CLASS I APPLICATION REVIEW

TITLE V FACILITY-WIDE OPERATING PERMIT

FOR:

SIERRA PACIFIC POWER CO.
NORTH VALMY GENERATING STATION

AP4911-0457

Interstate-80, Stonehouse Exit
Valmy, Nevada 89410

BY

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

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1.0 INTRODUCTION

Sierra Pacific Power Company - North Valmy Generating Station (Valmy), submitted a Class I Air Quality Operating Permit minor revision application on April 16, 2007. Valmy consists of two steam electric generating units that can be fired on a number of coal-based fuels with a wide range of heating value and chemical composition. There are 28 permitted sources, as well as several insignificant activities. The plant will consist of:

- One Babcock & Wilcox balanced draft pulverized coal-fired boiler
- One Foster Wheeler balanced draft pulverized coal-fired boiler
- Coal Handling System
- Circulating Water Treatment System
- Fly Ash Handling System
- Lime Scrubber System
- Cooling Tower System
- One 150,000 gallon fuel oil storage tank
- One Auxiliary Boiler

There are two permitted sources addressed in this minor revision of a Class I Operating Permit application. Overfire air is being added to the Valmy Unit 1 and Unit 2 boilers as an emissions control device to reduce the emissions of nitrogen oxides (NO_X) from each boiler. This control device addition is necessary to comply with changes in allowable NOx emissions levels in 40 CFR Part 76.7(a) by December 31, 2007. As both Unit 1 and Unit 2 boilers are defined as “dry bottom wall fired boilers,” effective January 1, 2008, the allowable NO_X emissions levels will be reduced from 0.70 lb/MMBtu based on an annual average to 0.46 lb/MMBtu based on an annual average for Unit #1; and from 0.50 lb/MMBtu based on an annual average to 0.46 lb/MMBtu based on an annual average for Unit #2. The hourly emissions, averaged over 30 days, will remain based on 0.70 lb/MMBtu and 0.50 lb/MMBtu, respectively. The remaining 26 permitted sources and other insignificant sources for the North Valmy Generating Station will remain unchanged.

2.0 Facility Description

The North Valmy Station consists of two steam electric generating units that can be fired on a number of coal-based fuels with a wide range of heating value and chemical composition. The North Valmy Station generates electricity by releasing chemical energy through combustion of organic fuels, primarily coal. The combustion of coal releases a tremendous quantity of heat that is transferred by a heat exchanger to water. The heated water becomes superheated steam that is used to turn several turbines, which in turn powers a generator creating electricity.

3.0 FACILITY LOCATION

The North Valmy Station is located approximately 4 miles north of US Interstate Highway 80 between Winnemucca, Nevada and Battle Mountain, Nevada. North Valmy is at an elevation of 4,400 feet above mean sea level and is located on the valley floor of a large intermountain basin. Mountainous terrain rises approximates 600 feet above the base elevation of the plant at a distance of approximately 13 miles to the east of the plant; to the west, elevated terrain is approximately 10 miles from the plant and rises approximately 500 feet above the valley floor; to the south, elevated terrain is approximately 9 miles from the plant and rises approximately 500 feet above the valley floor; to the north, terrain is approximately 26 miles and rises approximately 600 feet above the valley floor. Activity surrounding the plant consists of mining, ranching, and industrial and commercial activity in Battle Mountain, which is located approximately 15 miles to the east. Residential development is generally sparse throughout the valley with more concentrated development in the towns of Valmy and Battle Mountain.

Access to the plant is made by taking the Stonehouse Exit on I-80 and traveling approximately 13 miles north along a two-lane paved road owned by SPPCo. Ownership of the facility is a joint partnership between SPPC and Idaho Power. The property located between the entrance to the private road off of I-80 and the facility is owned/controlled by SPPCo. A security checkpoint and fence is installed just prior to entering the facility.

Partial makeup water requirements for the boilers are supplied by dewatering gold mining pits at the Newmont Lone Tree Mine, located approximately 13.5 miles south of the power station on the south side of I-80. The Lone Tree Mine is the nearest BAPC permitted source to the Valmy Station.

4.0 PROCESS DESCRIPTION

System 1: Unit #1 Boiler
The Valmy Facility's principle product is electricity supplied to a distribution grid (Standard Industrial Classification code of 4911). The principle operating scenario for the plant is for the production of steam from pulverized coal in two main units. The Valmy Unit #1 boiler (S2.001) Engineering Payment was made to the boiler vendor on July 1, 1977, the recognized contractual commitment is September 20, 1977. According to the application, this unit was constructed in 1979.

Boiler unit #1 (S2.001) is a Babcock and Wilcox dry bottom boiler firing either pulverized bituminous or sub-bituminous coal at a design heat input rate of 2,560 MMBtu/hr. #2 grade fuel oil by itself, or #2 fuel oil blended with "on-spec" used oil is used only to startup this unit from a cold start and for flame stabilization purposes in the coal burners (24) installed in Unit #1.

