DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

Permit Application Analysis
AP-5098

April 22, 2008

NAME OF FIRM:	PacifiCorp
NAME OF FACILITY:	Dave Johnston Plant
FACILITY LOCATION:	Sections 7 and 18, T33N, R74W UTM Zone: 13 Easting: 473,036 Northing: 4,737,279 Converse County, Wyoming
TYPE OF OPERATION:	Coal-fired Electric Generating Plant
RESPONSIBLE OFFICIAL:	Gregory Hager, Managing Director
MAILING ADDRESS:	1591 Tank Farm Road Glenrock, WY 82637
TELEPHONE NUMBER:	(307) 436-2712
REVIEWING ENGINEERS:	Jamie Sharp, Air Quality Engineer Don Watzel, Environmental Scientist

PURPOSE OF APPLICATION:

On November 20, 2006, the Division received an application from PacifiCorp to modify Units 3 and 4 at the Dave Johnston Plant, located in Sections 7 and 18, T33N, R74W, approximately two (2) miles east of Glenrock, in Converse County, Wyoming.

On November 23, 2007, the Division received a revised application from PacifiCorp to modify the Dave Johnston Facility. PacifiCorp proposes to modify Unit 3 by replacing the existing cell burner configuration with low NO_x burners with overfire air or booster overfire air, installing a spray dryer absorber flue gas desulfurization (FGD) system and a baghouse, and abandoning the existing electrostatic precipitator. PacifiCorp proposed to modify Unit 4 by replacing the existing burners with Alstom LNCFS Level II low NO_x firing systems with one elevation of separated overfire air, installing a spray dryer absorber flue gas desulfurization (FGD) system and a baghouse, and removing the existing particulate matter wet venturi scrubber. PacifiCorp is also proposes to perform other Capital and O&M work on Units 1, 2, 3, and 4 during the project. Installation of the pollution control equipment is expected to be completed by September 2012. PacifiCorp is requesting Plantwide Applicability Limitations (PALs) be set for Sulfur Dioxide (SO_2) and Nitrogen Oxide (NO_x) for Units 1-4.

On March 3, 2008, the Division received additional materials from PacifiCorp including AERMOD modeling files, certification of no excess emissions, hourly heat input justification, and a startup/shutdown plan. Furthermore, PacifiCorp stated in this documentation that the submittal in November of 2007 is a standalone application that supersedes all previous application materials.

PROCESS DESCRIPTION:

The Dave Johnston Plant generates electricity through the combustion of coal in four steam-electric generating units (Units 1-4). Coal is pulverized and combusted to generate thermal energy that heats water and produces steam. The steam is routed to turbines and converted to mechanical energy which drives electric generators to produce electricity. The capacities of the units are as follows, but may change in the future without issuance of a Chapter 6, Section 4 permit due to the requested PAL limits.

Unit	MMBtu/hr	MW
1	1350	106
2	1350	106
3	2800	230
4	4100	330

PERMIT HISTORY:

On February 12, 2007, PacifiCorp was issued Air Quality Waiver AP-5781 to control fugitive dust emissions from the coal belts and feeder associated with the Ready Pile #2 with a dust suppression spray system. This eliminated point source 5D. No emissions are associated with the dust suppression system.

On May 3, 2006, PacifiCorp was issued Air Quality Waiver AP-4646 to burn approximately 11,000 gallons per year of used on-specification oil (waste oil) in the Unit 3 boiler with no change in emissions.

On July 26, 2005, PacifiCorp was issued Operating Permit 3-1-148-1. This permit authorized the operation of a major source of emissions, and incorporated previously issued permits for this facility.

ESTIMATED EMISSIONS:

Pollutants of primary concern from the Dave Johnston Plant are Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Volatile Organic Compounds (VOC), Sulfur Dioxide (SO_2), Hydrogen Fluoride (HF), Lead (Pb), Sulfuric Acid Mist (H_2SO_4) and particulate matter (PM/PM_{10}).

Unit 3 is currently equipped with a Babcock & Wilcox cell-fired boiler with a non-typical three-cell burner configuration. These burners are to be replaced with low NO_x burners and either overfire air or booster overfire air (BOFA) systems. The final design is yet to be determined. With the installation of low NO_x burners, there will be an associated increase in carbon monoxide (CO) emissions. The applicant is proposing a NO_x emission limit of 0.28 lb/MMBtu for unit 3 after the low NO_x firing systems have been installed. Projected actual carbon monoxide emissions were estimated using emission factors from AP-42, Fifth Edition, Volume I, Table 1.1-3 and the projected actual coal burned. Potential carbon monoxide emissions are based on a 0.25 lb/MMBtu emission limit and the unit's maximum hourly heat input.

Unit 4 is currently equipped with a dry-bottom, tangentially-fire Combustion Engineering (CE) boiler. The replacement of the existing coal burners with Alstom LNCFS Level II low NO_x firing systems with one elevation of separated overfire air will reduce NO_x emissions. With the installation of low NO_x burners, there will be an associated increase in carbon monoxide (CO) emissions. The applicant is proposing a NO_x emission limit of 0.15 lb/MMBtu for unit 4 after the low NO_x firing systems have been installed. Projected actual carbon monoxide emissions were estimated using emission factors from AP-42, Fifth Edition, Volume I, Table 1.1-3 and the projected actual coal burned. Potential carbon monoxide emissions are based on a 0.20 lb/MMBtu emission limit and the unit's maximum hourly heat input.

Upgrading the existing flue gas desulfurization systems for Units 3 and 4 will result in a decrease in SO_2 emissions. Unit 3 is currently uncontrolled for sulfur dioxide, and Unit 4 is equipped with a CHEMICO wet venturi particulate scrubber modified with lime injection. A new dry flue gas desulfurization system with lime reagent is to be installed on Units 3 and 4. PacifiCorp is proposing an emission limit of 0.15 lb/MMBtu SO_2 once the upgrades have been completed.

The applicant is proposing to install fabric filter dust collectors with multiple compartments on Units 3 and 4. The proposed dust collectors allow for online cleaning. PacifiCorp is proposing an emission limit of 0.015 lb/MMBtu PM/PM_{10} once the upgrades have been completed.

PacifiCorp requested a Plantwide Applicability Limit (PAL) for NO_x and SO_2. A separate PAL is established for each pollutant and is a source-wide emission limitation (Units 1-4). The PAL level is determined by summing the baseline actual emissions, as defined by Chapter 6, Section 4(a) of the Wyoming Air Quality Standards and Regulations (WAQSR), of the PAL pollutant for each emissions unit at the facility with an amount equal to the applicable significant level for the PAL pollutant, as defined in Chapter 6, Section 4(a) of the WAQSR. For each PAL pollutant, the actual PAL level is determined using only one consecutive 24-month period for all existing emissions units, although a different consecutive 24 month period may be used for each different PAL pollutant.

The estimated change in NO_x, SO_2, CO, PM/PM_{10}, VOC, HF, H_2SO_4, and Lead emissions between the current potential emissions and the emissions after the pollution control equipment upgrades have been made are shown in Table 1. Baseline actual emissions are summarized in Table 2.

Table 1: Dave Johnston Units 1, 2, 3 and 4 Emissions									
Pollutant		Emission Rate (lb/MMBtu)	Emissions (lb/hr)	Emissions (tpy)	Emission Rate (lb/MMBtu)	Emissions (lb/hr)	Emissions (tpy)	Emissions (lb/hr)	Emissions (tpy)
Current Potential Emissions (based on design firing rate, capable of accommodating emissions, and 8760 hours of operation)					Proposed Potential Emissions (after proposed modifications)			Change in Emissions	
Unit 1	NO_x	0.75	1012.5	4434.8	0.5	675.0	2956.5	-337.5	-1478.3
	SO_2	1.20	1620.0	7095.6	1.2	1620.0	7095.6	0.0	0.0
	CO	0.025	34.0	148.9	0.025	34.0	148.9	0.0	0.0
	PM/PM_{10}	0.26	348.2	1525.0	0.1	135.0	591.3	-213.2	-933.7
	VOC	0.0032	4.1	17.9	--	4.1	17.9	0.0	0.0
	HF	0.0032	4.3	18.9	--	4.3	18.9	0.0	0.0
	H_2SO_4	0.00076	1.0	4.5	--	1.0	4.5	0.0	0.0
	Lead	3.2E-05	0.043	0.19	--	0.032	0.14	-0.011	-0.05
Unit 2	NO_x	0.75	1012.5	4434.8	0.5	675.0	2956.5	-337.5	-1478.3
	SO_2	1.20	1620.0	7095.6	1.2	1620.0	7095.6	0.0	0.0
	CO	0.024	31.8	139.2	0.024	31.8	139.2	0.0	0.0
	PM/PM_{10}	0.26	348.2	1525.0	0.1	135.0	591.3	-213.2	-933.7
	VOC	0.0028	3.8	16.7	--	3.8	16.7	0.0	0.0
	HF	0.0030	4.0	17.7	--	4.0	17.7	0.0	0.0
	H_2SO_4	0.00074	1.0	4.4	--	1.0	4.4	0.0	0.0
	Lead	3.2E-05	0.043	0.19	--	0.032	0.14	-0.011	-0.05
Unit 3	NO_x	0.75	1848.0	8094.2	0.28	784.0	3433.9	-1064.0	-4660.3
	SO_2	1.20	2956.8	12950.8	0.15	420.0	1839.6	-2536.8	-11111.2
	CO	0.030	73.1	320.1	0.25	700.0	3066.0	626.9	2745.9
	PM/PM_{10}	0.23	566.1	2479.6	0.015	42.0	184.0	-524.1	-2295.7
	VOC	0.0036	8.8	38.4	--	9.4	41.1	0.6	2.7
	HF	0.0038	9.3	40.7	--	1.19	5.2	-8.1	-35.5
	H_2SO_4	0.00094	2.3	10.1	--	0.037	0.16	-2.3	-9.9
	Lead	1.8E-05	0.043	0.19	--	0.0091	0.04	-0.0342	-0.15
Unit 4	NO_x	0.75	3075.0	13468.5	0.15	615.0	2693.7	-2460.0	-10774.8
	SO_2	1.20	4920.0	21549.6	0.15	615.0	2693.7	-4305.0	-18855.9
	CO	0.024	99.0	433.6	0.2	820.0	3591.6	721.0	3158.0
	PM/PM_{10}	0.210	862.0	3775.7	0.015	61.5	269.37	-800.5	-3506.4
	VOC	0.0029	11.9	52.0	--	13.7	59.9	1.8	7.9
	HF	0.00037	1.5	6.6	--	1.74	7.6	0.23	1.0
	H_2SO_4	0.00021	0.84	3.70	--	0.048	0.21	-0.80	-3.5
	Lead	1.1E-05	0.043	0.19	--	0.014	0.060	-0.030	-0.13
Total	**NO_x**	--	**6,948.0**	**30,432.2**	--	**2,749.0**	**12,040.6**	**-4,199.0**	**-18,391.6**
	SO_2	--	**11,116.8**	**48,691.6**	--	**4,275.0**	**18,724.5**	**-6,841.8**	**-29,967.1**
	CO	--	**237.8**	**1,041.8**	--	**1,585.8**	**6,945.7**	**1,347.9**	**5,903.9**
	PM/PM_{10}	--	**2,124.5**	**9,305.3**	--	**373.5**	**1,635.9**	**-1,751.0**	**-7,669.4**
	VOC	--	**28.5**	**125.0**	--	**31.0**	**135.6**	**2.4**	**10.6**
	HF	--	**19.2**	**83.9**	--	**11.3**	**49.4**	**-7.9**	**-34.5**
	H_2SO_4	--	**5.2**	**22.7**	--	**2.1**	**9.3**	**-3.1**	**-13.4**
	Lead	--	**0.17**	**0.76**	--	**0.09**	**0.38**	**-0.09**	**-0.38**

Table 2: Dave Johnston Units 1, 2, 3 and 4 Emissions				
Pollutant		Emission Rate (lb/MMBtu)	Emissions (lb/hr)	Emissions (tpy)
Baseline Actual Emissions (based on annual average of 24-month 2002-2007 lb/MMBtu values) [1]				
Unit 1	NO_x	0.43	543.8	2382.0
	SO_2	0.69	877.2	3842.0
	CO	0.026	32.8	143.7
	PM/PM_{10}	0.071	90.2	395.0
	VOC	0.0031	3.9	17.2
	HF	0.0033	4.2	18.3
	H_2SO_4	0.00077	1.0	4.3
	Lead	1.1E-05	0.014	0.1
Unit 2	NO_x	0.40	507.3	2222.0
	SO_2	0.67	845.7	3704.0
	CO	0.024	30.4	133.1
	PM/PM_{10}	0.032	40.9	179.0
	VOC	0.0029	3.7	16.0
	HF	0.0030	3.9	16.9
	H_2SO_4	0.00076	1.0	4.2
	Lead	3.6E-06	0.005	0.0
Unit 3	NO_x	0.49	1205.7	5281.0
	SO_2	0.80	1968.9	8624.0
	CO	0.029	70.8	309.9
	PM/PM_{10}	0.032	79.7	349.0
	VOC	0.0034	8.5	37.2
	HF	0.0037	9.0	39.4
	H_2SO_4	0.000899	2.2	9.7
	Lead	4.6E-06	0.011	0.1
Unit 4	NO_x	0.33	1359.1	5953.0
	SO_2	0.32	1321.0	5786.0
	CO	0.023	96.1	421.1
	PM/PM_{10}	0.063	257.1	1126.0
	VOC	0.0028	11.5	50.5
	HF	0.00036	1.5	6.4
	H_2SO_4	0.000200	0.8	3.6
	Lead	1.0E-05	0.041	0.2
Total	**NO_x**	--	**3,616.0**	**15838.0**
	SO_2	--	**5,012.8**	**21956.0**
	CO	--	**230.1**	**1007.8**
	PM/PM_{10}	--	**467.8**	**2049.0**
	VOC	--	**27.6**	**120.9**
	HF	--	**18.5**	**81.0**
	H_2SO_4	--	**5.0**	**21.8**
	Lead	--	**0.07**	**0.3**

[1] Evaluated on a 24-month period ending Jun-07 for NO_x; Sep-07 for SO_2 and H_2SO_4; Jul-07 for CO, VOC, and HF; and Jul-05 for PM/PM_{10} and Lead.

