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August 20, 2005.

U.S. Environmental Protection Agency
Clerk of the Board, Environmental Appeals Board (MC 1103B)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001

Subject: EPA Region 10 Wanapa Energy Center PSD Permit No. R10PSD-OR-05-01 Appeal

Environmental Appeals Board:

Introduction

I am writing to appeal the EPA Region 10 Wanapa Energy Center PSD Permit No. R10PSD-OR-05-01. I am under no illusion that such an appeal will have any impact upon resolving the issues I will discuss because I am one of the disposable downwind Umatilla County, Oregon citizens whose health and welfare are of no value to any local, state, of federal elected officials, agency officials, or the Wanapa Energy Center applicants. Every one of those individuals and/or organizations wants the facility build regardless of the ultimate cost to the downwind majority citizenship. I have been opposed to this project since first learning of its conception over seven years ago. I have taken advantage of every citizen input opportunity, but no one is interested in listening let alone responding directly to my concerns about EPA air quality policies that impacts our local airshed health. I am betting this appeal will continue that trend.

EPA's Wanapa Energy Center Permit Facts

I would first like to make comments about the list of alleged EPA Facts covered in the Final Permit.

1. Why is the EPA only interested in the impact of the Wanapa Energy Center upon the human health or environmental effects of minority populations? From this EPA Fact is where I came to the conclusion that as a member of the majority population my family members and I are disposable since the human health or environmental effects are of no consequence to the EPA during regulatory processes. The true fact is the EPA needs to address the human health or environmental effects of both majority and minority populations, which according to the EPA's Fact #1 it does not.

2. In the EPA's Fact #5 if a citizen's resident and/or business doesn't reside in a Class I United States Forest Service wilderness area or a National Scenic Area the airshed health is of no concern to the EPA in anyway unless by some accident the area falls into a non-attainment status. In Umatilla County such a potential classification is pretty much impossible since only one EPA recognized air quality measurement device

exists, a PM10 monitor in Pendleton, Oregon. When will the airshed health of those areas not included in a wilderness or scenic area ever be addressed in the permitting process by the EPA or even the Oregon Department of Environmental Quality (ODEQ)? Why not start with this EPA air quality permit or must we, the disposable majority wait for an airshed disaster to occur?

3. In the EPA Fact #6 I could find no mention of any method or an adequate verification process that will inform the EPA or any local citizens that Wanapa Energy Center has exceeded the VOC emissions of 99 tpy. I don't believe that the permit adequately addresses this particular emission and it appears the EPA is giving the Wanapa Energy Center a pass or at the very least "I'll look the other way and no one will ever know." The permit needs a public verification process of the tpy of VOC released by the Wanapa Energy Center and public notice when the permitted VOC level of 99 tpy is exceeded with an appropriate fine attached.

4. I have documentation I will present later in my appeal that counter's EPA Fact #7. The evidence that I uncovered disputes the claim that *"WEC emissions will not result in a significant off-property impact for CO and SOx."*

5. The EPA Facts #8 and #9's claim that no cumulative impact analysis was required has been one of the issues I constantly haggle with all air quality regulators about all the time. Why is the private energy industry given such a pass when cumulative airshed impact avoidance is not granted to any other air polluter? How can a reasonable person deny that SEVEN operating or sited carbon based electrical power generation facilities within 50 miles of our home and farm not have some impact? Oh yes, none of the permitted facilities were ever required to perform any cumulative impact analysis by any regulatory agency so no one will ever actual know let alone validate the airshed impact. And one facility, PGE's Boardman Coal Fired Plant, was granted an open ended air quality permit two weeks before the implementation of the 1976 Clear Air Act. Is that the most ethical way to permit such facilities?

Comments Outline

I have six areas of disagreement with the EPA for the EAB to consider in my appeal. All were discussed in some way in my Wanapa Energy Center EPA permit public comments. All were cast aside or not answered by the EPA as I have come to expect. I have been carrying on an almost two year running dialog with the EPA via Representative Walden, and when similar issues were broached with the EPA via this communication method all were cast aside as frivolous or of no consequence. When you watch a family member die a premature death of respiratory failure, the local airshed health and its subsequent impact upon human life is neither frivolous nor non-consequential. The six issues are:

- National Ambient Air Quality Standards (NAAQS)
- Cumulative Impacts
- Non-funded Mandate
- Impact Areas
- VOC Limits
- Project Diesel Engine Impacts

NAAQS

What a wonderful tool for the EPA and state DEQ to grant permits to Title V air polluters with minimum standards for the various pollutants, NOx, PM, CO, SOx, and VOC before any documental impacts to human health and welfare. However, not all polluters are granted the same privileges by the EPA via the NAAQS minimum standards before documental and quantitative impact occurs.

The EPA in April 2004 announced the draft nonroad Heavy Duty Diesel (HDD) engine regulations. Because of my interest in air quality as well as being a farmer where I utilize a number of vehicles that are classified as nonroad HDD vehicles I was extremely interested in the new draft regulations. I went to the web and found the organization that had assisted in the development of the regulations, State and Territorial Air Pollution Program Administrators, and Association of Local Air Pollution Control Officials (STAPPA/ALAPCO). Nancy Kruger, Deputy Director of STAPPA/ALAPCO was kind enough to share the data document for the draft regulations with me. It is just amazing the STAPPA/ALAPCO information as well as the damnation of the polluters, nonroad HDD engines.

This new knowledge about the nonroad HDD vehicle pollution lead me to the conclusion the NAQQS and subsequent non quantitative human health and welfare impact from ANY carbon based thermo power plant is what I now find most insulting about the siting of the proliferation of carbon based thermo power plants in Umatilla-Morrow County's airshed. The Wanapa Energy Center EPA air quality application and permit is no different from any of the other Title V carbon based thermo power plant permits when addressing the quantitative impact of the facilities air pollutants. The only quantitative impact statement is *"the air pollutants can have adverse affects on humans, plants, and animals."* As long as the facility is in an EPA air quality attainment area and the individual facility does not exceed any of EPA's minimum pollutant NAAQS's, then the EPA and applicants conclude that there are no significant human, crop, or animal impacts. Here are the individual minimum annual NAAQS requirements to ever have any quantitative impacts upon human health and welfare for the air pollutants from an individual carbon based thermo power plant; NOx 100 ug/m^3, SOx 80 ug/m^3, and PM_{10} 50 ug/m^3. In contrast to Wanapa and the carbon based thermo power plants' non-quantifiable impact, Table 1 is the EPA's quantitative impact determination of nonroad HDD engines[1] that occurs when the engines exceed the NAAQS individually and collectively because there is NO MINIMUM NAAQS applied to any nonroad diesel engines. STAPPA/ALAPCO researchers concluded *"it is not appropriate to adopt a threshold for use in either the primary analysis or any alternative calculations, because no adequate scientific evidence exists to support such a calculation.[2]"* In other words the first molecule of air pollution from a nonroad HDD engine has quantitative impact upon

[1] *The Dangers of the Dirtiest Diesels: The Health and Welfare Impacts of Non-road Heavy-Duty Diesel Engines and Fuels,* STAPPA/ALAPCO, June 2002, Table ES-2

human premature deaths and health. Where as, a carbon based thermo power plant can pump Tons of air pollution into an airshed without ever having any quantitative impact upon human premature deaths and health as long as the facility individually never exceeds any of the pollutants' NAAQS. In contrast to the ZERO minimum NAAQS for all nonroad HDD engines' air pollutants such standards are just another of my discoveries how the elected and appointed agency officials use discriminating processes and regulations in support of favorable polluting entities and industries. Will it ever change? Only after the airshed has been severely damaged and some enlightened leadership takes America in a new direction of equal treatment of all polluters.

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[2] *The Dangers of the Dirtiest Diesels: The Health and Welfare Impacts of Non-road Heavy-Duty Diesel Engines and Fuels,* STAPPA/ALAPCO, June 2002, pg 19

Table 1. Oregon's Benefits of Regulating Nonroad Heavy-Duty Diesel Engines & Fuels
Avoided Incidences (Cases/Year) At EPA's 12,000 National Rate

Location	A	B	C	D	E	F	G	H	I	J	K	L	M	Monetary Millions
Oregon	157	104	21	17	17	51	40	3,322	332	3,644	3,654	29,077	150,930	$ 1,241.0
DSL Mobile Agriculture (24.8%)	38.9	25.9	5.3	4.2	4.2	12.6	9.8	823.8	82.3	903.7	906.1	7,211.2	37,430.6	$ 307.8
Morrow County Ag (1.9%)	3.0	2.0	0.4	0.3	0.3	1.0	0.8	63.1	6.3	69.2	69.4	552.5	2,867.7	23.6
Umatilla County Ag (3.5%)	5.5	3.7	0.7	0.6	0.6	1.8	1.4	116.3	11.6	127.5	127.9	1,017.7	5,282.5	43.4

A = Premature mortality (adults, 30 and over)	H = Asthma attacks (asthmatics, all ages)
B = Chronic bronchitis (adults, 26 and over)	I = Acute bronchitis (children, 8 - 12)
C = Hospital admissions, pneumonia (adults, over 64)	J = Lower respiratory symptons (children, 7 - 14)
D = Hospital admissions, chronic obstructive pulmonary disease (COPD)	K = Upper respiratory symptons (children, 9 - 11)
E = Hospital admissions, asthma (adults, 65 and younger)	L = Work loss days (adults, 18 - 65)
F = Hospital admissions, cardiovascular (adults, over 64)	M = Minor restricted activity days (adults, 18 - 65)
G = Energency room visits, asthma (adults, 65 and younger)	

As I continued my air quality research I did uncovered an extremely interesting EPA web document http://www.epa.gov/air/clearskies/03technical_package_sectionb.pdf . The information I keyed in on is: *"By 2020, the benefits of reductions in fine particles and ozone are estimated to be $113 billion annually (1999$), including:*

(a) • $110 billion in annual human health benefits. This is a result of annually avoiding:

- 14,100 premature deaths;
- 8,800 new cases of chronic bronchitis;
- 23,000 non-fatal heart attacks;
- 30,000 total hospitalizations and emergency room visits for cardiovascular and respiratory causes;
  – Included in this total are 15,000 fewer hospital and emergency room visits for asthma attacks.
- 12.5 million days with respiratory-related symptoms, including lost work days, restricted activity days, and school absences.
  – Included in this total are approximately 180,000 fewer asthma attacks

(b) • An alternative estimate projects over 8,400 premature deaths prevented and $21 billion in health benefits annually by 2020.

(c) • $3 billion in annual visibility benefits from improving visibility at select National Parks and Wilderness Areas."

Amazing that the nonroad HDD engines account for 12,000 of the estimated 14,100 lives saved in the information presented above! Does anyone truly believe that nonroad HDD engines account for 85.1% of all the premature deaths as the result of their air pollution while carbon based thermo power plants account for ZERO? It appears what is really taking place is as Steven Milloy of JunkScience.com and an adjunct scholar at the Cato Institute states; *"Researchers are trying to scare the public with statistical malpractice."* The latest Journal of American Medical Association November 17, 2004 issue has an article titled "Short-Term Ozone Pollution Raises Mortality Risk". The document states: *"Increases in air pollution caused by cars, power plants and industry can be directly linked to higher death rates in U.S. cites."* The researchers' compared the non-injury-related death rates with the smog measurements for 95 urban areas for the period 1987-2000. They reported a one-half percent (0.5%) increase in premature death (mortality) per 10-part per billion increase in ground-level ozone (smog) in the urban areas. They claim that reducing smog levels by 35% could save about 4,000 lives per year. This document is important to my position because it lists power plants as a source of premature deaths which the EPA cannot or will not validate let alone document with any methodology. The research never mentions nonroad HDD engines as a contributing polluter. In addition, the document's premature death rate, 4,000, plus the EPA's premature nonroad HDD engines' 12,000 equals a total of 16,000 which far exceeds the EPA's 14,100 touted on their above web site document. It makes one really wonder which of the many premature death numbers are truly accurate or is it all *"statistical malpractice"*.

I included in Table 1 the percentage of the Oregon agricultural non-road mobile diesel engines, 24.8%, quantified impact figures. In addition, I included the Morrow and Umatilla agriculture non-road mobile diesel engines, 1.9% and 3.5% respectively, quantified impact figures. The conclusion from Table 1 is that

export from the region. Table 3 includes the public information available from the permitted air pollutant emissions of the Hermiston Power Partnership (HPP) (operational 1997), Hermiston Generating Project (HGP) (operational 2003), Umatilla Generating Project (UGP) (on the shelf with an ODEQ extension), and Wanapa Energy Center. The Umatilla/Morrow Counties Depot Facility (UMCDF) permitted emissions are included because the facility will be a major polluting entity within the region. However, Table 3 doesn't include any of the other 4 near-by operating or permitted carbon based thermo power plants in Morrow, Benton, and Walla Walla Counties (Coyote Springs 1 & 2 (540MV), PGE coal fire (550MV), Plymouth Generating (306MV), and Wallula (1,350MV)).

Table 3. Umatilla County Point Source Pollution with Carbon Based Thermo Power Plants

	PM	NOx	VOC	CO	SOx
	Tons per Year				
1996	174	181	215	130	10
HGP	64	272	34	447	11
HPP	120	315	50	759	39
UGP	198	167	72	39	86
UMCDF	20	129	4.8	55	22
Wanapa	562	486	99	933	57
Total	**1138**	**1550**	**474.8**	**2363**	**225**
% Increase	**554.0%**	**756.4%**	**120.8%**	**1717.7%**	**2150.0%**

If the local elected or appointed public officials saw such a remarkable increase in emissions of pollutants from any of the other region's industries or even motor vehicles they would be demanding that the ODEQ and EPA implement suppressive regulations to limit the damage to the airshed immediately. Don't hold your breath, although you should, such action will not occur anytime soon to limit the carbon based thermo power plant emissions. Only when the airshed reaches a non-attainment status will any action ever be taken and I would guarantee that the carbon based thermo power plants will not suffer any consequences from the non-attainment regulation implementation. Those non-attainment regulations will be levied upon those industries that lack the political clout to protect themselves, the natural resource industries.

With so many carbon based thermo power plants within a four county region why is there not a cumulative impact analysis performed when permitting the Title V facilities? What makes their pollution safer than any of the other region polluters of the same pollutants? Is the EPA afraid of what it will find regarding its protected industrial polluter?

[3] 2001 Oregon Air Quality Data Summaries, Appendix L

unsuspecting regulation is another of those wonderful Federal Government unfunded mandates with a twist. The twist this time is the nonroad HDD engine dependent industries will not only subsidize the "emission offsets", but also subsidize directly the exported electrical power for Western Oregonians' economic and quality of life enhancements. The natural resource industries will also be directly impacted by the human health and welfare of the emission NAAQS never quantified in the Wanapa or any other carbon based thermo power plant air quality permit application.