"On-spec" used oil is defined as non-hazardous used oil meeting the requirements of 40 CFR Part 279, Standards for the Management of Used Oil. Valmy receives several loads per year (1,000-2,000 gals/load) of "on-spec" used oil from facilities which it operates. The "on-spec" oil is sampled upon receipt for metals and halogen content in order to comply with the requirements of 40 CFR 60 Part 279, Standards for the Management of Used Oil. Part 279 requires used oil burners to certify a load of used oil as being non-hazardous prior to its combustion. BAPC will stipulate in the permit conditions that the used oil which Valmy burns must be generated only from Sierra Pacific Power Company's facilities, e.g., no outside sources of used oil are permitted to be burned at Valmy. The used oil is stored separately from the main fuel oil storage tank in a 1,850 gallon poly-propylene storage tank.

According to SPPCo documentation supplied to the BAPC, the maximum design capacity of fuel oil injection per burner in Unit #1 is 1.6 gpm of oil (13.3 MMBtu/hr). Oil is therefore used only for warming up a cold unit (0-12 hrs) and to stabilize the combustion of pulverized coal in a particular burner when bringing it on/off line. As oil is not designed to generate/supplement any electrical production, oil combustion does not represent a separate operating scenario in Unit #1. In SPPCo's application, the facility has estimated a maximum usage of fuel oil in Unit #1 for startups/shutdowns at 0.45% of the total annual heat input. Thus, BAPC will recognize the use of fuel oil in Unit #1 as a short-term startup/shutdown fuel and not as a supplemental fuel which would require a separate operating scenario in addition to coal combustion. Unit #1 is requested to operate 8,760 hrs/yr. Historically at Valmy, the maximum fuel oil consumed in any one year plant-wide was 683,791 gallons.

Emissions from Unit #1 are controlled by low NO_x burners and baghouses to remove particulate matter and PM_{10}. Emissions from this unit are monitored and recorded by NO_x, SO_2, CO_2, O_2, and opacity continuous monitoring and data recording systems.

4.0 PROCESS DESCRIPTION (continued)

System 2: Unit #2 Boiler
Unit #2 (S2.002) is a Foster Wheeler dry bottom boiler firing either pulverized bituminous or sub-bituminous coal at a design heat input rate of 2,881.02 MMBtu/hr. The Unit #2 boiler (S2.002) contractual commitment is recognized as April 11, 1979. According to the application, this unit was constructed in 1981. #2 grade fuel oil by itself, or #2 fuel oil blended with "on-spec" used is used only to startup this unit from a cold start and for flame stabilization purposes in the coal burners (16) installed in this unit. According to SPPCo documentation supplied to BAPC, the maximum design capacity of fuel oil injection per burner is 2.25 gpm of oil (18.7 MMBtu/hr). Oil is therefore used only for warming up a cold unit (0-12 hrs) and to stabilize the combustion of pulverized coal in a burner when bringing it on/off line. As oil is not designed to generate/supplement any electrical production, oil combustion does not represent a separate operating scenario in Unit #2. In SPPCo's application, the facility has also estimated a maximum usage of fuel oil for Unit #2 startups/shutdowns at 0.45% of the total annual heat input. Thus, BAPC will recognize the use of fuel oil in Unit #2 as a short-term startup/shutdown fuel and not as a supplemental fuel which would require a separate operating scenario from coal combustion. Unit #2 is also permitted to operate 8,760 hrs/yr.

Emissions from Unit #2 are controlled by low NO_x burners, baghouses to remove particulate matter and PM_{10}, and a spray dryer using a lime slurry to scrub SO_2 emissions at a minimum removal efficiency of 70%. Emissions from this unit are also monitored and recorded by NO_x, SO_2, CO_2, O_2, and opacity continuous monitoring and data recording systems.

System 3: Coal Handling System
Particulate matter emissions from the coal handling system are controlled by 10 fabric filter collectors (dust collectors located at key transfer points). The coal handling system includes coal handling, crushing, transfer, and conveying equipment. The coal conveyors measure approximately 3,500 feet in length.

The covered conveyors are kept under negative pressure and any resulting emissions from the coal conveyors are ducted to the 10 fabric filter collectors. Coal is brought to the facility on a daily basis by rail from mines in Western states such as Utah and Wyoming. The portion of the coal that is not loaded to the eight storage silos is maintained in the storage yard in a 30-day reserve pile to account for any disruptions in rail service. Fugitive emissions from the reserve piles are controlled through grading, compaction, and the spraying of either foam or surfactant in the conveyors. In the winter, Valmy may not have to spray foam or surfactant in the conveyors if freezing conditions and surface moisture on the coal piles allow the facility to minimize fugitive dust emissions in compliance with the NAC and SIP. In addition, the facility operates a mobile water truck to spray water on the coal pile as needed.