CHAPTER 6, SECTION 4 - PSD APPLICABILITY:

The Dave Johnston Plant is subject to Prevention of Significant Deterioration (PSD) review under Chapter 6, Section 4 of the Wyoming Air Quality Standards and Regulations (WAQSR) because it is classified as a "major emitting facility." Fossil-fuel fired steam electric plants of more than two hundred and fifty million Btu/hour heat input with the potential to emit one hundred tons per year or more of any regulated pollutant are considered "major emitting facilities" under Chapter 6, Section 4(a)(i) of the WAQSR.

To determine if the proposed modification would trigger a PSD review, PacifiCorp compared baseline actual emissions to projected actual emissions for Unit 1-4 at the Dave Johnston Plant. Potential emissions were calculated based on the boiler firing rate, the emission factor for a given pollutant, and any quantifiable fugitive emissions (based on maximum past actual emissions). The past actual emissions were calculated based on the average coal burned during any consecutive 24-month period selected by the owner/operator within the 5-year period immediately preceding when the owner/operator begins actual construction of the project, the emission factors for a given pollutant and any quantifiable fugitive emissions.

Projected potential emissions from the Dave Johnston Plant as a result of the pollution control equipment installation are shown in Table 3:

Table 3: Projected Potential Emissions for the Dave Johnston Facility, tpy						
	CO	**VOC**	**PM/PM_{10}**	**Sulfuric Acid Mist**	**Lead**	**Fluorides**
Potential Stack Emissions	6,945.7	135.6	1,635.9	9.3	0.38	49.4
Potential Non-Stack Emissions	--	--	310.0	--	--	--
Potential Emissions	6,945.7	135.6	1,945.9	9.3	0.38	49.4

The net emissions change from modification at the Dave Johnston Plant and the PSD significance levels are shown in Table 4. As shown, a PSD review is required for CO. The installation of the low NO_x burners will result in lower NO_x emissions but will increase CO emissions by creating oxygen deficient combustion zones in the boiler.

Table 4: PSD Applicability for Units 1-4					
Pollutant	Projected Potential Emissions (tpy)	Baseline Actual Emissions (tpy)	Net Emissions Changed (tpy)	PSD Significant Emission Rate (tpy)	PSD Review Required?
CO	6,945.7	1,007.8	5,937.9	100	Yes
PM/PM_{10}	1,945.9	2,359.0 [1]	-413.1	25/15	No
VOC	135.6	120.9	14.7	40	No
H_2SO_4	9.3	21.8	-12.5	7	No
Lead	0.4	0.3	0.1	0.6	No
Fluorides	49.4	81.0	-31.6	3	No

[1] Includes estimated non-stack emissions of 310 tpy.

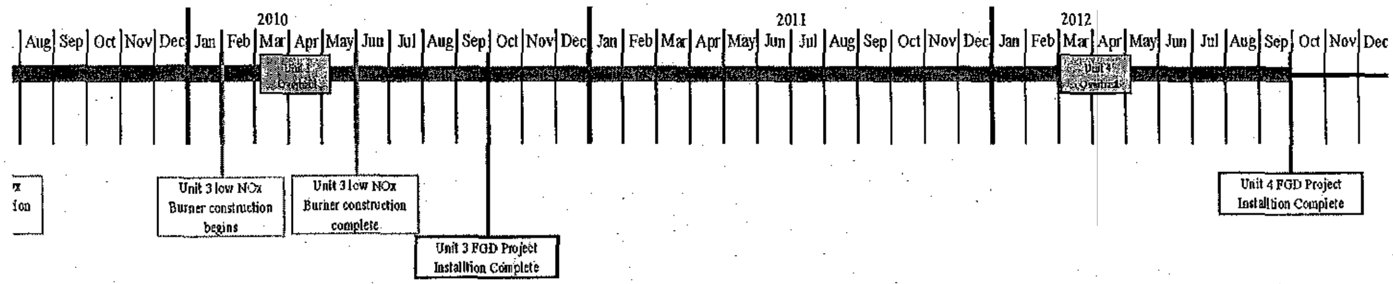
PacifiCorp requested a Plantwide Applicability Limit (PAL) for NO_x and SO_2. The PAL limits, effective upon permit issuance, were determined as the sum of the baseline actual emissions for the given pollutant (defined by Chapter 6, Section 4(a) of the WAQSR) and an amount equal to the applicable significant level (defined by Chapter 6, Section 4(a) of the WAQSR). The Division adjusted the baseline emissions to reflect the installation of low NO_x burners and overfire air or booster overfire air on Dave Johnston Unit 3 and Alstom LNCFS Level II low NO_x firing systems with one elevation of separated overfire air on Dave Johnston Unit 4. Baseline emissions were also adjusted to reflect the installation of dry flue gas desulfurization systems on Dave Johnston Units 3 and 4. If a physical change in or change in the method of operation is made of a major stationary source, and the total source-wide emissions are below the PAL level, the change is not a major modification for the PAL pollutant and does not have to be approved through a Chapter 6, Section 4 permit. The Division is setting future NO_x and SO_2 PAL levels based on the baseline actual emissions for Units 1 and 2 and the potential to emit for Units 3 and 4, effective once the control equipment upgrade is complete.

The NO_x and SO_2 PAL levels effective upon permit issuance, and the future NO_x and SO_2 PAL levels based on potential to emit, effective once the control equipment is modified on Units 3 and 4, are show in Table 5:

Table 5: Plantwide Applicability Limit (PAL)		
Current PAL, prior to modification		
	NO_x	SO_2
Baseline Actual Emissions, tpy	15,838.0	21,956.0
PSD Significance Level, tpy	40	40
PAL, tpy	**15,878.0**	**21,996.0**
Future PAL, after modification		
	NO_x	SO_2
Future Potential to Emit, tpy [1]	10,771.6	12,119.3
PAL, tpy	**10,771.6**	**12,119.3**

[1] Calculated based on Baseline Actual Emissions for Units 1 and 2, Projected Potential Emissions for Units 3 and 4, and PSD Significance Levels listed above.

PacifiCorp has proposed the following timeline for the installation of the pollution control equipment and completion of the capital and O&M projects:



- 2009

ement - 2009

heater

heater tube bundle

lacement

l superheater assemblies

ssure turbine

imilar metal welds in penthouse

eplacement

2010 Activities

2010 U2 Clean air - NOX
2010 U3 Hydrogen panel replacement
2010 U3 Boiler asbestos abatement
2010 U3 C mill PA flow replace
2010 U3 Generator stator rewedge
2010 U3 Replace twips controls
2010 U3 Replace burner impellers
2010 U3 Air preheater seal replacement
2010 U3 Boiler bifurcate tube replacement
2010 U3 Replace boiler/turbine controls
2010 U3 Economizer hoppers relocate - RES – SLC
2010 U3 Superheat assembly/header replacement
2010 U3 Turbine/generator major - 2009
2010 U3 Flue gas desulfurization system – spray dryer
2010 U3 Low NO_X burners
2010 U3 Replace front side slope boiler tubes
2010 U3 Replace boiler expansion joints
2010 U3 Boiler waterwall lagging supports
2010 U3 Waterwall tube replacement
2010 U3 Replace superheater tubing
2010 U3 Bottom ash hopper rebuild – 2010
2010 U3 Install economizer dry flight conveyor system
2010 U3 Replace superheater attemperator
2010 U3 CO monitor
2010 U3 Main transformer fire protection replacement
2010 U3 Replace safety valves - 2009
2010 U3/4 FGD Project

2011 Activities

2011 U2 Annunciator replacement
2011 U2 Boiler overhaul modifications
2011 U2 Boiler water wall tube replacement
2011 U2 Coal feeder replacement
2011 U2 HMI conversion
2011 U2 Replace high pressure superheater assemblies
2011 U2 Replace twips/feedwater level controls
2011 U2 Secondary superheater pendant replacement
2011 U4 FGD Project

2012 Activities

2012 U1 Boiler overhaul modifications
2012 U1 HMI conversion
2012 U1 Replace air heater baskets
2012 U1 Replace reheater header & terminal tubes
2012 U1 Replace battery bank/inverter
2012 U2 2.3 kv switch gear metering/project
2012 U2 Boiler asbestos abatement - 2012
2012 U2 CO monitor
2012 U2 Dcs component replacement
2012 U2 FD/ID fan damper drive replacement
2012 U2 Main transformer fire protection replacement
2012 U2 Replace air heater seals
2012 U2 Replace battery bank/inverter DCS
2012 U2 Replace mill damper drives
2012 U2 Turbine instrument upgrade
2012 U2 Replace reheater header & terminal tubes
2012 U4 Boiler overhaul modifications
2012 U4 DCS modifications
2012 U4 Platen secondary superheater replacement
2012 U4 Replace boiler upper arch tubes
2012 U4 Replace reheater & I superheater attemperators
2012 U4 Boiler waterwall tube panel replacement
2012 U4 Replace air heater seals
2012 U4 Replace burner nozzles
2012 U4 Replace finishing superheat dissimilar metal welds in penthouse
2012 U4 Replace FRV
2012 U4 Replace safety valve
2012 U4 Replace slag screen
2012 U4 Replace boiler upper arch refractory
2012 U4 FGD Project

DEQ 005043

CHAPTER 6, SECTION 4 – TOP DOWN BEST AVAILABLE CONTROL TECHNOLOGY (BACT):

Per the requirements of Chapter 6, Section 4 of the WAQSR, PacifiCorp conducted a top-down BACT analysis for control of CO emissions associated with the proposed modifications.

Boilers – CO Emissions

A. Identify Control Options

PacifiCorp conducted a top-down BACT analysis for controlling CO emissions from the boilers at the Dave Johnston Facility. They identified the following control technologies in their BACT analysis:

1. Catalytic Oxidation
2. Combustion Controls

B. Eliminate Technically Infeasible Options

Catalytic Oxidation is used for CO control primarily on natural gas fired turbines but has not been demonstrated in practice for coal fired boilers. In addition to oxidizing CO and VOC, an oxidation catalyst will also convert a portion of the SO_2 to SO_3.The SO_3 can form sulfuric acid leading to corrosion problems or combine with ammonia from the SCR and cause fouling problems. Additionally, oxidation catalysts are generally designed for a maximum particulate loading in the range of 50 mg/m^3 and the particulate loading prior to the fabric filter will be in excess of 5,000 mg/m^3. Although an oxidation catalyst could be installed downstream of the fabric filter, this would require reheating the flue gas from approximately 300 °F to greater than 600 °F leading to significant energy and economic impacts. For these reasons, catalytic oxidation is considered technically infeasible and is not reviewed further.

C. Rank Technologies by Control Effectiveness

Combustion Controls are the only remaining control option.

D. Evaluate Control Technologies

Combustion Controls are the only remaining control option.

E. Select BACT (Conclusion)

PacifiCorp proposed good combustion controls with an emission limit of 0.25 lb/MMBtu for Unit 3 and 0.20 lb/MMBtu for Unit 4 as BACT.

Measures taken to minimize the formation of NO_x inhibit complete combustion and tend to increase emissions of CO and a review of recently issued PSD permits does not show any BACT determinations using post combustion controls for CO from coal fired boilers. Therefore, the Division concurs that good combustion controls with an emission limits as stated above represent BACT for CO.

STARTUP AND SHUTDOWN OPERATIONS:

As part of the application, PacifiCorp addressed emissions during startup and shutdown of the units.