It appears from the previous tables that the carbon based thermo power plants came to the region for a number of economic reasons. One of those is the size and once cleanliness of the airshed. Second, the "emission offsets" being accomplished by the EPA regulating other air polluting industries, thus creating a cleaner airshed to dump power plant air pollution without any fear of penalties, "emissions offsets" costs, or regulatory repercussions.. Third, none of these facilities could ever pass the local or EPA permit process if they were located adjacent the population base where the power is required. Fourth, the rural sections of Oregon lack a population base with any significance in quantity or quality. Fifth, not only does Eastern Oregon take Western Oregon's trash and prisoners, but also we must now be the electrical power sump pump and airshed trash can for those "other" significant Oregonians.

Supporting my opinion that Umatilla and Morrow Counties' aished is a dumping atmosphere for Western Oregon's economic growth is the Oregonian's February 15, 2004 article, *Pollution rule revision kicks up dust*. The article documents Jackson County's experience with an EPA non-attainment status for PM10 and subsequent upcoming release from non-attainment status. In 1985, Medford and White City's air exceeded the EPA's PM10 NAAQS for 29 days. The EPA and ODEQ targeted wood stoves as the culprit during the non-attainment process. However, Doctor Robert Palzer, a retired chemistry professor, challenged the EPA and ODEQ's findings after his analysis identified the emissions from timber mills and smoke from burning slash on nearby forestland as significant sources of PM10 year-around. Thanks to Doctor. Palzer and community participation Jackson County implemented the toughest PM10 emissions regulations in Oregon and the United States. Now that Jackson County has met the federal deadline for PM10 standards, the ODEQ and Southern Oregon Regional Economic Development (SORED) organization want to relax the Jackson County PM10 standards so new industrial development can be permitted to create new jobs. Doesn't the call for economic growth have a similar ring to what local power plant development projects and their supporters tout here in Umatilla County? The present Jackson County PM10 emission standard is a limit of **five tons per year** with the use of state-of-the-art pollution controls, no matter how expensive. The ODEQ and SORED are supporting a 15 tons per year limit with the use of the BACT process (which has an economic loophole). 5 or 15 tons of PM10 limit for each project! Please examine Table 3. Is there any of the sited or proposed carbon based thermo facilities for Umatilla County that come anywhere near either of these two figures, 5 or 15 tons, for PM10? Could any of these sited or proposed facilities be sited and/or built in Jackson County? What is in Morrow and Umatilla Counties' airshed that makes it so available for

the dumping of pollutants into our atmosphere and not a Western Oregon County? In addition, I want you to compare Table 3's total PM10 figure with that of Table 4's woodstoves. Which table entry has the higher figure as well as is a year round pollutant vice a seasonal pollutant? There is also the comparison of Table 3's total PM10 with Table 5's project non-road diesel PM10 in the out years. One industry is being regulated for air emissions' reductions while another quickly fills that regulated reduction with its own air pollution emissions. The Oregonian article and the figures within this testimony's tables don't lie and clearly support the opinion that Morrow and Umatilla Counties' airshed is a dumping atmosphere for emission pollutants to support Western Oregon's economic growth and subsequent higher quality-of-life enhancements. Is this the way the EPA's air quality management should ethically be accomplished, make one industry in a particular region clean up so another can use the airshed for its pollution?

Impact Areas

The only documented concern of the EPA in the Wanapa Energy Center permit is the air quality impact upon Class I and II wilderness and scenic areas' visibility. There is a dichotomy with visibility concerns. Why isn't Umatilla County's local visibility of the same level of importance as Class I and II wilderness and scenic areas? Don't those of us living in Umatilla County have the same right to clear bright days with unlimited visibility? My conclusion from the applicant's air quality EPA permit application is Umatilla County citizens do not have that same right to those same clear skies and unlimited visibility standards because Umatilla County is not within a classified Class I and II wilderness or scenic area. In essence, the EPA and ODEQ are permitting Umatilla County's airshed as an air pollutant throwaway or pollutant dumping airshed without the same rights to clear skies and unlimited visibility as humans within Class I and II wilderness or scenic area. Once again, the issue of equal rights is tossed aside for special groups, industries, and individuals. Such discriminatory actions are from what I have concluded that the EPA and ODEQ consider the citizens within these airshed of less importance, disposable.

I have two specific points about the impact areas.

1. It is amazing that the meteorological data and its subsequent impact area is 100's of miles in diameter and from areas with statistically different climate and meteorological occurrences while the pollution emissions' impact area is specifically limited at the most to 3 kilometers. At the same time all other polluting entities (read not carbon based thermo power plants) are not given such a minuscule impact area, not even one of my nonroad HDD tractors or combines has such a minimal impact area.

2. This particular issue has been a constant irritant for me. My nonroad HDD vehicles can be trashed by the EPA for causing significant, measurable, and quantitative human health and welfare impacts, but Tons of carbon based thermo power plant emissions spewed into our airshed have ZERO impact according to the EPA and ODEQ. Thanks to a reporter for the Oregonian, Michael Milstein, I was given a BPA document that does address the impact of the significant number of carbon based thermo power plants within Umatilla and even Morrow Counties, Oregon. The document is my only attachment. It is never referenced in the

VOC emitted. I ran the formula backwards from the 99 typ VOC limit and came up with 2,512 hours or 104.7 days of allowed use to guarantee that the 99 tpy VOC limit is not exceeded. Realistically, what competent business is going to spend $300 million on a carbon based thermo power plant and only operate that facility for 28.6% of the year? Such simple calculations makes one wonder what are the consequences of exceeding the permitted levels for any of the regulated emissions and who is going to monitor the applicant's math and monitoring data?

Project Diesel Engine Impacts

I find the first two points of the EPA permit's Approval Conditions extremely interesting as well as problem for me. *"Diamond is authorized to construct and operate WEC consistent with the representations in the permit application and subject to the following conditions."* Why is the EPA at all concerned about one nonroad HDD engine with attached conditions of use while never addressing any conditions of the hundred's of nonroad HDD vehicles that will be utilized to *"construct"* the Wanapa Energy Center and all its associated service components? The EPA has ample data that clearly delineates the dramatic human health and welfare impact of nonroad HDD vehicles, but fails to acknowledge any of those delineated impacts when granting a permit for *"construction"* of one of its permitted facilities that requires 100's of such vehicles to accomplish both the construction and operation of such a facility. I believe it is only fair that the EPA be required to inform the general public of the human health and welfare cost they alone must assume from the additional nonroad HDD vehicles required to "construct and operate" the Wanapa Energy Center. Or do those document human health and welfare impacts only apply to the nonroad HDD vehicles utilized by the natural resource industries of the region?

Appeal Requests

1. Zeroize the Title V air pollutant NAAQS as was done to regulated the nonroad HDD engine emissions. Then calculate the quantifiable human health and welfare impacts from the Wanapa Energy Center's air pollutant emissions as was accomplished to justify the EPA's new nonroad HDD engine emissions regulations. Will the Wanapa Energy Center still have ZERO quantifiable human health and welfare impacts?

2. At the very least, demand the air pollution reductions, regardless of BACT, be equal to what the EPA now requires of all new and some old nonroad HDD vehicles. Again those nonroad HDD engine reductions are a 90% reduction in PM10 emissions, a 95% reduction in NOx emissions, and a 99% reduction in SOx emissions. I don't care if the same years of attainment are required, but hey, how about treating us polluters equally! I am betting that such an air pollution emissions requirement is not possible, is it? There is no equality among polluters just as with the population.

3. At the very least, consider Wanapa Energy Center's human health and welfare impact of the majority of citizen or is it true that America is all about minority rule in every facet of government?

pollution emissions and subsequent physical condition than taking any risk that would be associated with real and in the airshed air pollution measurements. One cannot be too careful because we don't want to discover some real data that could potentially discredit the air quality and emissions' modeling formulas.

8. How can such a massive facility be constructed without the additional nonroad HDD engine impacts, beyond those presently operating within the County, being documented, controlled, and the quantifiable human health and welfare impact shared with the citizenship expected to bear those cost without just compensation? How can the EPA implement new nonroad HDD regulations with its associated quantifiable data, but then ignore the issue and its subsequent impact when siting a facility requiring a significant number of nonroad HDD engines for both construction and operation?

Appendix

1. Phase I Results, Regional Air Quality Modeling Study, Bonneville Power Administration, August 1, 2001.

K.B THOMPSON

Phase I Results
Regional Air Quality Modeling Study
Bonneville Power Administration

August 1, 2001

BPA has completed the first phase of a Regional Air Quality Modeling Study to examine potential air quality impacts from 45 natural gas-fired combustion turbines proposed for construction in BPA's service area. BPA has completed the first phase of the study on the 45 projects. Phase I examined two scenarios: a worst-case scenario in which all 45 plants were built and operated for a total of more than 24,000 megawatts (MW) and a second scenario in which 28 of the facilities, totaling a little over 11,000 MW operated simultaneously. However, it is highly unlikely that more than 6,000 to 8,000 MW will be built. Generally, the results were lower than expected. The study did not show any standards violations of criteria pollutants identified in the Clean Air Act. The only result that showed a possible need for concern was a potential decrease in visibility in many of the region's most sensitive areas.

Background. The West Coast has immediate supply needs for electricity, as well as a long-term need for electrical energy resources. Recent long-term planning estimates by the Pacific Northwest Electric Power and Conservation Planning Council show the region will need an additional 6,000 MW of electricity over the next 10 years. Other estimates run as high as 8,000 MW. This demand for electricity has led to a number of new generating resources being proposed to meet the regional energy need. More than 24,000 MWs of resources have been proposed. These proposals far exceed the need, which makes it difficult, if not impossible, to determine which resources will ultimately be constructed and operated.

BPA is being asked to integrate many of these resources into the Federal Columbia River Transmission System. Since the majority of these resources are combustion turbines, there is a regional concern over air quality. Thus, BPA initiated this Regional Air Quality Modeling Study to better understand, under worst-case conditions, the interaction of the site-specific effects. This information will help provide clarifying information for the cumulative environmental effects analysis conducted in BPA's Business Plan Environmental Impact Statement. BPA will commission its contractor to conduct a Phase II evaluation of each individual power plant's effects on visibility as it is considered and decided upon for integration by BPA.

Results from Phase I of the study are now available for review by interested parties. An overview of the modeling approach and presentation of the results follows.

Modeling Overview. The dispersion modeling techniques employed by the study are described in the *Modeling Protocol*.[1] Features of the model simulations include the following:

- The study looked at two scenarios; 1) air impact that would accrue if 28 of the projects were built and energized by 2004 and 2) air impacts that would occur if all 45 projects were built as planned and operated simultaneously.

[1] Available at http://www.efw.bpa.gov/cgi-bin/PSA/NEPA/SUMMARIES/air2.

- Oxides of nitrogen (NOx), particulate matter (PM10) and sulfur dioxide (SO2) emissions from 45 proposed power projects with a combined capacity of more than 24,000 MW were considered in the analysis. The analysis assumed all plants, including the peaking plants, were operating at peak load with their primary fuel for the entire simulation period. Emissions from fuel oil firing were not modeled except for the Fredonia (Washington) facility, which is solely fired by oil. Peak load operating assumptions are likely to over-estimate impacts, while omission of fuel oil firing likely under-estimates impacts.

- Building downwash effects were not considered in the analysis and emissions were characterized using a single stack for each facility. Note the simulations only include emissions from the turbines or heat recovery steam generators, not from ancillary sources (such as auxiliary boilers, gas heaters, and standby generators) associated with each project.

- The CALPUFF (Version 5.4 Level 000602_6) dispersion model was applied in the simulations. CALPUFF is the EPA's preferred model for long-range transport assessments. CALPUFF treats plumes as a series of puffs that move and disperse according to local conditions that vary in time and space. CALPUFF incorporates algorithms for wet and dry deposition processes, aerosol chemistry, and is accompanied by post-processors designed to assess regional haze.

- Winds were based on the University of Washington's simulations of Pacific Northwest Weather with the MM5 model from April 1, 1998, to March 15, 1999. The MM5 data set used in the simulations has a horizontal mesh size of 12 kilometers km) and over 30 vertical levels. Only one year of MM5-quality regional meteorological data is currently available. Phase I results are based on weather conditions during this year. Actual impacts may vary from year to year as weather patterns shift.

- The 696-km by 672-km study area includes all of Washington and portions of Oregon, Idaho, and British Columbia. Meteorological, terrain, and land use data were provided to the model using a horizontal grid of 12 kilometers (km). The terrain data are based on an average for each grid cell, so the simulations do not resolve potential local impacts in complex terrain. Maximum concentrations may be under-estimated because the 12-km grid cannot accommodate plume collision with local terrain. (Note: In each facility's air discharge permit, localized effects are evaluated individually, but not cumulatively.)

- A 6-km sampling grid was used, with one receptor in each grid. A 12-km grid was used for terrain and meteorological data.

- The study evaluated impacts to 16 Class I/Scenic/Wilderness Areas (3 National Parks, the Spokane Indian Reservation, and 12 Wilderness Areas), the Columbia River Gorge National Scenic Area (CRGNSA), and the Mt. Baker Wilderness.

- The aerosol concentrations used to characterize background extinction coefficients in the study represent excellent visual conditions. Background visibility parameters are presented in Table 4 of the Protocol. These parameters represent visibility on the best 5% of the days in the Class I/Scenic/Wilderness Areas and the best 20% of days in the CRGNSA and the Spokane Indian Reservation. Background ozone and ammonia concentrations, nitrogen deposition, and sulfur deposition data were also based on generally conservative assumptions and are presented in the protocol.

- Background concentrations of PM10, SO2, and NOx were not included in Phase I modeling. The Protocol stated that MFG (the company conducting the study) would "...add the modeled predictions to the existing concentrations and compare the results against NAAQS and Class I significance criteria...." MFG did not include background in Phase I because preliminary results indicated that power plant emissions contributed only minimally to ambient concentrations.

- PM10 concentrations include both primary and secondary aerosols and the nitrogen deposition estimates include the ammonium ion.

Phase I Results. Model results for pollutant concentrations, total nitrogen deposition, total sulfur deposition, and changes to background extinction are summarized in the attached tables for each Class I/Scenic/Wilderness Areas, CRGNSA, and the Mt. Baker Wilderness. Contour plots are also attached displaying model predictions over the entire study domain. The summary tables and plots are provided for two source groups: all projects and projects with an energization date before January 2004. Key results of Phase I include the following:

- **Areas showing greatest impact.** The contour plots suggest that if all the proposed plants are built, the greatest air quality impacts will occur in the Puget Sound Lowlands from Centralia to Bellingham, in the Hermiston area, and in the eastern portions of the Lower Columbia River Basin.