4.0 PROCESS DESCRIPTION (continued)

System 4: Circulating Water Treatment System
The two main boilers each have separate magnesium oxide and soda ash bins to store dry chemicals for feed water conditioning (total of 4 storage bins). Each bin is outfitted with a bin vent fabric filter collector which is permitted to operate 8,760 hrs/yr.

System 5: Fly Ash Handling System
Each unit is outfitted with a flyash silo which is controlled by a dust collector permitted to operate 8,760 hrs/yr. The applicant has submitted emissions inventory data indicating that PM/PM_{10} emissions from these four dust collectors be calculated on the basis of their design flowrate (dry standard cubic feet per minute or dscfm) and an estimated outlet grain loading of 0.02 gr/dscf. The flyash silos will be in operation for the same period of operation as the two units.

System 6: Unit #2 Lime Scrubber System
Unit #2 is required by NSPS Subpart Da and NAC 445B.378 to limit the emissions of sulfur dioxide to no more than 0.60 lb/MMBtu with a minimum control efficiency control of 70%, based on a 30-day rolling average. To meet these limits, Unit #2 is controlled by a three-chambered spray dryer (one chamber remains off-line as a spare) which uses a lime slurry injected via centrifugal feeders. Sulfur dioxide emissions are continuously monitored at the inlet and outlet of the spray dryer system to calculate the percent reduction of emissions.

The spray dryer system includes two 35-ton lime day-bins, two 500- ton lime silos, and two 50-ton flyash bins. Each operational chamber of the spray dryer produces a flyash-type product which contains an amount of unreacted lime. A portion of this flyash is recycled in the spray dryer to reduce overall lime usage requirements. Each of the six storage bins/silos has its own fabric filter collector permitted to operate at 8,760 hrs/yr.

Unit #1 is not outfitted with a spray dryer since its sulfur dioxide limit is 1.2 lb/MMBtu per NSPS Subpart D. This limit is achievable through coal blending and monitoring.

System 7: Cooling Towers
Each main boiler unit is outfitted with an 80,200 gpm (maximum) circulation rate cooling tower. The cooling towers are permitted units in this operating permit because drift losses from each tower (with drift eliminators installed) have been calculated by BAPC to equate to a maximum potential of 148.97 and 148.51 tpy, respectively. This conservative emissions estimate is based on AP-42 Section 13.4 (Wet Cooling Towers) methodology which states that “the particulate matter constituent of the drift droplets may be considered an emission”. In the SPPC application material, the facility has stated manufacturer’s maximum drift losses from the Unit #1-2 cooling towers of 6.42 and 6.40 gpm, respectively, based on design drift losses of 0.008%. A representative TDS content of 10,600 ppm in the Valmy cooling tower basins has been used to calculate these emissions.

System 8: #2 Fuel Oil Tank
Valmy operates a 150,000 gallon #2 fuel oil storage tank permitted to have a throughput limit of 1,500,000 gallons per year. #2 fuel oil can be burned in Units #1-2, the emergency auxiliary boiler, and in several insignificant emission units.

4.0 PROCESS DESCRIPTION (continued)

System 9: Auxiliary (Emergency Warmup) Boiler
Valmy maintains a pre-NSPS (constructed 1979) #2 oil-fired auxiliary boiler rated at a heat input of 111.8 MMBtu/hr. According to Valmy documentation, this boiler is used solely to provide steam for plant warmup purposes in the rare event of bringing the plant on-line from a totally cold startup situation (e.g., both main units off-line and cold). The auxiliary boiler cannot be used to generate/supplement electrical production. When either main coal unit is off-line, the other operational coal unit provides the warmup steam requirement for the coal boiler being brought on-line.

Insignificant Activities:
A list of these activities is included as an attachment at the end of the Operating Permit. Key insignificant emission units include the emergency plant fire protection engine (500 hrs/yr cap), the Units #1-2 emergency electrical generators (500 hrs/yr cap), and the Units #1-2 plant fire protection engines (500 hrs/yr cap). The emergency diesel generators and fire protection engines meet the qualifications of an emergency generator per NAC 445B.288(3)(l) and thus do not require permitting. In the emissions inventory, the potential to emit (PTE) of insignificant activity internal combustion engines has been estimated at an operational schedule of 500 hrs/yr.

5.0 APPLICABLE REGULATIONS

Applicable requirements are those regulatory requirements that apply to a stationary source or to emissions units contained within the stationary source. In Nevada's program, the regulations governing the emissions of air pollutants from which the applicable requirements originate, are derived from four categories of regulations. These four categories consist of the requirements contained in the Nevada Revised Statutes (NRS), the Nevada Administrative Code (NAC), the Applicable State Implementation Plan (ASIP), and the Code of Federal Regulations (CFR, contained in various Parts within Title 40).