NO_x, SO_2 and CO

PacifiCorp has committed to complying with the limits for Units 1-4 during all operating periods. Therefore, no further analysis is required.

Opacity

Chapter 3, Section 2 of the Wyoming Air Quality Standards and Regulations limits opacity to 40% for Units 1-4. There are no provisions which explicitly exclude excess emissions during startup and shutdown. Therefore, it is assumed that the 40% limit applies during all opacity periods including startup and shutdown. No modifications are being proposed for Units 1 and 2. PacifiCorp has proposed to lower the particulate limits to reflect the current controls (ESP). Modeling for the project was based on the old limits for Units 1 and 2.

With the installation of a baghouse on Units 3 and 4, PacifiCorp has committed to an opacity limit of 20% with not more than one six-minute period per hour exceeding 27% during normal operations. PacifiCorp has requested that the opacity during startup and shutdown be limited to 40%. Based on previous EGU applications, compliance with the opacity limit during shutdown is not an issue. Therefore, the Division will limit the 40 percent opacity to startup only. All units are started on fuel oil. PacifiCorp states that the baghouse will be utilized during startup. Unlike an ESP, the efficiency of a baghouse is not temperature dependent. Therefore, once the boiler is switched over to coal as fuel, the baghouse will be at optimal control efficiency. For the purpose of this permit, startup begins with the introduction of fuel oil into the boiler and ends no later than the point in time when coal is introduced as fuel.

Particulate

The boilers are started on fuel oil. As stated above, startup begins with the introduction of fuel oil into the boiler and ends no later than the point in time when coal is introduced as fuel. As part of the application, PacifiCorp provided emission estimates for startup while burning fuel oil, which are provided below.

Unit	Max fuel oil flow gpm	PM Emissions lb/hr [1]	PM limit lb/hr
1	46	5.5	135
2	46	5.5	135
3	46	5.5	42
4	59	7.1	61

[1] AP 42, Fifth Edition, Volume I, Chapter 1: External Combustion Sources Table 1.3-1 for No. 2 Oil Fired, 9/98

As shown, the estimated PM emissions during startup are well within the PM lb/hr limits.

CHAPTER 5, SECTION 2 - NEW SOURCE PERFORMANCE STANDARDS (NSPS):

New Source Performance Standards Subpart Y is applicable to the Dave Johnston facility in accordance with WAQSR, Chapter 5, Section 2.

Subpart Y - Coal Handling Facilities

Subpart Y applies to coal preparation plants which process more than 200 tons per day with facilities that are constructed or modified after October 24, 1974. Subpart Y limits opacity to less than 20% from all coal processing and conveying equipment, coal storage systems, and coal transfer and loading systems at Dave Johnston Plant.

CHAPTER 5, SECTION 3 - NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs) AND CHAPTER 6, SECTION 6 – HAZARDOUS AIR POLLUTANT (HAP) EMISSIONS AND MAXIMUM AVAILABLE CONTROL TECHNOLOGY (MACT):

The boilers at the Dave Johnston Plant are not subject to NESHAP or case-by-case MACT requirements.

CHAPTER 6, SECTION 3 - OPERATING PERMIT:

The Dave Johnston Plant is a major source under Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations. PacifiCorp will need to modify their operating permit in accordance with Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR).

BEST AVAILABLE RETROFIT TECHNOLOGY (BART):

Units 3 and 4 are BART eligible sources under the Regional Haze Rule. PacifiCorp has submitted an application addressing BART for these sources. It is the intent of the Division to issue a New Source Review (NSR) permit for the BART application, which will provide opportunity for public comment.

PROJECTED IMPACT ON EXISTING AMBIENT AIR QUALITY:

The applicant submitted a modeling significance analysis for CO only to evaluate the proposed increases in CO emissions against the Class II significant impact levels (SILs). Predicted plant-wide impacts were compared against the Wyoming Ambient Air Quality Standards (WAAQS) for Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), Particulate Matter less than 10 microns (PM_{10}), Lead (Pb), and Hydrogen Fluoride (HF). Cumulative analyses for NO_2, SO_2, and PM_{10} were required, as discussed in the results of the significance analysis.

Model Justification:

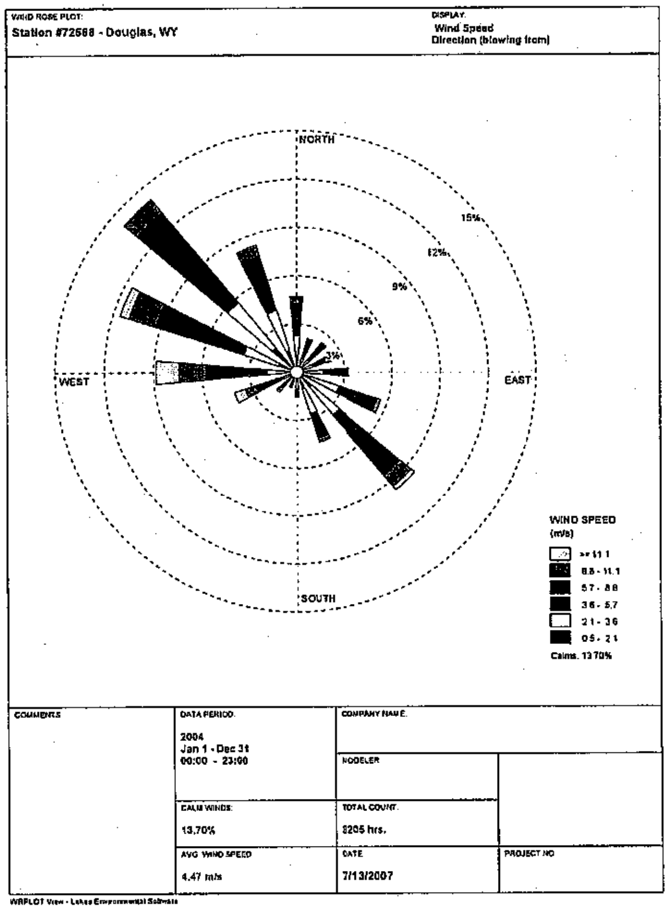
The applicant used the Environmental Protection Agency's (EPA) AERMOD model, version 07026, for evaluating concentrations of NO_x, CO, SO_2, PM_{10}, Pb, and HF. All model runs were simulated using recommended regulatory defaults. Options used were rural dispersion with no exponential decay, elevated terrain algorithms, stack-tip downwash (except for building downwash cases), calms processing, and missing data processing. The topography in the geographic area can be characterized as complex terrain due to some terrain elevations being greater than stack top elevations. EPA has specified that the model of choice for complex terrain in an industrial setting with multiple sources is AERMOD. The applicant used the EPA BPIP – Prime program to determine downwash parameters to include in the model runs.

Meteorological Data

The applicant chose to use four years (2000, 2002-2004) of surface data collected at the Douglas-Converse County Airport Automated Surface Observation System (ASOS) monitoring site. This monitoring site is the closest meteorological site readily available with cloud cover and ceiling height data, and the surrounding surface characteristics are comparable to those around the facility. Data recovery for the four years used in the modeling analysis was over 90 percent complete. Data recovery from 2001 was below 90 percent, plus the frequency distribution of the wind profile showed substantial differences from the other data sets. The surface data was collected at a height of 6.1 meters with a base elevation of 1502 meters. Upper air data were collected at the Rawlins, Wyoming Municipal airport (Station #24061) for the same time period and merged with the hourly data using EPA's AERMET meteorological data preprocessor for use in AERMOD.

In AERMET, surface characteristics for the surface meteorological site are required for the computation of the fluxes and stability of the atmosphere. These surface parameters are albedo (fraction of total incident solar radiation reflected by the earth's surface back into space), Bowen Ratio (an indicator of surface moisture), and surface roughness length (height at which the mean horizontal wind speed is zero and is related to the height of obstacles to wind flow). These surface parameters can be entered on an annual, seasonal, or monthly basis. Average seasonal values for "desert shrubland" and "grassland", as listed in Tables 4-1, 4-2b, and 4-3 of the AERMET User's Guide, were used for Stage 3 processing within AERMET. These surface characteristics were applied for all wind direction sectors because of the uniformity of the land use in the vicinity of the meteorological measurement site. In addition, the location of the facility with respect to the surface meteorological site is required as AERMET adjusts its computations to account for solar radiation differences (sunrise/sunset) between the surface data site and facility location.

An average of the wind statistics for this data set indicates the predominant winds originate from the northwest direction approximately 33% of the time, and from the southeast direction approximately 17% of the time. The average calculated wind speed is approximately 5.5 meters/sec (12.3 miles per hour). The percentage of calm hours for this data set equates to 13.0%. A windrose for the 2004 data set is shown below.



<u>Background Concentrations:</u>

Background concentrations for the various pollutants were derived from ambient air quality monitoring data in the central and northeast portions of the state. More specifically, annual background NO_2 concentrations were taken from calendar years 2003-2006 from the Antelope Site 3 (#560050892) in Converse County; the highest recorded background concentration was observed in 2005.

3-hour, 24-hour, and annual background SO_2 concentrations were recorded from calendar years 2005-2007 at the Rodeo St. site (#560450800) in Weston County, as well as from calendar years 2002-2006 at the Wyodak Site 4 (#560050857) in Campbell County. The highest 2[nd]-highest 3-hour and annual background SO_2 concentrations were observed in 2002; the highest 2[nd]-highest 24-hour background SO_2 concentration was observed in 2006, all of which were located at the Wyodak Site 4 and used in this modeling analysis.

Background PM_{10} concentrations for this application were obtained from data collected in calendar years 2002-2005 at the Glenrock Coal Co. (#560090830) in Converse County. The highest 2nd-highest 24-hour and annual background PM_{10} concentrations were recorded in the year 2005. Background values used in the Division's review of the WAAQS analyses are summarized in Table 6.

Table 6: Background Concentrations Used in Modeling Analyses for Dave Johnston Power Plant		
Criteria Pollutant	**Averaging Period**	**Background Concentration**
NO_2	Annual	9.4 μg/m³
SO_2	3-hour	156.7 μg/m³
	24-hour	73.1 μg/m³
	Annual	13.1 μg/m³
PM_{10}	24-Hour	55 μg/m³
	Annual	23 μg/m³

Emissions:
The emission rates for the various pollutants used by the applicant for the Dave Johnston Power Plant near field analysis are shown in Table 7.

Table 7: Pollutant Emissions				
Pollutant	**Dave Johnston Boiler 1 (lb/hr)**	**Dave Johnston Boiler 2 (lb/hr)**	**Dave Johnston Boiler 3 (lb/hr)**	**Dave Johnston Boiler 4 (lb/hr)**
NO_x	675.0	675.0	784.0	697.0
CO	34.0	31.8	700.0	820.0
SO_2	1620.0	1620.0	420.0	615.0
PM/PM_{10}	135.0	135.0	42.0	61.5
Pb	0.032	0.032	0.0091	0.014
HF	4.3	4.0	1.19	1.74

Emission rates and stack parameters from the Sinclair Oil Company-Casper Refinery, Kinder Morgan-Casper Extraction Plant, and Kinder Morgan-Douglas Gas Plant were also included in the WAAQS analyses. Specific emissions of the various pollutants from these sources are detailed later in this analysis.

