Appendix C

Saint Alphonsus Regional Medical Center, Boise

P-050052

Modeling Analysis

Harbi Elshafei

From: Darrin Mehr

Sent: Wednesday, November 22, 2006 10:41 AM

To: Harbi Elshafei; Kevin Schilling

Cc: Darrin Mehr

Subject: 1) FW: St. Als directive; 2) Email Memorandum for the modeling approval for St. Al's RMC (Boise) REVIEW of October 6 and 18, 2006 Modeling Addendum and Files

November 22, 2006

MEMORANDUM

TO: Harbi Elshafei, Permit Writer, Air Quality Program

FROM: Darrin Mehr, Air Quality Analyst

RE: P-050052; St. Alphonsus Regional Medical Center, Boise, Review of the October 6, 2006 Modeling Addendum to Increase Operating Hours for Emergency Electrical Generators 1, 2, 3, 5, 6, 7, 8, 9, 10, and 11

1.0 Summary

St. Alphonsus Regional Medical Center (SARMC) submitted a revised ambient dispersion modeling analysis on October 6, 2006. The electronic modeling files were submitted on October 18, 2006. This submittal is an addendum to the 15-Day Pre-permit Permit to Construct (15-Day PTC) received on November 28, 2005, and was developed by CH2M HILL, on behalf of SARMC in response to the facility draft PTC, issued on August 30, 2006.

DEQ provided an option to revise the modeling inputs for emergency electrical generators that were equipped with horizontal discharge for the combustion exhaust. This option required that SARMC demonstrate that buoyancy flux due to thermal energy in the exhaust dominate the momentum flux due to the mass flow rate of exhaust. Typically, the exit velocity for horizontally oriented stacks is set to 0.001 meters per second instead of the actual stack velocity, which provides conservative ambient impacts. This approach was discussed in depth in the August 10, 2006 modeling memo for the facility draft 15-Day PTC.

SARMC provided a table of results of the buoyancy dominance analysis. DEQ checked the analysis for Generators 10 and 11, and agrees that the buoyancy approach is appropriate for the emergency electrical generators.

DEQ modeling staff did not check the revised emissions rates that were included in this analysis. The increase in requested operating hours will increase the average emission rate estimates for the 8-hour and 24-hour averaging periods compared to those used as a basis for the facility draft 15-Day PTC.

DEQ also checked the electronic output files for several of the pollutants and averaging periods. The revised ambient impact compliance demonstration presented by SARMC was supported by the documentation in those files that were checked. This revised analysis only affects the compliance demonstration for short-term National Ambient Air Quality Standards (NAAQS). SARMC did not submit revised impacts for annual NAAQS or annual TAPs for this project.

The emission rates utilized by SARMC and the revised ambient impacts for 1-hour and 8-hour carbon

monoxide; 3-hour and 24-hour sulfur dioxide, and 24-hour PM_{10} NAAQS are presented in the October 6, 2006 modeling addendum memorandum.

2.0 Recommendation:

DEQ recommends that allowable operating hours of Generators 1, 2, 3, 5, 6, 7, 8, 9, 10, and 11 may be increased to 6 hours per day for each individual generator.

From: Kevin Schilling
Sent: Tuesday, November 21, 2006 11:31 AM
To: Darrin Mehr
Subject: St. Als directive

Darrin,

It is my understanding that you provided a standard review of the originally submitted modeling analyses for the St. Als permit. After completing the review, St. Als decided that more allowable testing hours were needed for the generators. The original permit application was not withdrawn, but revised modeling analyses were submitted to account for the revised generator operations.

Ideally, DEQ would conduct a standard, thorough review of the new analyses. However, in light of our workload I would like you to conduct an abbreviated review for this project. I suggest that you quickly check the modeling result to assure that applicable air quality standards would be met, then briefly look at modeling parameters to evaluate whether they are within reasonable ranges. I have already checked the validity of the buoyancy calculations for the method to model the generators as a vertical release, so you don't need to recheck those. I suggest spending less than an hour doing these. As for the remainder of the analyses, we will be accepting the conducted analyses as "true, accurate, and complete," as certified by the applicant.

Simply forward this email to Harbi, with your comments assuring that you checked results and briefly reviewed parameters.

I feel this approach is acceptable for this project because of the following:

- DEQ has already conducted a thorough analysis of the project with a lower operational rate. Therefore, proper layout, met data, terrain issues, etc. have already been assessed and a modeling memo was generated. That memo should be included with the SOB, along with a copy of this email with your comments.
- The generators will only be operated infrequently for testing purposes (less than 1 day each month). There is a very low probability that operations would occur during a time when dispersion characteristics are worst-case.
- The highest modeled concentrations are very localized, typically at only a few receptors. It is unlikely that public would be present at such locations when the testing will be conducted.

Let me know if you have any questions or concerns.

Thank you,

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

Harbi Elshafei

From: Allan.Cawrse@CH2M.com
Sent: Friday, October 06, 2006 4:45 PM
To: Harbi Elshafei; William Rogers; Kevin Schilling
Cc: WILLMORG@sarmc.org; natalie.liljenwall@ch2m.com; rick.mccormick@ch2m.com
Subject: SARMC Revised Generator Run Time Model Results
Attachments: Revised_Gen_Model Report100606.doc

Harbi,

The Saint Alphonsus Regional Medical Center (SARMC) has applied for a Tier II Permit to Construct from the Idaho Department of Environmental Quality (IDEQ). This permit application described changes to three existing steam boilers, and the installation of two new emergency power generators. Review of this permit application by the IDEQ is complete, but the issuance of the final permit was stayed on 9/21/2006 at the request of SARMC staff. This action was to allow for evaluation of additional load test run time, from 4 to 6 hours, for all of the emergency power generators.

The permit application and air dispersion modeling analysis was submitted November 22, 2005. This permit application information specified that each emergency power generator would operate for a total of 4 hours for the annual load test. Air dispersion modeling was performed that demonstrated conformance with the 4 hour load test to IDAPA 58.01.01 air quality standards. However, it was determined that more than 4 hours will be required for load testing of each generator. SARMC conforms to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standard for emergency power generators. JCAHO standard EC.7.40 requires a 4 *continuous* hour load test, so additional time is required for generator start-up, system check (4 hour load test), then idle and shut down. SARMC requests that the emergency generator annual load test allowance be **revised to allow for 6 hours for Generators 1, 2, 3, 5, 6, 7, 8, 9, 10, and 11.**

Attached is the modeling report which evaluated SARMC emergency generators during the requested 6 hours load annual test event. This modeling report demonstrates compliance with IDAPA 58.01.01 ambient air quality standards. This modeling evaluation was performed with the generators operating on distillate oil at 0.5% sulfur content and the boilers operating on natural gas. Please review this modeling report and let me know if you have any questions or require additional information.

Allan E. Cawrse
Project Manager
CH2M HILLCH2M HILL - Boise

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10/6/2006

Addendum to Air Dispersion Modeling Report for St. Alphonsus Regional Medical Center Permit Application Boise, Idaho

Prepared for:

St. Alphonsus Regional Medical Center

Submitted to:

Idaho Department of Environmental Quality

October, 2006

Prepared By:

CH2MHILL

Brief Project Background

In January 2003, a Tier II Operating Permit (Tier II) was issued to St. Alphonsus Medical Regional Center (SARMC) by the Idaho Department of Environmental Quality (IDEQ). SAMRC would like to modify their existing Tier II and have recently submitted a modeling protocol, and final modeling files and modeling results for the following changes to their existing permit:

- Removal of Boiler 5 – Bryan Steam Boiler, model RV-500
- Removal of Generator 4 - Detroit Diesel, model 573RS17034BP
- Increasing the maximum heat input rating on Boiler 1, Boiler 2 and Boiler 3
- Adding two new Caterpillar 1,250 kilo Watt (kW) generators, Generator 10 and Generator 11

Since the submittal of final modeling files made in March 2006, SAMRC have decided to update the hours of operation for their annual generator load testing from 4 hours per generator to 6 hours per generator on 0.5% sulfur distillate fuel oil. The following paragraphs describe this scenario in more detail and provide the emissions, stack parameters, modeling methodology used and the modeling results.

Modeling Approach

The modeling approach used was to perform buoyancy calculations for all generators that have a horizontal release stacks. Kevin Schilling of IDEQ had used this approach for one generator on the March model run submittal. For this modeling report only the load testing scenario is presented.

Project Description

Location and Landuse

The SARMC is located a few kilometers west of Boise, Idaho. Auer's (1978) land-use classification method for determining urban vs. rural dispersion coefficients in the modeling indicates that more than 50 percent of the land use within three kilometers around the proposed facility appears to be urban. Modeling was performed using the urban dispersion coefficients.

Emissions

Source Information

The modeling analysis includes all sixteen sources that were modeling previously. The modeling analysis was conducted for only short term averaging periods and it was prepared to demonstrate the load testing for generators that will be conducted in the

summer months and will occur during a 6 hour period per generator. It was assumed that since load testing will occur in summer month, boilers will be operating on natural gas during this time. For comparison to short term standards, the emergency generators will be modeled as operating 6 hours a day, all together with all boilers operating on natural gas only. No other modeling scenarios are included in this addendum.

Building Downwash

The affect of building downwash at this specific site was included in the model. Direction specific building downwash parameters were calculated using the EPA Building Profile Input Program (BPIP-PRIME), Version 04272, and included in the ISC3-PRIME model input file.

Stack Information and Buoyancy

Table 1 identifies the future stack parameters for SARMC. The locations of all stacks were identical to model runs submitted in March 2006. For horizontal flow stack, buoyancy calculations were performed to determine if the actual flow rate could be used in place of the substituted flow rate of 0.001 m/s that is normally recommended by IDEQ guidance. This methodology was used for buoyancy calculations that were performed by Kevin Schilling of IDEQ in previous model reruns for the SAMRC permit modification. The buoyancy calculations are summarized in Table 2 below for each of the 4 generators. Buoyancy calculations show that in both unstable and stable atmospheres, the very hot and fast flow rates coming out of these four generators will still be buoyant even though the stacks are horizontal.

The equations involved are summarized below. In both cases of stable and unstable atmospheres ΔT is greater than ΔT_c and therefore buoyancy dominates.