5.1 GENERALLY APPLICABLE REQUIREMENTS

Of the four categories of regulations governing emissions of air pollutants, there are many generally applicable requirements that apply to stationary sources and emission units located at a stationary source. A comprehensive summary of all the generally applicable permit requirements is contained in Sections I through IV of the proposed operating permit.

5.2 SPECIFIC APPLICABLE REQUIREMENTS

The remainder of this section of the review will focus on specific applicable requirements associated with each emission unit or process.

5.3 State Statutes & Administrative Code

Valmy is subject to Nevada Revised Statutes (NRS) stipulated in NRS 445B.100 through 445B.640, which refer to the control of air pollution. The governing body in the State of Nevada for setting air quality regulation applicable to sources regulated by BAPC is the Nevada State Environmental Commission (SEC).

Valmy is also subject to Nevada Administrative Code (NAC) 445B.001 through 445B.3791, inclusive, which govern the control of air pollution from regulated facilities in the State of Nevada. Key regulations in the NAC applicable to Valmy's operations include 445B.252 (testing and sampling), 445B.255 (monitoring), 445B.288 (exemptions for certain insignificant activities), NAC 445B.2202 (maximum opacity of emissions), NAC 445B.2203 (maximum emissions of PM_{10} from fuel-burning equipment), NAC 445B.22037 (fugitive dust), NAC 445B.22047 (maximum emissions of sulfur from fuel-burning equipment), and NAC 445B.22063 (specific state requirement for sulfur emissions from Valmy Unit #2).

5.0 APPLICABLE REGULATIONS (continued)

5.4 Nevada State Implementation Plan (SIP)

The Applicable State Implementation Plan (ASIP) is a document that is prepared by a State or Local air regulatory agency and required to be submitted to the U.S. EPA for approval. Title I of the Clean Air Act is the statutory authority for the U.S. EPA regulations that require a State to submit a SIP. The contents of the SIP are intended to show how a State, through the implementation and enforcement of the regulations contained in the SIP, will either show how attainment of the ambient air quality standards (NAAQS) will be achieved or how a State will continue to maintain compliance with the NAAQS. Nevada's revised SIP submittal is currently under EPA review with updates occurring frequently. In general, the regulations contained in the ASIP closely parallel the current NAC regulations. However, because the ASIP is based on older air quality regulations (at this time), compliance with all of the current NAC regulatory requirements does not necessarily ensure compliance with the ASIP requirements. All of the equipment considered in this application must meet, at a minimum, the standards set forth in the ASIP. Specifically, the emission standards contained in ASIP 445B.2203 for particulate matter, ASIP 445B.22047 for sulfur emissions, ASIP 445B.22017 for opacity, and ASIP 445B.22097 for the ambient air quality standards must not be exceeded.

5.5 EPA 40 CFR Part 60 New Source Performance Standards (NSPS)

System 1: Unit #1 Boiler

SPPCo entered into contractual obligations to purchase/construct Unit #1 prior to September 18, 1978. Therefore, Unit #1 is subject to the provisions of 40 CFR Part 60 Subpart D, *Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction is Commenced After August 17, 1971*. Specific emission limits under this Subpart include: a PM limit of 0.10 lb/MMBtu, SO_2 limit of 1.2 lb/MMBtu, NO_x limit of 0.70 lb/MMBtu, and an opacity limit of 20% (except for one six-minute period per hour of not more than 27% opacity). The NSPS PM limit of 0.1 lb/MMBtu for Unit #1 is more stringent than the PM and PM_{10} limits as determined by ASIP 445B.2203 and NAC 445B.2203, respectively. The SIP and NAC PM and PM_{10} limits are both equivalent to 0.166 lb/MMBtu, based on the Unit #1 design heat input rate of 2,560.0 MMBtu/hr. Particulate matter from Unit #1 is controlled by baghouses.

Subpart D also stipulates continuous monitoring and recording of SO_2, NO_x, opacity, and oxygen. These monitors are in place at Valmy including a carbon dioxide analyzer required under Valmy's EPA Acid Rain Permit monitoring requirements.

System 2: Unit #2 Boiler

SPPC entered into contractual obligations to purchase/construct Unit #2 after September 18, 1978. Therefore, Unit #2 is subject to the provisions of 40 CFR Part 60 Subpart Da, *Standards of Performance for Electric Utility Steam Generating Units for Which Construction Is Commenced After September 18, 1978*.