Good Engineering Practice Analysis:

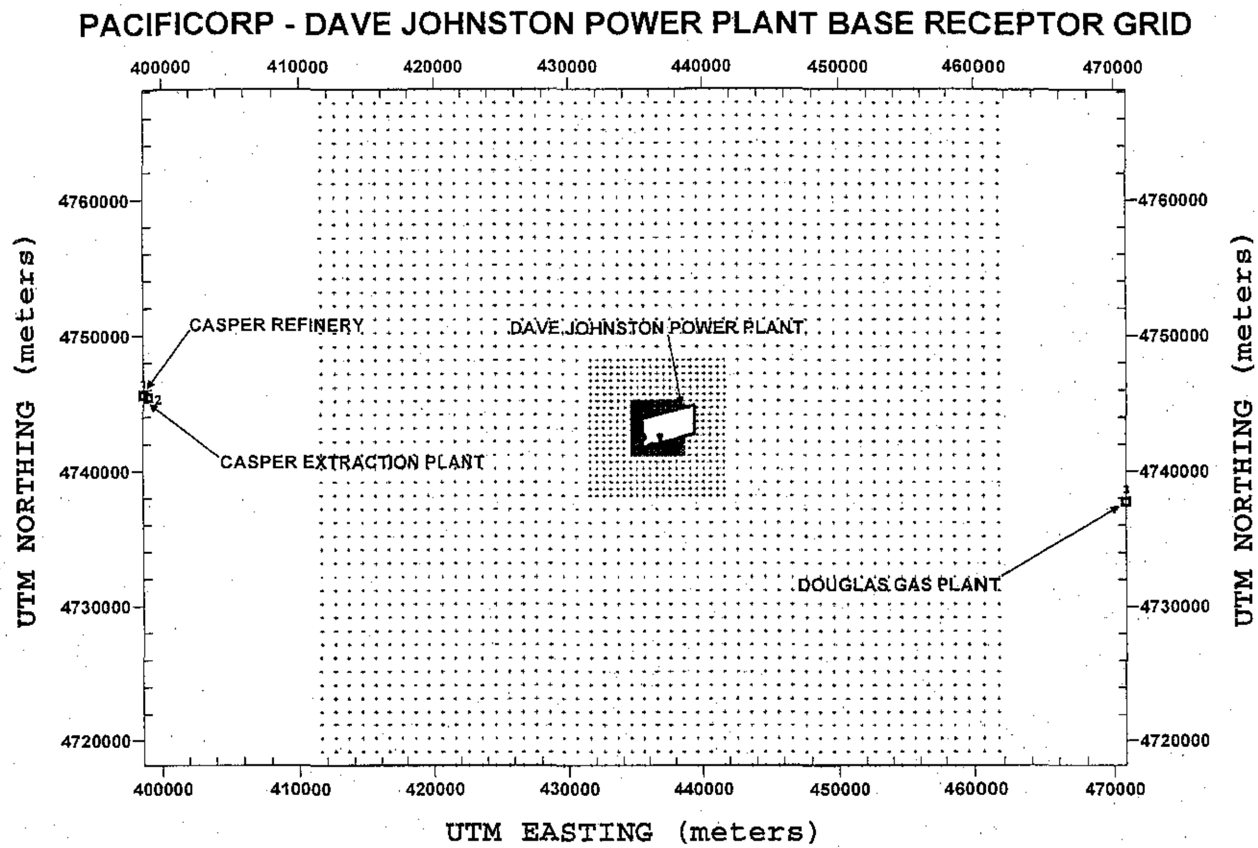
Section 123 of the Clean Air Act defines Good Engineering Practice (GEP), with respect to stack heights, as "the height necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies or wakes which may be created by the source itself, nearby structures or nearby terrain obstacles." In accordance with Chapter 6, Section 2(d) of the WAQSR, sources cannot model stack heights above GEP when showing compliance with an Ambient Air Quality Standard or increment.

Since stack heights for the Dave Johnston Power Plant sources are less than the calculated GEP height, direction specific building dimensions from the latest version of the EPA Building Profile Input Program (BPIP) were included in the AERMOD simulations to account for downwash effects from nearby structures.

Receptor Grid:

A rectangular receptor grid around the Dave Johnston Power Plant was developed for locations considered to be *ambient air*, which is defined as "that portion of the atmosphere, external to buildings, to which the general public has access". Discrete Cartesian receptors were placed at 50-meter (m) spacing along the ambient boundary, or fenceline. A fine receptor grid with 100-m spacing started just beyond the 50-m grid to a total distance of approximately 2 km from the grid origin. A coarse receptor grid of 500-m spacing was placed from 2km to 5km from the grid origin. A final receptor grid with 1000-m spacing began at the end of the 500-m receptor grid and extended out to a total distance of approximately 25 km in each direction. Any maximum predicted modeled impact that occurred outside the fine receptor grid was supplemented with a refined grid around the maximum impact receptor with a spacing of 100-m. The base receptor grid used in the ambient air quality impact analysis is shown in the figure below.

Receptor elevations and hill heights for input to AERMOD were determined from electronic data contained in USGS 7.5-minute Digital Elevation Model (DEM) files using EPA's AERMAP program. All receptors were developed using NAD 27 data.



Class II Significant Impact Analyses:
EPA guidance contained in the New Source Review Workshop Manual, October 1990, states that in the event that the maximum modeled ambient impact of a proposed emissions increase is below the appropriate ambient air quality significance level for all locations and averaging periods, the EPA does not require any further NAAQS or PSD Class II Increment analyses for that pollutant. The designated PSD Class II Significant Impact Levels (SILs), as specified by the EPA, and in WAQSR, Chapter 6, Section 2(c)(ii)(A) are provided in Table 8.

PacifiCorp proposes to add additional pollution control devices that will significantly reduce unit-specific emissions for Sulfur Dioxide (SO_2), Nitrogen Oxides (NO_x), and Particulate Matter (PM_{10}). The new combustion control devices that reduce NO_x, however, will increase Carbon Monoxide (CO) emissions. The increase in CO emissions from the new controls would exceed PSD significant emission rates.. Therefore, a significance analysis was performed to determine if impacts of CO would exceed the Class II SILs. The results of that analysis, which are summarized in Table 8, demonstrate that CO impacts, after the new pollution control devices are installed on Units 3 and 4, would not exceed the Class II SILs. Therefore, no further modeling analysis for CO was required.

Table 8: Results of PSD Class II Significant Analysis				
Pollutant	**Averaging Period**	**Dave Johnston Plant Maximum Impact ($\mu g/m^3$)**	**SILs ($\mu g/m^3$)**	**Dave Johnston Plant Impact Exceeds SILs (Yes/No)**
CO	8-hour	131.2	500	No
	1-hour	690.4	2,000	No

In addition to modeling CO, the Division requested the applicant model remaining criteria pollutants, which are NO_x, SO_2, and PM_{10}, in addition to Fluorides and Lead to evaluate ambient air concentrations of these pollutants after the new control devices are installed. The nearby emission sources within 50 km of the Dave Johnston Power Plant are summarized in Table 9.

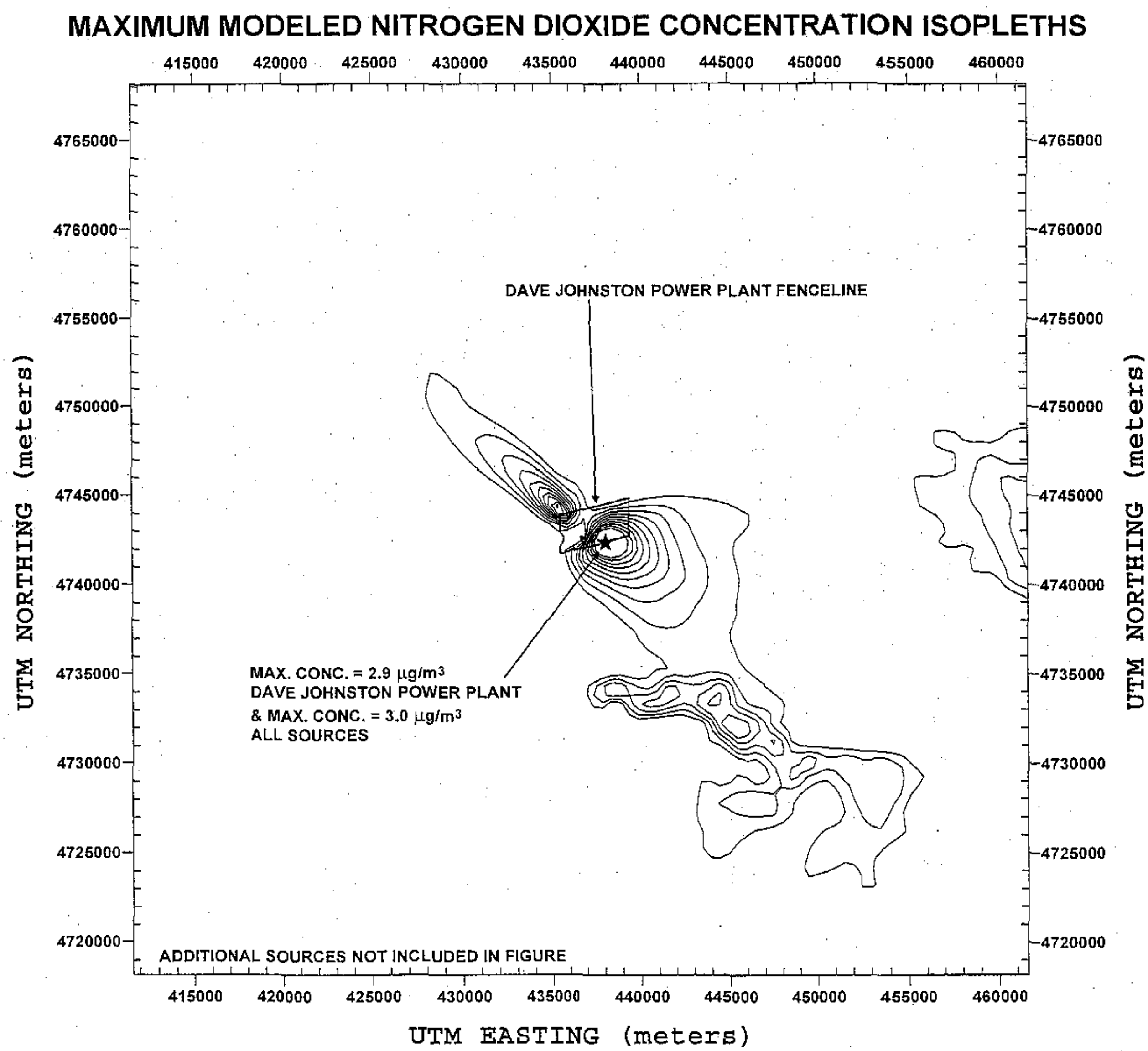
Table 9: Nearby Sources Included in WAAQS Analyses			
Facility	**NO_x tpy**	**SO_2 tpy**	**PM_{10} tpy**
Sinclair Oil Company – Casper Refinery	1049.8	3319.2	421.1
Kinder Morgan – Casper Extraction Plant	621.2	0.0	0.0
Kinder Morgan – Douglas Gas Plant	1834.6	0.0	0.0

WYOMING AMBIENT AIR QUALITY STANDARDS (WAAQS) ANALYSIS

□ Nitrogen Dioxide (NO_2) □

A cumulative modeling analysis was performed to determine compliance with the WAAQS for NO_2 of 100 $\mu g/m^3$. NO_x emissions from sources located within 50 km of the Dave Johnston Power Plant were included in the modeling analysis. The maximum modeled impact from all sources was 4.1 $\mu g/m^3$ using 2003 meteorology, which was a fenceline impact on the southern facility fenceline at receptor (438065, 4742345). This result was obtained using the conservative assumption that 100% of the NO_x emissions convert to NO_2. Supplement C to the Guideline on Air Quality Models allows for the use of the Ambient Ratio Method, which provides for a 25% reduction in modeled NO_x concentrations for purposes of estimating NO_2 concentrations. Multiplying the maximum model predicted annual NO_x concentration by 0.75 yields an annual NO_2 concentration of 3.0 $\mu g/m^3$. With the addition of the background level of 9.4 $\mu g/m^3$, the total predicted impact is 12.4 $\mu g/m^3$. This predicted impact is well below the WAAQS for NO_2. Hence, this analysis demonstrates compliance with the annual WAAQS for NO_2. Results of the WAAQS analysis for NO_2 are provided in Table 10, and an isopleth plot of the model predicted annual average NO_2 concentrations are shown in the figure below.

Table 10: Annual NO_2 Modeling Results for WAAQS Analysis						
Receptor Location (Zone 13) X (m)	Y (m)	Maximum Annual NO_2 Conc. ($\mu g/m^3$)	Background Annual NO_2 Conc. ($\mu g/m^3$)	Total Annual NO_2 Conc. ($\mu g/m^3$)	Annual NO_2 WAAQS ($\mu g/m^3$)	Percent of Standard
438065	4742345	3.0	9.4	12.4	100	12%



□ Sulfur Dioxide (SO_2) □

Cumulative modeling analyses were conducted to determine compliance with the WAAQS for SO_2. SO_2 emissions from sources located within 50 km of the Dave Johnston Power Plant were included in the modeling analyses.

Using 2003 meteorology, the highest second-highest (HSH) model predicted 3-hour concentration was 428.7 $\mu g/m^3$ at receptor (434595, 4735155), which is located approximately 8 km south-southwest of the power plant. Because the HSH concentration occurred at a receptor located in a coarse (1000-meter receptor spacing) receptor grid, a refined grid using 100-meter spacing was placed around the maximum impact receptor to further refine the result. The HSH modeled concentration using the 100 meter fine receptor grid was 440.7 $\mu g/m^3$ at receptor (434695, 4735455), which is located 100 meters east and 300 meters north of the HSH concentration using the 1000-meter grid. The total HSH 3-hour concentration, including background, was 597.4 $\mu g/m^3$, which is below the 3-hour WAAQS of 1,300 $\mu g/m^3$.

The HSH model predicted 24-hour concentration was 67.3 $\mu g/m^3$ using 2004 meteorology at receptor (441595, 4734155), which is located approximately 10 km southeast of the power plant. Because the HSH concentration occurred at a receptor located in a coarse (1000-meter receptor spacing) receptor grid, a refined grid using 100-meter spacing was placed around the maximum impact receptor to further refine the result; using this receptor grid, the HSH modeled 24-hour concentration was 97.3 $\mu g/m^3$ at receptor (441295, 4734355), which is located 300 meters west and 200 meters north of the HSH concentration using the 1000-meter grid. The total HSH 24-hour concentration, including background, was 170.4 $\mu g/m^3$, which is below the 24-hour WAAQS of 260 $\mu g/m^3$.