Buoyancy Flux $F_b = (g\ v\ d^2\ \Delta T)/4T_s$
ΔT- Stack Temperature – Ambient temperature
ΔT_c for unstable conditions = $0.00297\ Ts\ (v^{1/3}/d^{2/3})$
ΔT_c for stable conditions = $0.019582\ Ts\ v\ (s^{1/2})$
Where $s = g(\delta\theta/\delta z)/T_a$

Table 1. Stack Parameters

Source ID	Source Description	Easting (X)	Northing (Y)	Stack Height	Temp.	Exit Velocity	Stack Diameter	Notes
		(m)	(m)	(m)	(K)	(m/s)	(m)	
B123_G12	South Tower Boiler (Colocated)	560060	4828998	28.95	502.59	5.16	1.75	
MOBV1	Cardiology Building Boiler	560100	4829163	8.22	433.15	0.001	0.36	Raincap
MOBV2	Cardiology Building Boiler	560100	4829161	8.22	433.15	0.001	0.36	Raincap
MOBV3	Cardiology Building Boiler	560100	4829159	8.22	433.15	0.001	0.15	Raincap
GEN3	Information Resources Building Emergency Generator	560184	4828938	3.35	702.59	78.65	0.15	
GEN5	Psych Center Emergency Generator	559238	4828143	6.09	810.93	40.98	0.10	
GEN6	Orthopedic Building Emergency Generator (Horizontal Discharge)	559974	4829000	7.31	600	56.0	0.26	Horizontal Discharge
GEN7	Liberty Building Emergency Generator	559863	4829000	3.44	619.26	57.95	0.15	
GEN8	Cardiology Building Emergency Generator(Horizontal Discharge)	560106	4829146	3.1	600	79.0	0.206	Horizontal Discharge
GEN9	Health Tech Building Emergency Generator	559455	4828905	1.64	778.15	0.336	0.76	
GEN10	New Central Building Generator	560067	4829018	10.67	699.37	22.42	0.36	Horizontal Discharge
GEN11	New Central Building Generator	560069	4829018	10.67	699.37	22.42	0.36	Horizontal Discharge

Notes: For stacks with raincaps, the exit velocity was set to 0.001 m/s according to IDEQ guidance. For horizontal stack flow actual flow rates were used based on buoyancy calculations for generators 6, 8, 10 and 11.

Table 2. Buoyancy Calculations

Generator	Flow Rate	Diam.	Temp	Vel.	Buoyancy Flux Fb	Unstable Delta Tc	Delta T	Unstable Pass	Stable Delta Tc	Stable Pass
	acfm	meters	K	m/s						
Generator 6	6080	0.256	600	56.0	4.332	189.053	289	Yes	16.515	yes
Generator 8	5109	0.206	600	79	3.955	219.158	289	Yes	23.295	yes
Generator 10	4718	0.356	699	22.4	3.857	116.677	388.4	Yes	7.707	yes
Generator 11	4718	0.356	699	22.4	3.857	116.677	388.4	Yes	7.707	yes

October 6, 2006

Emissions Rates

For the criteria emission analysis, all of the existing and future sources were modeled to be compared to the regulatory criteria for short term averaging periods. The benzene and formaldehyde emissions that were previously modeled for generator 10 and 11 are the same and will not need to be remodeled for this model scenario.

Table 3.
Short Term Emission Estimates

SOURCE ID	PM10 24 Hr	SO2 3 Hr	SO2 24 HR	CO 1HR	CO 8 HR
	lbs/hr				
B123_G12	1.093	7.790	1.992	15.391	13.639
MOBV1	0.013	0.001	0.001	0.144	0.144
MOBV2	0.013	0.001	0.001	0.144	0.144
MOBV3	0.004	0.0003	0.0003	0.040	0.040
GEN3	0.221	0.825	0.206	2.667	2.016
GEN5	0.059	0.220	0.055	0.717	0.537
GEN6	0.141	3.255	0.814	4.425	3.319
GEN7	0.148	0.550	0.137	1.792	1.344
GEN8	0.141	3.255	0.814	4.425	3.319
GEN9	0.022	0.082	0.021	0.269	0.202
GEN10	0.075	6.780	1.695	2.550	1.912
GEN11	0.075	6.780	1.695	2.550	1.912

Note: The combined stack B123_G12 is the combined emission rates for 5 sources which include Boiler 1, Boiler 2, Boiler 3 and Generator 1 and 2. The emission rates are for each generator operating for 6 hours per day.

Dispersion Model

For the air quality analysis, ISC3-PRIME (Version 01228) model was used to stay consistent with the air dispersion model previously used by IDEQ to model sources for the existing Tier II permit. ISC3-PRIME was run with the following options.

- Regulatory default options,
- Direction-specific building downwash,
- Urban land use option was used,
- Consideration of elevated terrain
- Complex/intermediate terrain algorithms.

Meteorological Data

October 6, 2006

For ISCPRIME Model, preprocessed meteorological data was used. Surface meteorological data collected from the Boise surface and upper air meteorological station was used for the analysis. Five years of data from the years 1987 to 1991 was used. This data was provided by IDEQ.

Ambient Conditions

Table 4 provides a summary of these background concentrations.

TABLE 4
Background Criteria Pollutant Concentrations ($\mu g/m^3$)

Pollutant	1-hr	3-hr	8-hr	24-hr
SO_2	NA	120	NA	40
PM_{10}	NA	NA	NA	100
CO	12, 200	NA	6800	NA

Note: These background concentrations are based on data provided to Allan Cawrse of CH2M HILL by Kevin Schilling of IDEQ via phone call on November 7, 2005.

Receptors

The receptors that were used for the previous modeling analysis were used for this analysis. This receptor grid includes

- The 25-meter grid extended approximately 100 km around the facility, and
- The 50-meter grid extended approximately 1 km.

Model Results

The modeling results are summarized in Table 5 below. The overall concentrations for all short term averaging periods are below the NAAQs.

TABLE 5

Pollutant	Averaging Period	Concentration (ug/m3)	Background (ug/m3)	Overall Conc. (ug/m3)	NAAQs (ug/m3)	UTM (x) (meters)	UTM (Y) (meters)
SO2	24-Hour	36.18	40	76	365	559885	4829065
SO2	3-Hour	358.16	120	478	1300	560160	4829115
CO	1-Hour	287.44	12,200	12,487	40,000	560210	4829090
CO	8-Hour	150.66	6,800	6,951	10,000	560110	4829115
PM10	24-Hour	6.81	100	107	150	559910	4829040

Note:
All model runs were done with ISCPRIME
Background concentrations provided by Kevin Schilling of DEQ, November, 7, 2005

October 6, 2006

MEMORANDUM

DATE: August 10, 2006

TO: Harbi Elshafei, Permit Writer, Air Program

THROUGH: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

FROM: Darrin Mehr, Air Quality Analyst, Air Program

PROJECT NUMBER: P-050052

SUBJECT: Modeling Review for Saint Alphonsus Regional Medical Center 15-day Permit to Construct Modification Application for their facility in Boise, Idaho.

1.0 Summary

Saint Alphonsus Regional Medical Center (SARMC) submitted a 15-day Pre-Permit to Construct (PTC) application for the installation of two new package generators and the modification of existing Boilers 1, 2, and 3 to increase steam production capacity on November 28, 2005. SARMC also requested that existing Tier II/PTC No. 011-00027, issued January 17, 2003, be modified to reflect the removal of the paint spray booth, ethylene oxide sterilizer, Boiler 5 and Generator 4. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were submitted in support of a permit application to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02).

DEQ contacted CH2M HILL, SARMC's consultant, on February 9, 2006, and notified them that there were errors in the BPIP (building profile input program) file for two of the SARMC buildings for a zero entry on the base of the Central Tower building and a missing section of the South Tower building.

Revised modeling was submitted on March 15, 2006. The original modeling demonstration used ISCST3 for emissions unit GEN8, with an inflated stack diameter of 17.52 meters and an exit velocity of 0.010 m/s. The revised modeling demonstration used these same stack parameters for GEN8, but used the ISC3-PRIME model.

DEQ conducted revised modeling for this project due to issues with SO_2 NAAQS compliance and the assumed anemometer height for the meteorological data sets for 1987 through 1991 that were obtained from the Boise airport met site. The anemometer height during that time period was 6.1 meters rather than the default value of ten meters. The DEQ modeling will be used to establish the modeling review compliance determination and provide recommendations for development of the PTC.