- **Class II Significant Impact Levels not exceeded (two exceptions).** With the exception of 2 receptors, predicted concentrations from the proposed power plants are less than the Significant Impact Levels (SILs)[2] for all pollutants and averaging periods. The peak PM10 concentration occurred near the Wallula Gap. The predicted PM10 concentration at this location was 4.54 micrograms per cubic meter (ug/m3), due to the operation of all of the plants scheduled to be energized prior to 2004. The peak PM10 concentration of all the proposed plants at this location was 12.4 ug/m3 (the 24 hour PM10 SIL is 5 ug/m3). The SILs were also exceeded in one other location; the 24 hour PM10 SIL was exceeded at a receptor located near the Tacoma tide flats, where the model predicts a 24

[2] It has been EPA's longstanding policy under the New Source Review and PSD programs to allow the use of Significant Impact Levels (SILs) to assess whether a proposed new or modified stationary source causes or contributes to a violation of the NAAQS or PSD Class II increments (40 CFR 51.165 (b)(2)). Sources with pollutant concentrations under the SILs are considered insignificant, whether or not background or other increment consuming sources affect the applicable pollutant concentration and averaging period of concern. Note that the use of the term "significant" impact level in the PSD program does not imply a "significant adverse impact" in a SEPA or NEPA sense, nor does it imply exceedances of ambient standards.

hour PM10 concentration of 6.2 ug/m3. The SILs are thresholds used in the evaluation of individual, not multiple facility impacts to the NAAQS.[3] If the combined impacts are below the individual plant thresholds (the SILs), their collective impact to NAAQS should be considered minimal and an in-depth analysis of these plants' impacts to NAAQS unnecessary. However the fact that SILs are exceeded does not necessarily mean that significant adverse impacts will result.

- **National Ambient Air Quality Standards not exceeded.** This study has not examined local impacts from the power projects[4], but model results suggest that even if all the proposed power plants were energized, they are unlikely to exceed the National Ambient Air Quality Standards (NAAQS). The peak ambient concentration occurred at a receptor near the Wallula gap (which is a non-attainment area for particulate matter). Predicted ambient concentrations at this location were only 8% of the NAAQS (PM10 24 hour NAAQS is 150 ug/m3). According to Washington State Department of Ecology estimates, proposed power plant emissions are small compared to emissions from existing sources. For example, NOx emissions from all of the proposed power plants comprise only 3.3% of Washington's total NOx emissions and only 11% of Washington's particulate emissions.

- **Proposed Class I SILs exceeded at several locations.** If all the plants scheduled to be energized before 2004 are built, their emissions are predicted to exceed the proposed 24 hour PM10 Class I SIL (0.3 ug/m3) in the CRGNSA and in the Spokane Indian Reservation. When all proposed sources were included in the model, the proposed 24 hour PM10 Class I SIL was exceeded in 11 out of 18 Class I/Scenic/Wilderness Areas. These exceedances suggest that if all the proposed plants were built, EPA might need to evaluate the effect of these plants on Class I/Scenic/Wilderness Areas in combination with existing sources, to evaluate increment consumption. However, BPA anticipates only a small portion of these plants will likely be built[5]. (Note: exceeding a SIL indicates that further evaluation is necessary, but it does not necessarily indicate that significant impacts have occurred.)

- **Relatively little Increment consumed.** Predicted concentrations of PM10, NOx, and SO2 from the proposed power projects are small fractions of the applicable Class I increments. For example, the peak PM10 concentration was only 1.54 ug/m3 in the Columbia River Gorge National Scenic Area (not a Class I/Scenic/Wilderness Area) which is well below the 24 hour PM10 Class I increment of 8 ug/m3. Based on EPA's Prevention of Significant Deterioration criteria, this implies that the power plants alone do not cause a significant deterioration of air quality as characterized by PM10, NOx, and SO2 concentrations.

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[3] Because there is no other available benchmark for evaluating impacts to NAAQS, this study conservatively compares multiple plant impacts to individual plant SILs.

[4] The 12km grid used in this study is too large to capture plume impaction with local terrain. Localized plant effects are captured in each facility's air permit.

[5] Power Planning Council estimates that the region will need approximately 6,000 MW by 2010 to meet load growth and reliability standards. The proposed projects total over 24,000 MW in capacity.

- **Nitrogen and Sulfur deposition below levels of concern.** Annual nitrogen and sulfur deposition predicted for the Class I/Scenic/Wilderness Areas, the CRGNSA, and the Mt. Baker Wilderness are less than one percent of the background deposition rates provided by the Federal Land Managers for these areas.

- **Visibility impacted.** The study results suggest the proposed power projects could have the potential to degrade visibility in the Class I areas, as characterized by guidance criteria established by the Federal Land Managers[6]. The model predictions indicate emissions from the plants scheduled to be energized prior to 2004 would degrade visibility on very clear days by more than 5% at 14 out of 18 Class I/Scenic/Wilderness Areas and by more than 10% at 8 areas. If all the proposed plants are built, visibility on very clear days has the potential to be frequently degraded by more than 10% at 12 out of 18 Class I/Scenic/Wilderness Areas and in the surrounding Class II areas. The sensitive areas most affected by the first group of plants (energized before 2004) are Mt. Rainier, the Alpine Lakes Wilderness, and the Mt. Baker Wilderness Area. The inclusion of all proposed plants (pre- and post-January 2004) results in more than 10% change in visibility in 12 out of 18 of the northwest's Class I/Scenic/Wilderness Areas. The model shows the Mt. Baker Wilderness Area, Alpine Lakes Wilderness Area, CRGNSA, Mt. Rainier National Park, and the Olympic National Park would be most affected.

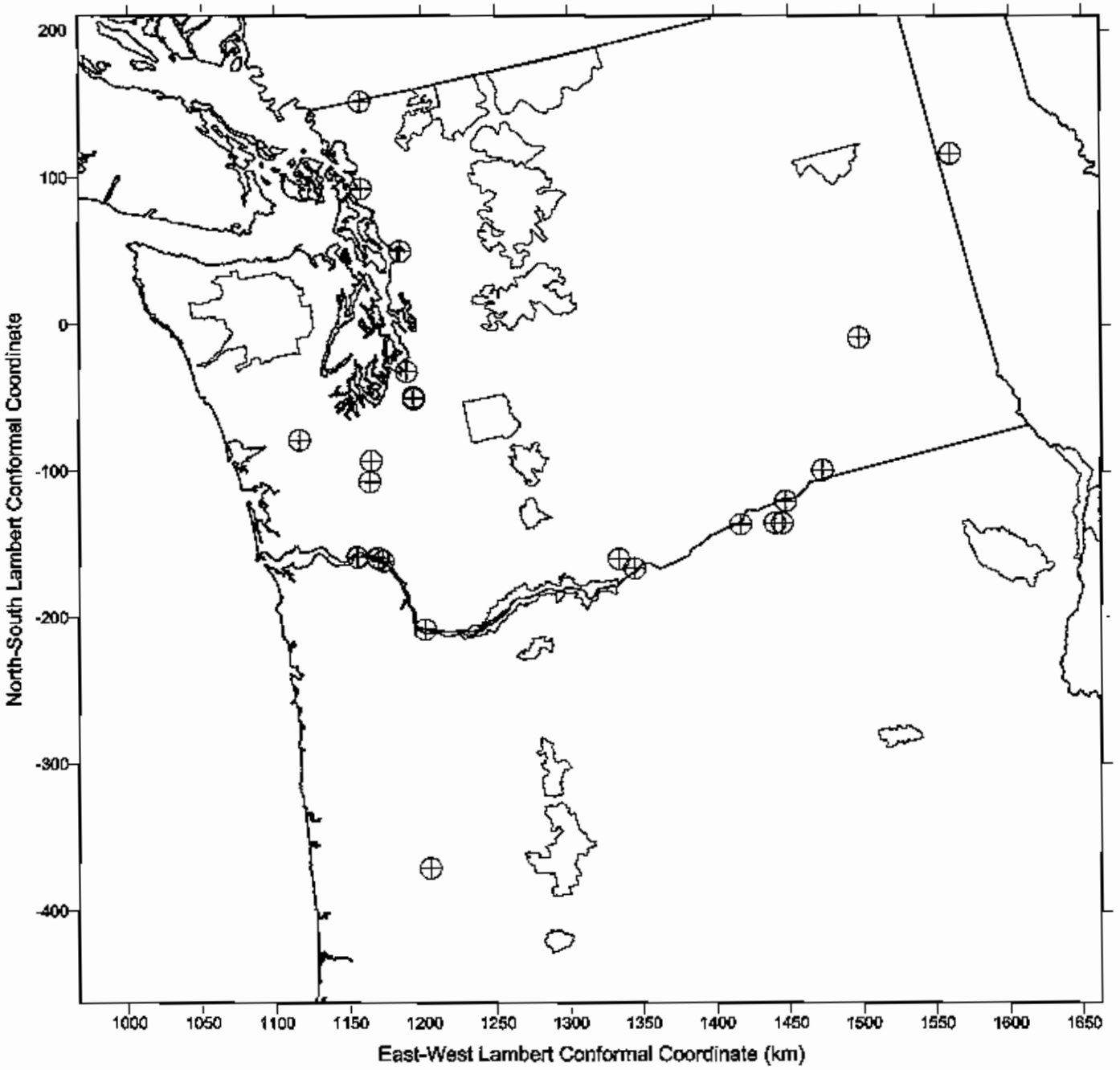
Phase II. Phase II will be implemented, as necessary, for power plants being considered for integration by BPA and evaluated through the NEPA process. Phase II will consist of a separate evaluation of each power plant's contribution to visibility impacts. This information will become part of the record and will be provided to the BPA decision-maker for use in making a decision on integration.

[6] "Federal Land Managers Air Quality Related Values Workgroup, Phase I Report, December, 2000".

Peak Emissions with Primary Fuel
Sources with Energization Dates Before January 2004

Num	Project Name	Owner	(MW)	Date	Peak Emissions (lb/hr) SO2	NOx	PM10
1	TransAlta Centralia Generation LLC Big Hanaford Project	Transalta	248	Jun-01	6.6	21.1	16.2
2	Fredonia Facility	PSE	111	Jul-01	102.4	46.4	24.3
3	Rathdrum Power, LLC	Cogentrix	270	Aug-01	2.7	29.8	21.4
4	Vancouver a (Alcoa)	Calpine	100	Nov-01	0.7	16.0	5.0
5	Columbia Peaking Generation Project	Avista	200	Dec-01	2.8	13.6	11.2
6	Mcnary B	Calpine	200	Dec-01	1.3	32.0	10.0
7	Sumas Energy 2	NESCO	660	Jan-02	15.8	33.0	47.6
8	Goldendale (The Cliffs)	Summit	225	Feb-02	1.0	38.3	15.0
9	Columbia River Project	AES Columbia	220	May-02	7.3	25.3	17.2
10	Fredrickson	Calpine	350	May-02	1.5	17.1	18.0
11	Frederickson Power	West Coast	249	May-02	10.2	19.7	16.9
12	Coyote Springs 2	Avista	280	Jun-02	1.1	30.0	4.5
13	Port of Tacoma Generation Project Phase I Peaking Project	SW Power	175	Jun-02	2.6	61.0	18.0
14	Goldendale Energy Project	Calpine	248	Jul-02	1.0	14.9	11.8
15	Hermiston Power Project	Calpine	546	Sep-02	2.5	71.7	38.1
16	Everett Delta I	FPL	248	Sep-02	11.0	25.0	18.0
17	Everett Delta II	FPL	248	Sep-02	11.0	25.0	18.0
18	Pierce County Project	Duke	320	Jan-03	44.0	148.0	44.0
19	Satsop CT Project - Phase I	Duke	650	Jan-03	2.7	43.5	50.6
20	Mint Farm Generation Project I	Avista	248	Jul-03	2.7	25.0	18.8
21	Umatilla Tribal Generation Project	Confed.Tribes	1000	Jul-03	5.6	122.4	109.6
22	Longview Energy	Enron	290	Jul-03	1.4	25.0	19.9
23	Coburg Power	Frontier	600	Aug-03	1.5	54.7	15.8
24	Starbuck	NW Power Ent.	1200	Oct-03	17.7	106.4	82.8
25	Umatilla Generating Project	PG&E	620	Nov-03	9.8	40.4	48.0
26	Summit/Westward (Clatskanie)	Summit	520	Nov-03	8.0	54.0	48.0
27	Chehalis Generating Facility	Tractebel	520	Nov-03	20.8	40.9	31.6
28	Port Westward	PGE	650	Dec-03	12.7	43.8	26.8

Source Locations for Sources with Energization Date Before 1/04



Peak Emissions with Primary Fuel
Sources with Energization Dates After December 2003

Num	Project Name	Owner	(MW)	Date	Peak Emissions (lb/hr) SO2	NOx	PM10
1	Cherry Point	BP	750	Jan-04	3.0	45.1	35.7
2	Frederickson Power II	West Coast	249	Jan-04	10.2	13.6	15.6
3	Mcnary A	Calpine	600	Jun-04	3.0	34.2	36.0
4	Salem (Bethel PGE)	Calpine	600	Jun-04	3.0	34.2	36.0
5	Port of Tacoma Phase II (5 units)	SW Power	825	Jun-04	13.0	101.5	90.0
6	Grizzly Power	Cogentrix	980	Jul-04	52.8	114.4	105.6
7	Wallula Power Project	Newport Generation	1300	Jul-04	9.5	108.2	72.8
8	Mercer Ranch Generation Project	Cogentrix	800	Oct-04	42.7	92.4	85.3
9	Satsop CT Project - Phase II	Duke	650	Oct-04	2.7	43.5	50.6
10	Satsop CT Project - Phase III	Duke	650	Oct-04	2.7	43.5	50.6
11	Northern Idaho Power	Cogentrix	810	Dec-04	34.5	83.5	70.5
12	Morrow Generating Project	PG&E	620	Jan-05	9.8	40.4	48.0
13	Ferndale	Calpine	600	Jun-05	3.0	34.2	36.0
14	Mount Vernon	Calpine	600	Jun-05	3.0	34.2	36.0
15	Vancouver b (Alcoa)	Calpine	600	Jun-05	3.0	34.2	36.0
16	Mattawa (Grant Co)	Grant Co. LLC	1300	Jun-05	9.5	108.2	72.8
17	Kootenai Power (Rathdrum)	Kootenai Generation	1300	Jun-05	4.4	87.6	94.4

Maximum Concentration Predictions (ug/m3)
Includes Sources with Energization Dates Before Jan 2004

