# Mirant Potomac River, LLC
# Alexandria, VA

# Update 5 to:

# A Dispersion Modeling Analysis of Downwash from Mirant's Potomac River Power Plant

# Modeling Cycling Units 1, 2 plus One Baseload Unit

**ENSR Corporation**
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# 1.0 INTRODUCTION

This report describes dispersion modeling performed for simultaneous operation of one baseload unit and two cycling units at Mirant's Potomac River Generating Station (PRGS). This mode of operation is also referred to as Option A in Mirant Potomac River LLC's December 30, 2005 letter to the U.S. Department of Energy regarding District of Columbia Public Service Commission, Docket No. EO-05-01. The modeling was performed according to the Protocol approved by the Virginia Department of Environmental Quality. The purpose of the modeling was to demonstrate that Option A operations will not cause or contribute to exceedances of the National Ambient Air Quality Standards (NAAQS).

Section 2 of this report presents the stack and emission parameters included in the modeling. Section 3 presents modeling results and conclusions.

# 2.0 MODEL INPUTS

Modeling was performed using the same version of AERMOD/AERMET and the same meteorological data and receptor grid used in the August, 2005 report prepared by ENSR.

Mirant is proposing to operate the cycling units (Units 1 and 2) up to 16 hours per day each (with up to 8 hours at full load and 8 hours or more at minimum load) while also operating one of the baseload units (Units 3,4,5) continuously without constraints as to load or operating hours. When operating, Mirant will use trona injection and a blend of the Appalachian coal generally used at the plant and lower sulfur coal to manage $SO_2$ emissions. In this configuration, Mirant would rotate use of the three baseload units in intervals of approximately two weeks so that one baseload unit is operating at a time and none of the three baseload units would remain or be placed in lay-up mode.

Mirant will operate in the following manner.

- When operating Unit 3 at baseload for up to 24-hours during a calendar day, Units 1, 2 will operate together for up to 4 hours each at minimum load (35 MW) and up to 5 hours each at maximum load (88MW) during that calendar day.

- When operating Unit 4 at baseload for up to 24-hours during a calendar day, Units 1, 2 will operate together for up to 5 hours each at minimum load (35 MW) and up to 6 hours each at maximum load (88MW) during that calendar day.

- When operating Unit 5 at baseload for up to 24-hours during a calendar day, Units 1, 2 will operate together for up to 8 hours each at minimum load (35 MW) and up to 8 hours each at maximum load (88MW) during that calendar day. When operating Unit 5, the cycling units will be able to operate up to a maximum of 16 hours each during that calendar day.

Stack gas flow rates for all units operating below maximum load were derived from continuous emission monitoring data for 2004. Hourly flow rates were plotted versus load and a best fit curve was derived. Similarly, hourly temperature measured at the stack breeching was plotted versus load and a best fit curve derived. The values of ACFM and temperature on the best fit curves corresponding to 35 MW were selected and used in the modeling for units operating at minimum load. Exit velocity was calculated from ACFM using the stack diameter.

Power plant personnel provided the historical heat rate versus load for all units. The heat rate for Unit 1 at 35 MW is 14.0 MMBtu/MWh. The heat rate for Unit 2 at 35 MW is 13.4 MMBtu/MWh. The heat rate was used to calculate $SO_2$ emissions at 35 MW using the following equation:

- $SO_2$ (lb/hr) = Unit heat rate x 35 MW x 0.24 lb $SO_2$/MMBtu

$SO_2$ emissions for all units at maximum load (88 MW for Units 1, 2 and 107 MW for Units 3,4,5) were calculated in exactly the same manner as the August 2005 modeling report except that an emission factor of 0.24 lb $SO_2$/MMBtu was used instead of the permit limit of 1.52 lb $SO_2$/MMBtu. Mirant plans to control $SO_2$ emissions from all units using Trona.

$PM_{10}$ emissions for all units at maximum load were calculated in the same manner as the August 2005 report except that an emission factor of 0.06 lb/MMBtu was used instead of the permit limit of 0.12 lb/MMBtu. Stack testing indicates that maximum PM/$PM_{10}$ emissions are less than 0.06 lb/MMBtu.

NOx emission rates at maximum load are 0.45 lb/MMBtu for Units 1, 2 and 0.24 lb/MMBtu for Units 3, 4, 5 based on CEMS data.

Table 2-1 shows the stack and flue gas exit parameters used in modeling all units.

Sources of $PM_{10}$ emissions include the combustion stacks, two fly ash silos and one bottom ash silo, plus material handling sources. Table 2-1 shows the Units' stack emissions plus the silos. In modeling $PM_{10}$ emissions from PRGS when only three units are operating (one at baseload and two cycling), Mirant assumed that emissions from all the silos and from the material handling sources are 60% of what they are when all units are operating at maximum load. This is because three units operating produce approximately 60% of the entire station's power output. The one exception to this is the coal pile wind erosion. We assumed that these emissions remain the same as they were in the August 2005 modeling.