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Generator 8 (GEN8) stack has a horizontal discharge orientation. The modeling protocol stated that ISCST3 would be used to predict impacts from this source, and would be combined with the impacts determined using ISC3-PRIME for all other emission sources. The protocol listed the exhaust exit velocity for GEN8 as 0.001m/s. SARMC's submittal used an exit velocity of 0.01 m/s and a stack diameter of 15.72 meters. ISC3-PRIME was used for all sources in the applicant's March 15, 2006 submittal.	Use of an exhaust exit velocity of 0.01 m/s and an effective stack diameter of 17.52 m/s for GEN8 results in an assumed exhaust flow rate of 5,108 actual cubic feet per minute (ACFM) in the vertical direction. Stack-tip-induced downwash may be conservatively applied by using the large diameter for the stack and ISC3-PRIME for the model. Any future modeling for the facility will warrant discussion on this approach.
Generator testing was conducted using 4.0 hours per day for each generator. Multiple generators were assumed to operate concurrently during the same day. Emission rates for pollutants with averaging periods greater than 4 hours (except annual) were scaled to account for 4 hours of operation for testing. Annual emission rates of each existing generator were scaled to account for 500 hours per year.	Daily operation of each generator is limited to 4 hours of testing during any day. Annual testing operating hours for each existing generator should be limited to 500 hours per year.
Newly proposed Generator 10 (GEN10) and Generator 11 (GEN11) were assumed to each operate for up to 4 hours in a day and 500 hours per year.	GEN10 and GEN11 should each be limited to 4 hours per day and 500 hours per year of operation for testing purposes.
TAPs emissions from proposed emergency electrical generators Nos. 10 and 11 were analyzed for this project. An operational restriction of 500 hours per year was requested.	TAPs emissions from the proposed generators relied on a controlled emissions and controlled ambient concentration scenario for the compliance demonstration with IDAPA 58.01.01.210.
TAPs and criteria air pollutant emissions resulting from the increase in heat input capacity due to burner changeouts in Boilers 1, 2, and 3 (stack B123_G12) demonstrated compliance with NAAQS and TAPs increments.	The rated heat capacities for Boiler 1 and Boiler 2 can be increased to 43 million Btu per hour (MMBtu/hr) for natural gas and 41 MMBtu/hr for distillate fuel oil No. 2. The rated heat capacity for Boiler 3 can be increased to 18.8 million Btu per hour (MMBtu/hr) for natural gas and 16.8 MMBtu/hr for distillate fuel oil No. 2. The increase in TAPs emissions from the difference in baseline currently-permitted heat input capacities and requested potential capacities were analyzed.
Emission rates and modeling account for 360 hours per year of operation at requested capacity on No. 2 distillate fuel oil containing 0.5 percent by weight for Boilers 1, 2, and 3.	Boilers 1, 2, and 3 should either be limited to 360 hours per year of operation (each boiler) on No. 2 distillate fuel oil, or, alternatively, should be limited a maximum of 107,640 gallons per year for Boilers 1 and 2 (each boiler), and 44,280 gallons per year for Boiler 3. No. 2 distillate fuel oil with a sulfur content of 0.5 percent by weight was used as the sulfur limit in the emission estimates and modeling demonstration.
Operation of Boilers 1, 2, and 3 were analyzed with the following scenario: Boiler 1-No. 2 distillate fuel oil Boiler 2-No. 2 distillate fuel oil	Boilers 1 and 2 will have the greatest heat input capacity of the three boilers and are the worst-case boilers with regard to emissions and impacts for SO_2 and TAPs.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Boiler 3-Natural gas	Any two boilers out of the Boiler 1, 2, and 3 group may operate on No. 2 distillate fuel oil at any time. The third boiler may operate concurrently while combusting natural gas with the other two boilers combusting No. 2 distillate fuel oil.
Generator 4 and Boiler 5 were omitted from the modeling demonstration.	Existing permitted emissions units Generator 4 and Boiler 5 are to be removed from service at the SARMC facility per the application.
The anemometer height was corrected to a user input value of 6.1 meters.	The 6.1 meter height is accurate for the time period of the 1987-1991 meteorological data sets at the Boise airport met site.
Generator 6 (GEN6) was modeled using the following exhaust parameters: • Exhaust velocity of 56 meters per second • Actual stack diameter of 0.256 meters • Exhaust temperature of 600 Kelvin • Modeled as an unobstructed vertical release	Kevin Schilling, Modeling Coordinator, DEQ, performed an analysis to identify whether the temperature buoyancy flux or the momentum flux was the dominant dispersion mechanism. This analysis assumed the exit temperature for the generator exhaust was 600 Kelvin to account for temperature loss due to some amount of radiation and convection losses as the exhaust travels from the engine's exhaust manifold and through the exhaust stack. CH2M HILL provided exhaust parameters for Generator 6. Therefore, DEQ's revised analysis only revised modeling parameters for that source. No additional operational scenarios for the facility's sources were examined by DEQ. Emission rates for all emissions units were used as submitted in SARMC's March 15, 2006 submittal.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The SARMC facility is located in Ada County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). The area operates under limited maintenance plans for PM_{10} and CO. There are no Class I areas within 10 kilometers of the facility.

2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.90, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. CRITERIA AIR POLLUTANTS APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Value Used[d]**
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[h]	Maximum 1st highest[g]

[a]IDAPA 58.01.01.006.90
[b]Micrograms per cubic meter
[c]IDAPA 58.01.01.577 for criteria pollutants
[d]The maximum 1st highest modeled value is always used for significant impact analysis
[e]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f]Never expected to be exceeded in any calendar year
[g]Concentration at any modeled receptor
[h]Never expected to be exceeded more than once in any calendar year
[i]Concentration at any modeled receptor when using five years of meteorological data
[j]Not to be exceeded more than once per year

The increase in emissions from the proposed modification are required to demonstrate compliance with the toxic air pollutant (TAP) increments with an ambient impact dispersion analysis for any TAP with a requested potential emission rate that exceeds the screening emission rate limit specified by IDAPA 58.01.01.585 or 58.01.01.586. Table 3 lists the applicable screening emission rates and regulatory limits (allowable increments) for the TAPs of concern for this project.

Table 3. TOXIC AIR POLLUTANTS APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Screening Emission Rate Limit[a] (lb/hr)[b]**	**Regulatory Limit (AAC/AACC)[c] ($\mu g/m^3$)[d]**	**Modeled Value Used[e]**
3-Methylcholanthrene (CAS[f]# 56-49-5)	24-hour	2.5E-06	3.7E-04	Maximum 1st highest[g]
Arsenic (CAS# 7440-38-2)	Annual	1.5E-06	2.3E-04	Maximum 1st highest[g]
Benzene (CAS# 71-43-2)	Annual	8.0E-04	0.12	Maximum 1st highest[g]
Beryllium (CAS# 440-41-7)	Annual	2.8E-05	4.2E-03	Maximum 1st highest[g]
Cadmium (CAS# 7440-43-9)	Annual	3.7E-06	5.6E-04	Maximum 1st highest[g]
Formaldehyde (CAS# 50-00-0)	Annual	5.1E-04	0.077	Maximum 1st highest[g]
Nickel (CAS# 7440-02-0)	Annual	2.7E-05	4.2E-03	Maximum 1st highest[g]

[a]IDAPA 58.01.01.585 and 58.01.01.586
[b]Pounds per hour
[c]Increment for acceptable ambient concentration/acceptable ambient concentration for carcinogens
[d]Micrograms per cubic meter
[e]The maximum 1st highest modeled value is always used to establish TAPs compliance
[f]Chemical abstract service
[g]Concentration at any modeled receptor, never expected to be exceeded in any calendar year

2.2 Background Concentrations

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations used in these analyses are listed in Table 4. Monitored concentrations for the Boise area were used for background concentrations of nitrogen dioxide (NO_2), carbon monoxide (CO), and annual PM_{10}. Airshed modeling results were used for 24-hour PM_{10}. Default values for urban areas were used for sulfur dioxide (SO_2).

Table 4. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	100
	Annual	27
NO_2[c]	Annual	40
CO[d]	1-hour	12,200
	8-hour	6,800
SO_2[e]	3-hour	120
	24-hour	40
	Annual	10

[a] Micrograms per cubic meter
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[c] Nitrogen dioxide

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

Table 5 provides a summary of the modeling parameters used in the DEQ verification analyses.

Table 5. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Additional Description
Model	ISC3-PRIME/BEE-LINE BEEST GUI[a]	ISC3PBEE, Version 04272/BEE-LINE BEEST Version 9.50.
Meteorological data	1987-1991	Boise surface and upper air data
Land Use (urban or rural)	Urban	Urban dispersion coefficients were used by SARMC based on Auer land use classification for the 3 kilometer (km) area surrounding SARMC.
Terrain	Considered	Receptor 3-dimensional coordinates were obtained by CH2M Hill from USGS DEM files and used to establish elevation of ground level receptors. DEQ did not re-import the DEM files.
Building downwash	Downwash algorithm	Building dimensions obtained from modeling files submitted, and BPIP-Prime and ISCS3-Prime were used to evaluate downwash effects.
Receptor grid	Grid 1	25 meter spacing exterior to all buildings. The 25 meter spacing extends approximately 200 meters to the east, 200 meters on the north and south sides of the facility, and directly along the HLTHTCH building (western portion of facility).
	Grid 2	50 meter spacing for 700 meters to the east, for 650 meters to the south; for 700 meters to the north, and for 250 meters to the west.

[a] Graphic user interface

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

3.1.1 Modeling protocol

A protocol was submitted by CH2M HILL, on behalf of SARMC, to DEQ prior to submission of the application, as required by IDAPA 58.01.01.213.01.c.

Written approval of the modeling protocol, with comments on modeling methodology, was issued by Kevin Schilling, Modeling Coordinator, by email dated November 21, 2005. Modeling was conducted using methods and data presented in the modeling protocol and the *State of Idaho Air Quality Modeling Guideline*. SARMC used an increased stack diameter and an exhaust velocity of 0.01 m/s for source GEN8 instead of the 0.10 meter diameter and 0.001 m/s exhaust velocity listed in the modeling protocol. SARMC used ISC3-Prime in the March 15, 2006, submittal instead of ISCST3 to model GEN8.

3.1.2 Model Selection

ISC3-PRIME was used by SARMC to conduct the ambient air analyses. ISCST3 is the recommended model for this instance, and the PRIME algorithm accounted for wind-induced downwash effects due to structures at the site.

3.1.3 Meteorological Data

Boise surface and upper air meteorological data were used for the SARMC site in Boise. The anemometer height was incorrectly set at 10 meters in the application's modeling demonstration. DEQ used an anemometer height of 6.1 meters in the verification analyses.

3.1.4 Terrain Effects

The modeling analyses submitted by SARMC considered elevated terrain. The actual elevation of each receptor was determined using United States Geological Survey (USGS) digital elevation map (DEM) files. Elevations of emission sources, buildings, and receptors were not regenerated from DEM files for DEQ's verification analyses.

3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a scaled facility plot plan submitted with the application. The scaled facility plot plan depicted the existing and proposed emissions sources. Satellite images of the site were obtained from Google Earth to confirm the facility layout.

3.1.6 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program-PRIME (BPIP-PRIME) was used by the applicant to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for ISC3-PRIME. ISC3-PRIME identified the effects of structure-induced downwash on predicted ambient impacts.

DEQ's verification modeling used BPIP-PRIME and ISC3-PRIME.

3.1.7 Ambient Air Boundary

Ambient air was determined to exist for all areas immediately exterior to SAMRC buildings. This ambient air boundary is appropriate considering public access is not restricted because the facility a regional medical center.

3.1.8 Receptor Network

The receptor grids used by SARMC met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ verification analyses were conducted using the same receptor grid.

3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for DEQ verification modeling:

- All modeled criteria and toxic air pollutant (TAP) emissions rates were equal to or greater than the SARMC facility's emissions calculated in the PTC application or the permitted allowable rate.

Tables 6 and 7 list the criteria air pollutant emissions rates for sources included in the dispersion modeling analyses for short term and annual averaging periods, respectively. Daily emissions were modeled by SARMC for 24 hours. Annual emissions were modeled over 8,760 hours per year. See Section 3.4 of this memorandum to review a discussion on the emission rate and ambient impact of 3-methylcholanthrene.

