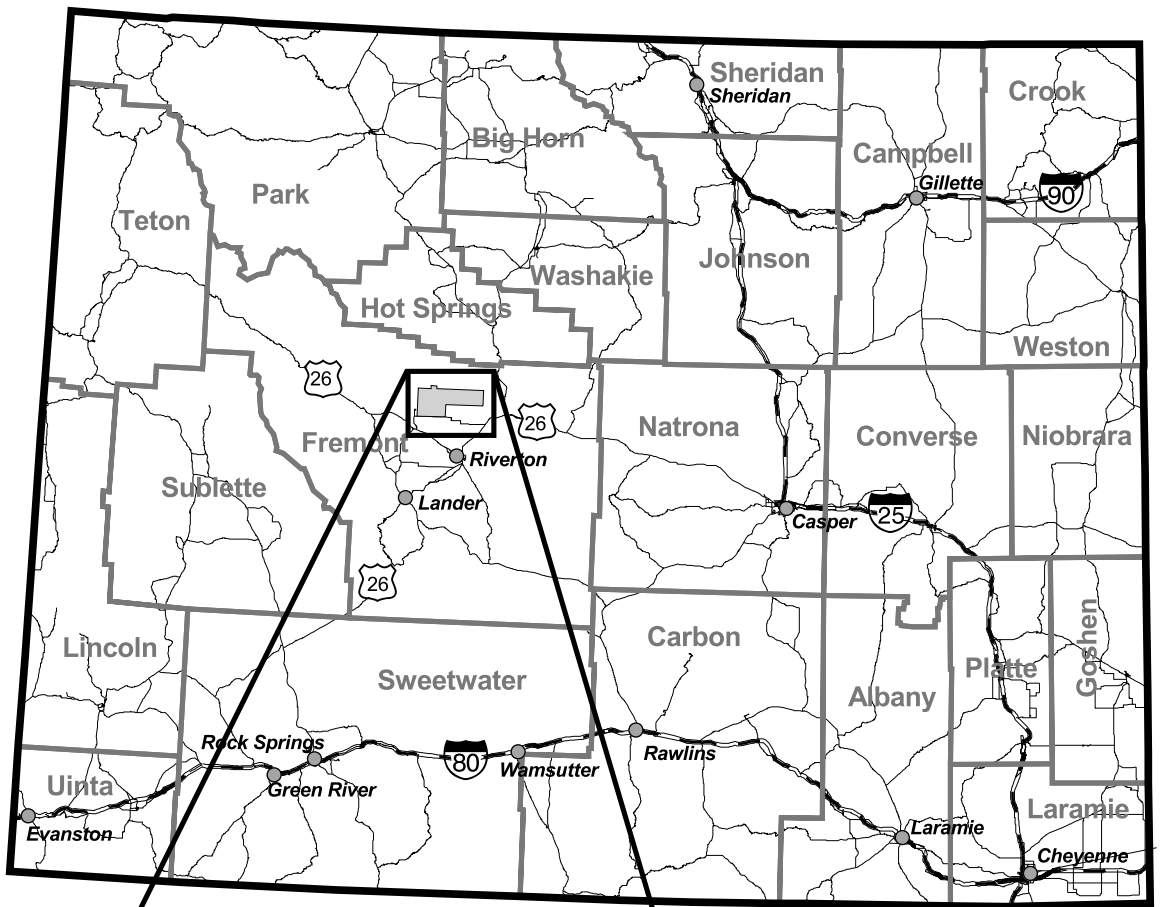
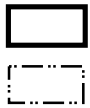