The maximum modeled annual SO_2 concentration was 6.3 $\mu g/m^3$ using 2003 meteorology at receptor (438065, 4742345), which was a fenceline impact occurring on the southern edge of the facility boundary. The total annual SO_2 concentration, including background was 19.4 $\mu g/m^3$, which is below the annual WAAQS of 60 $\mu g/m^3$.

Modeling results from the WAAQS analysis for SO_2 indicate that the ambient air quality impacts from all SO_2 sources in the project area, including the applicable background concentrations, are below the 3-hour, 24-hour, and annual WAAQS for SO_2, respectively, with results provided in Tables 11-13. In all three WAAQS analyses, the Dave Johnston Power Plant contributes nearly 100% to the total modeled impact. Isopleth plots of the 3-hour, 24-hour, and annual model predicted SO_2 concentrations are shown in the figures below.

Table 11: High Second High 3-Hour SO_2 Modeling Results for WAAQS Analysis

Receptor Location (Zone 13) X (m)	Y (m)	2nd High 3-Hour SO_2 Conc. ($\mu g/m^3$)	Background 3-Hour SO_2 Conc. ($\mu g/m^3$)	Total 3-Hour SO_2 Conc. ($\mu g/m^3$)	3-Hour SO_2 WAAQS ($\mu g/m^3$)	Percent of Standard
434695	4735455	440.7	156.7	597.4	1,300	46%

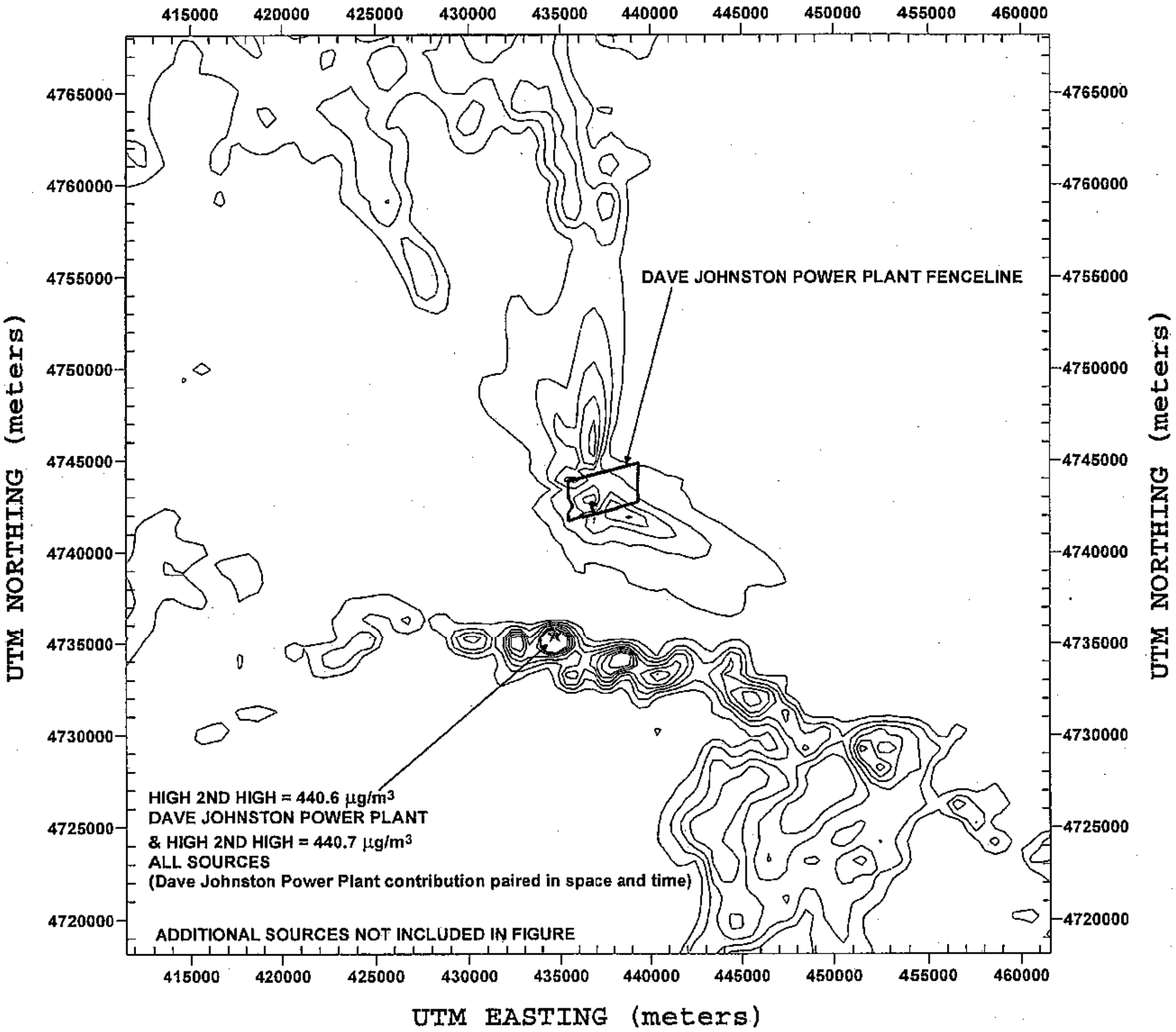
Table 12: High Second High 24-Hour SO_2 Modeling Results for WAAQS Analysis

Receptor Location (Zone 13) X (m)	Receptor Location (Zone 13) Y (m)	2nd High 24-Hour SO_2 Conc. ($\mu g/m^3$)	Background 24-Hour SO_2 Conc. ($\mu g/m^3$)	Total 24-Hour SO_2 Conc. ($\mu g/m^3$)	24-Hour SO_2 WAAQS ($\mu g/m^3$)	Percent of Standard
441295	4734355	97.3	73.1	170.4	260	66%

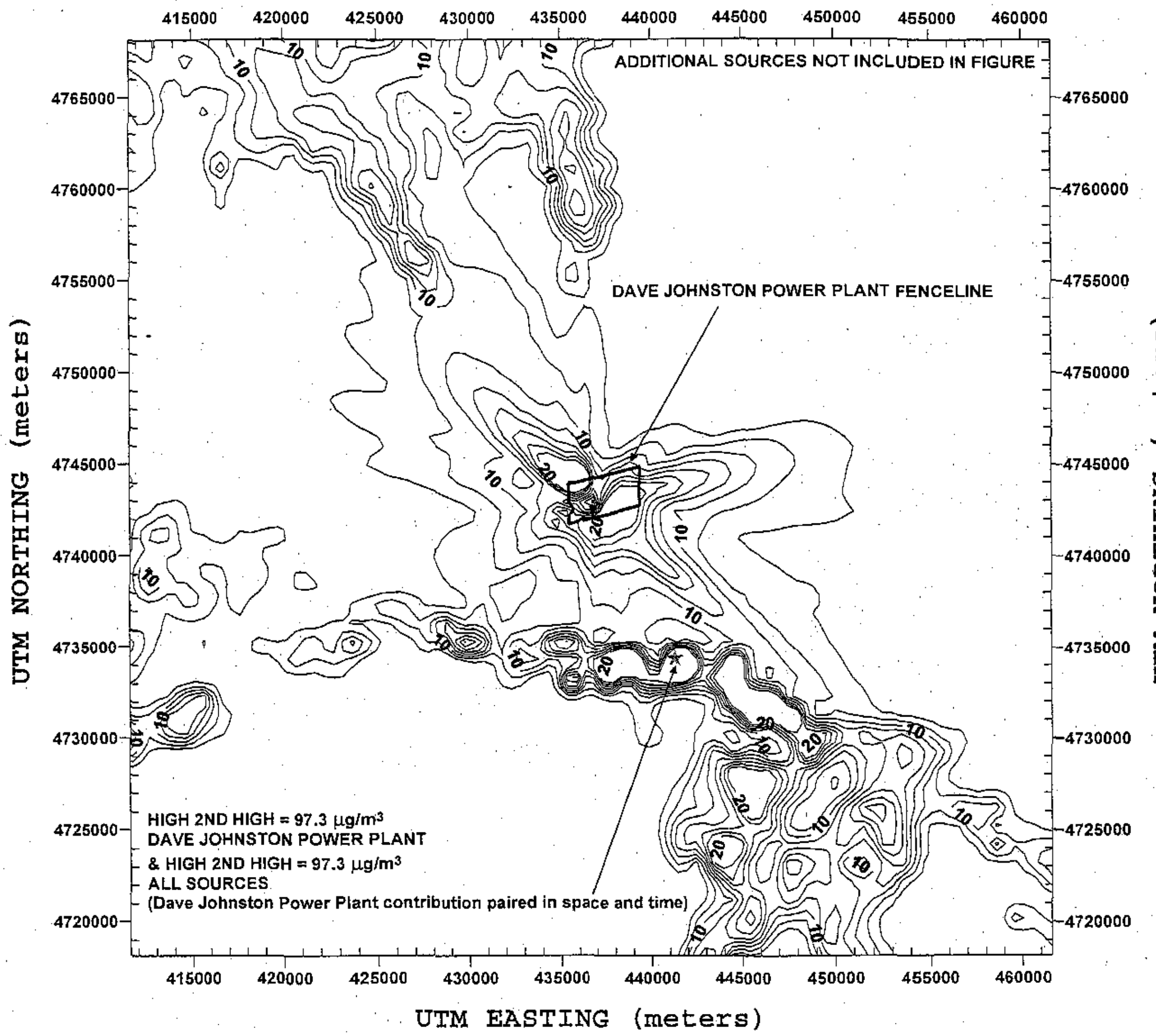
Table 13: Annual SO_2 Modeling Results for WAAQS Analysis

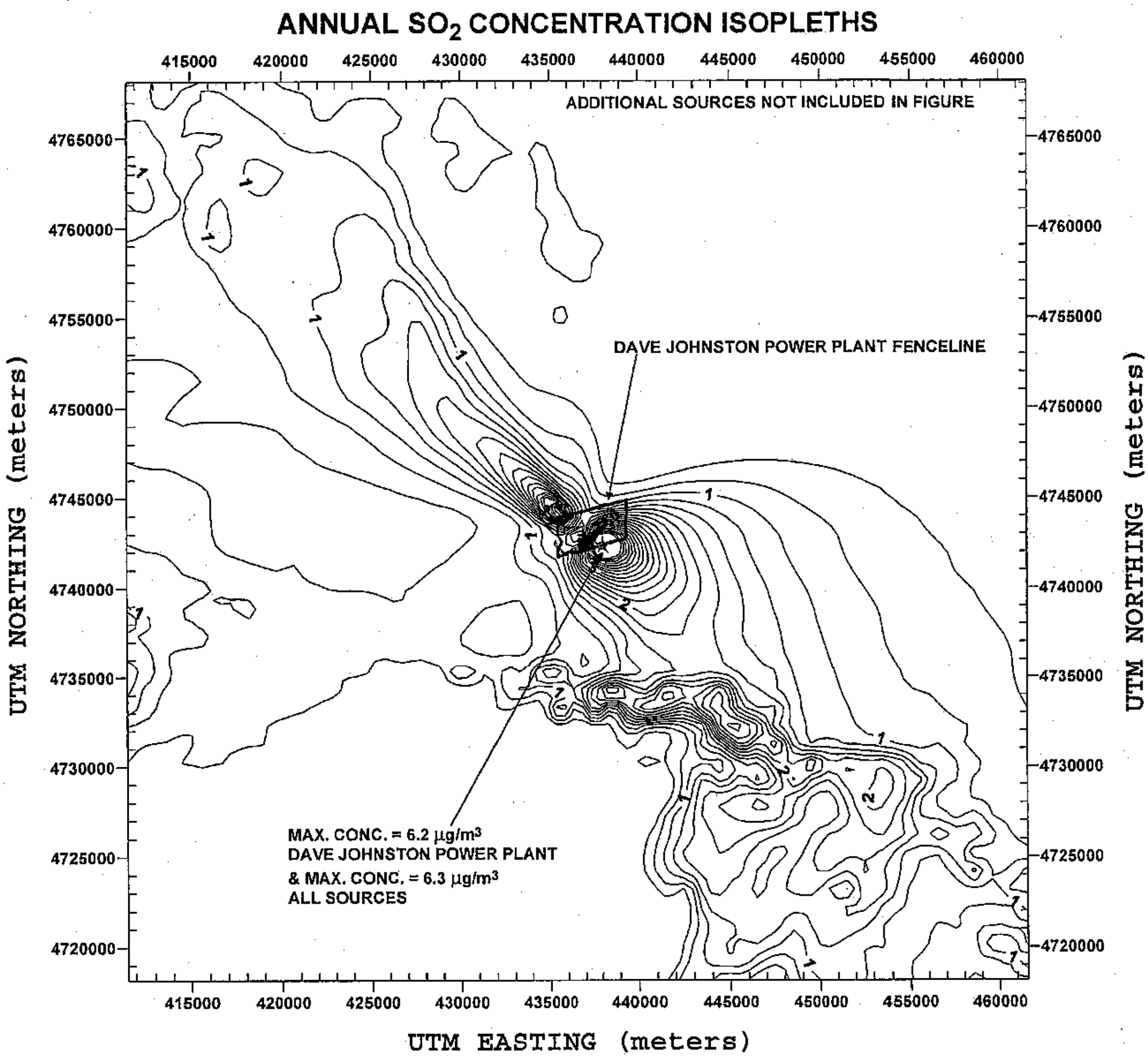
Receptor Location (Zone 13) X (m)	Receptor Location (Zone 13) Y (m)	Maximum Annual SO_2 Conc. ($\mu g/m^3$)	Background Annual SO_2 Conc. ($\mu g/m^3$)	Total Annual SO_2 Conc. ($\mu g/m^3$)	Annual SO_2 WAAQS ($\mu g/m^3$)	Percent of Standard
438065	4742345	6.3	13.1	19.4	60	32%

3-HR. HIGH SECOND HIGH SO_2 CONCENTRATION ISOPLETHS



24-HR. HIGH SECOND HIGH SO_2 CONCENTRATION ISOPLETHS





♦ Particulate Matter less than 10 microns (PM_{10}) ♦

The applicant performed a cumulative modeling analysis for PM_{10} for the 24-hour and annual averaging periods. PM_{10} emissions from sources located within 50 km of the Dave Johnston Power Plant were included in the modeling analyses.