Table 6. MODELED CRITERIA SHORT-TERM EMISSIONS RATES				
Source ID	Description	Emission Rates (lb/hr[d])		
		PM_{10}[a]	SO_2[b]	CO[c]
Point Sources				
B123_G12	South Tower Building - Boilers 1, 2, and 3 and Emergency Generators 1 and 2 which all share a combined stack (emissions are aggregated)	2.20	48.19 (3-hr avg.)[e] 43.45 (24-hr avg)[e]	15.39 (1-hr avg.)[e] 11.89 (8-hr avg)[e]
MOBV1	Cardiology Building – Boiler 1	0.013	0.001 (3-hr avg.) 0.001 (24-hr avg)	0.144 (1-hr avg.) 0.144 (8-hr avg)
MOBV2	Cardiology Building – Boiler 2	0.013	0.001 (3-hr avg.) 0.001 (24-hr avg)	0.144 (1-hr avg.) 0.144 (8-hr avg)
MOBV3	Cardiology Building – Boiler 3	0.0036	0.0003 (3-hr avg.) 0.0003 (24-hr avg)	0.040 (1-hr avg.) 0.040 (8-hr avg)
GEN3	Information Resources Building – Generator	0.148	0.825 (3-hr avg.) 0.137 (24-hr avg)	2.69 (1-hr avg.) 1.34 (8-hr avg)
GEN5	Psychology Center Building Emergency Generator	0.039	0.220 (3-hr avg.) 0.037 (24-hr avg)	0.72 (1-hr avg.) 0.36 (8-hr avg)
GEN6	Orthopedic Building Emergency Generator	0.094	3.25 (3-hr avg.) 0.54 (24-hr avg)	4.43 (1-hr avg.) 2.21 (8-hr avg)
GEN7	Liberty Building Emergency Generator	0.098	0.55 (3-hr avg.) 0.092 (24-hr avg)	1.79 (1-hr avg.) 0.90 (8-hr avg)
GEN8	Cardiology Building Emergency Generator	0.094	3.25 (3-hr avg.) 0.54 (24-hr avg)	4.43 (1-hr avg.) 2.21 (8-hr avg)
GEN9	Health Tech Building Emergency Generator	0.015	0.082 (3-hr avg.) 0.014 (24-hr avg)	0.27 (1-hr avg.) 0.13 (8-hr avg)
GEN10	New Central Tower Building Emergency Generator	0.050	6.78 (3-hr avg.) 1.13 (24-hr avg)	2.55 (1-hr avg.) 1.27 (8-hr avg)
GEN11	New Central Tower Building Emergency Generator	0.050	6.78 (3-hr avg.) 1.13 (24-hr avg)	2.55 (1-hr avg.) 1.27 (8-hr avg)

[a]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[b]Sulfur dioxide
[c]Carbon monoxide
[d]Pounds per hour
[e]The carbon monoxide NAAQS have a 1-hour (hr) averaging (avg) period and an 8-hr avg period. Sulfur dioxide NAAQS have a 3-hr avg period and a 24-hr avg period.

Table 7. MODELED CRITERIA ANNUAL EMISSIONS RATES				
Source ID	Description	Emission Rates (lb/hr[d])		
		PM_{10}[a]	NO_2[b]	SO_2[c]
B123_GI2	South Tower Building - Boilers 1, 2, and 3 and Emergency Generators 1 and 2 which all share a combined stack (emissions are aggregated)	0.902	6.90	2.49
MOBV1	Cardiology Building – Boiler 1	0.013	0.17	0.0010
MOBV2	Cardiology Building – Boiler 2	0.013	0.17	0.0010
MOBV3	Cardiology Building – Boiler 3	0.0036	0.048	0.0003
GEN3	Information Resources Building – Generator	0.051	0.71	0.047
GEN5	Psychology Center Building Emergency Generator	0.013	0.19	0.013
GEN6	Orthopedic Building Emergency Generator	0.032	1.10	0.186
GEN7	Liberty Building Emergency Generator	0.035	0.47	0.031
GEN8	Cardiology Building Emergency Generator	0.032	1.10	0.186
GEN9	Health Tech Building Emergency Generator	0.0050	0.071	0.0047
GEN10	New Central Tower Building Emergency Generator	0.017	1.48	0.387
GEN11	New Central Tower Building Emergency Generator	0.017	1.48	0.387

[a]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[b]Nitrogen dioxide
[c]Sulfur dioxide
[d]Pounds per hour

Table 8 lists the modeled TAP emissions rates for the proposed modification project. The project, as defined in the PTC application, is subject to compliance with the TAPs increments. Daily emissions were modeled by SARMC for 24 hours. Annual emissions were modeled over 8,760 hours per year.

Table 8. MODELED TOXIC AIR POLLUTANT EMISSIONS RATES						
	Emissions Sources					
Pollutant[a]	B123_G12[d]		GEN10[e]		GEN11[f]	
	(lb/hr)[b]	(T/yr)[c]	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
3-Methylcholanthrene	1.68E-04	7.34E-04	0.0	0.0	0.0	0.0
Arsenic	3.54E-05	1.55E-04	0.0	0.0	0.0	0.0
Benzene	2.02E-04	8.84E-04	5.41E-04	2.37E-04	5.41E-04	2.37E-04
Beryllium	1.37E-05	5.99E-05	0.0	0.0	0.0	0.0
Cadmium	1.15E-04	5.0E-04	0.0	0.0	0.0	0.0
Formaldehyde	7.95E-03	3.48E-02	9.6E-04	4.2E-03	9.6E-04	4.2E-03
Nickel	2.08E-04	9.1E-04	0.0	0.0	0.0	0.0

[a]All TAPs for this project are carcinogenic TAPs regulated under IDAPA 58.01.01.586.
[b]Pounds per hour
[c]Tons per year
[d]South Tower Building Boilers 1, 2, and 3, and emergency electrical generators 1 and 2.

3. 3 *Emission Release Parameters*

Table 9 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. Values used in the analyses appeared reasonable and within expected ranges. Additional documentation /verification of these parameters was not required. The approach used by SARMC for Generator 8 (GEN8) was approved by DEQ for this project. Source GEN8 has a horizontal release of exhaust and was modeled using an exhaust flow rate of 5,108 cubic feet per minute (CFM).

DEQ performed an analysis to determine whether the dispersion of the emissions plume from Generator 6 (GEN6) was dominated by thermal buoyancy flux or by the momentum flux. Calculations performed by DEQ indicate that the buoyancy flux will be the dominant dispersion mechanism. Therefore, the horizontal release point can be modeled as an uninterrupted vertical release without the model inappropriately accounting for momentum plume rise. See Attachment B of this memorandum to review this analysis. Generator 6 was remodeled by DEQ using the actual stack diameter of 0.256 meters and an exhaust velocity of 56 meters per second. The temperature at the point of release to the atmosphere was reduced to 600 Kelvin to account for heat loss of the plume within the stack. DEQ only altered the emission release point parameters.

Table 9. POINT SOURCE STACK PARAMETERS								
Release Point	Source Type	X UTM[a] Coordinate (m)[b]	Y UTM Coordinate (m)	Source Base Elevation (m)	Stack Height (m)	Modeled Stack Diameter (m)	Stack Gas Flow Temperature (K)[c]	Stack Gas Flow Velocity (m/sec)[d]
B123_G12 (5 co-located stacks aggregated as a single stack)	Point	560060.4	4828998	826.7	28.95	1.75	502.59	5.16
MOBV1[f]	Point	560100.3	4829163	826.3	8.22	0.3566	433.15	0.001
MOBV2[f]	Point	560100.3	4829161	826.3	8.22	0.3566	433.15	0.001
MOBV3[f]	Point	560100.4	4829159	826.3	8.22	0.1524	433.15	0.001
GEN3	Point	560184	4828938	827.2	3.35	0.1524	702.59	78.65
GEN5	Point	559237.8	4828144	823	6.09	0.1	810.93	40.98
GEN6[g]	Point	559973.8	4829000	826.6	7.31	0.256	724.82 (600)[g]	56.0
GEN7	Point	559862.8	4829000	826.3	3.44	0.1524	619.26	57.95
GEN8[e]	Point	560105.7	4829146	826.3	3.1	17.52	697.04	0.01
GEN9	Point	559455	4828906	825.2	1.64	0.762	778.15	0.336
GEN10[e]	Point	560066.9	4829018	826.6	12.192	0.3556	699.37	0.001
GEN11[e]	Point	560069.4	4829018	826.6	12.192	0.3556	699.37	0.001

[a]Universal transverse Mercator
[b]Meters
[c]Kelvin
[d]Meters per second
[e]Horizontal release for exhaust
[f]Stack equipped with a raincap
[g]A lower exhaust temperature of 600 Kelvin (or 620 degrees Fahrenheit) was assumed by DEQ.

3.4 Results for Full Impact Analyses

A significant contribution analysis was not submitted for this application. SARMC submitted a full impact analysis for the proposed modification project. Results of DEQ's verification analyses are shown in Table 10 and were obtained using the revised exhaust parameters for Generator 6 (GEN6). DEQ verification analyses did not alter any pollutant emission rates submitted by SARMC.

Table 10. RESULTS OF FULL IMPACT ANALYSES						
Pollutant	Averaging Period	Modeled Design Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS[b] ($\mu g/m^3$)	Percent of NAAQS
PM_{10}[c]	24-hour	8.8	100	108.8	150	72.5%
	Annual	1.3	27	28.3	50	56.6%
SO_2[d]	3-hour	666.2	120	786.2	1,300	60.5%
	24-hour	162.3	40	202.3	365	55.4%
	Annual	5.4	10	15.4	80	19.3%
CO[e]	1-hour	562.9	12,200	12,762.9	40,000	31.9%
	8-hour	109.6	6,800	6,909.6	10,000	69.1%
NO_2[f]	Annual	23.2	40	63.2	100	63.2%

[a]Micrograms per cubic meter
[b]National ambient air quality standards
[c]Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d]Sulfur dioxide
[e]Carbon monoxide
[f]Nitrogen dioxide
[g]Values in parentheses were obtained from DEQ verification modeling using BPIP-PRIME/ISC-PRIME.

Table 11 lists the maximum predicted TAP ambient impacts presented by SARMC, and the results of DEQ's verification analyses for the proposed project. TAPs compliance was evaluated for the incremental increase in emissions that would be caused by the proposed increase in heat input capacity for Boilers 1, 2, and 3, and proposed emergency electrical generators #10 and #11.