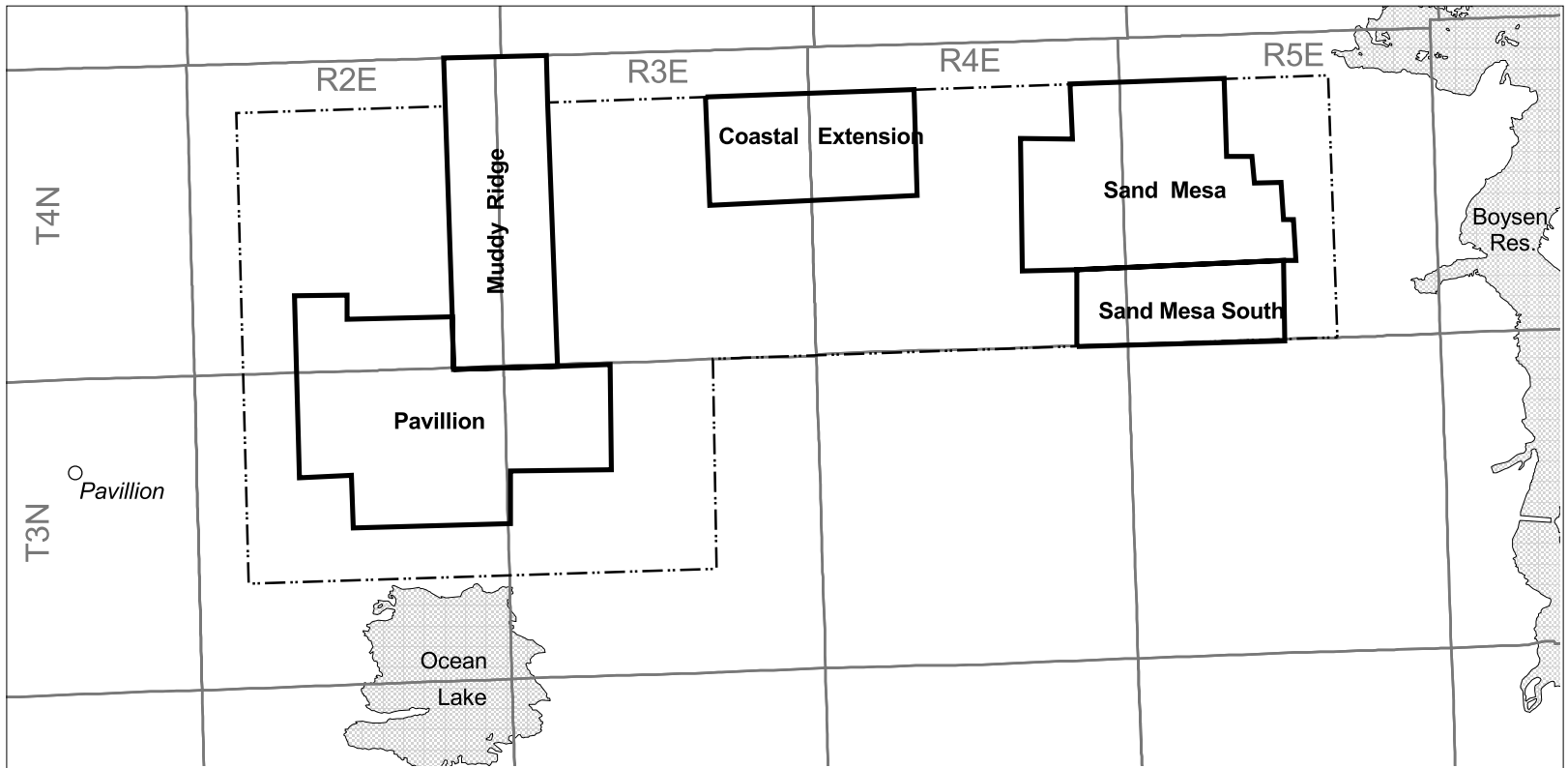