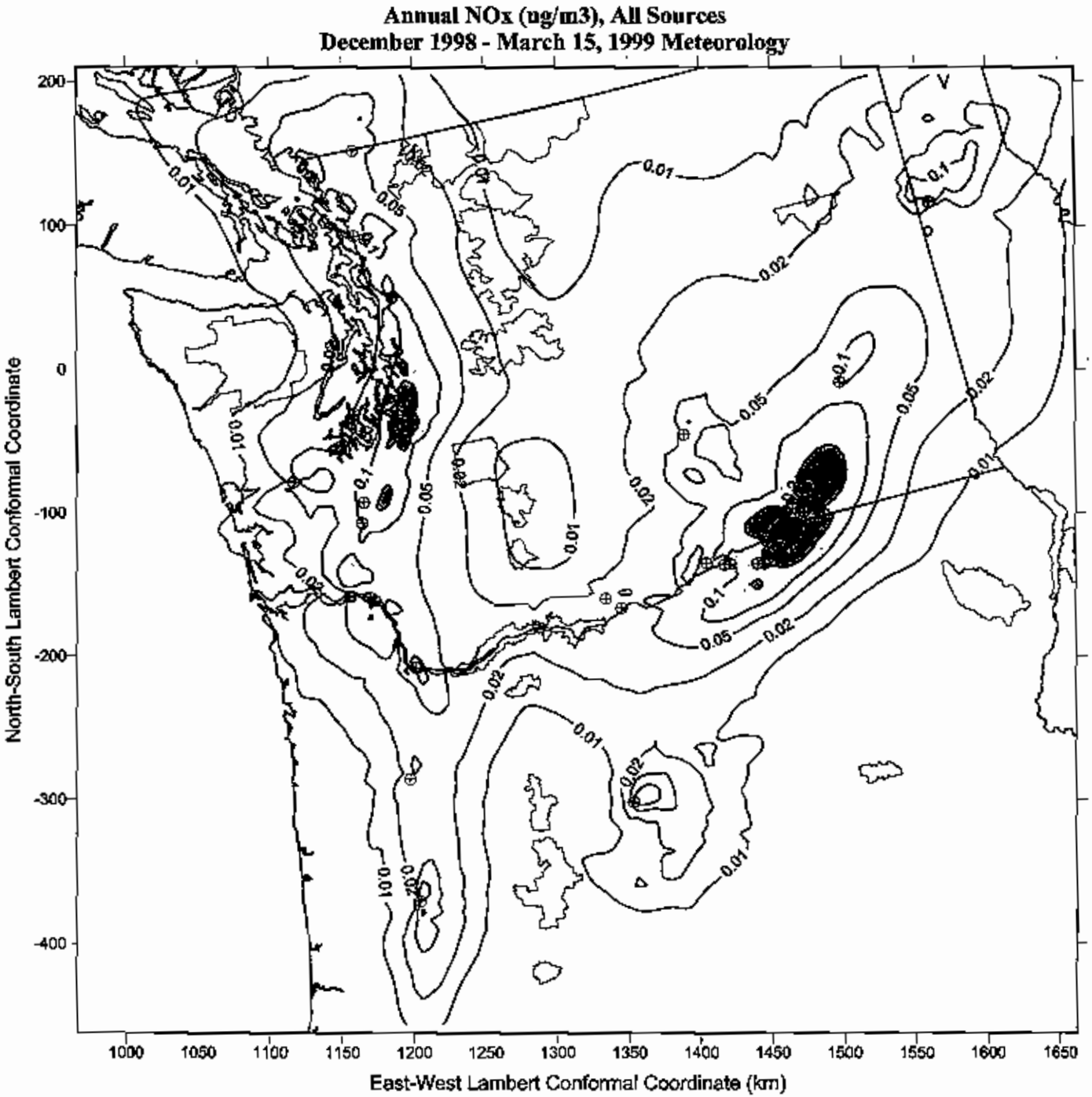
	Annual Average			24-hour		3-hour
Area	NOx	PM10	SO2	PM10	SO2	SO2
Diamond Peak Wilderness	0.001	0.005	0.000	0.07	0.01	0.01
Three Sisters Wilderness	0.004	0.010	0.001	0.11	0.01	0.03
Mt. Jefferson Wildnerness	0.003	0.013	0.001	0.15	0.01	0.03
Strawberry Mtn. Wilderness	0.001	0.008	0.001	0.14	0.01	0.02
Mt. Hood Wilderness	0.009	0.027	0.003	0.28	0.02	0.05
CRGNSA	0.032	0.055	0.007	0.62	0.05	0.16
Eagle Cap Wilderness	0.004	0.014	0.001	0.12	0.01	0.03
Hells Canyon Wilderness	0.004	0.012	0.001	0.10	0.01	0.02
Mt. Adams Wilderness	0.007	0.020	0.003	0.19	0.03	0.05
Goat Rocks Wilderness	0.008	0.020	0.003	0.13	0.03	0.08
Mt. Rainier National Park	0.017	0.034	0.008	0.29	0.05	0.20
Olympic National Park	0.009	0.017	0.003	0.20	0.10	0.22
Alpine Lakes Wilderness	0.028	0.045	0.013	0.29	0.10	0.26
Glacier Peak Wilderness	0.014	0.026	0.011	0.17	0.13	0.61
North Cascades National Park	0.013	0.024	0.015	0.17	0.19	0.61
Pasayten Wilderness	0.006	0.011	0.005	0.06	0.06	0.21
Mt. Baker Wilderness	0.025	0.042	0.029	0.25	0.26	1.41
Spokane Indian Res.	0.010	0.025	0.003	0.46	0.04	0.11
EPA Proposed Class I SIL	0.100	0.200	0.100	0.30	0.20	1.00

Note: PM10 includes sulfates and nitrates.

Maximum Concentration Predictions (ug/m3)
Includes All Sources

	Annual Average			24-hour		3-hour
Area	NOx	PM10	SO2	PM10	SO2	SO2
Diamond Peak Wilderness	0.003	0.014	0.002	0.15	0.02	0.06
Three Sisters Wilderness	0.007	0.025	0.004	0.31	0.08	0.21
Mt. Jefferson Wildneress	0.007	0.031	0.004	0.37	0.08	0.25
Strawberry Mtn. Wilderness	0.003	0.019	0.002	0.18	0.02	0.12
Mt. Hood Wilderness	0.014	0.051	0.005	0.71	0.07	0.12
CRGNSA	0.047	0.094	0.010	1.54	0.18	0.33
Eagle Cap Wilderness	0.007	0.028	0.003	0.24	0.02	0.08
Hells Canyon Wilderness	0.006	0.022	0.002	0.18	0.01	0.04
Mt. Adams Wilderness	0.010	0.036	0.004	0.41	0.03	0.17
Goat Rocks Wilderness	0.010	0.034	0.004	0.24	0.03	0.11
Mt. Rainier National Park	0.022	0.055	0.010	0.52	0.08	0.35
Olympic National Park	0.019	0.035	0.003	0.43	0.10	0.23
Alpine Lakes Wilderness	0.040	0.077	0.016	0.49	0.11	0.31
Glacier Peak Wilderness	0.020	0.047	0.012	0.28	0.14	0.63
North Cascades National Park	0.022	0.043	0.016	0.32	0.19	0.63
Pasayten Wilderness	0.009	0.020	0.005	0.11	0.06	0.22
Mt. Baker Wilderness	0.041	0.075	0.031	0.38	0.27	1.42
Spokane Indian Res.	0.021	0.055	0.006	0.66	0.07	0.32
EPA Proposed Class I SIL	0.100	0.200	0.100	0.30	0.20	1.00

Note: PM10 includes sulfates and nitrates.