DEQ re-ran the TAPs modeling demonstration with a revised anemometer height of 6.1 meters and the ISC3-Prime model. SARMC used an anemometer height of 10 meters with the ISC3-Prime model. Predicted ambient impacts of the project's TAPs emissions did not exceed allowable increments. See Attachment A of this memorandum to review the summary output files of DEQ's modeling of criteria air pollutants and TAPs.

DEQ's verification analysis for the carcinogenic TAP of 3-methylcholanthrene did not match the results presented by SARMC. DEQ did not determine why there was such a variation in predicted ambient impacts for 3-methlycholanthrene between DEQ's and SARMC's results. An emission rate of 2.11E-05 grams per second (1.68E-04 lb/hr) was modeled by SARMC, as confirmed in the ".LST" file for this pollutant.

DEQ assumes that SARMC's analysis multiplied the combined emission rate by a factor of 1000 for the model, and divided the modeled design concentration by a factor of 1000 to obtain a predicted ambient impact of 1.9E-07 $\mu g/m^3$, annual average. The modeling predicts compliance with the AACC whether or not the design concentration is divided by a factor of 1000. A review of the emission estimates provided in the application lists an aggregated emissions rate of 1.80E-07 lb/hr of 3-methylcholanthrene for Boilers 1, 2, and 3. This emission rate is below the screening emission rate limit of 2.5E-06 lb/hr, which indicates modeling of this TAP is not required to comply with the TAPs rules in IDAPA 58.01.01.210 et. seq., and IDAPA 58.01.01.586.

Table 11. TOXIC AIR POLLUTANTS ANALYSIS RESULTS

Pollutant	Year	Averaging Period	Maximum Concentration ($\mu g/m^3$)[a]	Receptor Location				Percent of Limit
				East (m)[b]	North (m)	Elevation (m)	AACC[c] ($\mu g/m^3$)	
Carcinogenic TAPs								
3-Methylcholanthrene	1987	Annual	1.9E-07 (1.9E-04)[d]	559,910	4,829,040	826.3	3.7E-04	0.05% (51.4%)[d]
Arsenic	1987-1990	Annual	4E-05 (4E-05)	559,910	4,829,040	826.3	2.3E-04	17.4% (17.4%)
Benzene	1989	Annual	7.41E-03 (6.48E-03)	560,035	4,829,065	826.4	1.2E-01	3.7% (5.4%)
Beryllium	1987	Annual	2E-05 (2E-05)	559,910	4,829,040	826.3	4.2E-03	0.5% (0.5%)
Cadmium	1987	Annual	1.3E-04 (1.3E-04)	559,910	4,829,040	826.3	5.6E-04	23.2% (23.2%)
Formaldehyde	1989	Annual	1.63E-02 (1.28E-02)	560,060	4,829,065	826.4	7.7E-02	21.2% (16.6%)
Nickel	1987	Annual	2.4E-04 (2.4E-04)	559,910	4,829,040	826.3	4.2E-03	5.7% (5.7%)

[a]Micrograms per cubic meter
[b]Meters
[c]Acceptable ambient concentration for carcinogens
[d]Values in parentheses are DEQ verification analysis results, highest 1st high for design concentrations and percentages for the percent of limit values

4.0 Conclusions

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.

Attachment A

St. Alphonsus Regional Medical Center (Boise)

P-050052

DEQ Verification Modeling Results

St Alphonsus Regional Medical Center - Boise

Project
Addition of Generators 10 and 11
Removal of Boiler #5
Removal of Generator #4
Increase in Heat Input Capacity for Boilers 1, 2, and 3

DEQ Verification Analyses--DEQ modeling runs using revised thermal buoyancy parameters for Generator #6

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	ALL	1ST	390.34659	560035	4829065	826.4	87101709	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	ALL	2ND	390.17279	560035	4829065	826.4	87121810	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	GEN123	1ST	165.47617	560035	4828990	826.6	87060505	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	GEN123	2ND	155.9167	560060	4829065	826.4	87082120	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	GEN6	1ST	116.75865	559960	4829090	826.3	87070405	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	GEN6	2ND	116.33417	559960	4829090	826.3	87102020	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	1ST	355.03406	560035	4829065	826.4	87101709	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	2ND	355.03015	560035	4829065	826.4	87121810	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	ALL	1ST	107.20212	560160	4829115	826.3	87080708	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	ALL	2ND	98.68807	560135	4829115	826.3	87111716	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	GEN123	1ST	52.9748	559910	4829040	826.3	87011016	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	GEN123	2ND	51.14487	559910	4829040	826.3	87032908	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	GEN6	1ST	35.46347	559960	4829065	826.3	87090708	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	GEN6	2ND	33.86829	559960	4829065	826.3	87071108	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	1ST	77.31914	560035	4829065	826.4	87062308	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	2ND	51.00626	560035	4829065	826.4	87022208	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_NO2_ANNL.USF	NO2_ANNL	ANNUAL	ALL	1ST	21.57114	560060	4829065	826.4	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN123	1ST	11.10067	560060	4829190	826	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN6	1ST	5.29113	559935	4829065	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN10_11	1ST	16.47178	560035	4829065	826.4	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_PM10_ANN.USF	PM10_ANN	ANNUAL	ALL	1ST	1.29904	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN123	1ST	1.07741	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN6	1ST	0.15456	559935	4829065	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN10_11	1ST	0.18971	560035	4829065	826.4	1 YRS	BoiBoiAdj87.MET

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	ALL	1ST	153.9045	559885	4829065	826.3	87012924	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	ALL	2ND	150.32262	559910	4829040	826.3	87012924	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	1ST	139.33043	559885	4829065	826.3	87012924	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	2ND	137.11436	559910	4829040	826.3	87012924	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	1ST	6.41584	559935	4829065	826.3	87110424	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	2ND	6.25562	559910	4829065	826.3	87110424	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	1ST	36.8871	560035	4829065	826.4	87122624	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	2ND	33.72249	560035	4829065	826.4	87112234	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	ALL	1ST	628.008	560035	4829065	826.4	87121812	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	ALL	2ND	536.25909	560035	4829065	826.4	87110915	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	1ST	292.3049	560060	4829065	826.4	87072818	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	2ND	268.0676	560110	4829140	826.3	87100906	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	1ST	71.60412	559960	4829065	826.3	87092324	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	2ND	61.24008	559960	4829065	826.3	87091124	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	1ST	620.56708	560035	4829065	826.4	87121812	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	2ND	505.47256	560035	4829065	826.4	87102106	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_ANNL.USF	SO2_ANNL	ANNUAL	ALL	1ST	5.14192	559910	4829065	826.3	1 YRS	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN123	1ST	2.88912	559910	4829040	826.3	1 YRS	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN6	1ST	0.89185	559935	4829065	826.3	1 YRS	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_87_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN10_11	1ST	4.29351	560035	4829065	826.4	1 YRS	BoiBoiAd87.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	ALL	1ST	381.84286	560035	4829065	826.4	88082708	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	ALL	2ND	379.6698	560035	4829065	826.4	88041019	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	GEN123	1ST	168.33582	560060	4829065	826.4	88091602	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	GEN123	2ND	161.12941	560060	4829065	826.4	88091523	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	GEN6	1ST	116.17952	559960	4829090	826.3	88072002	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	GEN6	2ND	116.10392	559960	4829090	826.3	88091124	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	1ST	348.44891	560035	4829065	826.4	88082708	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	2ND	339.9823	560035	4829065	826.4	88041019	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	ALL	1ST	122.98789	560060	4829065	826.4	88091524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	ALL	2ND	104.42581	560060	4829065	826.4	88091608	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	GEN123	1ST	80.86597	560060	4829065	826.4	88091524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	GEN123	2ND	53.39976	560085	4829115	826.3	88121216	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	GEN6	1ST	37.3339	559910	4829065	826.3	88120208	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	GEN6	2ND	35.66702	559935	4829065	826.3	88102408	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	1ST	88.21499	560035	4829065	826.4	88121008	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	2ND	77.37582	560035	4829065	826.4	88092208	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_NO2_ANNL.USF	NO2_ANNL	ANNUAL	ALL	1ST	22.84868	560060	4829065	826.4	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN123	1ST	11.72991	560060	4829190	826.1	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN6	1ST	5.28338	559935	4829065	826.3	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN10_11	1ST	17.70714	560035	4829065	826.4	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_PM10_ANN.USF	PM10_ANN	ANNUAL	ALL	1ST	1.17298	559910	4829065	826.3	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN123	1ST	0.96291	560060	4829190	826	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN6	1ST	0.15434	559935	4829065	826.3	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_88_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN10_11	1ST	0.20394	560035	4829065	826.4	1 YRS	BoiBoiAd88.MET

Model	File	Pollutant	Average	Group	Rank	Coenc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_24HR.USF	SO2_24HR	24-HR	ALL	2ND	184.76331	560060	4829065	826.4	88091524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_24HR.USF	SO2_24HR	24-HR	ALL	2ND	147.94685	559910	4829040	826.3	88013124	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	1ST	165.56088	560060	4829065	826.4	88091524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	2ND	132.37088	559910	4829040	826.3	88013124	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	1ST	5.77359	559910	4829065	826.3	88102524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	2ND	5.77305	559910	4829065	826.3	88122824	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	1ST	38.90681	560060	4829065	826.4	88072424	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	2ND	36.23211	560035	4829065	826.4	88021124	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	ALL	1ST	644.43622	560060	4829065	826.4	88091524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	ALL	2ND	596.57983	560035	4829065	826.4	88111624	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	1ST	488.3605	560060	4829065	826.4	88091524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	2ND	359.30957	560060	4829065	826.4	88091515	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	1ST	64.35357	559960	4829065	826.3	88070924	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	2ND	62.82292	559960	4829065	826.3	88082003	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	1ST	583.27887	560035	4829065	826.4	88111524	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	2ND	550.771	560035	4829065	826.4	88053105	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_ANNL.USF	SO2_ANNL	ANNUAL	ALL	1ST	5.32829	560060	4829065	826.4	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN123	1ST	2.53489	559910	4829040	826.3	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN6	1ST	0.89055	559935	4829065	826.3	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_88_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN10_11	1ST	4.61551	560035	4829065	826.4	1 YRS	BoiBoiAd88.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	ALL	1ST	421.6838	559960	4829065	826.3	89101106	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	ALL	2ND	383.51196	560035	4829065	826.4	89010716	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	GEN123	1ST	163.86513	560060	4829065	826.4	89061318	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	GEN123	2ND	159.03614	560060	4829065	826.4	89031711	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	GEN6	1ST	123.2256	559960	4829065	826.3	89123122	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	GEN6	2ND	122.29837	559960	4829065	826.3	89072302	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	1ST	355.55493	560035	4829065	826.4	89020101	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	2ND	351.69472	560035	4829065	826.4	89010716	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	ALL	1ST	106.8142	560110	4829115	826.3	89041218	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	ALL	2ND	103.05265	560110	4829115	826.3	89013008	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	GEN123	1ST	59.54903	560110	4829115	826.3	89041215	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	GEN123	2ND	58.52374	560110	4829115	826.3	89013008	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	GEN6	1ST	38.90255	559935	4829065	826.3	89101408	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	GEN6	2ND	38.45435	559935	4829065	826.3	89121208	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	1ST	87.22742	560035	4829065	826.4	89001208	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	2ND	72.75631	560035	4829065	826.4	89090408	BoiBoiAd89.MET