Figure 2-1. Location of Wind River Gas Development Project Area in Central Wyoming.

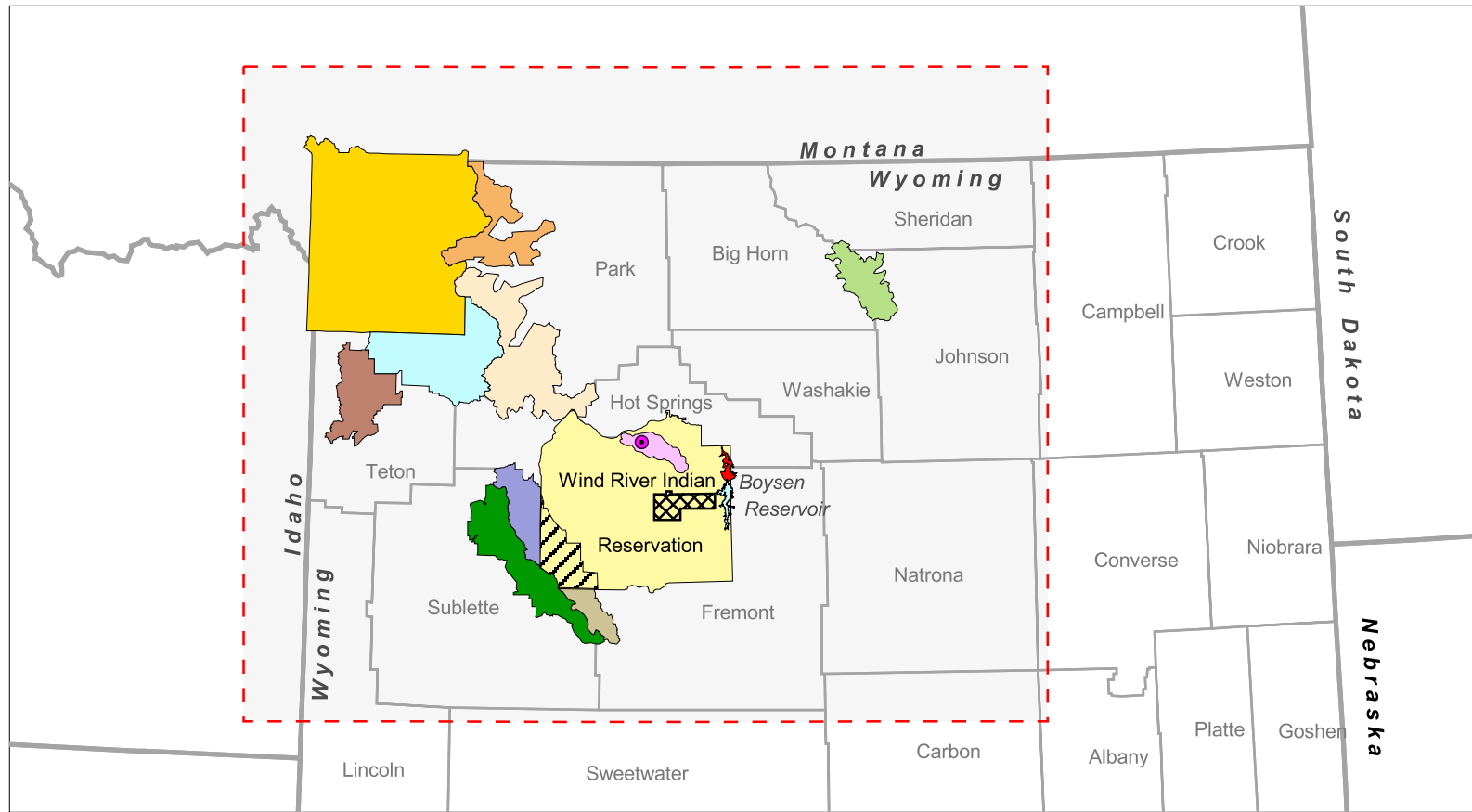


Boundary of Potential Development Areas

Project Area Boundary



Figure 2-2. WRPA Project Boundary and Gas Fields.



Areas of Special Concern

Study Area Boundary

Wind River Project Area

- Grand Teton National Park (PSD Class I)
- Yellowstone National Park (PSD Class I)
- Bridger Wilderness (PSD Class I)
- Cloud Peak Wilderness (PSD Class II)
- Fitzpatrick Wilderness (PSD Class I)
- North Absaroka Wilderness (PSD Class I)
- Popo Agie Wilderness (PSD Class II)

- Teton Wilderness (PSD Class I)
- Washakie Wilderness (PSD Class I)
- Wind River Canyon (PSD Class II)
- Wind River Roadless Area (PSD Class II)
- Owl Creek Range (PSD Class II)
- Phlox Mountain (PSD Class II)

0 30 60



Scale (Miles)

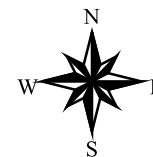


Figure 3-1. Wind River Project Area and Study Domain Boundaries.