Annual NOx (ug/m3), All Sources
December 1998 - March 15, 1999 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
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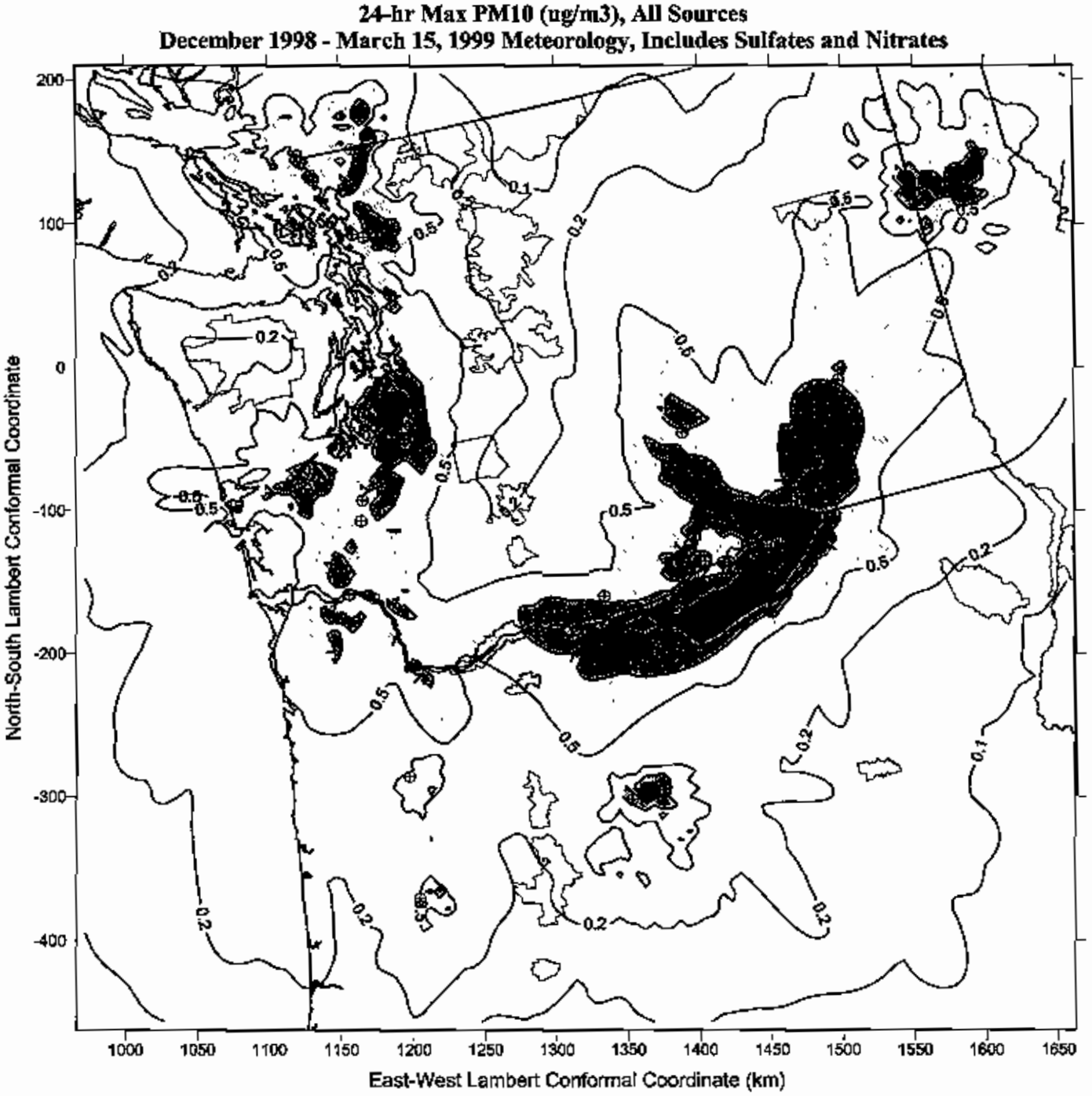
24-hr Max PM10 (ug/m3), All Sources
December 1998 - March 15, 1999 Meteorology, Includes Sulfates and Nitrates
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
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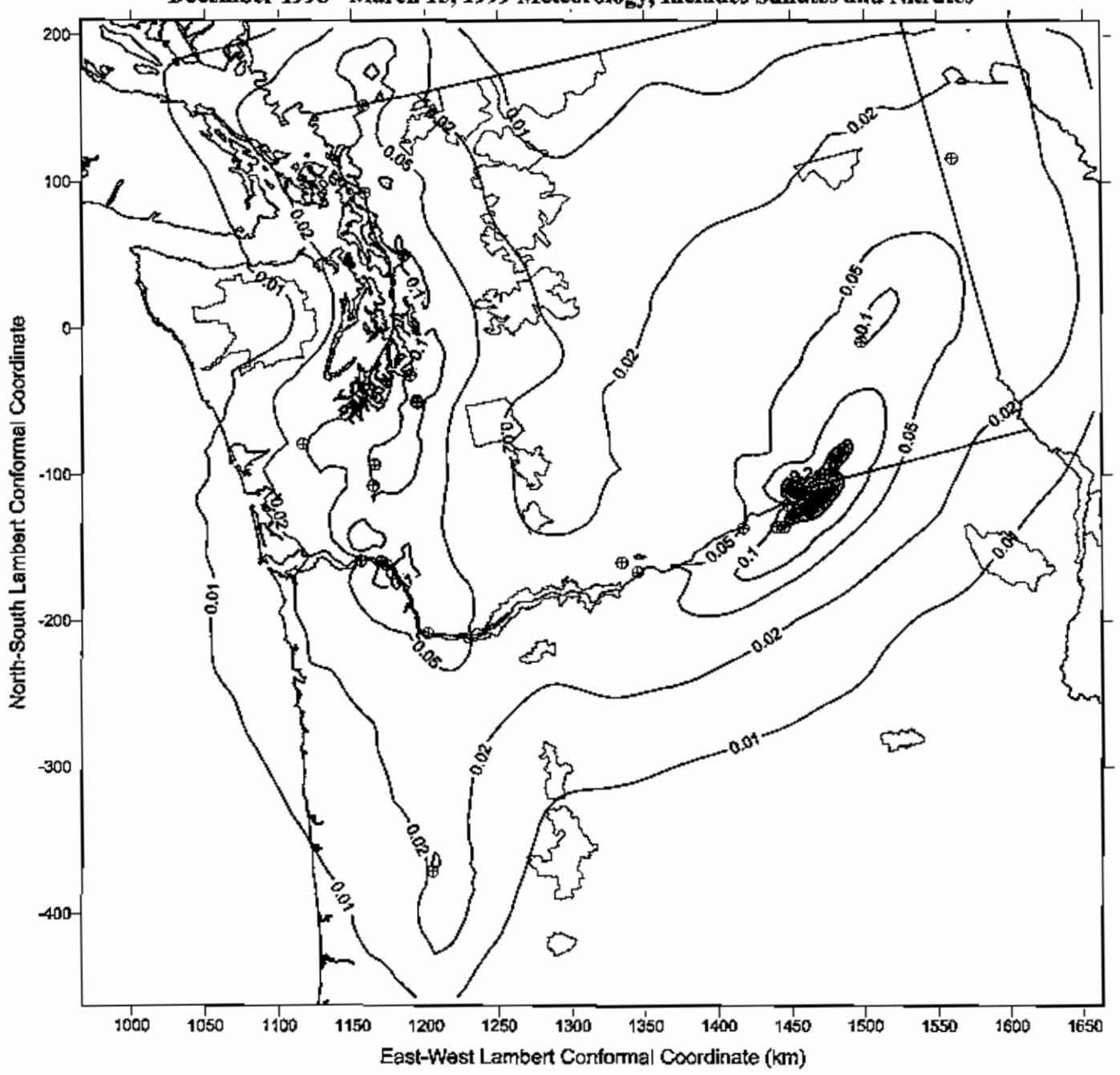
Annual PM10 (ug/m3), Sources with Energization Date Before 1/04
December 1998 - March 15, 1999 Meteorology, Includes Sulfates and Nitrates
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
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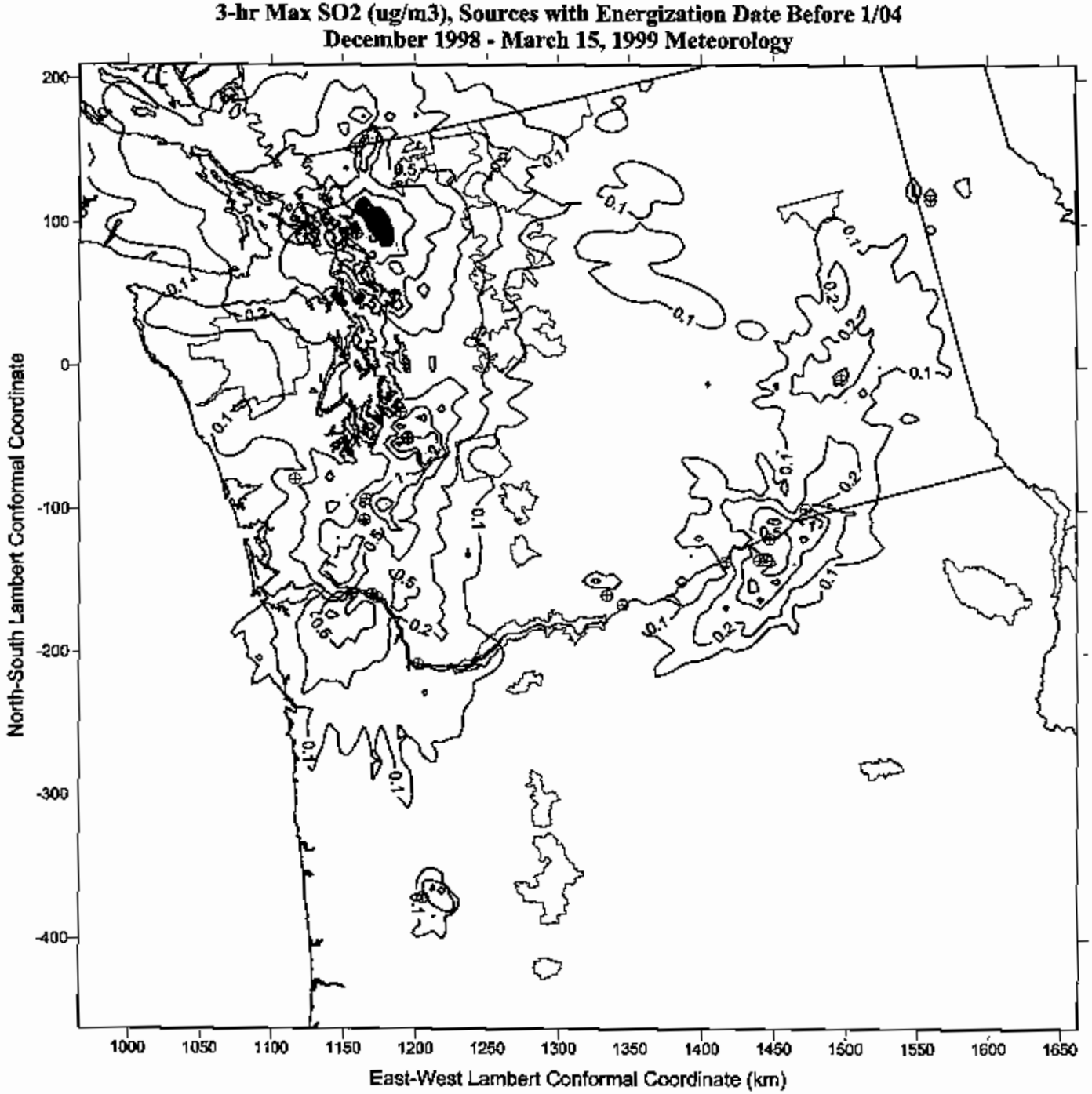
3-hr Max SO2 (ug/m3), Sources with Energization Date Before 1/04
December 1998 - March 15, 1999 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
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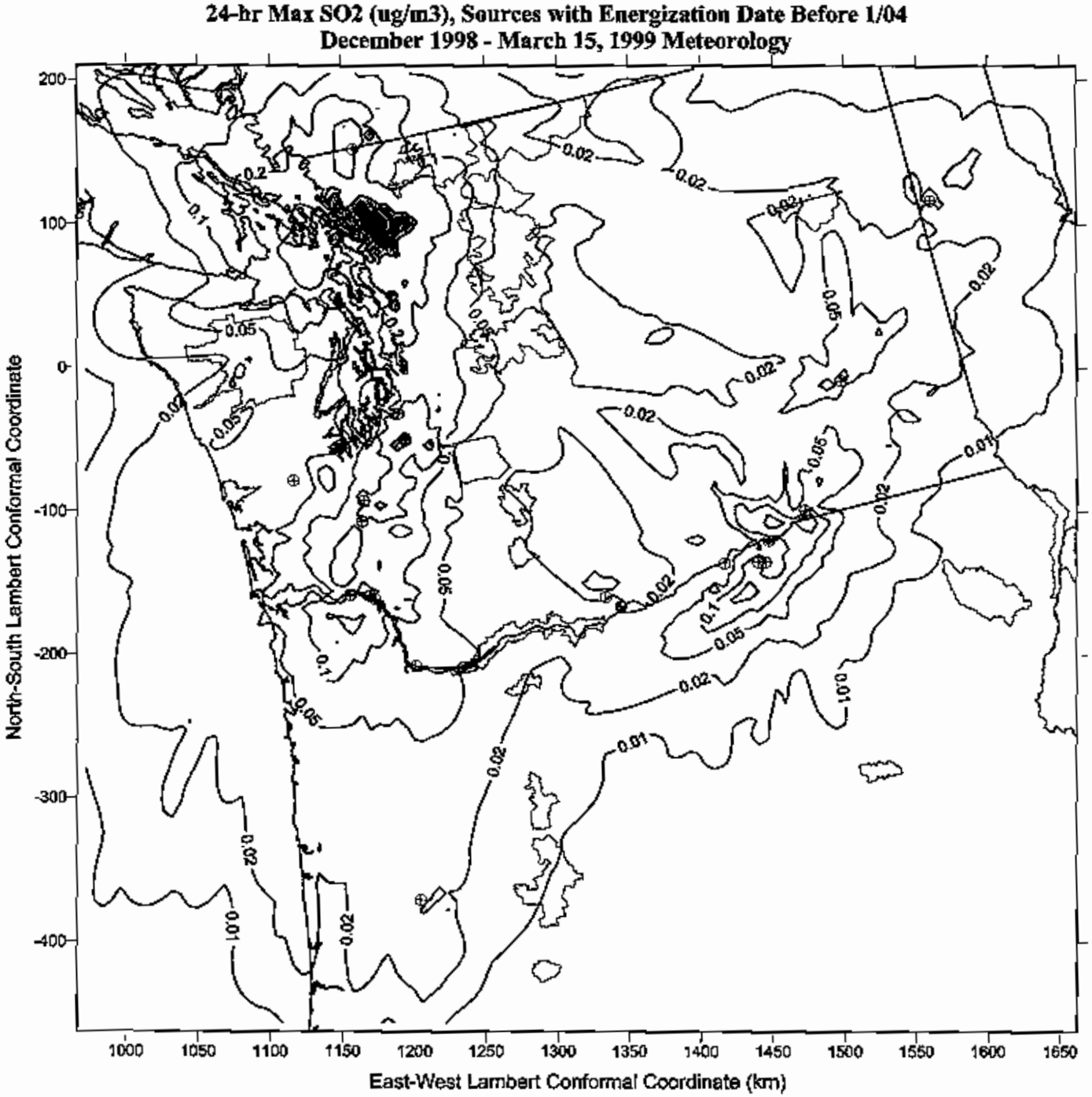
24-hr Max SO2 (ug/m3), Sources with Energization Date Before 1/04
December 1998 - March 15, 1999 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
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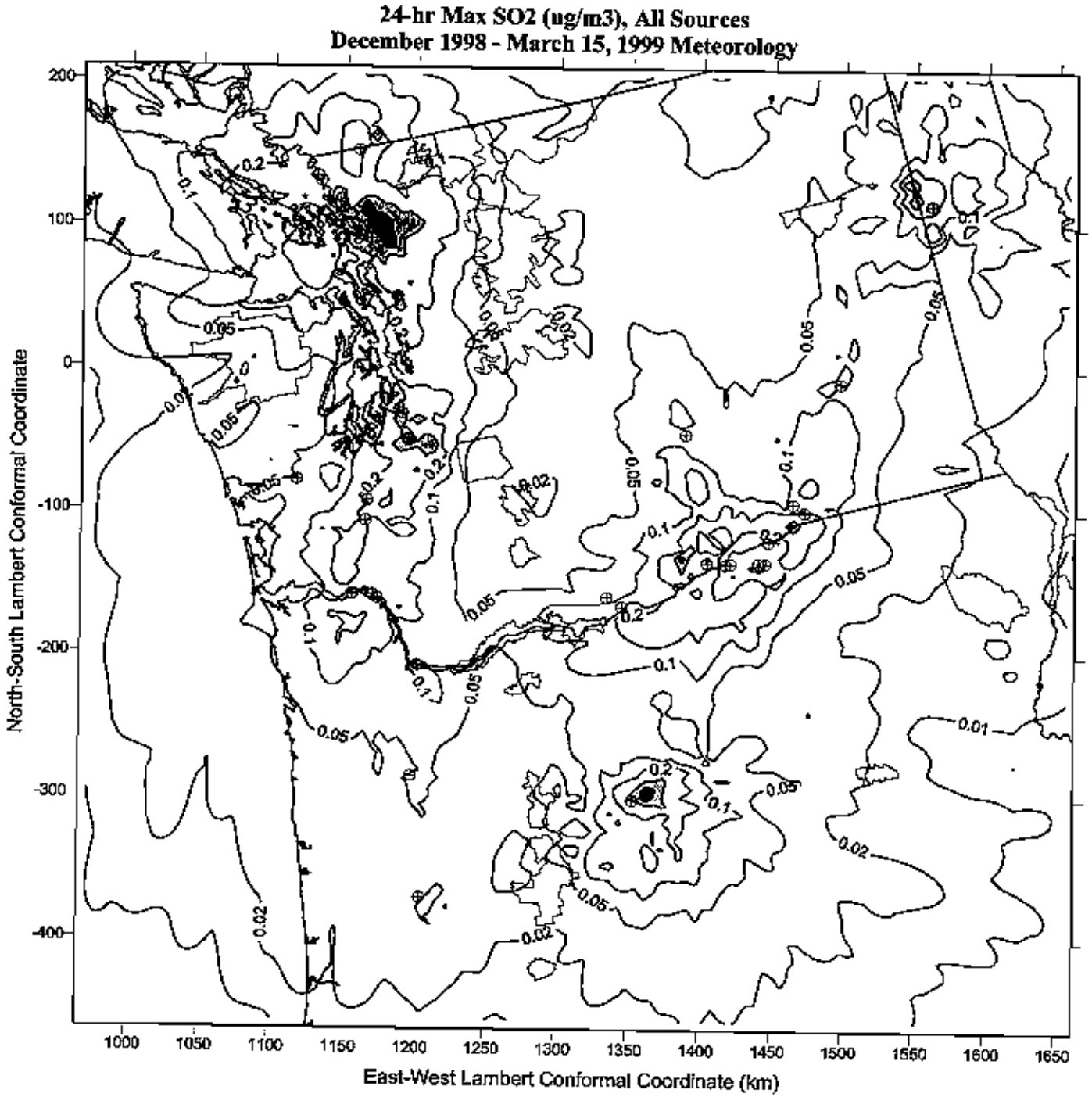
24-hr Max SO2 (ug/m3), All Sources
December 1998 - March 15, 1999 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
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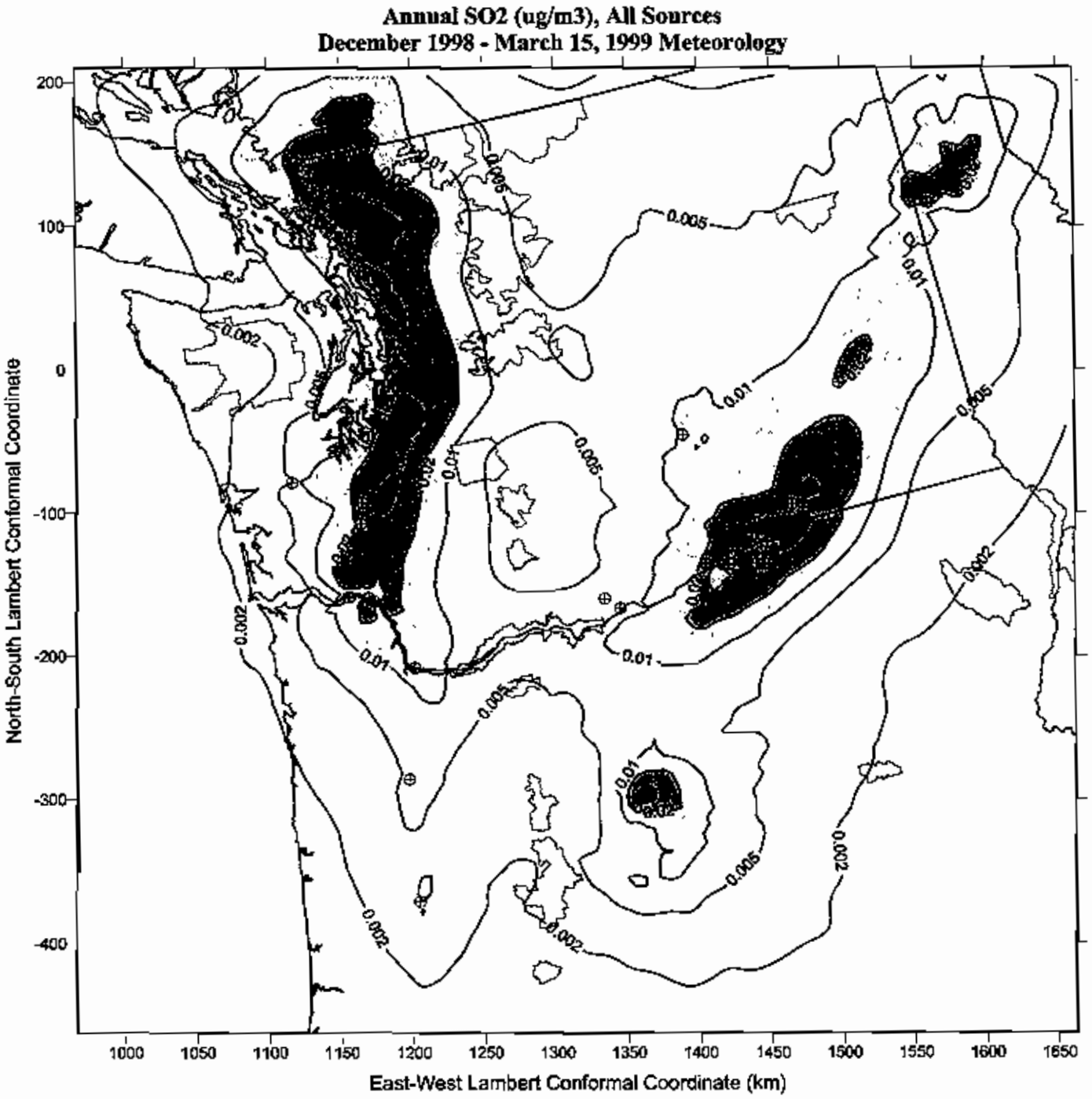
Annual SO2 (ug/m3), All Sources
December 1998 - March 15, 1999 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
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Maximum Annual Deposition (Wet + Dry) Flux
Includes Sources with Energization Dates Before Jan 2004