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_NO2_ANNL.USF	NO2_ANNL	ANNUAL	ALL	1ST	23.23228	560060	4829065	826.4	1 YRS	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN123	1ST	11.73414	560060	4829190	826.1	1 YRS	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN6	1ST	5.33292	559935	4829065	826.3	1 YRS	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN10_11	1ST	17.74625	560035	4829065	826.4	1 YRS	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_PM10_ANN.USF	PM10_ANN	ANNUAL	ALL	1ST	1.19531	559910	4829065	826.3	1 YRS	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN123	1ST	0.87392	559910	4829040	826.3	1 YRS	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN6	1ST	0.1578	559935	4829065	826.3	1 YRS	BoiBoiAd89.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 extnt_89_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN10_11	1ST	0.20439	560035	4829065	826.4	1 YRS	BoiBoiAd89.MET

ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	ALL	1ST	170.38241	559910	4829040	826.3	89010924	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	ALL	2ND	162.30281	559910	4829040	826.3	89031524	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	GEN123	1ST	157.03473	559910	4829040	826.3	89010924	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	GEN123	2ND	147.90736	559910	4829040	826.3	89031524	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	GEN6	1ST	6.27138	559910	4829065	826.3	89163024	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	GEN6	2ND	5.93777	559935	4829065	826.3	89012424	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	GEN10_11	1ST	43.25306	560035	4829065	826.4	89011224	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 24HR USF	SO2	24-HR	GEN10_11	2ND	39.87427	560035	4829065	826.4	89101724	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	ALL	1ST	675.33234	560035	4829065	826.4	89100403	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	ALL	2ND	597.56427	560035	4829065	826.4	89010718	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	GEN123	1ST	317.12689	560060	4829215	826.5	89042718	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	GEN123	2ND	268.41959	560160	4829815	827.2	89080718	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	GEN6	1ST	72.71997	559960	4829065	826.3	89123124	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	GEN6	2ND	57.20618	559960	4829065	826.3	89121624	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	GEN10_11	1ST	657.17489	560035	4829065	826.4	89100403	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 3HR USF	SO2	3-HR	GEN10_11	2ND	588.24351	560035	4829065	826.4	89010718	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 ANNL USF	SO2	ANNL	ALL	1ST	5.39794	560060	4829065	826.4	1 YRS	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 ANNL USF	SO2	ANNL	GEN123	1ST	2.606111	559910	4829040	826.3	1 YRS	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 ANNL USF	SO2	ANNL	GEN6	1ST	0.8989	559935	4829065	826.3	1 YRS	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 89 SO2 ANNL USF	SO2	ANNL	GEN10_11	1ST	4.62571	560035	4829065	826.4	1 YRS	BoBoAd89.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	ALL	1ST	573.9541	560035	4829065	826.4	9011224	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	ALL	2ND	562.9176	560035	4829065	826.4	9009181	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	GEN123	1ST	168.69366	560035	4829890	826.8	9008091	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	GEN123	2ND	166.48734	560035	4829890	826.8	9008100	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	GEN6	1ST	128.96658	559860	4829115	826.3	9004250	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	GEN6	2ND	122.5154	559860	4829065	826.3	9007240	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	GEN10_11	1ST	528.5993	560035	4829065	826.4	9001224	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 1HR USF	CO	1-HR	GEN10_11	2ND	522.52253	560035	4829065	826.4	9009181	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	ALL	1ST	111.77928	560110	4829115	826.3	9007140	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	ALL	2ND	108.88719	559885	4829065	826.3	9002262	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	GEN123	1ST	56.17422	560085	4829115	826.3	9006210	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	GEN123	2ND	49.97151	560085	4829115	826.3	9004050	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	GEN6	1ST	37.11825	559885	4829065	826.3	9002262	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	GEN6	2ND	36.12816	559910	4829040	826.3	9012250	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	GEN10_11	1ST	64.83654	560035	4829065	826.4	9002220	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 CO 8HR USF	CO	8-HR	GEN10_11	2ND	62.54427	560035	4829065	826.4	9010042	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 NO2 ANNL USF	NO2	ANNL	ALL	1ST	22.01026	560060	4829065	826.4	1 YRS	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 NO2 ANNL USF	NO2	ANNL	GEN123	1ST	11.11904	560060	4829190	826	1 YRS	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 NO2 ANNL USF	NO2	ANNL	GEN6	1ST	5.15458	559935	4829065	826.3	1 YRS	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 NO2 ANNL USF	NO2	ANNL	GEN10_11	1ST	16.32842	560060	4829065	826.4	1 YRS	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 PM10 ANN USF	PM10	ANN	ANNUAL	ALL	1.21711	559910	4829040	826.3	1 YRS	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 PM10 ANN USF	PM10	ANN	ANNUAL	GEN123	0.59689	559910	4829040	826.3	1 YRS	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 PM10 ANN USF	PM10	ANN	ANNUAL	GEN6	0.15057	559935	4829065	826.3	1 YRS	BoBoAd890.MET		
ISC3PBEE	St As ST SO2 altrd GEN6 exhst 90 PM10 ANN USF	PM10	ANN	ANNUAL	GEN10_11	0.15806	560060	4829065	826.4	1 YRS	BoBoAd890.MET		

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	ALL	1ST	164.56629	559910	4829040	826.3	90112424	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	ALL	2ND	159.29016	559910	4829040	826.3	90112824	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	1ST	145.93866	559910	4829040	826.3	90112424	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	2ND	141.0723	559910	4829040	826.3	90112824	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	1ST	6.17941	559910	4829065	826.3	90120824	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	2ND	5.86222	559910	4829040	826.3	90112424	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	1ST	40.5871	560035	4829065	826.4	90091624	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	2ND	37.28883	560035	4829065	826.4	90100824	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	ALL	1ST	627.77264	560035	4829065	826.4	90100821	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	ALL	2ND	564.08557	560035	4829065	826.4	90072124	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	1ST	449.88948	560010	4829015	826.6	90072012	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	2ND	300.73141	560060	4829065	826.4	90051618	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	1ST	62.13981	559935	4829090	826.3	90091806	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	2ND	59.01657	559960	4829065	826.3	90021903	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	1ST	611.21991	560035	4829065	826.4	90100821	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	2ND	555.09972	560035	4829065	826.4	90022024	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_ANNL.USF	SO2_ANNL	ANNUAL	ALL	1ST	5.11987	560060	4829065	826.4	1 YRS	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN123	1ST	2.66848	559910	4829040	826.3	1 YRS	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN6	1ST	0.86884	559935	4829065	826.3	1 YRS	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_90_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN10_11	1ST	4.23614	560060	4829065	826.4	1 YRS	BoiBoAdj90.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	ALL	1ST	537.75476	560125	4829065	826.4	91021902	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	ALL	2ND	491.1741	560035	4829065	826.4	91010404	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	GEN123	1ST	169.50613	560060	4829065	826.4	91081823	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	GEN123	2ND	162.61982	560060	4829065	826.4	91062721	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	GEN6	1ST	128.72568	559960	4829090	826.3	91071904	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	GEN6	2ND	127.9809	559960	4829115	826.3	91060722	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	1ST	495.60239	560035	4829065	826.4	91021902	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_1HR.USF	CO_1HR	1-HR	GEN10_11	2ND	428.82364	560035	4829065	826.4	91091720	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	ALL	1ST	118.9405	560110	4829115	826.3	91123124	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	ALL	2ND	109.57504	560110	4829115	826.3	91082308	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	GEN123	1ST	65.08983	560110	4829115	826.3	91123124	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	GEN123	2ND	57.63928	560110	4829115	826.3	91082308	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	GEN6	1ST	38.11055	559910	4829040	826.3	91012308	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	GEN6	2ND	36.94211	559910	4829040	826.3	91010408	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	1ST	71.82042	560035	4829065	826.4	91021908	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_CO_8HR.USF	CO_8HR	8-HR	GEN10_11	2ND	70.43185	560035	4829065	826.4	91062808	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_NO2_ANNL.USF	NO2_ANNL	ANNUAL	ALL	1ST	20.99827	560060	4829065	826.4	1 YRS	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN123	1ST	10.52782	560060	4829190	826.1	YRS	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN6	1ST	4.77136	559935	4829065	826.3	1 YRS	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_NO2_ANNL.USF	NO2_ANNL	ANNUAL	GEN10_11	1ST	16.57332	560060	4829065	826.4	1 YRS	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_PM10_ANN.USF	PM10_ANN	ANNUAL	ALL	1ST	1.12205	559910	4829040	826.3	1 YRS	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN123	1ST	0.912784	559910	4829040	826.3	1 YRS	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN6	1ST	0.13938	559935	4829065	826.3	1 YRS	BoiBoAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_PM10_ANN.USF	PM10_ANN	ANNUAL	GEN10_11	1ST	0.17935	560060	4829065	826.4	1 YRS	BoiBoAdj91.MET