5.0 APPLICABLE REGULATIONS (continued)

5.5 EPA 40 CFR Part 60 New Source Performance Standards (NSPS)

Specific emission limits under this Subpart include: a PM limit of 0.03 lb/MMBtu, SO_2 limit of 0.6 lb/MMBtu with 70% reduction of potential emissions based on a 30-day rolling average, NO_x limit of 0.50 lb/MMBtu based on a 30-day rolling average, and an opacity limit of 20% (except for one six-minute period per hour of not more than 27% opacity). The NSPS PM limit of 0.03 lb/MMBtu for Unit #2 is more stringent than the PM and PM_{10} limits prescribed by ASIP 445B.2203 and NAC 445B.2203. The SIP and NAC PM and PM_{10} limits are both equivalent to 0.162 lb/MMBtu, based on the Unit #2 design heat input rate of 2,881.02 MMBtu/hr.

Subpart Da also stipulates continuous monitoring and recording of SO_2, NO_x, opacity, and oxygen. These monitors are in place at Valmy including a carbon dioxide analyzer required under Valmy's EPA Acid Rain Permit monitoring requirements.

In order to meet the SO_2 limit of 0.6 lb/MMBtu with 70% reduction in potential emissions, Valmy has installed a three-chambered spray-dryer system on Unit #2, prior to the baghouse. The spray dryer uses lime to reduce SO_2 emissions. Subpart Da requires that the inlet and outlet of this spray dryer be continuously monitored for SO_2 emissions so that the percent reduction in emissions be calculated and recorded.

System 3: Coal Handling System

An EPA Region 4 letter dated April 16, 1998 from R. Douglas Neeley was relied upon to determine whether any portion of the coal handling equipment at Valmy could be considered a coal preparation plant subject to the provisions of 40 CFR Part 60 Subpart Y, *Standards of Performance for Coal Preparation Plants*. The provisions of Subpart Y are applicable to affected facilities which constructed after October 24, 1974 and process more than 200 tons per day of coal. Both of these conditions are applicable to Valmy which has stated in its application that the capacity of its coal handling equipment is 800 tons per hour.

Specifically, the Neeley memo states that "Any coal conveyors which are functionally linked to and directly convey coal to or remove coal and refuse from coal processing equipment are subject to Subpart Y". This memo was in reference to NSPS affected coal processing equipment at the Carolina Power & Light Company, Mayo Steam Electric Plant. For this facility, a determination by Region 4 EPA was made that at the Mayo Steam Electric Plant, the coal crusher, conveyors, and storage silos were all NSPS Subpart Y affected equipment.

For Valmy, this means that the entire coal handling system, with the exception of open storage piles, is subject to a 20% opacity limit applicable to the gases discharged from the 10 dust collectors.

5.0 APPLICABLE REGULATIONS (continued)

5.5 EPA 40 CFR Part 60 New Source Performance Standards (NSPS)

By design, any emissions from the conveyors are maintained under negative pressure and exhaust to the dust collectors so the conveyor emissions are included with the dust collector emissions.

Although the NSPS provisions do not stipulate any other performance test, BAPC is requiring an initial Method 5 or 17 and 201A performance tests on 9 of the 10 dust collectors to show compliance with the PM/ PM_{10} emission limits based on the unit's design flowrate and an outlet grain loading equivalent to 0.02 gr/dscf for both PM and PM_{10}. One of the 10 units has been exempted (S2.003 - Rotary Stacker) from stack testing since it is a small collector rated at 900 ACFM. The other 9 units which are required to be stack tested handle approximately 10 times or greater the air requirement of S2.003.

System 8: #2 Fuel Oil Tank

The 150,000 gallon capacity #2 fuel oil tank was constructed in 1979 but is exempt from the provisions of 40 CFR Part 60 Subpart Ka, *Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984*, by definition in the NSPS provisions of what constitutes a petroleum liquid. According to 40 CFR Part 60.111a(b), No. 2 fuel oil does not constitute a petroleum liquid, and hence, the storage of No. 2 fuel oil in a storage tank of this age is exempt from the NSPS provisions.

System 9: Auxiliary Boiler

The auxiliary boiler was constructed in 1979 and has a design heat input rating of 111.8 MMBtu/hr. Because the auxiliary boiler's construction date pre-dates June 19, 1984, this unit is therefore exempt from NSPS Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*.

5.6 EPA Acid Rain Program

The Clean Air Act Amendments of 1990 (Title IV) established a requirement to reduce the emissions of pollutants contributing to acid rain (SO_2 and NO_x). It also established a market-based emissions trading program for SO_2. U.S. EPA is responsible for developing regulations and implementing the requirements of the acid rain provisions of the Clean Air Act Amendments. As a result, U.S. EPA adopted acid rain related regulations at 40 CFR Parts 72 through 78.

The overall goal of the Acid Rain Program is to achieve environmental and public health benefits through reductions in emissions of SO_2 and NO_x. To achieve this goal, the program employs both traditional and innovative, market-based approaches for controlling air pollution. Title IV of the Clean Air Act sets as its primary goal the reduction of annual SO_2 emissions by 10 million tons below 1980 levels.

5.0 APPLICABLE REGULATIONS (continued)

5.6 EPA Acid Rain Program

To achieve these reductions, the law requires a two-phase tightening of the restrictions placed on fossil fuel-fired Power plants.