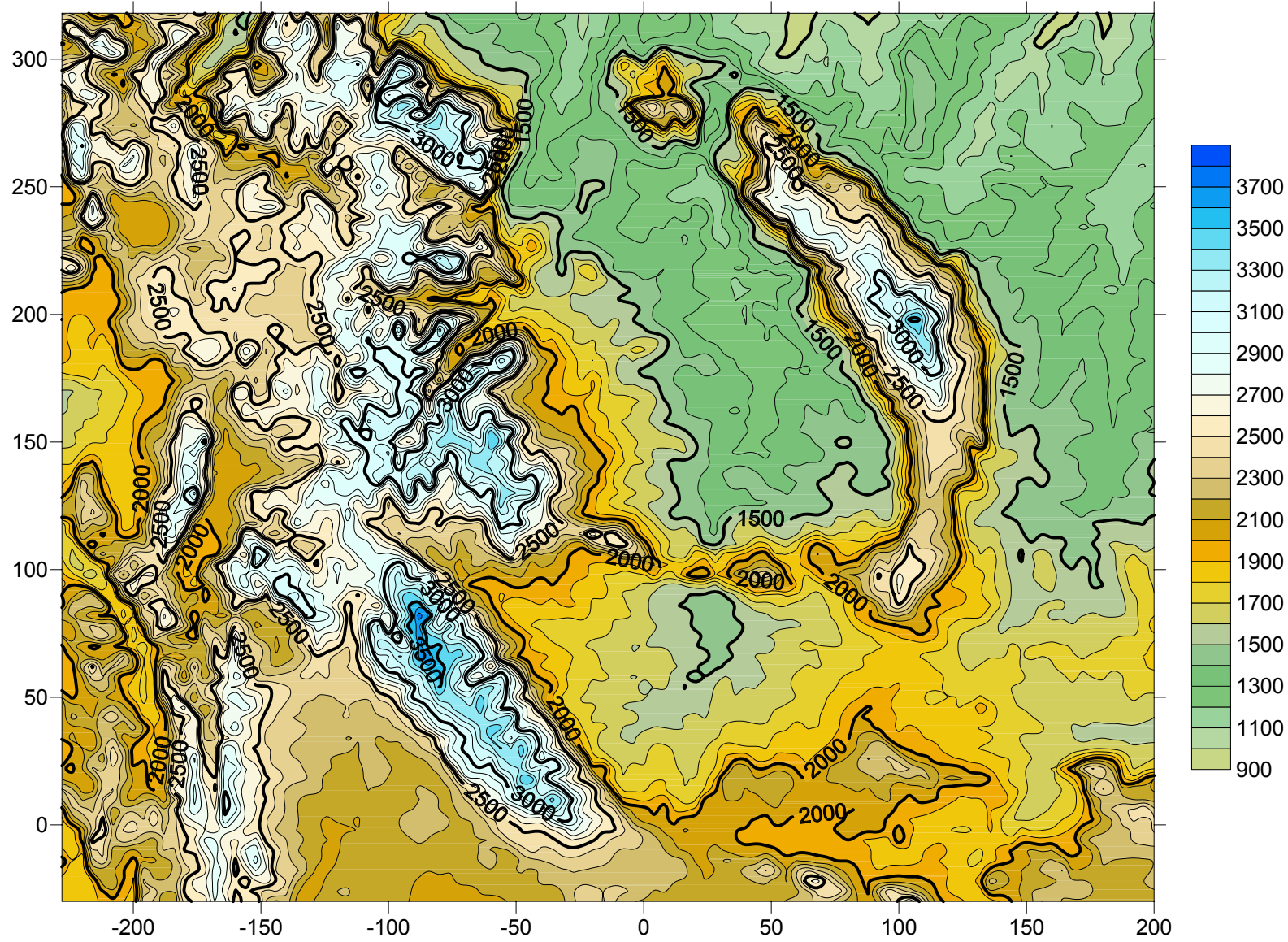


Figure 3-2. Terrain Features Within the Study Area

Elevation Contours are every 100 meters