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	ALL	1ST	161.24995	559910	4829040	826.3	91020324	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	ALL	2ND	154.96602	559910	4829040	826.3	91031224	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	1ST	144.22902	559910	4829040	826.3	91020324	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	GEN123	2ND	141.51349	559910	4829040	826.3	91031224	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	1ST	6.89534	559910	4829065	826.3	91022124	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	GEN6	2ND	6.19469	559910	4829040	826.3	91010424	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	1ST	36.07541	560035	4829065	826.4	91022124	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_24HR.USF	SO2_24HR	24-HR	GEN10_11	2ND	34.62926	560035	4829065	826.4	91010324	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	ALL	1ST	731.97729	560035	4829065	826.4	91021903	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	ALL	2ND	666.17181	560035	4829065	826.4	91032724	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	1ST	282.70261	560085	4829115	826.3	91082509	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	GEN123	2ND	267.84781	560085	4829115	826.3	91090306	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	1ST	70.99225	559960	4829065	826.3	91090306	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	GEN6	2ND	69.94183	559960	4829065	826.3	91071908	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	1ST	723.4521	560035	4829065	826.4	91021903	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_3HR.USF	SO2_3HR	3-HR	GEN10_11	2ND	653.50269	560035	4829065	826.4	91032724	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_ANNL.USF	SO2_ANNL	ANNUAL	ALL	1ST	4.85855	560060	4829065	826.4	1 YRS	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN123	1ST	2.43021	559910	4829040	826.3	1 YRS	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN6	1ST	0.80425	559935	4829065	826.3	1 YRS	BoiBoiAdj91.MET
ISC3PBEE	St Als ST SO2 altrd GEN6 exhst_91_SO2_ANNL.USF	SO2_ANNL	ANNUAL	GEN10_11	1ST	4.05933	560060	4829065	826.4	1 YRS	BoiBoiAdj91.MET

PM-10, 24-hr avg Modeling - Concatenated 5 year meteorological data file

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	ALL	1ST	9.64793	560060	4829065	826.4	88091524	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	ALL	2ND	9.32304	559910	4829040	826.3	90112424	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	ALL	6TH	8.84328	559910	4829040	826.3	90020924	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN123	1ST	8.29635	560060	4829065	826.4	88091524	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN123	2ND	7.77348	559910	4829040	826.3	89031524	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN123	5TH	7.41632	559910	4829040	826.3	91031224	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN6	1ST	1.19587	559910	4829065	826.3	91022124	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN6	2ND	1.11271	559935	4829065	826.3	87110424	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN6	6TH	1.07171	559910	4829065	826.3	90120624	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN10_11	1ST	1.91385	560035	4829065	826.4	89011224	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN10_11	2ND	1.79589	560035	4829065	826.4	90031624	Boi87_91.MET
ISC3PBEE	St Als 24hr PM10 altrd GEN6 exhst_87_PM1024HR.USF	PM1024HR	24-HR	GEN10_11	6TH	1.63217	560035	4829065	826.4	87122624	Boi87_91.MET

DEQ Verification of TAPs Modeling - A 6.1 meter anemometer height was used in the model

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_3METH.USF	3METH	ANNUAL	ALL	1ST	0.00019	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_3METH.USF	3METH	ANNUAL	GEN123	1ST	0.00019	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_ARSENIC.USF	ARSENIC	ANNUAL	ALL	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_ARSENIC.USF	ARSENIC	ANNUAL	GEN123	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_BENZENE.USF	BENZENE	ANNUAL	ALL	1ST	0.00602	560035	4829065	826.4	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_BENZENE.USF	BENZENE	ANNUAL	GEN123	1ST	0.00023	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_BENZENE.USF	BENZENE	ANNUAL	GEN10	1ST	0.00333	560060	4829065	826.4	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_BENZENE.USF	BENZENE	ANNUAL	GEN11	1ST	0.00288	560035	4829065	826.4	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_BERYLL.USF	BERYLL	ANNUAL	ALL	1ST	0.00002	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_BERYLL.USF	BERYLL	ANNUAL	GEN123	1ST	0.00002	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_CADMIUM.USF	CADMIUM	ANNUAL	ALL	1ST	0.00013	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_CADMIUM.USF	CADMIUM	ANNUAL	GEN123	1ST	0.00013	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_FORMALD.USF	FORMALD	ANNUAL	ALL	1ST	0.01235	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_FORMALD.USF	FORMALD	ANNUAL	GEN123	1ST	0.00912	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_FORMALD.USF	FORMALD	ANNUAL	GEN10	1ST	0.0059	560060	4829065	826.4	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_FORMALD.USF	FORMALD	ANNUAL	GEN11	1ST	0.00507	560035	4829065	826.4	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_NICKEL.USF	NICKEL	ANNUAL	ALL	1ST	0.00024	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_87_NICKEL.USF	NICKEL	ANNUAL	GEN123	1ST	0.00024	559910	4829040	826.3	1 YRS	BoiBoiAdj87.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_3METH.USF	3METH	ANNUAL	ALL	1ST	0.00017	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_3METH.USF	3METH	ANNUAL	GEN123	1ST	0.00017	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_ARSENIC.USF	ARSENIC	ANNUAL	ALL	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_ARSENIC.USF	ARSENIC	ANNUAL	GEN123	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_BENZENE.USF	BENZENE	ANNUAL	ALL	1ST	0.00647	560035	4829065	826.4	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_BENZENE.USF	BENZENE	ANNUAL	GEN123	1ST	0.0002	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_BENZENE.USF	BENZENE	ANNUAL	GEN10	1ST	0.00355	560060	4829065	826.4	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_BENZENE.USF	BENZENE	ANNUAL	GEN11	1ST	0.00305	560035	4829065	826.4	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_BERYLL.USF	BERYLL	ANNUAL	ALL	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_BERYLL.USF	BERYLL	ANNUAL	GEN123	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_CADMIUM.USF	CADMIUM	ANNUAL	ALL	1ST	0.00012	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_CADMIUM.USF	CADMIUM	ANNUAL	GEN123	1ST	0.00012	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_FORMALD.USF	FORMALD	ANNUAL	ALL	1ST	0.01263	560060	4829065	826.4	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_FORMALD.USF	FORMALD	ANNUAL	GEN123	1ST	0.008	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_FORMALD.USF	FORMALD	ANNUAL	GEN10	1ST	0.0063	560060	4829065	826.4	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_FORMALD.USF	FORMALD	ANNUAL	GEN11	1ST	0.00542	560035	4829065	826.4	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_NICKEL.USF	NICKEL	ANNUAL	ALL	1ST	0.00021	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_88_NICKEL.USF	NICKEL	ANNUAL	GEN123	1ST	0.00021	559910	4829040	826.3	1 YRS	BoiBoiAdj88.MET

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_3METH.USF	3METH	ANNUAL	ALL	1ST	0.00017	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_3METH.USF	3METH	ANNUAL	GEN123	1ST	0.00017	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_ARSENIC.USF	ARSENIC	ANNUAL	ALL	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_ARSENIC.USF	ARSENIC	ANNUAL	GEN123	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_BENZENE.USF	BENZENE	ANNUAL	ALL	1ST	0.00648	560035	4829065	826.4	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_BENZENE.USF	BENZENE	ANNUAL	GEN123	1ST	0.00021	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_BENZENE.USF	BENZENE	ANNUAL	GEN10	1ST	0.00362	560060	4829065	826.4	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_BENZENE.USF	BENZENE	ANNUAL	GEN11	1ST	0.00305	560035	4829065	826.4	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_BERYLL.USF	BERYLL	ANNUAL	ALL	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_BERYLL.USF	BERYLL	ANNUAL	GEN123	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_CADMIUM.USF	CADMIUM	ANNUAL	ALL	1ST	0.00012	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_CADMIUM.USF	CADMIUM	ANNUAL	GEN123	1ST	0.00012	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_FORMALD.USF	FORMALD	ANNUAL	ALL	1ST	0.01275	560060	4829065	826.4	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_FORMALD.USF	FORMALD	ANNUAL	GEN123	1ST	0.00822	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_FORMALD.USF	FORMALD	ANNUAL	GEN10	1ST	0.00642	560060	4829065	826.4	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_FORMALD.USF	FORMALD	ANNUAL	GEN11	1ST	0.00542	560035	4829065	826.4	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_NICKEL.USF	NICKEL	ANNUAL	ALL	1ST	0.00022	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_89_NICKEL.USF	NICKEL	ANNUAL	GEN123	1ST	0.00022	559910	4829040	826.3	1 YRS	BoiBoiAdj89.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_3METH.USF	3METH	ANNUAL	ALL	1ST	0.00018	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_3METH.USF	3METH	ANNUAL	GEN123	1ST	0.00018	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_ARSENIC.USF	ARSENIC	ANNUAL	ALL	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_ARSENIC.USF	ARSENIC	ANNUAL	GEN123	1ST	0.00004	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_BENZENE.USF	BENZENE	ANNUAL	ALL	1ST	0.00599	560060	4829065	826.4	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_BENZENE.USF	BENZENE	ANNUAL	GEN123	1ST	0.00021	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_BENZENE.USF	BENZENE	ANNUAL	GEN10	1ST	0.00334	560060	4829065	826.4	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_BENZENE.USF	BENZENE	ANNUAL	GEN11	1ST	0.00279	560035	4829065	826.4	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_BERYLL.USF	BERYLL	ANNUAL	ALL	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_BERYLL.USF	BERYLL	ANNUAL	GEN123	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_CADMIUM.USF	CADMIUM	ANNUAL	ALL	1ST	0.00012	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_CADMIUM.USF	CADMIUM	ANNUAL	GEN123	1ST	0.00012	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_FORMALD.USF	FORMALD	ANNUAL	ALL	1ST	0.01211	560060	4829065	826.4	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_FORMALD.USF	FORMALD	ANNUAL	GEN123	1ST	0.00841	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_FORMALD.USF	FORMALD	ANNUAL	GEN10	1ST	0.00593	560060	4829065	826.4	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_FORMALD.USF	FORMALD	ANNUAL	GEN11	1ST	0.00495	560035	4829065	826.4	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_NICKEL.USF	NICKEL	ANNUAL	ALL	1ST	0.00022	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_90_NICKEL.USF	NICKEL	ANNUAL	GEN123	1ST	0.00022	559910	4829040	826.3	1 YRS	BoiBoiAdj90.MET