For the WAAQS analysis, the highest 2nd-high 24-hour modeled impact was 62.8 μg/m^3 using 2002 meteorology, at UTM coordinate (436810, 4742664), which is located on the facility fenceline. After adding in the 24-hour background concentration of 55 μg/m^3, the total predicted impact was 117.8 μg/m^3, which is below the 24-hour WAAQS of 150 μg/m^3.

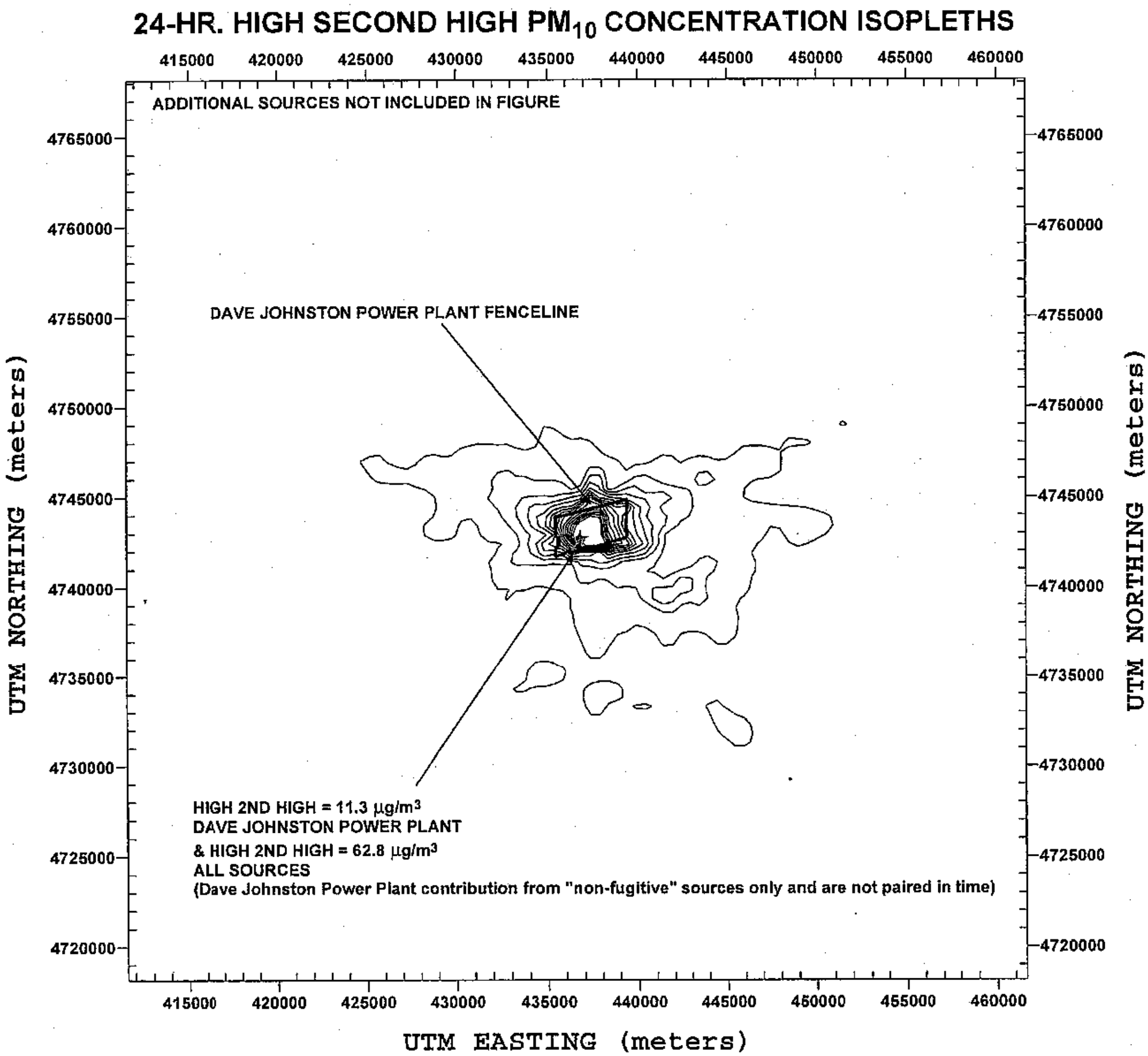
The maximum modeled annual PM_{10} concentration was 12.2 μg/m^3 using 2004 meteorology, which also occurred at UTM coordinate (436810, 4742664). The total predicted annual PM_{10} impact, including a 23 μg/m^3 background value, was 35.2 μg/m^3. Hence, the annual model predicted concentrations demonstrate compliance with the applicable WAAQS of 50 μg/m^3 for PM_{10}. The results of the WAAQS modeling for PM_{10} are presented in Tables 14-15. Isopleth plots of the highest second highest 24-hour and annual PM_{10} impacts are presented in the following figures.

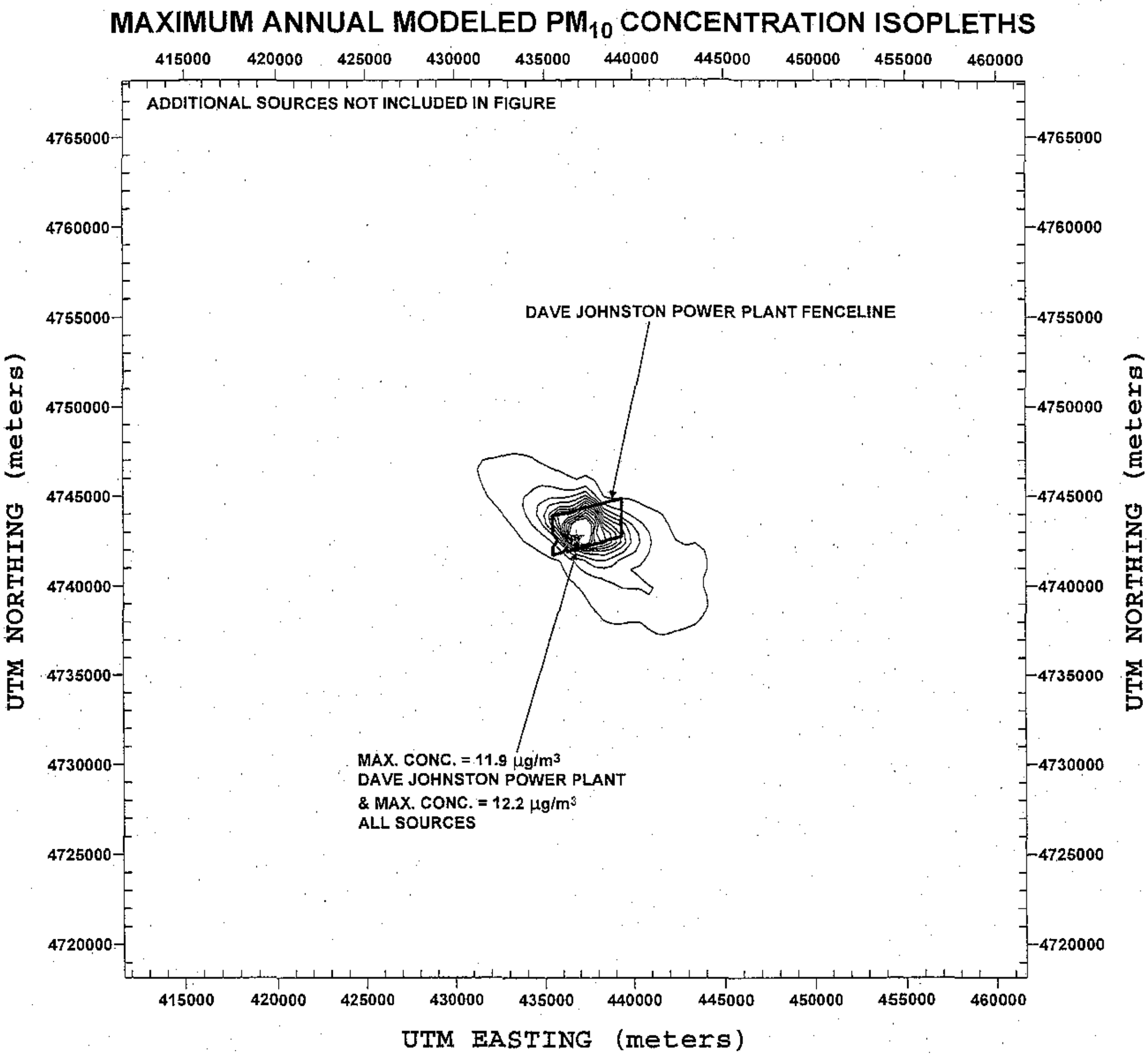
Table 14: High Second High 24-Hour PM_{10} Modeling Results for WAAQS Analysis

Receptor Location (Zone 13) X (m)	Receptor Location (Zone 13) Y (m)	2nd High 24-Hour PM_{10} Conc. (μg/m^3)	Background 24-Hour PM_{10} Conc. (μg/m^3)	Total 24-Hour PM_{10} Conc. (μg/m^3)	24-Hour PM_{10} WAAQS (μg/m^3)	Percent of Standard
436810	4742664	62.8	55	117.8	150	79%

Table 15: Annual PM_{10} Modeling Results for WAAQS Analysis

Receptor Location (Zone 13) X (m)	Receptor Location (Zone 13) Y (m)	Maximum Annual PM_{10} Conc. (μg/m^3)	Background Annual PM_{10} Conc. (μg/m^3)	Total Annual PM_{10} Conc. (μg/m^3)	Annual PM_{10} WAAQS (μg/m^3)	Percent of Standard
436810	4742664	12.2	23	35.2	50	70%


24-HR. HIGH SECOND HIGH PM_{10} CONCENTRATION ISOPLETHS
415000
420000
425000
430000
435000
440000
445000
450000
455000
460000
ADDITIONAL SOURCES NOT INCLUDED IN FIGURE
4765000
4760000
4755000
4750000
4745000
4740000
4735000
4730000
4725000
4720000
DAVE JOHNSTON POWER PLANT FENCELINE
HIGH 2ND HIGH = 11.3 µg/m³
DAVE JOHNSTON POWER PLANT
& HIGH 2ND HIGH = 62.8 µg/m³
ALL SOURCES
(Dave Johnston Power Plant contribution from "non-fugitive" sources only and are not paired in time)
UTM NORTHING (meters)
UTM EASTING (meters)



♦ Hydrogen Fluoride (HF) ♦

Current permitted Hydrogen Fluoride (HF) emissions from the Dave Johnston Power Plant are approximately 83.9 tpy. After the new control devices are installed for each of the four units at the power plant, hydrogen fluoride emissions will be reduced to 49.4 tpy. Hydrogen Flouride emission factors were based on the design firing rate, potential emissions, and annual operation of 8,760 hours per year.

The applicant modeled the proposed HF emissions to determine the maximum 12-hour, 24-hour, 7-day, and 30-day concentrations of HF on the ambient air quality. AERMOD does not have an option for calculating impacts for a 7-day averaging period. Therefore, concentrations for the 7-day averaging period were conservatively estimated by comparing the 24-hour concentration with the 7-day WAAQS of 0.5 µg/m^3.