Area	Annual Sulfur Deposition (kg/ha/yr)				Annual Nitrogen Deposition (kg/ha/yr)			
	Background	Sources	Total	Change (%)	Background	Sources	Total	Change (%)
Diamond Peak Wilderness	4.000	0.001	4.001	0.027%	2.200	0.003	2.203	0.126%
Three Sisters Wilderness	5.600	0.002	5.602	0.040%	3.600	0.007	3.607	0.185%
Mt. Jefferson Wildnerness	4.000	0.002	4.002	0.057%	1.800	0.006	1.806	0.345%
Strawberry Mtn. Wilderness	1.400	0.001	1.401	0.073%	1.200	0.002	1.202	0.192%
Mt. Hood Wilderness	8.600	0.003	8.603	0.039%	5.400	0.008	5.408	0.148%
CRGNSA	12.000	0.006	12.006	0.048%	10.000	0.013	10.013	0.133%
Eagle Cap Wilderness	1.600	0.002	1.602	0.108%	1.600	0.005	1.605	0.327%
Hells Canyon Wilderness	1.400	0.002	1.402	0.123%	1.200	0.005	1.205	0.448%
Mt. Adams Wilderness	10.800	0.004	10.804	0.036%	9.000	0.007	9.007	0.079%
Goat Rocks Wilderness	11.800	0.004	11.804	0.038%	9.000	0.007	9.007	0.077%
Mt. Rainier National Park	3.100	0.009	3.109	0.294%	2.400	0.012	2.412	0.511%
Olympic National Park	5.600	0.004	5.604	0.078%	2.000	0.008	2.008	0.396%
Alpine Lakes Wilderness	7.200	0.019	7.219	0.261%	5.200	0.024	5.224	0.452%
Glacier Peak Wilderness	8.000	0.017	8.017	0.216%	5.800	0.015	5.815	0.261%
North Cascades National Park	3.500	0.026	3.526	0.730%	5.200	0.017	5.217	0.329%
Pasayten Wilderness	7.200	0.009	7.209	0.126%	5.200	0.007	5.207	0.142%
Mt. Baker Wilderness	No Data	0.048			No Data	0.027		
Spokane Indian Res.	No Data	0.003			No Data	0.009		
USFS Criteria			3.000				5.000	

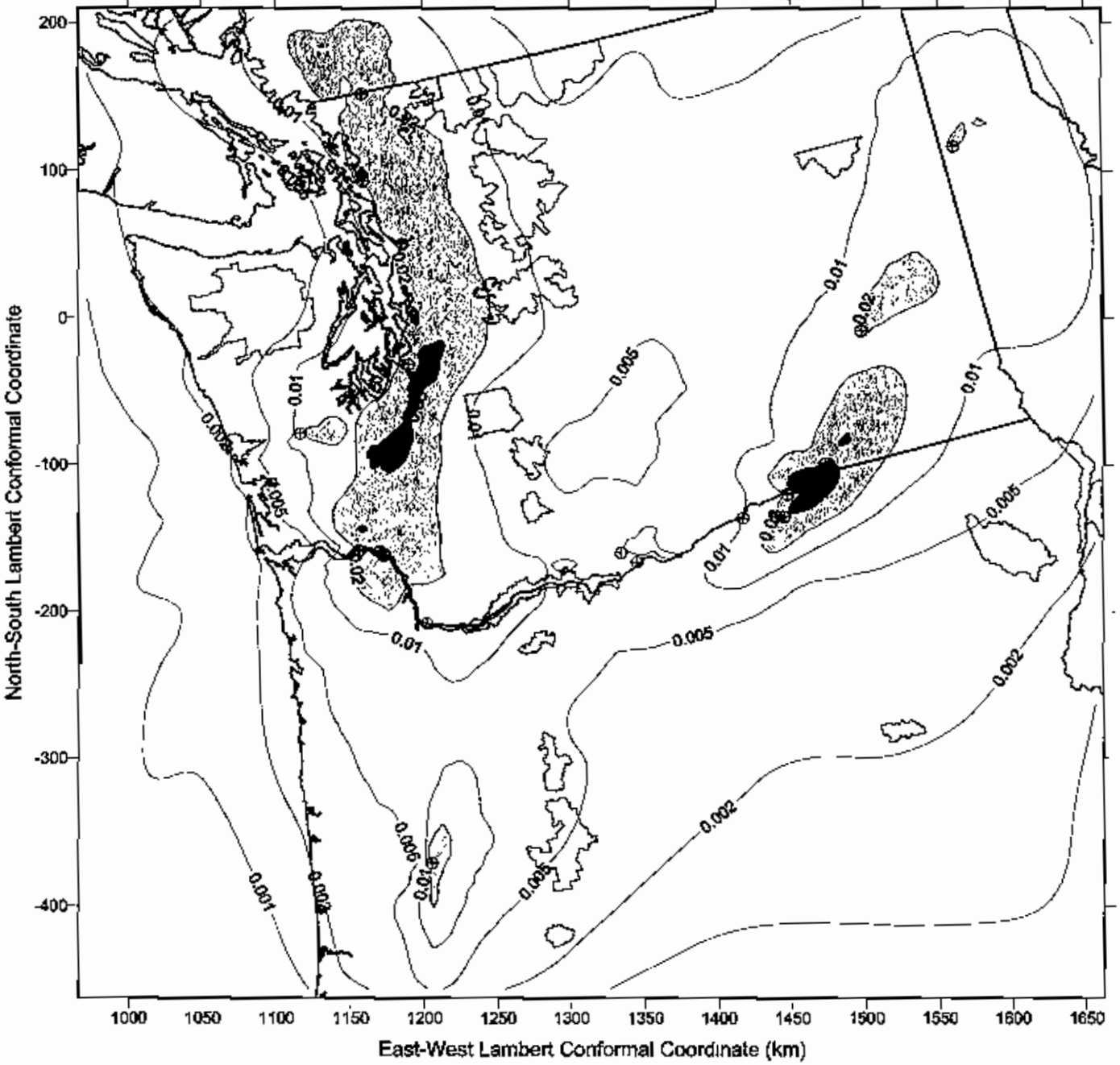
Note: Nitrogen deposition includes ammonium ion.

Maximum Annual Deposition (Wet + Dry) Flux
Includes All Sources

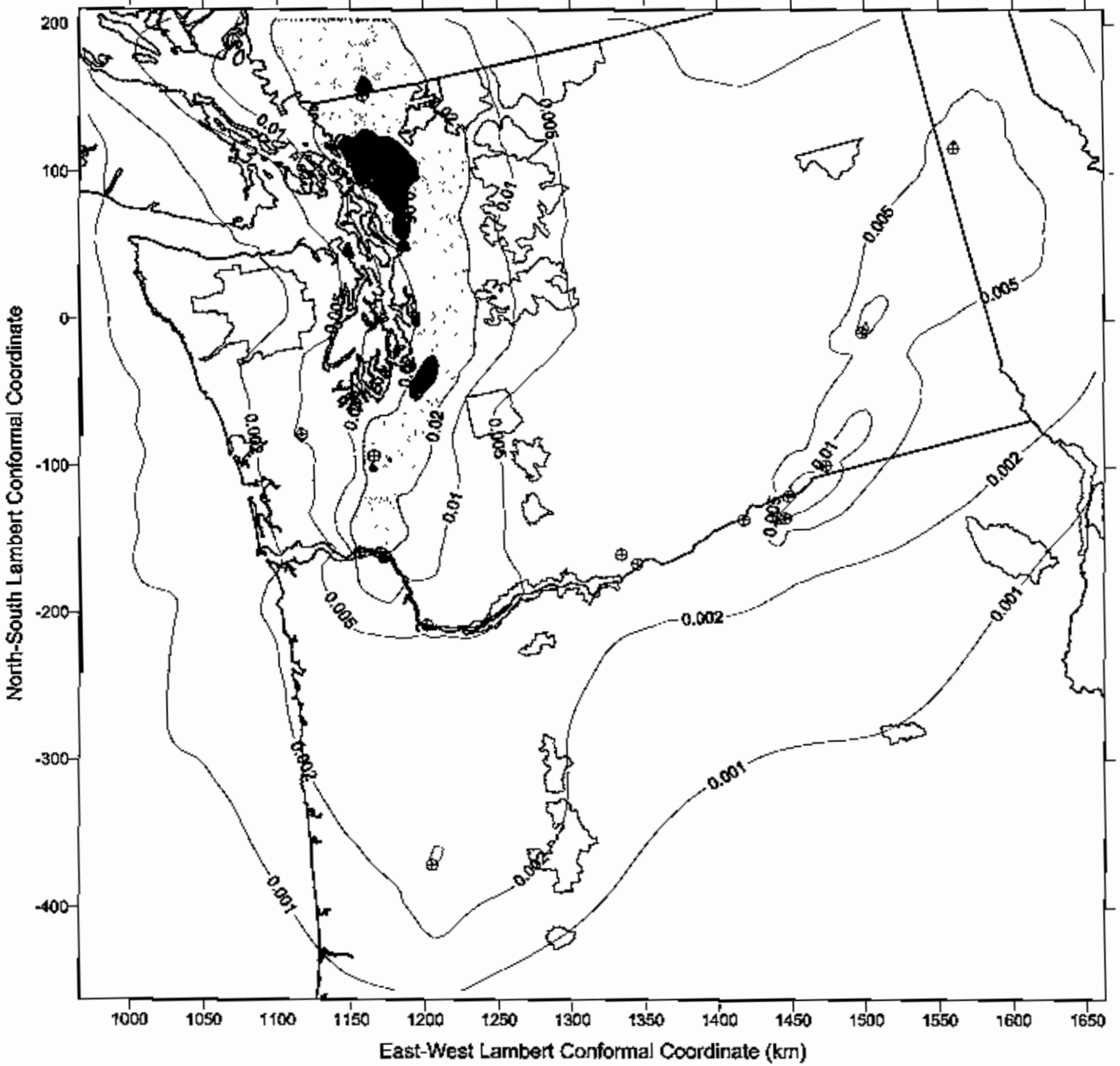
Area	Annual Sulfur Deposition (kg/ha/yr)				Annual Nitrogen Deposition (kg/ha/yr)			
	Background	Sources	Total	Change (%)	Background	Sources	Total	Change (%)
Diamond Peak Wilderness	4.000	0.003	4.003	0.064%	2.200	0.005	2.205	0.231%
Three Sisters Wilderness	5.600	0.006	5.606	0.101%	3.600	0.011	3.611	0.310%
Mt. Jefferson Wildnerness	4.000	0.006	4.006	0.148%	1.800	0.012	1.812	0.644%
Strawberry Mtn. Wilderness	1.400	0.003	1.403	0.194%	1.200	0.005	1.205	0.406%
Mt. Hood Wilderness	8.600	0.006	8.606	0.070%	5.400	0.013	5.413	0.240%
CRGNSA	12.000	0.009	12.009	0.075%	10.000	0.021	10.021	0.214%
Eagle Cap Wilderness	1.600	0.004	1.604	0.250%	1.600	0.010	1.610	0.595%
Hells Canyon Wilderness	1.400	0.004	1.404	0.256%	1.200	0.009	1.209	0.760%
Mt. Adams Wilderness	10.800	0.006	10.806	0.053%	9.000	0.011	9.011	0.126%
Goat Rocks Wilderness	11.800	0.006	11.806	0.049%	9.000	0.010	9.010	0.113%
Mt. Rainier National Park	3.100	0.011	3.111	0.354%	2.400	0.017	2.417	0.706%
Olympic National Park	5.600	0.007	5.607	0.119%	2.000	0.015	2.015	0.758%
Alpine Lakes Wilderness	7.200	0.024	7.224	0.327%	5.200	0.034	5.234	0.654%
Glacier Peak Wilderness	8.000	0.020	8.020	0.250%	5.800	0.023	5.823	0.401%
North Cascades National Park	3.500	0.029	3.529	0.812%	5.200	0.025	5.225	0.483%
Pasayten Wilderness	7.200	0.011	7.211	0.146%	5.200	0.012	5.212	0.222%
Mt. Baker Wilderness	No Data	0.052			No Data	0.040		
Spokane Indian Res.	No Data	0.008			No Data	0.019		
USFS Criteria			3.000				5.000	