Model	File	Pollutant	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_3METH.USF	3METH	ANNUAL	ALL	1ST	0.00016	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_3METH.USF	3METH	ANNUAL	GEN123	1ST	0.00016	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_ARSENIC.USF	ARSENIC	ANNUAL	ALL	1ST	0.00003	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_ARSENIC.USF	ARSENIC	ANNUAL	GEN123	1ST	0.00003	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_BENZENE.USF	BENZENE	ANNUAL	ALL	1ST	0.00571	560060	4829065	826.4	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_BENZENE.USF	BENZENE	ANNUAL	GEN123	1ST	0.00019	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_BENZENE.USF	BENZENE	ANNUAL	GEN10	1ST	0.00317	560060	4829065	826.4	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_BENZENE.USF	BENZENE	ANNUAL	GEN11	1ST	0.00265	560035	4829065	826.4	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_BERYLL.USF	BERYLL	ANNUAL	ALL	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_BERYLL.USF	BERYLL	ANNUAL	GEN123	1ST	0.00001	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_CADMIUM.USF	CADMIUM	ANNUAL	ALL	1ST	0.00011	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_CADMIUM.USF	CADMIUM	ANNUAL	GEN123	1ST	0.00011	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_FORMALD.USF	FORMALD	ANNUAL	ALL	1ST	0.01144	560060	4829065	826.4	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_FORMALD.USF	FORMALD	ANNUAL	GEN123	1ST	0.00785	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_FORMALD.USF	FORMALD	ANNUAL	GEN10	1ST	0.00582	560060	4829065	826.4	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_FORMALD.USF	FORMALD	ANNUAL	GEN11	1ST	0.00471	560035	4829065	826.4	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_NICKEL.USF	NICKEL	ANNUAL	ALL	1ST	0.0002	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET
ISC3PBEE	SARMC TAPS 87_91 MET 6.1m anem_91_NICKEL.USF	NICKEL	ANNUAL	GEN123	1ST	0.0002	559910	4829040	826.3	1 YRS	BoiBoiAd91.MET

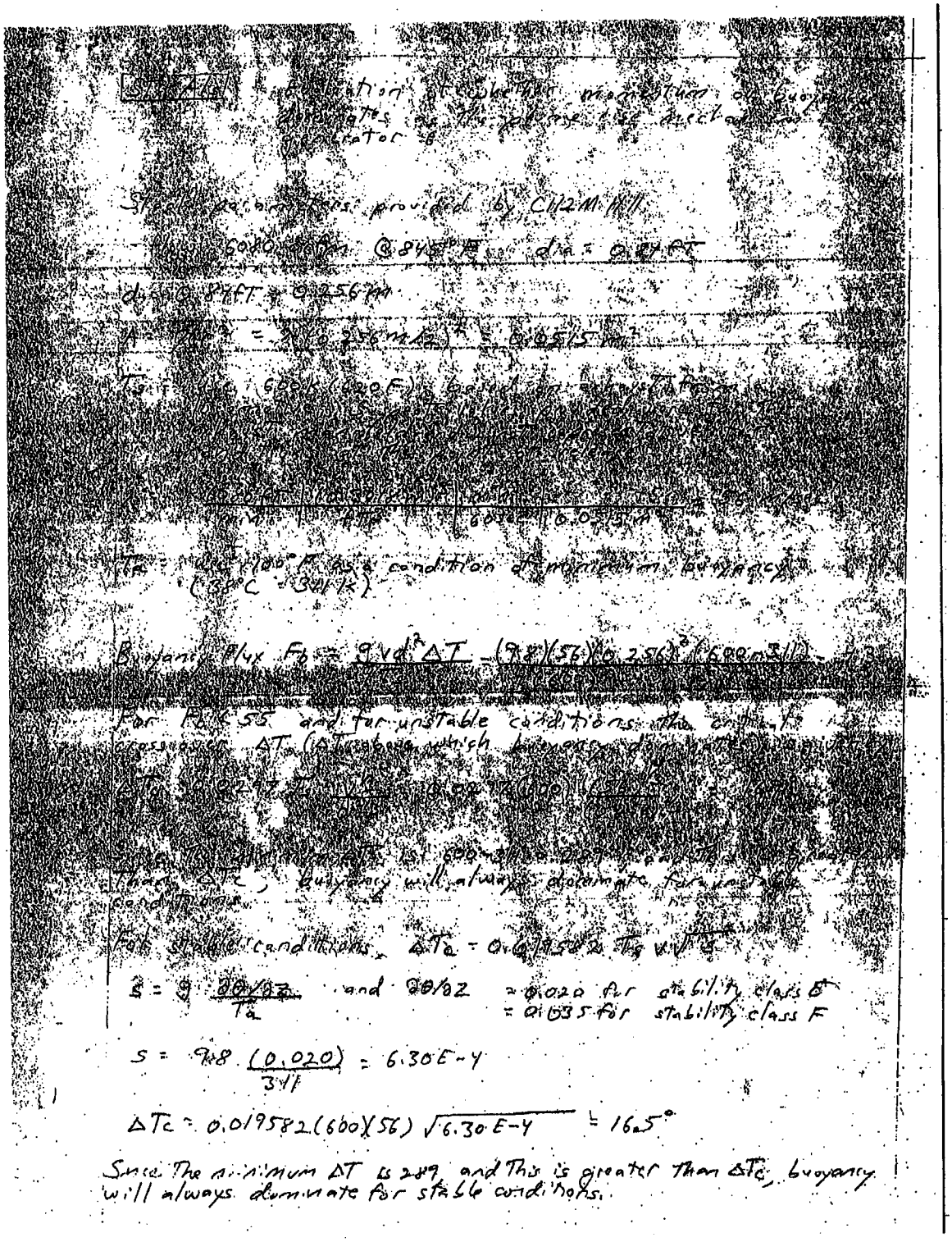
Attachment B

St. Alphonsus Regional Medical Center (Boise)

P-050052

DEQ Analysis of Buoyancy Flux or Momentum Flux Dominance
For Modeling the Horizontal Discharge of Generator 6

Created by Kevin Schilling, Stationary Source Modeling Coordinator, DEQ



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Modeling Hot Horizontal Releases

1.0 Description of Issue

When hot gases from an industrial stack are emitted to the atmosphere the plume may experience an initial rise depending on characteristics of the released gas stream. If the gases are emitted from a vertical stack, the plume may rise because of vertical momentum. If the gases are at a temperature greater than the surrounding air, the plume may also rise because of thermal buoyancy.

The Gaussian dispersion models used in these analyses calculate plume rise based on the greater of either momentum or thermal buoyancy. If the stack gases vent in a horizontal direction or the emissions stack is capped, then only thermal buoyancy will contribute to plume rise. The models do not have a switch to disregard plume momentum for horizontal releases. Therefore, methods were developed to adjust release parameters such that momentum is effectively eliminated. The most typical method used for the ISCST3 model was to set the exit velocity to 0.001 m/sec. This effectively eliminated momentum plume rise. This unfortunately also effectively eliminated thermal buoyancy. To overcome this problem, the stack diameter was increased to a point where the modeled volumetric flow (using the 0.001 m/sec exit velocity) was equal to the actual flow. This method reestablished the proper thermal mass of emitted gases to achieve the correct plume rise from thermal buoyancy.

The above method cannot be used with models utilizing the PRIME downwash algorithm, such as AERMOD and ISC-PRIME. The algorithms in PRIME use stack diameter to define the plume radius, and the plume radius is used to solve conservation laws. EPA is aware of this problem and has provided some discussion in the AERMOD Implementation Guide, issued on September 27, 2005. The guide suggests a conservative approach of setting the exit velocity to 0.001 m/sec but not altering the stack diameter. This approach will result in an underestimation of thermal buoyancy and likely an overestimation of maximum impacts of the source.

2.0 Alternate Approach for Modeling Hot Horizontal Releases

Plume rise in AERMOD and ISCST3 are calculated based on methods developed by Briggs (Briggs, G.A., 1975: Plume Rise Predications. In Lectures on Air Pollution and Environmental Impact Analysis, American Meteorological Society, Boston, Massachusetts) (Briggs, G.A., 1984: Plume Rise and Buoyancy Effects. Atmospheric Science and Power Production. Randerson, D., U.S. Dept. of Energy, 327-366 pp.). The crossover point between momentum and buoyancy can be calculated from the plume rise equations, and such equations are presented in the ISC Users Guide (User's Guide for the Industrial Source Complex (ISC3) Dispersion Models, Volume II – Description of Model Algorithms. EPA-454/B-95-003b). The crossover point calculations are different for stable conditions and neutral/unstable conditions.

The buoyancy flux value for the emitted plume is needed to calculate the crossover point in neutral/unstable conditions, and is calculated by the following equation:

$$F_b = \frac{gvd^2\Delta T}{4T_s}$$

Where:

F_b	=	buoyancy Flux (m^4/sec^3)
g	=	gravitational acceleration (9.8 m/sec^2)
v	=	stack velocity (m/sec)
d	=	stack diameter (m)
ΔT	=	difference between stack gas temperature and ambient air temperature (K)
T_s	=	stack gas temperature (K)

For Fb < 55, the critical temperature difference, beyond which momentum dominates buoyancy, is calculated by the following:

$$\Delta T_e = 0.0297\, T_s \frac{v^{1/3}}{d^{2/3}}$$

For Fb ≥ 55, the critical temperature difference is calculated by:

$$\Delta T_e = 0.00575\, T_s \frac{v^{2/3}}{d^{1/3}}$$

If the minimum temperature difference between the stack gas and ambient air is greater than ΔT_e, then plume rise will always be calculated using the buoyancy algorithm. If the plume is emitted in a horizontal direction, adjusting the exit velocity to 0.001 m/sec to negate momentum is not necessary.

The stability parameter, s, is needed for calculating the crossover point in stable conditions, and is given by:

$$s = g\frac{\partial\theta/\partial z}{T_a}$$

Where:

$\partial\theta/\partial z$	=	potential temperature gradient with height (K/m)
T_a	=	Ambient Temperature (K)

For stability class E (stable), a value of 0.020 K/m can be used for $\partial\theta/\partial z$; and for stability class F (very stable), a value of 0.035 K/m can be used for $\partial\theta/\partial z$.

The critical temperature difference is then calculated by:

$$\Delta T_c = 0.019582\, T_s\, v\sqrt{s}$$

3.0 Results for Hot, Horizontally Released Sources at Potlatch

. indicated there were five sources having a horizontal release at elevated temperatures. Table 2-1 shows results of the critical temperature difference calculations. The ambient temperature of 313.4 K (104.7° F) used in the calculation was the upper 95th percentile value from the 1992 meteorological data file used in the verification modeling analyses. Using such a high ambient temperature will result in minimal Δtemperature values and a lower critical temperature at which momentum becomes the plume rise mechanism.

Calculations indicated that for all five sources having hot, horizontal releases, the ambient temperature at which momentum becomes the plume rise mechanism is well above any observed ambient air temperatures. Therefore, these sources can be correctly modeled without adjusting the stack gas exit velocity to negate vertical momentum.