The maximum predicted HF concentrations are summarized in Table 16. The maximum 12-hour and 24-hour concentrations both occurred in the year 2002, and were refined because they were located outside of the original fine receptor grid with 100-m spacing. The maximum 30-day concentration occurred in the year 2003. Based on the results of this analysis, no violations of the HF standards were predicted as modeled concentrations of HF are well below Wyoming's HF standards.

Table 16: Maximum Modeled Hydrogen Fluoride Impacts

Averaging Period	Dave Johnston Modeled Impact ($\mu g/m^3$)	HF WAAQS ($\mu g/m^3$)	Percent of WAAQS for HF
12-hour	0.66	3.0	22%
24-hour	0.33	1.8	18%
7-day [1]	0.33	0.5	66%
30-day [2]	0.036	0.4	9%

[1] 7-day impact estimated using the 24-hour concentration as a surrogate.
[2] Monthly concentrations reported in the modeled results.

♦ Lead (Pb) ♦

Current potential lead (Pb) emissions from the Dave Johnston Power Plant are approximately 0.76 tpy. After the new control devices are installed for each of the four boilers, lead emissions will be reduced to 0.38 tpy. Lead emission factors were based on the design firing rate, potential emissions, and annual operation of 8,760 hours per year.

The applicant conducted modeling for Pb to determine compliance with WAAQS for lead. The highest modeled impact was 0.00026 $\mu g/m^3$ at receptor (435495, 4744055), which is located along the power plant's facility fenceline. The total impact for lead, assuming a natural background concentration of 0 $\mu g/m^3$, is well below the WAAQS, as noted in Table 17.

Table 17: Maximum Modeled Lead Impacts

Averaging Period	Dave Johnston Modeled Impact ($\mu g/m^3$)	Pb WAAQS ($\mu g/m^3$)	Percent of WAAQS for Pb
Quarterly[1]	0.00026	1.5	<1%

[1] Calendar quarter modeled impact (3-month) for lead was based on using the maximum modeled monthly concentration.

SOILS AND VEGETATION ANALYSIS

NAAQS, or equivalently, the WAAQS have been established to protect public health and welfare from any adverse effects of criteria pollutants. With the installation of new pollution control devices on the four coal-fired boilers, emissions for all criteria pollutants will decrease, with the exception of CO. Ambient air quality modeling demonstrates that impacts of CO are predicted to be below the Class II SILs for the 1-hour and 8-hour averaging periods. In addition, the WAAQS modeling analyses for NO_2, SO_2, PM_{10}, HF, and Pb indicate that the ambient air quality impacts are below the respective WAAQS. Therefore, based on the modeling analyses submitted by the applicant, and the decrease in emissions after the new pollution control devices are installed, it is expected that the operation of the Dave Johnston Power Plant will not adversely impact soils and vegetation in the near vicinity of the power plant.

Near-Field Modeling Analysis Summary:

The modeling analysis indicates that the model predicted concentrations of CO are below the PSD Class II modeling significance levels. Modeled cumulative NO_2, SO_2, PM_{10}, HF, and Pb concentrations for Dave Johnston and sources in the near vicinity are below the applicable respective Wyoming Ambient Air Quality Standards. Based on results of this analysis, the Dave Johnston Power Plant is expected to be in compliance with all applicable ambient standards.

PROPOSED PERMIT CONDITIONS:

The Division proposes to issue an Air Quality Permit to PacifiCorp for the modification of the Dave Johnston Plant with the following conditions:

1. Authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution, and for determining compliance or non-compliance with any rules, standards, permits or orders.

2. All substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit. Units 1-4 heat input and megawatt ratings listed in the application (AP-5098) and the Division's permit application analysis are not enforceable as conditions of this permit.

3. That PacifiCorp shall modify their Operating Permit in accordance with Chapter 6, Section 3 of the WAQSR.

4. All notifications, reports and correspondence associated with this permit shall be submitted to the Stationary Source Compliance Program Manager, Air Quality Division, 122 West 25th Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 152 North Durbin, Suite 100, Casper, WY 82601.

5. Each time Low NO_x Burners or an FGD/baghouse system is installed, the owner or operator shall furnish the Administrator written notification of: (i) the anticipated date of initial startup not more than 60 days or less than 30 days prior to such date, and; (ii) the actual date of initial start-up within 15 days after such date in accordance with Chapter 6, Section 2(i) of the WAQSR.

6. Each time Low NO_x Burners or an FGD/baghouse system is installed, the date of commencement of construction shall be reported to the Administrator within 30 days of such date. The permit shall become invalid if construction or modification is not commenced within 24 months of the date of permit issuance or if construction is discontinued for a period of 24 months or more in accordance with Chapter 6, Section 2(h) of the WAQSR. The Administrator may extend such time period(s) upon a satisfactory showing that an extension is justified.

7. Performance tests shall be conducted and a written report of the results submitted within 30 days of achieving maximum design rate but not later than 90 days following initial start-up in accordance with Chapter 6, Section 2(j) of the WAQSR. The operator shall provide 15 days prior notice of the test date. If maximum design production rate is not achieved within 90 days of start-up, the Administrator may require testing at the rate achieved and again when maximum rate is achieved.

8. Emissions from each unit shall not exceed the levels below. Units 1-4 annual plantwide applicability limits (PALs) for NO_x and SO_2 are established in Condition 17 of this permit.

Unit 1

- i. Effective upon issuance of permit:
  1. NO_x: 0.75 lb/MMBtu; 3-hour rolling average
     0.5 lb/MMBtu; 12-month rolling average
     a. Limits shall apply during all operating periods.
  2. SO_2: 1,620 lb/hr; 24-hr rolling average
     1.2 lb/MMBtu; 2-hr rolling average
     a. Limits shall apply during all operating periods.
  3. PM:
     a. 0.1 lb/MMBtu
        i. Limit shall apply during all operating periods, except startup.
        ii. Filterable PM/PM_{10}
     b. 135 lb/hr
        i. Limit shall apply during all operating periods.
        ii. Filterable PM/PM_{10}

Unit 2

- i. Effective upon issuance of permit:
  1. NO_x: 0.75 lb/MMBtu; 3-hour rolling average
     0.5 lb/MMBtu; 12-month rolling average
     a. Limits shall apply during all operating periods.
  2. SO_2: 1,620 lb/hr; 24-hr rolling average
     1.2 lb/MMBtu; 2-hr rolling average
     a. Limits shall apply during all operating periods.
  3. PM:
     a. 0.1 lb/MMBtu
        i. Limit shall apply during all operating periods, except startup.
        ii. Filterable PM/PM_{10}
     b. 135 lb/hr
        i. Limit shall apply during all operating periods.
        ii. Filterable PM/PM_{10}

Unit 3

- i. Effective upon issuance of permit:
  1. NO_x: 0.75 lb/MMBtu; 3-hour rolling average
     0.5 lb/MMBtu; 12-month rolling average
     Limits shall apply during all operating periods.

  SO_2: 1.2 lb/MMBtu; 2-hr rolling average
     a. Limit shall apply during all operating periods.

2. PM:
    a. 0.23 lb/MMBtu
        i. Limit shall apply during all operating periods, except startup.
        ii. Filterable PM/PM_{10}
    b. 566.1 lb/hr
        i. Limit shall apply during all operating periods.
        ii. Filterable PM/PM_{10}

ii. Upon installation or upgrade of control equipment:

1. NO_x: 0.28 lb/MMBtu and 784 lb/hr; 12-month rolling average
    a. Limits shall apply during all operating periods.
    b. Limits shall become effective upon startup of unit with Low-NO_x burners and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.
2. SO_2: 0.15 lb/MMBtu; 12-month rolling average
    0.5 lb/MMBtu; 30-day rolling average
    1.2 lb/MMBtu; 3-hr block average, not to be exceeded more than once per year.
    420 lb/hr; 24-hr rolling average
    a. Limits shall apply during all operating periods.
    b. Limits shall become effective upon startup of unit after FGD/baghouse installation and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.
3. PM:
    a. 0.015 lb/MMBtu
        i. Limit shall apply during all operating periods, except startup.
        ii. Filterable PM/PM_{10}
        iii. Limit shall become effective upon startup of unit after FGD/baghouse installation and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.
    b. 42.1 lb/hr and 184 tpy
        i. Limits shall apply during all operating periods.
        ii. Filterable PM/PM_{10}
        iii. Limits shall become effective upon startup of unit after FGD/baghouse installation and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.

4. CO: 0.25 lb/MMBtu and 700 lb/hr; 30-day rolling average
    a. Limits shall apply during all operating periods.
    b. Limits shall become effective upon startup of unit with Low-NO_x burners and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.

Unit 4

i. Effective upon issuance of permit:
    1. NO_x: 0.75 lb/MMBtu; 12-month rolling average
       0.5 lb/MMBtu; 12-month rolling average
        a. Limits shall apply during all operating periods.
    2. SO_2: 1.2 lb/MMBtu; 3-hr block average, not to be exceeded more than once per year.
       0.5 lb/MMBtu; 30-day rolling average
        a. Limits shall apply during all operating periods.
    3. PM:
        a. 0.21 lb/MMBtu
            i. Limit shall apply during all operating periods, except startup.
            ii. Filterable PM/PM_{10}
        b. 862 lb/hr
            i. Limit shall apply during all operating periods.
            ii. Filterable PM/PM_{10}

ii. Upon installation or upgrade of control equipment:
    1. NO_x: 0.17 lb/MMBtu and 697 lb/hr; 12-month rolling average
        a. Limits shall apply during all operating periods.
        b. Limits shall become effective upon startup of unit with Low-NO_x burners and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.
    2. SO_2: 0.15 lb/MMBtu; 12-month rolling average
       0.5 lb/MMBtu; 30-day rolling average
       1.2 lb/MMBtu; 3-hr block average, not to be exceeded more than once per year.
       615 lb/hr; 24-hr rolling average
        a. Limits shall apply during all operating periods.
        b. Limits shall become effective upon startup of unit after FGD/baghouse installation and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.

3. PM:
    a. 0.015 lb/MMBtu
        i. Limit shall apply during all operating periods, except startup.
        ii. Filterable PM/PM_{10}
        iii. Limit shall become effective upon startup of unit after FGD/baghouse installation and completion of the initial performance tests required by Condition 7 of this permit Actual date of startup shall be submitted as required by Condition 5 of this permit.
    b. 61.5 lb/hr and 269 tpy
        i. Limits shall apply during all operating periods.
        ii. Filterable PM/PM_{10}
        iii. Limits shall become effective upon startup of unit after FGD/baghouse installation and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.
4. CO: 0.2 lb/MMBtu and 820 lb/hr; 30-day rolling average
    a. Limits shall apply during all operating periods.
    b. Limits shall become effective upon startup of unit with Low-NO_x burners and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.

9. Opacity shall be limited as follows:

i. Units 1-2:
1. No greater than 40 percent opacity of visible emissions.
    a. Limit shall apply during all operating periods.

Units 3-4:
1. No greater than 20 percent opacity of visible emissions, except one six-minute period per hour of not more than 27 percent opacity.
    a. Limit shall apply during all operating periods, except startup.
    b. Limit shall become effective upon startup of unit after FGD/baghouse installation and completion of the initial performance tests required by Condition 7 of this permit. Actual date of startup shall be submitted as required by Condition 5 of this permit.

2. No greater than 40 percent opacity of visible emissions.
    a. Limit shall apply during startup of the boiler.
        i. Startup begins with the introduction of fuel oil into the boiler and ends no later than the point in time when coal is introduced as fuel.

a. PacifiCorp will comply with all reporting and record keeping requirements as specified in WAQSR, Chapter 5, Section 2(g).

   i. Reports shall include specific identification of each period of excess emissions that occur during startup, shutdown, or malfunctions of boilers.

   ii. For Units 1-2, opacity excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 40 percent.

   iii. For Units 3 and 4, opacity excess emissions are defined as

      a. Any six-minute period, excluding startup, in which the average opacity of emissions exceeds 20 percent except that one six-minute period per hour of not more than 27 percent opacity need not be reported.

      b. Any six-minute period during startup in which the average opacity of emissions exceeds 40 percent.

10. Initial performance tests, required by Condition 7 of this permit, shall consist of the following:

i. SO_2: Compliance with the SO_2 24-hour average shall be determined using a continuous emissions monitoring system (CEMS). Testing is required for Units 3 and 4 after FGD/baghouse installation.

ii. PM/PM_{10}:
Units 1 and 2:

   i. Testing shall follow 40 CFR 60.46 and EPA Reference Test Methods 1-4 during normal operations no later than 90 days after permit issuance.