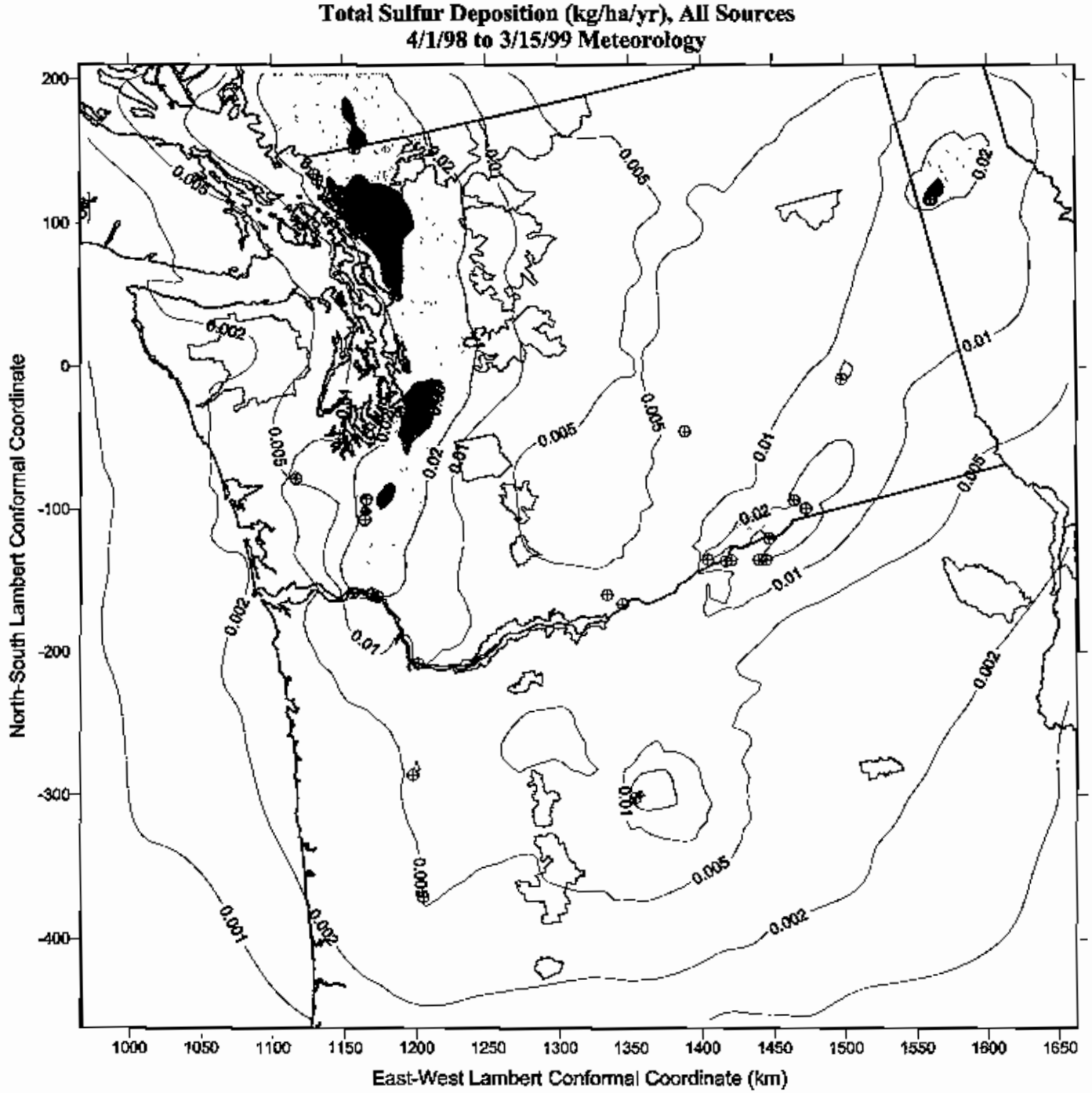
Note: Nitrogen deposition includes ammonium ion.

Total Nitrogen Deposition (kg/ha/yr), Sources with Energization Date Before 1/04
4/1/98 to 3/15/99 Meteorology, Includes Ammonium Ion



Total Sulfur Deposition (kg/ha/yr), Sources with Energization Date Before 1/04
4/1/98 to 3/15/99 Meteorology




Total Sulfur Deposition (kg/ha/yr), All Sources
4/1/98 to 3/15/99 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
200
100
0
-100
-200
-300
-400
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
0.001
0.002
0.005
0.01
0.02

Number of Days with Greater than 5% Change to Background Extinction
Includes Sources with Energization Dates Before Jan 2004

Area	Spring	Fall	Summer	Winter	Total
Diamond Peak Wilderness	0	0	0	0	0
Three Sisters Wilderness	1	1	0	0	2
Mt. Jefferson Wildnerness	0	0	0	1	1
Strawberry Mtn. Wilderness	0	0	0	0	0
Mt. Hood Wilderness	2	2	0	5	9
CRGNSA	3	9	9	5	26
Eagle Cap Wilderness	0	1	0	0	1
Hells Canyon Wilderness	0	0	0	0	0
Mt. Adams Wilderness	1	0	0	2	3
Goat Rocks Wilderness	0	1	0	0	1
Mt. Rainier National Park	13	4	4	1	22
Olympic National Park	1	7	0	8	16
Alpine Lakes Wilderness	19	6	5	10	40
Glacier Peak Wilderness	6	6	6	6	24
North Cascades National Park	3	3	2	5	13
Pasayten Wilderness	0	0	0	0	0
Mt. Baker Wilderness	12	9	11	11	43
Spokane Indian Res.	0	2	0	5	7

Background extinction based on aerosol concentrations on days with the best visibility. For the CRGNSA and Spokane Indian Reservation based on top 20 percent, for all other areas based on the average of the top 5 percent.

Number of Days with Greater than 5% Change to Background Extinction
Includes All Sources

Area	Spring	Fall	Summer	Winter	Total
Diamond Peak Wilderness	0	0	0	0	0
Three Sisters Wilderness	6	9	5	2	22
Mt. Jefferson Wildnerness	2	5	0	3	10
Strawberry Mtn. Wilderness	0	0	0	2	2
Mt. Hood Wilderness	5	17	3	6	31
CRGNSA	10	19	17	11	57
Eagle Cap Wilderness	1	2	0	3	6
Hells Canyon Wilderness	0	0	0	0	0
Mt. Adams Wilderness	1	8	0	7	16
Goat Rocks Wilderness	2	6	0	2	10
Mt. Rainier National Park	18	11	9	8	46
Olympic National Park	8	14	1	16	39
Alpine Lakes Wilderness	28	19	16	22	85
Glacier Peak Wilderness	12	12	12	12	48
North Cascades National Park	6	6	6	7	25
Pasayten Wilderness	1	2	0	4	7
Mt. Baker Wilderness	18	20	18	17	73
Spokane Indian Res.	0	9	2	13	24

Background extinction based on aerosol concentrations on days with the best visibility. For the CRGNSA and Spokane Indian Reservation based on top 20 percent, for all other areas based on the average of the top 5 percent.

Number of Days with Greater than 10% Change to Background Extinction
Includes Sources with Energization Dates Before Jan 2004

Area	Spring	Fall	Summer	Winter	Total
Diamond Peak Wilderness	0	0	0	0	0
Three Sisters Wilderness	0	0	0	0	0
Mt. Jefferson Wildnerness	0	0	0	0	0
Strawberry Mtn. Wilderness	0	0	0	0	0
Mt. Hood Wilderness	0	0	0	1	1
CRGNSA	0	0	0	1	1
Eagle Cap Wilderness	0	0	0	0	0
Hells Canyon Wilderness	0	0	0	0	0
Mt. Adams Wilderness	0	0	0	0	0
Goat Rocks Wilderness	0	0	0	0	0
Mt. Rainier National Park	6	1	0	0	7
Olympic National Park	0	1	0	1	2
Alpine Lakes Wilderness	4	0	0	3	7
Glacier Peak Wilderness	0	0	0	0	0
North Cascades National Park	0	1	0	0	1
Pasayten Wilderness	0	0	0	0	0
Mt. Baker Wilderness	2	2	2	1	7
Spokane Indian Res.	0	1	0	0	1

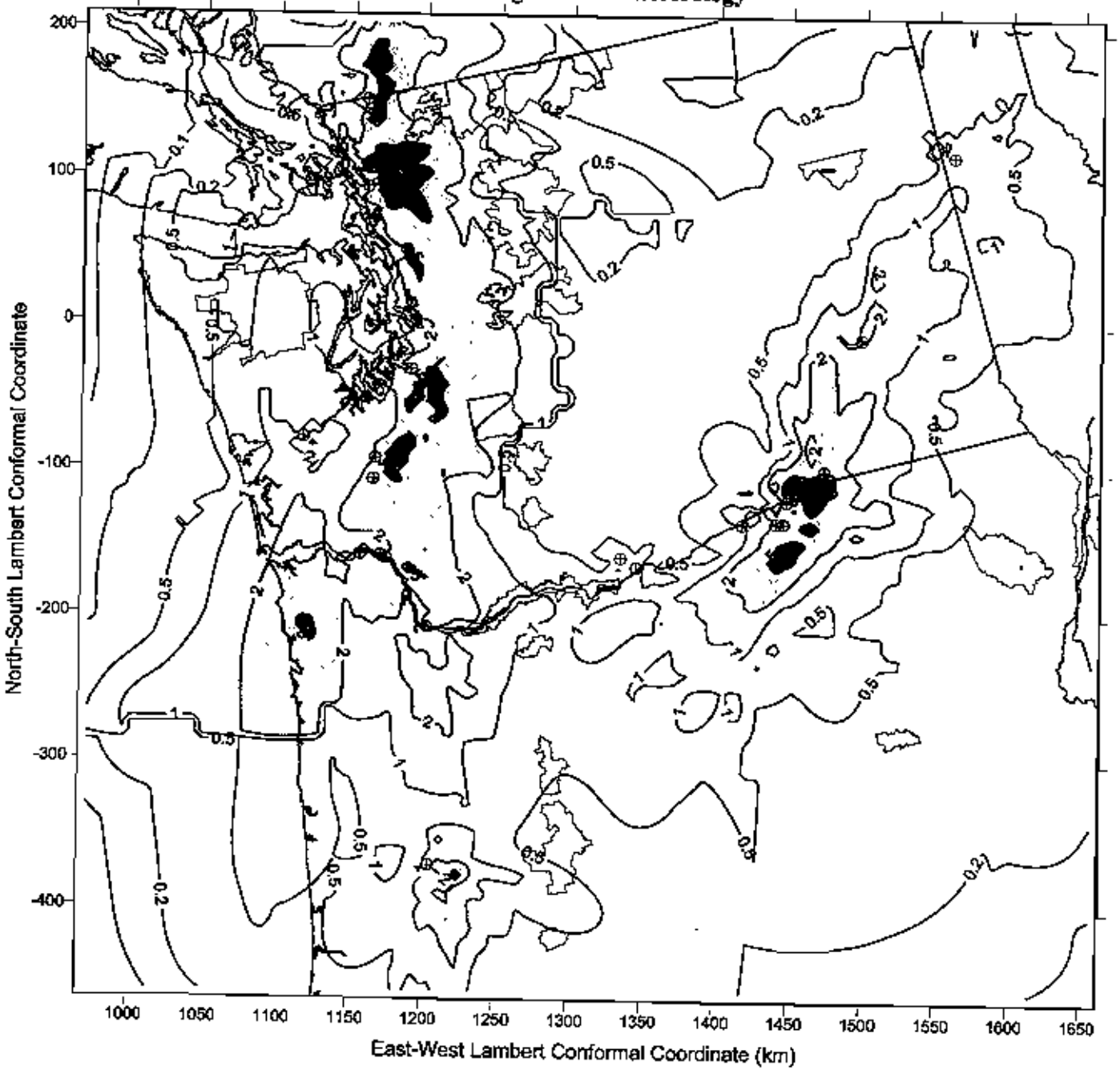
Background extinction based on aerosol concentrations on days with the best visibility. For the CRGNSA and Spokane Indian Reservation based on top 20 percent, for all other areas based on the average of the top 5 percent.

Number of Days with Greater than 10% Change to Background Extinction
Includes All Sources

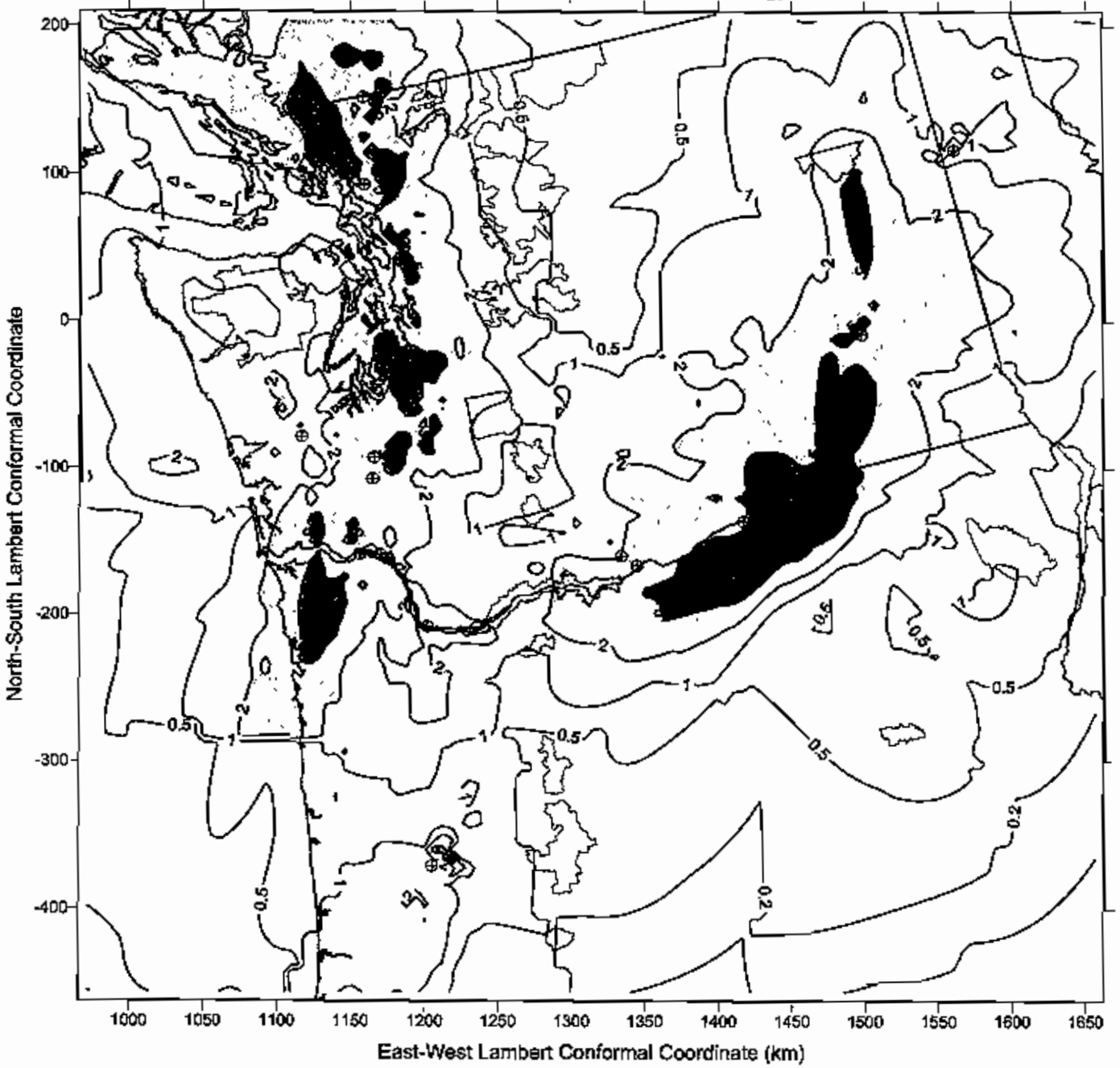
Area	Spring	Fall	Summer	Winter	Total
Diamond Peak Wilderness	0	0	0	0	0
Three Sisters Wilderness	0	2	0	1	3
Mt. Jefferson Wildnerness	0	0	0	2	2
Strawberry Mtn. Wilderness	0	0	0	0	0
Mt. Hood Wilderness	0	2	0	5	7
CRGNSA	0	9	1	6	16
Eagle Cap Wilderness	0	0	0	0	0
Hells Canyon Wilderness	0	0	0	0	0
Mt. Adams Wilderness	0	1	0	2	3
Goat Rocks Wilderness	0	0	0	0	0
Mt. Rainier National Park	9	2	1	0	12
Olympic National Park	0	6	0	5	11
Alpine Lakes Wilderness	12	2	0	4	18
Glacier Peak Wilderness	1	1	1	1	4
North Cascades National Park	0	1	0	1	2
Pasayten Wilderness	0	0	0	0	0
Mt. Baker Wilderness	5	5	5	5	20
Spokane Indian Res.	0	4	0	2	6