Phase I began in 1995 and affects 263 units at 110 mostly coal-burning electric utility plants located in 21 eastern and Midwestern states.

An additional 182 units joined Phase I of the program as substitution or compensating units, bringing the total of Phase I affected units to 445. Emissions data indicate that 1995 SO_2 emissions at these units nationwide were reduced by almost 40% below their required level.

Phase II, began in the year 2000, tightens the annual emissions limits imposed on these large, higher emitting plants and also sets restrictions on smaller, cleaner plants fired by coal, oil, and gas, encompassing over 2,000 units in all. The program affects existing utility units serving generators with an output capacity of greater than 25 megawatts and all new utility units.

The NOx program embodies many of the same principles of the SO_2 trading program in its design: a results-orientation, flexibility in the method to achieve emission reductions, and program integrity through measurement of the emissions. However, it does not "cap" NO_x emissions as the SO_2 program does, nor does it utilize an allowance trading system. The Act calls for a 2 million ton reduction in NO_x emissions by the year 2000. A significant portion of this reduction will be achieved by coal-fired utility boilers that will be required to install low NO_x burner technologies and to meet new emissions standards.

Valmy's boilers are subject to the provisions of the Acid Rain Program. To comply with EPA's Acid Rain Program for Units #1 & 2, Valmy has submitted a Phase II Permit Application to the EPA.

5.7 EPA 40 CFR Part 52 Prevention of Significant Deterioration

The Valmy Facility is an existing major stationary source of PSD pollutants for fossil fuel-fired steam electric plants. Valmy's rated heat capacity of steam producing units (Units #1 & 2) is greater than 250 million Btu/hr and the plant emits and/or has the potential to emit 100 tpy of at least one or more pollutants subject to regulation under the Act (40 CFR 52.21). As this applies to Valmy, the facility is an *existing* major stationary source of regulated pollutants (e.g., major source of SO_2, NO_x, CO, and PM/PM_{10} emissions) subject to PSD regulations.

5.0 APPLICABLE REGULATIONS (continued)

5.7 EPA 40 CFR Part 52 Prevention of Significant Deterioration

As part of the revision application, Valmy has supplied a baseline actual to future potential emissions test in order to determine that the proposed modification did not exceed PSD significant thresholds. The BAPC has accepted the baseline actual emissions calculations for CO and VOC based on the Part 75 heat input rate for the preceding two years and an AP-42 emission factor for the appropriate boiler type. However, since the addition of the NOx control system will change the combustion profile of the boiler combustion chamber, the AP-42 factor is no longer valid for computing future actual for future potential emissions.

The BAPC, therefore, disputes the methodology used by SPPCo to calculate the future potential emissions increases for CO and VOC. The BAPC, additionally, did not review, nor will it rely on, any demand growth exclusions analyses presented by SPPCo for this modification. The BAPC does agree in principal that the PSD significant thresholds will not be exceeded as a result of the addition of the NOx control systems. In order to expedite the processing of the NOx reduction program and to verify that the thresholds have not been exceeded, Valmy will be conducting a post modification performance test on both Units #1 and #2 for comparison with the pre-modification emissions calculations for CO and VOC.

6.0 EMISSIONS INVENTORY

6.1 Introduction

For the purpose of setting emission limits for Units #1 & 2, BAPC calculated emission limits per the applicant's proposed limits documented in the application and from the following applicable requirements: current permit conditions in Air Quality Operating Permit No. AP4911-0457, New Source Performance Standards (NSPS), Nevada Administrative Code (NAC) 445B, and the Nevada State Implementation Plan (SIP).

6.2 Emissions Summary

The user is referred to the BAPC emissions inventory as an illustration of how the proposed permit emission limits (e.g., PM/PM_{10}, sulfur, SO_2, VOC, and NO_x) and inventory values (e.g., CO, VOC, Pb, and other HAPs) were calculated. Annual emission levels of regulated pollutants (tons per year) from the permitted emission units and insignificant combustion units are presented in Table 1 below. Annual fugitive emissions of PM and PM_{10} (tons per year) from related secondary activities associated with the Valmy facility are presented in Table 2 below.