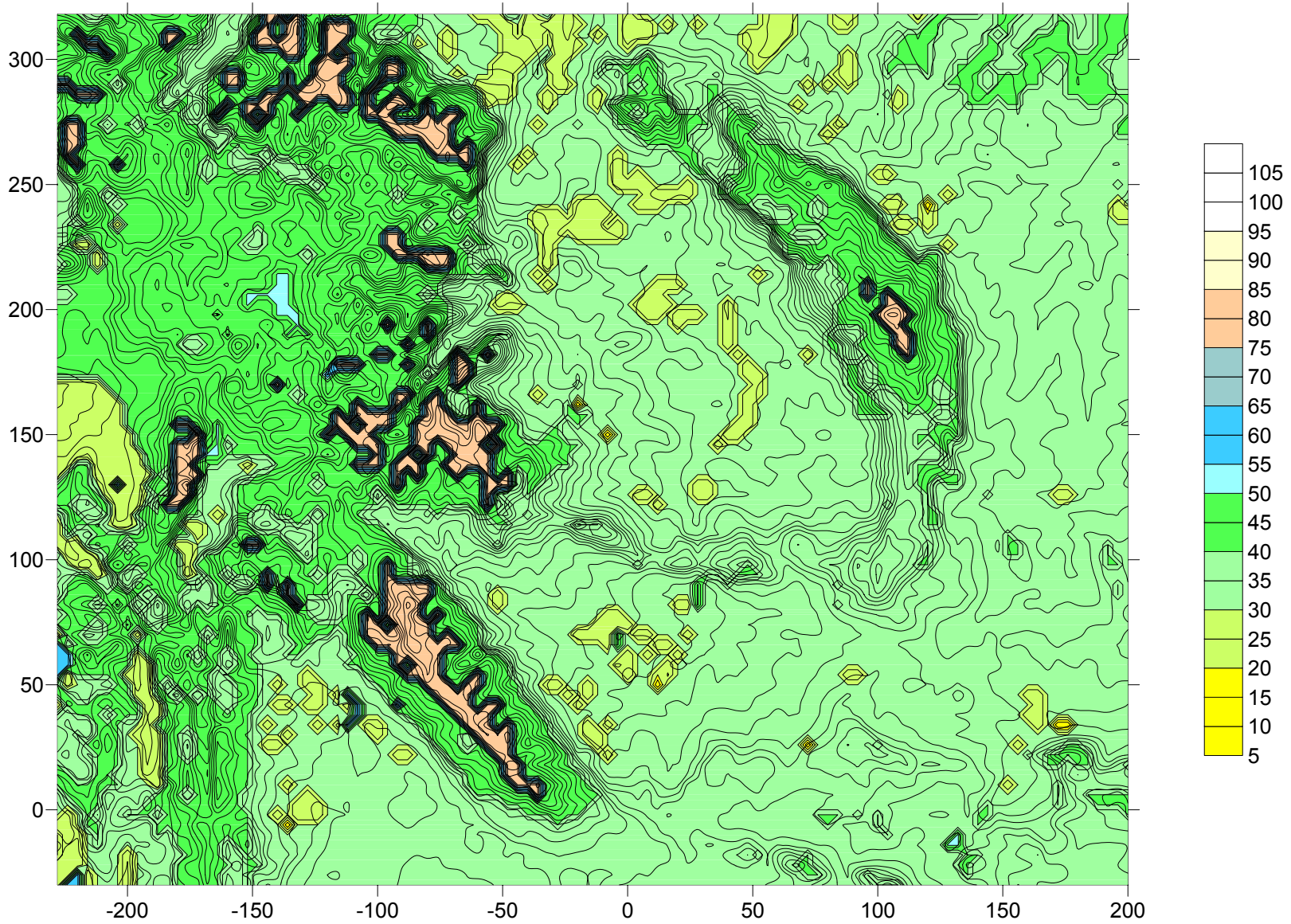


Figure 3-3. Land Use Features Within the Study Area