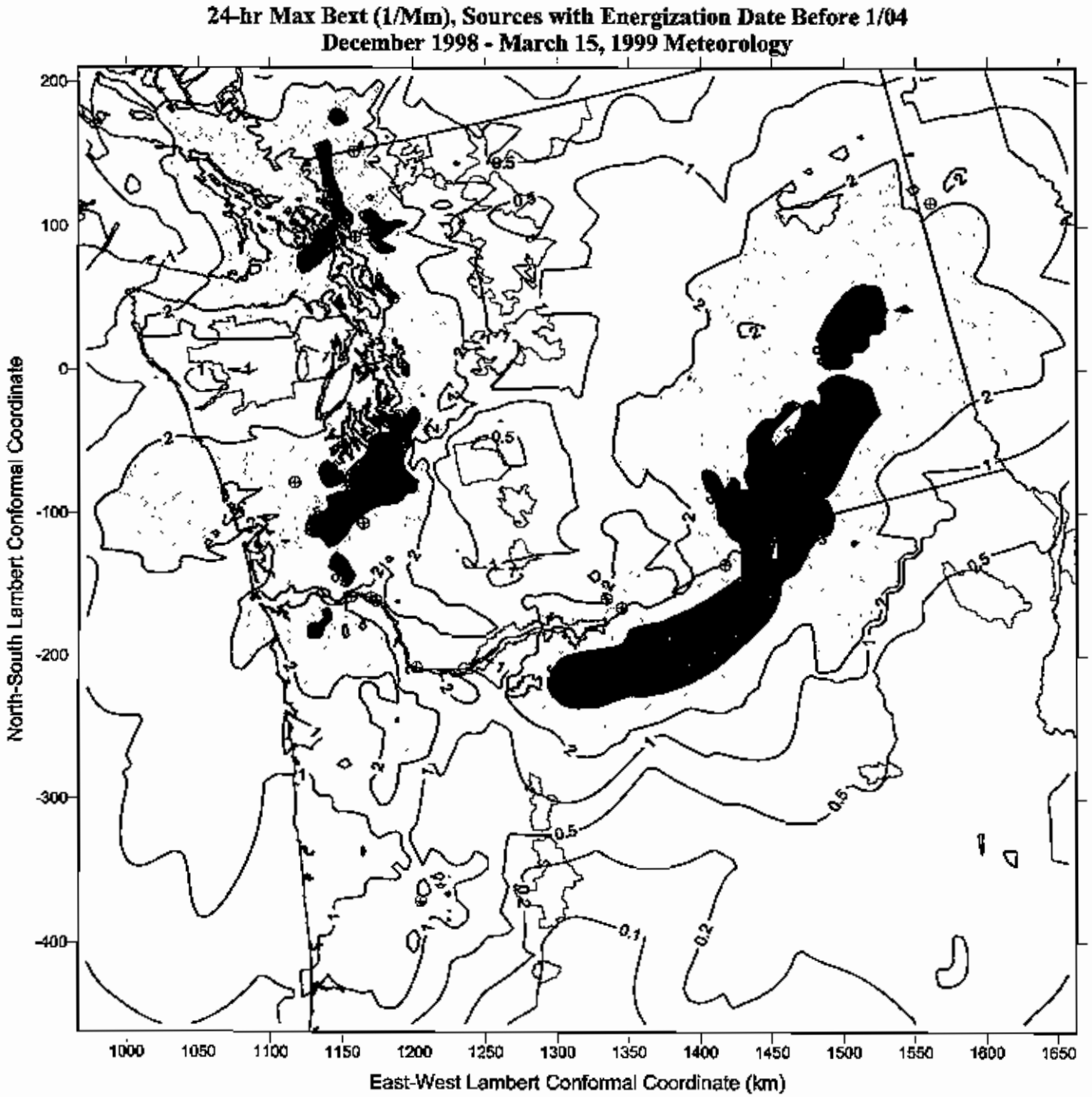
Background extinction based on aerosol concentrations on days with the best visibility. For the CRGNSA and Spokane Indian Reservation based on top 20 percent, for all other areas based on the average of the top 5 percent.

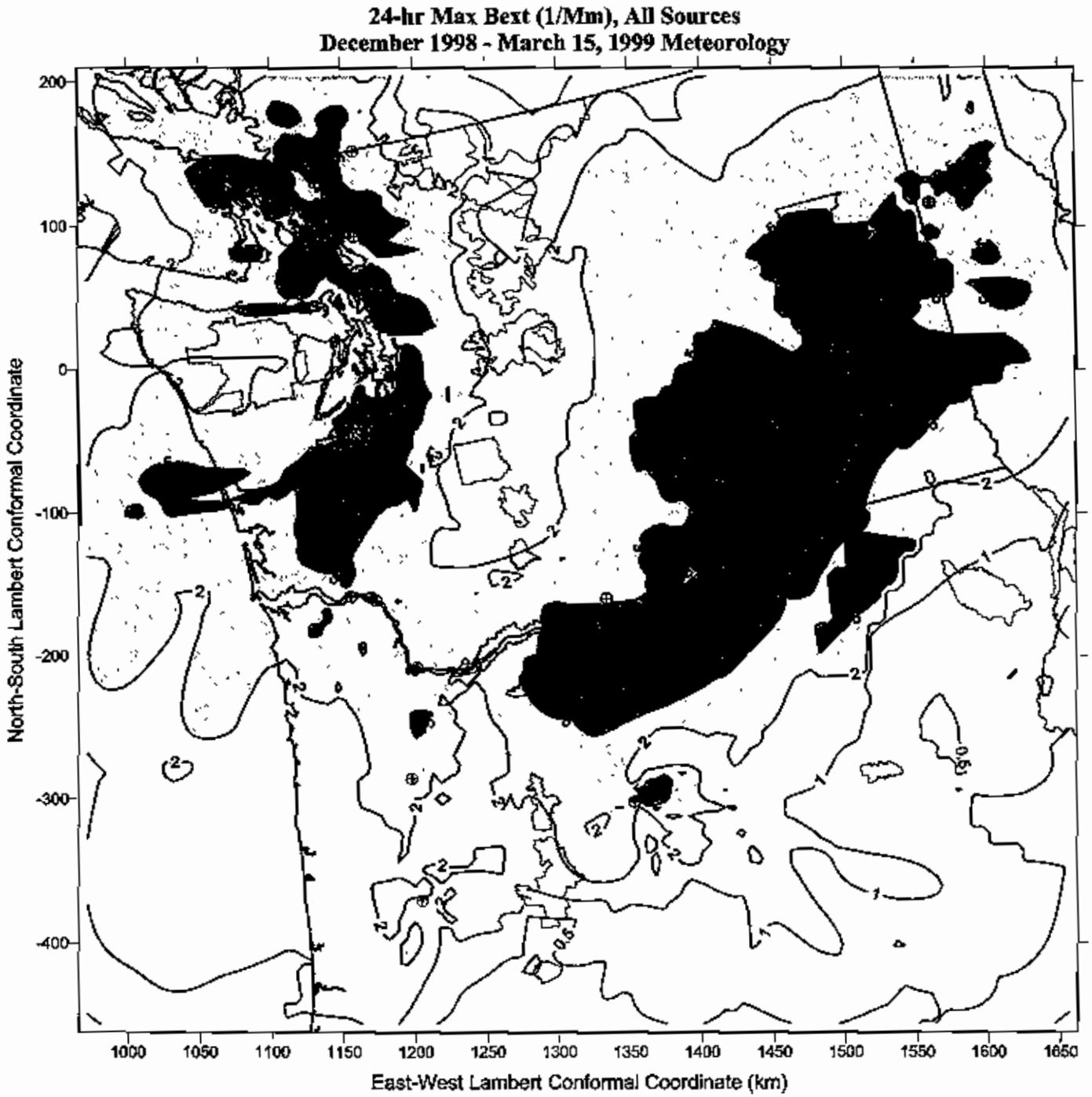
24-hr Max Bext (1/Mm), Sources with Energization Date Before 1/04
June - August 1998 Meteorology



24-hr Max Bext (1/Mm), Sources with Energization Date Before 1/04
September - November 1998 Meteorology




24-hr Max Bext (1/Mm), Sources with Energization Date Before 1/04
December 1998 - March 15, 1999 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
200
100
0
-100
-200
-300
-400
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650


24-hr Max Bext (1/Mm), All Sources
December 1998 - March 15, 1999 Meteorology
North-South Lambert Conformal Coordinate
East-West Lambert Conformal Coordinate (km)
200
100
0
-100
-200
-300
-400
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650

Regional Air Quality Impacts Study
Carbon Dioxide Emissions from Proposed Power Plants
(08/01/2001)

Source Name	State	Ener. Date	Net Output (MW) Ann Avg	CO2 Annual (tons)
AES COLUMBIA				
Columbia River Project	WA	May-02	220	1,201,718
AVISTA				
Coyote Springs 2	OR	Jun-02	280	920,939
Mint Farm Generation Project I	WA	Jul-03	248	1,001,835
Columbia Peaking Generation Project	WA	Dec-01	192	775,614
BP				
Cherry Point	WA	Jan-04	750	3,029,744
CALPINE				
Ferndale	WA	Jun-05	600	2,423,795
Fredrickson	WA	May-02	350	1,413,881
Hermiston	OR	Sep-02	546	2,205,654
Hermiston II	OR	Jun-04	600	2,423,795
Hermiston Peaker	OR	Dec-01	200	807,932
Mount Vernon	WA	Jun-05	600	2,423,795
Salem (Bethel PGE)	OR	Jun-04	600	2,423,795
Vancouver a (Alcoa)	WA	Nov-01	100	403,966
Vancouver b (Alcoa)	WA	Jun-05	600	2,423,795
Goldendale Energy Project	WA	Jul-02	248	1,001,835
COGENTRIX				
Rathdrum Power, LLC	ID	Aug-01	270	1,090,708
Mercer Ranch Generation Project	WA	Oct-04	800	3,231,727
Grizzly Power	OR	Jul-04	874	3,530,662
Northern Idaho Power	ID	Dec-04	810	3,272,124
CONFEDERATED TRIBES				
Umatilla Tribal Generation Project	OR	Jul-03	1,000	4,814,671
DUKE				
Pierce County Project	WA	Jan-03	84	90,084
Satsop CT Project - Phase I	WA	Jan-03	562	2,042,963
Satsop CT Project - Phase II	WA	Oct-04	638	2,392,847
Satsop CT Project - Phase III	WA	Oct-04	638	2,392,847
ENRON				
Longview Energy	WA	Jul-03	290	1,126,567
CO2 from burning #2 fuel oil	WA	Jul-03	-------	265,898
FPL/NORTHWEST POWER				
Everett Delta I	WA	Sep-02	248	973,674
Everett Delta II	WA	Sep-02	248	973,674
FRONTIER ENERGY				
Coburg Power	OR	Aug-03	570	1,943,368
CO2 from burning #2 fuel oil	OR	Aug-03	-------	1,458,686
GRANT County LLC				
Mattawa (Grant Co)	WA	Jun-05	1,300	5,251,556

Regional Air Quality Impacts Study
Carbon Dioxide Emissions from Proposed Power Plants
(08/01/2001)

Source Name	State	Ener. Date	Net Output (MW) Ann Avg	CO2 Annual (tons)
Kootenai Generation				
Kootenai Power (Rathdrum)	ID	Jun-05	1,240	5,009,177
NESCO				
Sumas Energy 2	WA	Jan-02	660	2,417,744
NEWPORT GENERATION				
Wallula Power Project	WA	Jul-04	1,300	5,251,556
NORTHWEST POWER ENT.				
Starbuck	WA	Oct-03	1,180	3,769,997
PG&E				
Umatilla Generating Project	OR	Nov-03	580	2,077,749
Morrow Generating Project	OR	Jan-05	580	2,077,749
PORTLAND GENERAL ELECTRIC				
Coyote Springs I only	OR	On-line	250	1,000,783
CO2 from burning #2 fuel oil	OR	On-line	-------	82,520
Port Westward	OR	Dec-03	650	2,480,718
PUGET SOUND ENERGY				
Fredonia Facility	WA	Jul-01	No Data	
SOUTHWESTERN POWER GROUP				
Port of Tacoma Generation Project Phase I Peaking Project	WA	Jun-02	170	158,625
Port of Tacoma Phase II (5 units)	WA	Jun-04	No Data	793,125
SUMMIT				
Goldendale (The Cliffs)	WA	Feb-02	225	977,550
Summit/Westward (Clatskanie)	OR	Nov-03	520	1,857,120
TRACTABEL				
Chehalis Generating Facility	WA	Nov-03	520	1,725,240
CO2 from burning #2 fuel oil	WA	Nov-03		208,050
TRANSALTA				
TransAlta Centralia Generation LLC Big Hanaford Project	WA	Jun-01	174	702,901
WESTCOAST				
Frederickson Power	WA	May-02	249	1,005,875
Frederickson Power II	WA	Jan-04	249	917,610
Total				92,248,239