Table 1 - Annual Emissions from Permitted Units and Insignificant Activities (tpy)

Emission Unit	PM	PM_{10}	NO_x	SO_2	CO	VOC	Pb	non-Pb HAPs
Unit #1	1,121	1,121	7,849	13,455	36,529	241	0.24	1.60
Unit #2	379	379	6,309	7,571	36,529	241	0.26	0.70
Coal Handling (10 units)	43.49	43.49						
Water Treatment (4 units)	2.45	2.45						
Fly Ash (2 units)	3.37	3.37						
Unit #2 Scrubber (6 units)	11.30	11.30						
Cooling Towers (2 units)	298.00	298.00						
#2 Oil Tank						0.05		
Auxiliary Boiler	0.08	0.08	0.40	0.32	0.20	0.01		
Insignificant Combustion Units	0.72	0.72	10.20	0.67	2.20	0.81		0.02
Valmy Totals	**1,859**	**1,859**	**14,169**	**21,027**	**73,060**	**483**	**0.50**	**2.32**

6.0 EMISSIONS INVENTORY

6.2 Emissions Summary

Table 2 - Annual Fugitive Emissions from Related Secondary Activities (tpy)

Activity	PM	PM_{10}	NO_x	SO_2	CO	VOC	Pb	non-Pb HAPs
Coal Piles	103.6	19.1						
Trestle Unloading	0.2	0.1						
Ash Handling	7.6E-03	3.6E-03						
Haul Roads	72.5	26.1						
Fugitive Totals	176.3	45.3						

7.0 AMBIENT AIR QUALITY IMPACT

7.1 Introduction

This dispersion modeling impact analysis has been completed by Tetra Tech EM, Inc. (Tetra Tech) for the Nevada Division of Environmental Protection (NDEP) in support of a Title V Minor Permit Revision Application for the Valmy Generating Station (Valmy), located in the Humboldt River Basin in Northern Nevada. The Sierra Pacific Power Company (SPPC) facility contains two steam boilers. SPPC proposes to install emission controls on the boilers, significantly reducing nitrogen oxide (NO_X) emissions. Additional equipment includes an auxiliary boiler, two cooling towers, and material handling operations. The fenceline for this facility was resurveyed in July 2005. The revised fenceline has been incorporated into this analysis.

7.2 Classification of Air Basin

The Valmy Facility is located in Hydrographic Basin 64, Clovers Area. This basin was triggered for SO_2 and PM_{10} on March of 1977.

7.3 Model Selection and Setup

The dispersion modeling was conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), which is consistent with the NDEP PSD increment tracking system. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components; AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor, and AERMOD includes the dispersion modeling algorithms.

AERMOD was used to predict maximum pollutant concentrations in ambient air from Valmy emissions for comparison with modeling significant impact levels, the AAQS, and PSD increments. Based on input from NDEP, a paired-in-time approach was used for the modeling. This approach is consistent with traditional EPA methods for calculating PSD increment consumption. AERMOD was run using all the regulatory default options including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, and no use of gradual plume rise. The local terrain has been incorporated into the calculations.

7.0 AMBIENT AIR QUALITY IMPACT (continued)

7.4 Source Input Data

Emission inventories for CO, NO_X, PM_{10}, SO_2, and VOC's from Valmy were obtained from Sierra Pacific Power Company. Valmy emission sources modeled for the Title V analysis include two steam boilers, an auxiliary boiler, two cooling towers (one with eight cells and one with six cells), two emergency generators, two fire pumps and material handling sources. Discharges from some material handling sources are oriented in a horizontal direction. These sources are represented with discharge velocities of 0.01 meters per second. Emission rates and source release parameters for Valmy sources are available in Appendix 9 of the Title V Minor Revision Application.

Certain emissions in this table have been revised since the submittal of the original Title V Permit Application. An explanation of emission calculations has been presented in Appendix 6 of the Title V Minor Revision Application.

7.5 Building Downwash

The modeling analysis includes evaluation of building dimensions at Valmy to assess the potential downwash effects on stack emissions from nearby structures. Direction-specific downwash parameters were calculated in previous analyses and used in the current model runs. EPA's Building Profile Input Program PRIME (BPIPPRM) software was used to produce building dimension data that were incorporated into AERMOD input files.

7.6 Meteorological Data

The AERMOD modeling analysis was completed using meteorological datasets from 2000, 2001 and 2004, with surface data collected on-site at Valmy and mixing height data from the Reno International Airport in Reno, Nevada. These data were processed using the AERMET meteorological data preprocessor program. An additional surface dataset collected from the National Weather Service (NWS) station in Winnemucca, Nevada was also used as input to AERMET. This dataset was used to provide additional variables for data processing and to substitute for any missing values from the Valmy data.

The meteorological data were processed into model-ready format using the AERMET software. AERMET processed the Valmy on-site surface data and twice-daily upper air soundings from the National Weather Service Station in Reno, Nevada into the proper format using a three-stage process.

The first stage extracts the data and administers several data quality checks. The second stage merges the data, and the third stage estimates required boundary layer parameters.

7.0 AMBIENT AIR QUALITY IMPACT (continued)

7.6 Meteorological Data

Valmy meteorological data include wind parameters observed at three levels - 10, 55, and 100 meters. All three levels were used as input to AERMET. Using three wind levels provides a better estimate of boundary layer conditions than using only one wind level. Surface data required as input to AERMET, but not included in the Valmy dataset, were estimated using guidance in the *User's Guide for the AERMOD Meteorological Preprocessor* (EPA 2004). These variables include albedo of the ground, Bowen ratio, and surface roughness. Figures 2-2 and 2-3 of Appendix 9 of the Title V Minor Revision Application show wind rose diagrams of the Valmy meteorological data used in the modeling analysis.