Units 3 and 4

   i. Testing shall follow 40 CFR 60.46 and EPA Reference Test Methods 1-4 during normal operations after FGD/baghouse installation.

   ii. Each unit shall be tested during startup after the installation of the FGD/baghouses to determine compliance with the Chapter 3, Section 2 lb/MMBtu limit and lb/hr limit established in this permit. In lieu of performance tests, PacifiCorp may submit for approval engineering calculations to demonstrate compliance with the particulate limits.

iii. CO: Compliance with the CO 30-day average shall be determined using a continuous emissions monitoring system (CEMS). Testing is required for Units 3 and 4 after installation of the Low-NOx burners.

iv. NO_x: 3 – 1 hour testing following EPA Reference Test Methods 1-4 and 7E to demonstrate compliance with the lb/hr and lb/MMBtu limits. Testing is required for Units 3 and 4 after installation of the Low-NOx burners.

v. Opacity: EPA Method 9 and the procedures in WAQSR, Chapter 5, Section 2(i) shall be used to determine initial compliance with opacity limits in this permit. Testing is required for Units 3 and 4 after FGD/baghouse installation.

11. Prior to any performance testing required by this permit, a test protocol shall be submitted to the Division for approval, at least 30 days prior to testing. Results of the tests shall be submitted to the Division within 45 days of completing the tests.

12. Units 3 and 4 shall be equipped with in-stack continuous emission monitoring (CEM) equipment to demonstrate continuous compliance with the CO emission limits set forth in this permit:

i. CEMs shall be installed and certified within 90 days of startup with Low-NO_x burners.

ii. PacifCorp shall install, calibrate, operate, and maintain a monitoring system, and record the output, for measuring CO emissions discharged to the atmosphere in units of lb/MMBtu and lb/hr. The CO monitoring system shall consist of the following:

a. A continuous emission CO monitor located in the stacks of Units 3 and 4.
b. An in-stack oxygen or carbon dioxide monitor for measuring oxygen or carbon dioxide content of the flue gas at the location NO_X emissions are monitored.
c. A continuous flow monitoring system for measuring the flow of exhaust gases discharged into the atmosphere.

iii. Each continuous monitor system listed in this condition shall comply with the following:

a. Monitoring requirements of WAQSR, Chapter 5, Section 2(j) including the following:

1. 40 CFR 60, Appendix B, Performance Specification 4 or 4a for carbon monoxide. The monitoring systems must demonstrate linearity in accordance with Division requirements and be certified in both concentration (ppm_v) and units of the standard (lb/MMBtu and lb/hr).
2. Quality Assurance requirements of 40 CFR 60, Appendix F.
3. PacifiCorp shall develop and submit for the Division's approval a Quality Assurance plan for the monitoring systems listed in this condition within 90 days of completing the certification tests for each unit.

13. Compliance with the limits set forth in this permit shall be determined with data from the continuous monitoring systems required by 40 CFR Part 75 as follows:

i. Exceedances of the limits shall be defined as follows:

a. Any 12-month rolling average which exceeds the lb/MMBtu and lb/hr NO_x or SO_2 limit as calculated using the following formula:

$$E_{avg} = \frac{\sum_{h=1}^{n}(C)_h}{n}$$

Where:

C = 1-hour average emission rate (lb/MMBtu or lb/hr) for hour "h" calculated using data from the CEM equipment required by 40 CFR Part 75 and the procedures in 40 CFR 60, Appendix A, Method 19. All 1-hour averages must meet the requirements of WAQSR, Chapter 5, Section 2(j).

E_{avg} = Weighted 12-month rolling average emission rate (lb/MMBtu or lb/hr).

n = The number of unit operating hours in the 12-month period with valid emissions data.

b. Any 30-day rolling average which exceeds the lb/MMBtu CO or SO_2 limit as calculated using the following formula:

$$E_{avg} = \frac{\sum_{h=1}^{n} (C)_h}{n}$$

Where:

C = 1-hour average emission rate (lb/MMBtu) for hour "h" calculated using data from the CEM equipment required by 40 CFR Part 75 and the procedures in 40 CFR 60, Appendix A, Method 19. All 1-hour averages must meet the requirements of WAQSR, Chapter 5, Section 2(j).

E_{avg} = Weighted 30-day rolling average emission rate (lb/MMBtu).

n = The number of unit operating hours in the 30-day period with valid emissions data.

c. Any 24-hour rolling average of SO_2 emissions calculated using data from the CEM equipment required by 40 CFR Part 75 which exceeds the lb/hr limit established in this permit. The 24-hour rolling average emission rate shall be calculated as the arithmetic average of the previous 24 1- hour averages meeting the requirements of WAQSR, Chapter 5, Section 2(j). Data (and associated monitoring data hours) which do not meet the requirements of WAQSR, Chapter 5, Section 2(j) shall not be included in the averages.

d. Any 2-hour rolling average of SO_2 emissions calculated using data from the CEM equipment required by 40 CFR Part 75 which exceeds the lb/MMBtu limit established in this permit. The 2-hour rolling average emission rate shall be calculated as the arithmetic average of the previous 2 1-hour averages meeting the requirements of WAQSR, Chapter 5, Section 2(j). Data (and associated monitoring data hours) which do not meet the requirements of WAQSR, Chapter 5, Section 2(j) shall not be included in the averages.

e. Any 3-hour block average of SO_2 emissions calculated using data from the CEM equipment required by 40 CFR Part 75 which exceeds the lb/MMBtu or lb/hr limit established in this permit using valid data. Valid data shall meet the requirements of WAQSR, Chapter 5, Section 2(j). The 3-hour average emission rate shall be calculated at the end of each 3-hour operating block as the arithmetic average of hourly emissions with valid data during the previous three operating hours.

f. Any 3-hour rolling average of NO_x emissions calculated using data from the CEM equipment required by 40 CFR Part 75 which exceeds the lb/MMBtu limit established in this permit. The 3-hour rolling average emission rate shall be calculated as the arithmetic average of the previous 3 1-hour averages meeting the requirements of WAQSR, Chapter 5, Section 2(j). Data (and associated monitoring data hours) which do not meet the requirements of WAQSR, Chapter 5, Section 2(j) shall not be included in the averages.

ii. PacifiCorp will comply with all reporting and record keeping requirements as specified in WAQSR, Chapter 5, Section 2(g).

14. PacifiCorp shall comply with all applicable requirements of 40 CFR, Part 60, Subpart Y.

15. The annual coal throughput for all four boilers shall be limited to 4.5 million tons per calendar year. Records shall be maintained documenting the amount of coal burned each year at the Dave Johnston Plant.

16. Records required by any applicable regulation or permit condition shall be maintained for a minimum period of five (5) years and shall be readily accessible to Division representatives.

PLANTWIDE APPLICABILITY LIMIT (PAL) CONDITIONS

17. NO_x emissions from Dave Johnston Units 1, 2, 3 and 4 shall have a plantwide applicability limit (PAL) and SO_2 emissions from Dave Johnston Units 1, 2, 3 and 4 shall have a PAL. Compliance with the NO_x PAL and SO_2 PAL shall be determined using a 12-month rolling total.

i. Effective upon issuance of permit:

1. NO_x: 15,878 tons per year
   a. Limit is based on a 12-month rolling total.
   b. Initial compliance shall be determined 12 months from the issuance date of this permit
2. SO_2: 21,996 tons per year
   a. Limit is based on a 12-month rolling total.
   b. Initial compliance shall be determined 12 months from the issuance date of this permit

ii. Effective upon installation or upgrade of control equipment on Units 3 and 4:

1. NO_x: 10,772 tons per year
   a. Limit is based on a 12-month rolling total.
   b. Limit shall become effective upon completion of the Low-NO_x burners installations to Units 3 and 4.
   c. Initial compliance shall be determined 12 months after startup of the last unit with the Low-NO_x burner upgrades. Actual date of startup shall be submitted as required by Condition 5 of this permit.
2. SO_2: 12,120 tons per year
   a. Limit is based on a 12-month rolling total.
   b. Limit shall become effective upon completion of the FGD/baghouse upgrades to Units 3 and 4.
   c. Initial compliance shall be determined 12 months after startup of the last unit with the FGD/baghouse upgrades. Actual date of startup shall be submitted as required by Condition 5 of this permit.

18. The NO_x PAL and SO_2 PAL shall be in effect on the date of permit issuance and shall expire exactly ten (10) years, to the day, of the effective date.

19. Emission calculations provided by PacifiCorp to show compliance with the NO_x PAL and SO_2 PAL shall include emissions from start-ups, shutdowns and malfunctions.

20. PacifiCorp shall monitor all emissions units as follows:

    i. Plantwide NO_x and SO_2 emissions, in terms of lb/hr, shall be monitored by the continuous emissions monitoring system (CEMS) required by 40 CFR Part 75. Failure to use a monitoring system approved by the Division will render the PAL invalid.

    ii. PacifiCorp shall provide substituted data for an emissions unit according to the missing data procedures of 40 CFR Part 75 during any period of time that there is not monitoring data. All monitoring data must meet the requirements of WAQSR, Chapter 5, Section 2(j).

21. PacifiCorp shall submit a timely application, in accordance with Chapter 6, Section 4(b)(xv)(J) of the WAQSR, to the Division to request renewal of a PAL. A timely application is one that is submitted at least 6 months prior to, but not earlier than 18 months from, the date of permit expiration. This deadline for application submittal is to ensure that the permit will not expire before the permit is renewed. If PacifiCorp submits a complete application to renew the PAL within this time period, then the PAL shall continue to be effective until the revised permit with the renewed PAL is issued.

22. If PacifiCorp decides not to renew the NO_x PAL or SO_2 PAL, the PAL will expire at the end of the PAL effective period and the Dave Johnston Plant will be subject to the requirements of Chapter 6, Section 4(b)(xv)(I) of the WAQSR.

23. All records, as required below, shall be retained on site. Records may be retained in an electronic format.

i. PacifiCorp shall retain a copy of all records necessary to determine compliance with the NO_x PAL and SO_2 PAL, including a determination of each emissions unit's 12-month rolling total emissions, for five (5) years from the date of such record.

ii. A copy of the following records shall be retained for the duration of the PAL effective period plus five (5) years:

a. A copy of the PAL permit application and any application revisions to the PAL.
b. Each annual certification of compliance pursuant to Chapter 6, Section 3 and the data relied on in certifying the compliance.

24. PacifiCorp shall submit the following reports by the required deadlines:

i. PacifiCorp shall submit semi-annual monitoring reports and prompt deviation reports to the Division in accordance with the applicable Chapter 6, Section 3 operating permit program. The reports shall meet the requirements listed below:

a. The semi-annual report shall be submitted to the Division within 30 days of the end of each reporting period. This report shall contain the following information:

1. The identification of owner and operator and the permit number.

2. Total annual emissions (tons per year) based on a 12-month rolling total for each month in the reporting period.

3. All data relied upon, including but not limited to any Quality Assurance or Quality Control data, in calculating the monthly and annual NO_x and SO_2 PAL emissions.

4. A list of any emissions units modified or added to the major stationary source during the preceding 6-month period.

5. The number, duration, and cause of any deviations or monitoring malfunctions (other than time associated with zero and span calibration checks), and any corrective action taken.

6. A notification of a shutdown of any monitoring system, whether the shutdown was permanent or temporary, the reason for the shutdown, the anticipated date that the monitoring system will be fully operational or replaced with another monitoring system, and whether the emissions unit monitored by the monitoring system continued to operate, and the calculation of the emissions of the pollutant.

7. A signed statement by the responsible official certifying the truth, accuracy, and completeness of the information provided in the report.

b. PacifiCorp shall promptly submit reports of any deviations or exceedance of the PAL requirements, including periods where no monitoring is available. The reports shall contain the following:

1. The identification of owner and operator and the permit number.

2. The PAL requirement that experienced the deviation or that was exceeded.

3. Emissions resulting from the deviation or the exceedance.

4. A signed statement by the responsible official certifying the truth, accuracy, and completeness of the information provided in the report.

25. PacifiCorp shall use EPA's Clean Air Markets reporting program to convert the monitoring system data to monthly emissions and annual emissions based on a 12-month rolling total for each month.

26. That during the PAL effective period, the Division may reopen the permit in accordance with Chapter 6, Section 4(b)(xv)(H) of the WAQSR.

27. That PacifiCorp shall address permitting requirements under Chapter 6, Section 2 of the WAQSR prior to commencing construction activities associated with:
    1. A new emission unit to be constructed under the PAL limits.
    2. Modifications/repairs to an existing boiler that meet the definition of reconstruction under Chapter 5, Section 2 (l) of the WAQSR.
    3. Modifications/repairs/upgrades after the pollution control project is completed that would increase the annual average heat input rating of a unit above the heat input values represented in application AP-5098.

Appendix A
Map of Facility Location

PacifiCorp
Dave Johnston Power Plant
Sections 7 and 8, T33N, R74W
Converse County, Wyoming

N W E S

0 0.3 0.6 1.2 Miles

DEPARTMENT OF ENVIRONMENTAL QUALITY WYOMING

DEQ 005077