Scale Represents USGS Land Use Categories

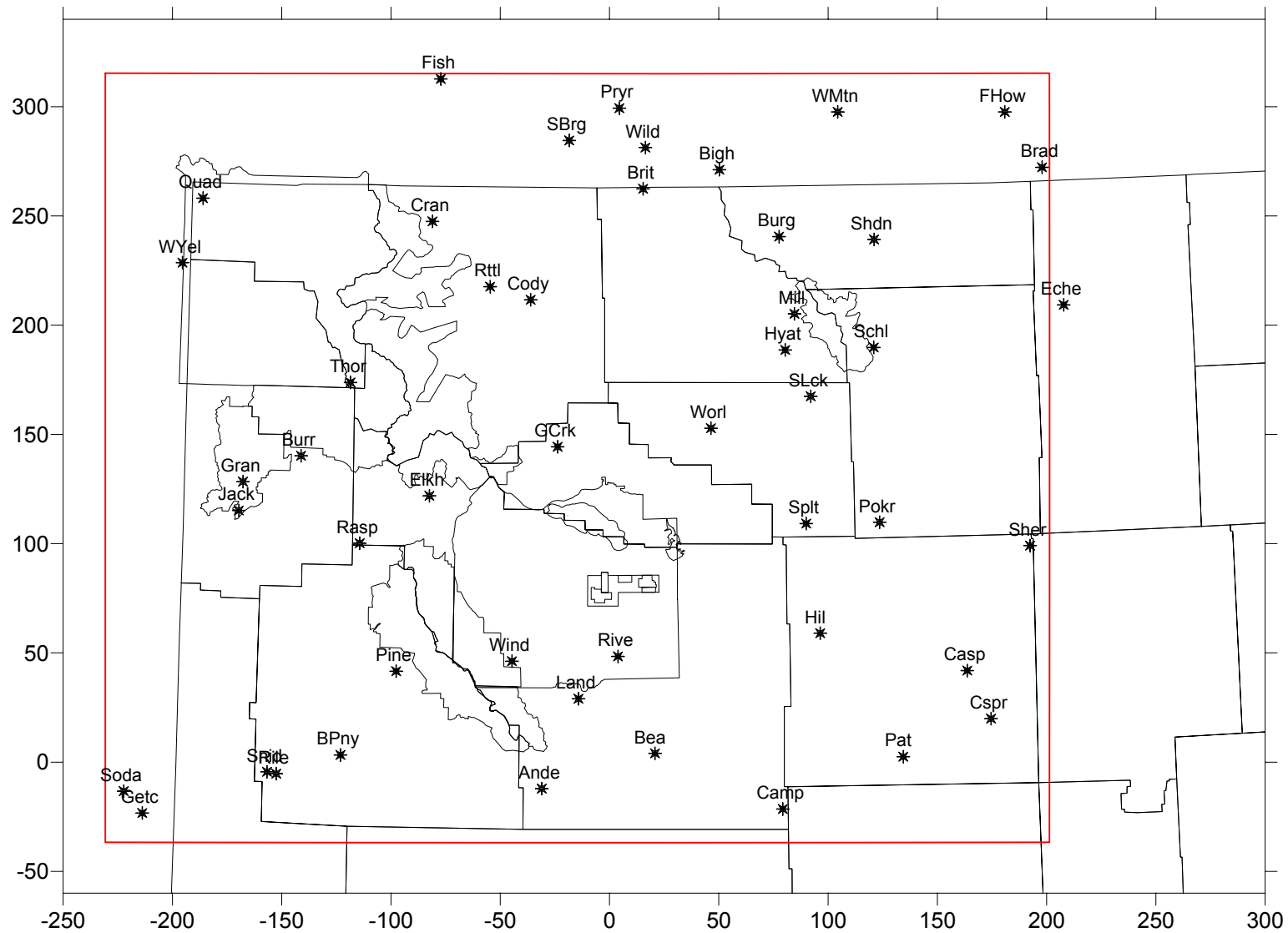


Figure 3-4. Surface Meteorological Stations