7.7 AERMOD Model Receptors

The modeling was completed using many receptor locations to ensure that the maximum estimated impacts are identified. Following EPA guidelines, receptor locations were identified with sufficient density and spatial coverage to isolate the area with the highest impacts. The NDEP Increment Tracking Study HA64 receptor grid was reviewed and paired down. In addition, revised fenceline receptors identified in the recent survey of the site were included. The following receptor spacing was used:

- 50-m spacing (approximately) along the fenceline;
- 500-m spacing from the fenceline to approximately 5.0 km from the fenceline; and
- 1000-m spacing from 5.0 km to approximately 20.0 km from the fenceline.

A total of 2,627 receptors were used in the AAQS analysis. Model receptors are presented in the Universal Transverse Mercator (UTM) coordinate system using meters and the North American Datum of 1983 (NAD83). All model receptors were preprocessed using the AERMAP software associated with AERMOD. AERMAP was run using U.S. Geological Survey (USGS) digital elevation model (DEM) data. Although AERMAP supports both 7.5-minute and 1-degree data resolution, Tetra Tech used 7.5-minute DEM data to give a detailed characterization of the terrain through the region.

7.0 AMBIENT AIR QUALITY IMPACT (continued)

Table 3 - Valmy Criteria Pollutants Modeling Analysis

Pollutant	Averaging Period	Total Facility Impact ($\mu g/m^3$)	Nevada Ambient Standard ($\mu g/m^3$)
PM_{10}	24-hr	31.7	150
	annual	8.3	50
SO_2	3-hr	338.6	1,300
	24-hr	95.6	365
	annual	12.1	80
NO_2	annual	4.8[a]	100
CO	1-hr	2982.6	40,000
	8-hr	701.4	10,000
VOC (O_3)	1-hr	70.5	235

Notes:
a. Concentrations of NOx were converted to NO_2 by multiplying by EPA's empirically derived scaling factor of 0.75.

7.3 PSD Increment Analysis

Although not required for a non-PSD Title V permit, Tetra Tech also performed for Valmy a PSD Increment modeling analysis. The PSD increment Analysis, which is also contained in the modeling analysis report, demonstrates that the PSD increments for PM_{10} and SO_2 are not exceeded at the requested permit levels.

Once again, the reader is referred to the Tetra Tech air quality modeling report for a discussion of the PSD Increment Analysis. The results of the PSD Increment Analysis are summarized below in Table 4. The results in Table 4 are based on a high second-high basis for those averaging periods not on an annual basis, which is the standard for PSD analyses as federal ambient standards use the high second-high approach.

7.0 AMBIENT AIR QUALITY IMPACT (continued)

Table 4 - PSD Increment Analysis

Pollutant	Averaging Period	Modeled Increment Consumption (Fg/m^3)[a]	Class II PSD Increment (Fg/m^3)
PM_{10}	24-hr	21.4[b]	30[c]
	annual	8.1[d]	17
SO_2	3-hr	318.9[b]	512[c]
	24-hr	68.5[b]	91[c]
	annual	12.1[d]	20

Notes:
a PSD Increment impacts referenced from Table 3-3 of SPPC Valmy Modeling Analysis.
b High-second-high modeled concentration
c Not to be exceeded more than once per calendar year.
d Maximum modeled concentration

8.0 SPECIFIC AMBIENT MONITORING REQUIREMENTS

Section IX of the Title V Permit Conditions does not contain any significant changes from the Specific State Monitoring Requirements specified in Section V of the existing operating permit for Valmy. Valmy is expected to sample and record meteorological conditions and ambient air quality data (e.g., PM_{10} and SO_2) at three sampling stations located at the Valmy plant site for the life of the project until reclamation is complete as required by the specific permit conditions. These monitoring requirements prescribe quarterly reporting to BAPC of the monitoring results. All required ambient air quality and meteorological monitoring is to be performed in accordance with the current Nevada Bureau of Air Quality's *Ambient Air Quality Monitoring Guidelines*.

9.0 CONCLUSIONS & RECOMMENDATIONS

Based on the above application review and supporting data and analyses, the proposed SPPC North Valmy Generating Station Title V operating permit renewal demonstrates attainment of state and Federal air quality standards in areas accessible to the public. The permit conditions specify all applicable state and Federal air quality requirements that the North Valmy Generating Station must comply with as of this date. It is BAPC's recommendation that the revision to Title V Air Quality Operating Permit No. AP4911-0457.01 be issued with all appropriate restrictions contained therein, following successful completion of public and U.S. EPA review and comment periods.

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_____ _____

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_____ _____

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