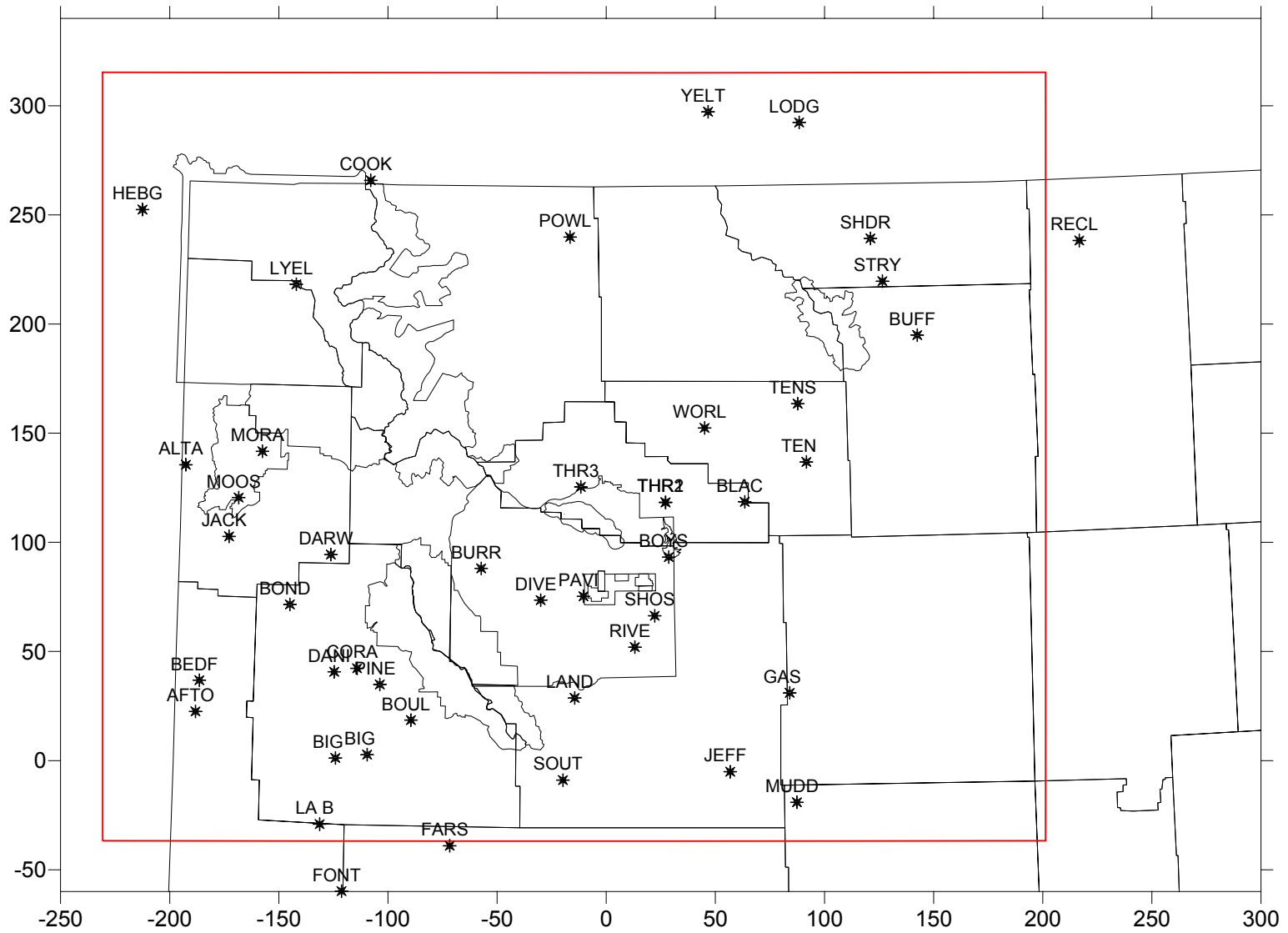


Figure 3-5. Precipitation Stations

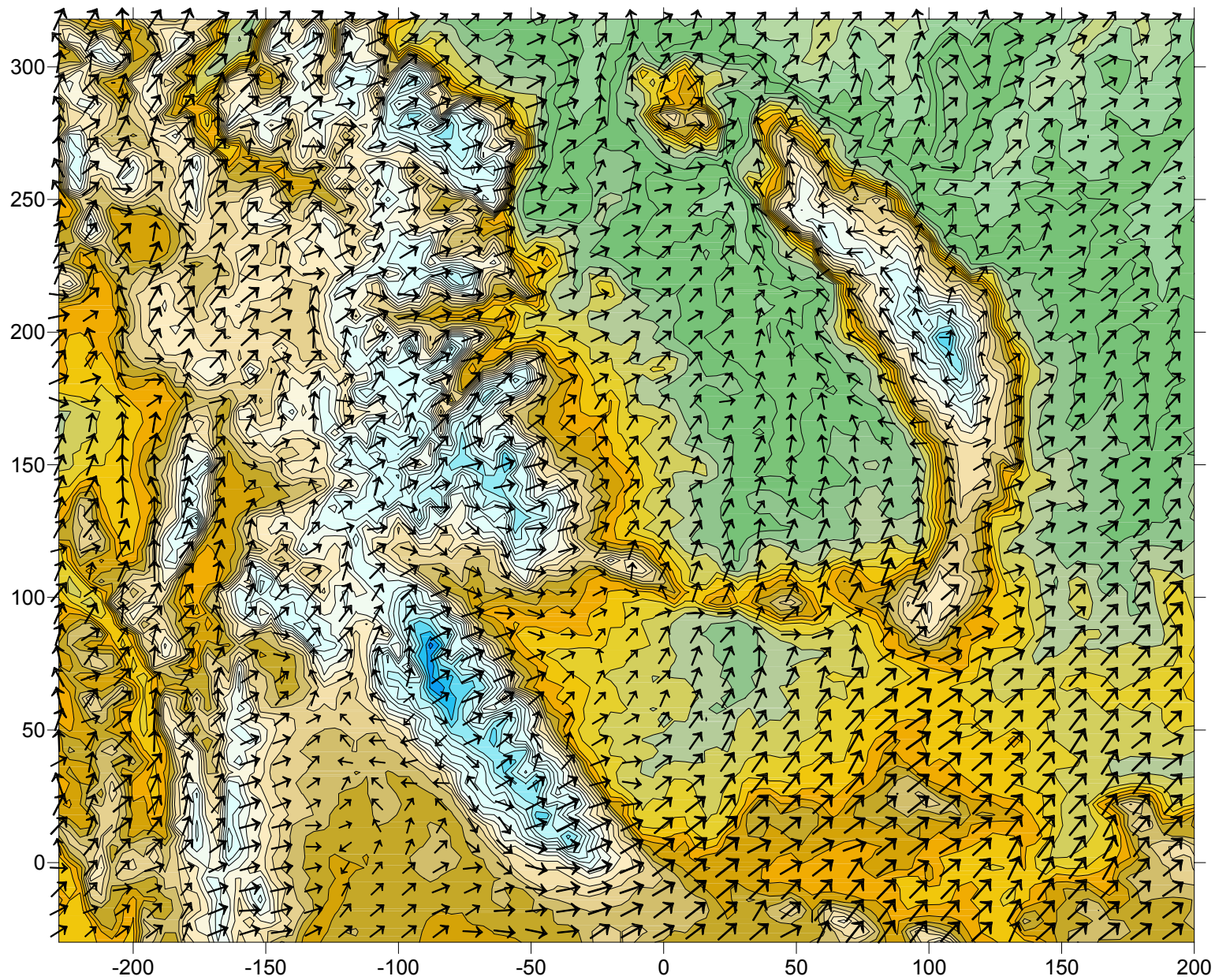


Figure 3-6. Wind Field for January 9, 1995, Hour 3, Level 1

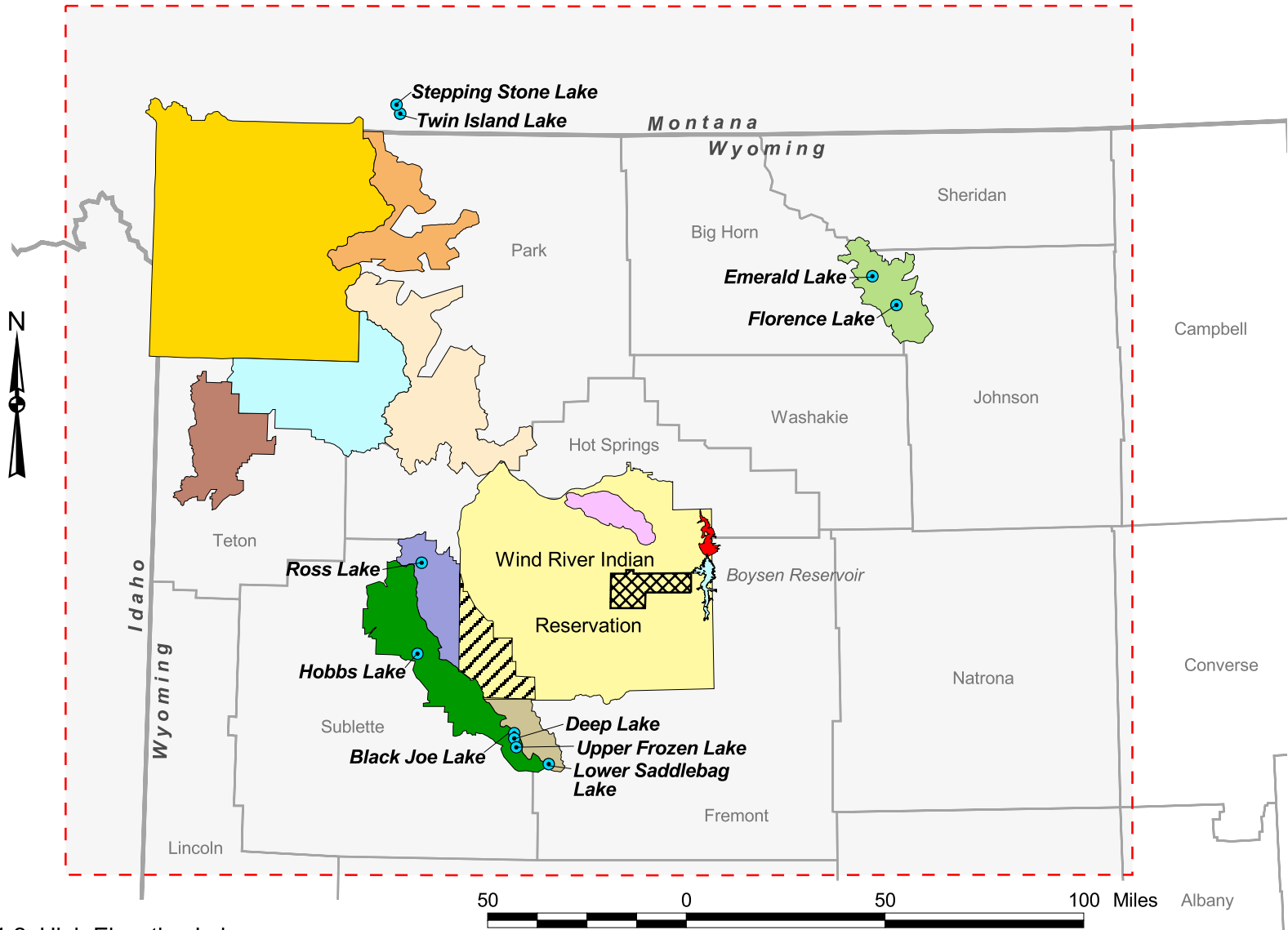


Figure 4-2. High Elevation Lakes.