**Table 2-1 - Stack and Emission Parameters Used in the Modeling**

| Point Source | Height (m) | Diam (m) | Temp (K) | | Exit Velocity (m/s) | | Emissions (g/sec) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | $SO_2$ | | $PM_{10}$ | | NOx | |
| | | | *Min Load* | *Max Load* | *Min Load* | *Max Load* | *Min Load* | *Max Load* | *Min Load* | *Max Load* | *Min Load* | *Max Load* |
| Boiler 1/ Stack 1 | 48.2 | 2.6 | 442.6 | 444.3 | 19.0 | 35.7 | 14.82 | 31.84 | 3.704 | 7.961 | 27.783 | 59.705 |
| Boiler 2/ Stack 2 | 48.2 | 2.6 | 431.5 | 455.4 | 18.7 | 30.2 | 14.18 | 31.12 | 3.546 | 7.779 | 26.592 | 58.344 |
| Boiler 3/ Stack 3 | 48.2 | 2.4 | - | 405.4 | - | 30.8 | - | 30.78 | - | 7.696 | - | 30.784 |
| Boiler 4/ Stack 4 | 48.2 | 2.4 | - | 405.4 | - | 33.2 | - | 32.87 | - | 8.218 | - | 32.871 |
| Boiler 5/ Stack 5 | 48.2 | 2.4 | - | 405.4 | - | 33.8 | - | 33.48 | - | 8.369 | - | 33.476 |
| Fly Ash Silo | 33.6 | 1.0 | 293.0 | | 0.1 | | 0.0 | | 0.051 | | 0.0 | |
| Fly Ash Silo | 33.6 | 1.0 | 293.0 | | 0.1 | | 0.0 | | 0.051 | | 0.0 | |
| Bottom Ash Silo | 31.0 | 1.0 | 293.0 | | 0.1 | | 0.0 | | 0.070 | | 0.0 | |

**Table 2-2 - Stack and Emission Parameters Used in the Modeling**

| Area Sources | Size | Height | $PM_{10}$ Existing Emissions | | | |
|---|---|---|---|---|---|---|
| | $m^2$ | m | lb/hr | tpy | g/sec | g/sec-$m^2$ |
| Ash Loader Upgrade | 546 | 2.0 | 0.03 | 0.024 | 0.0036 | 7.08E-06 |
| Coal Pile Wind Erosion and Dust Suppression | 17,679 | 4.6 | 0.93 | 1.12 | 0.118 | 6.66E-06 |
| Coal Stackout Conveyor Dust Suppression | 263 | 9.1 | 0.03 | 0.12 | 0.0036 | 1.31E-05 |
| Coal Railcar Unloading Dust Suppression | 288 | 1.0 | 0.072 | 0.036 | 0.0096 | 3.23E-05 |
| Ash trucks on Paved Roads | 5,886 | 1.0 | 0.36 | 0.73 | 0.046 | 7.72E-06 |

Notes:

Coal Pile = 4 acres = 17,679 $m^2$
Modeled height of coal pile = one half of average pile height = 30 feet x 0.5 = 15 feet (4.6 meters)
Modeled height stackout conveyor dust suppression = average height of coal pile (9.1 meters)
Resuspended roadway dust from paved roads: area = 2 x 0.3 miles x 20 feet wide = 5,886 $m^2$

# 3.0 MODELING RESULTS

## 3.1 Modeling Results For Cycling Units 1 & 2 and Baseload Unit 3

Tables 3-1, 3-2 and 3-3 present results of modeling $SO_2$ emissions from the two cycling units plus one baseload unit. Table 3-1 presents results for Units 1, 2 and 3. Table 3-2 presents results for Units 1, 2 and 4. Table 3-3 presents results for Units 1, 2 and 5.

### 3.1.1 $SO_2$ Results

Highest second highest 3-hour and 24-hour impacts and highest annual average impacts for each year are presented in Table 3-1. Modeled impacts are added to the highest monitored background concentrations for comparison with the NAAQS. The monitored background for the 24-hour average was 60.3 µg/m$^3$. This represented the highest, second highest concentration over the three year (2002-2004) period used in the August 2005 report. Mirant reviewed daily monitored concentrations for the entire 5-year period 2000-2004 and determined that the highest monitored background concentrations do not occur on the days when highest 24-hour $SO_2$ impacts are predicted from these three units. For this modeling of Units 1, 2 and 3, Mirant identified all the days in years 2000-2004 during which the top twenty-five 24-hour $SO_2$ concentrations were predicted for each year. Mirant then recorded the 24-hour monitored $SO_2$ concentration on these days and ranked them. The highest monitored 24-hour $SO_2$ concentration during these five years was 21 µg/m$^3$. This value was used in the NAAQS compliance assessment shown in Table 3-1.

As shown in Table 3-1, the highest second highest 3-hour average $SO_2$ concentration is 943 µg/m$^3$. This concentration is below the 1,300 µg/m$^3$ 3-hour NAAQS. The highest, second highest 24–hour average concentration is 361 µg/m$^3$. This concentration is below the 365 µg/m$^3$ 24-hour NAAQS. Finally, the highest annual average concentration of 67 µg/m$^3$ is below the 80 µg/m$^3$ annual NAAQS.

### 3.1.2 $PM_{10}$ Results

Table 3-1 presents results of modeling $PM_{10}$ emissions from Units 1, 2 and 3 plus all other non-combustion sources at PRGS. The highest, second highest 24-hour average concentration is 144.0 µg/m$^3$. This concentration is below the 150 µg/m$^3$ 24-hour NAAQS. The highest annual average concentration of 41 µg/m$^3$ is below the 50 µg/m$^3$ annual NAAQS.

### 3.1.3 Nitrogen Oxides (as $NO_2$) Results

Table 3-1 presents results of modeling NOx emissions from Units 1, 2 and 3. Maximum total $NO_2$ concentrations are predicted to be 97 µg/m$^3$. This concentration is below 100 µg/m$^3$ annual NAAQS.

## 3.2 Modeling Results for Cycling Units 1, 2 and Baseload Unit 4

### 3.2.1 $SO_2$ Results

Highest second highest 3-hour and 24-hour impacts and highest annual average impacts for each year are presented in Table 3-2. Modeled impacts are added to the highest monitored background concentrations for comparison with the NAAQS. The monitored background for the 24-hour average was 60.3 μg/m$^3$. This represented the highest, second highest concentration over the three year (2002-2004) period used in the August 2005 report. Mirant reviewed daily monitored concentrations for the entire 5-year period and determined that the highest monitored background concentrations do not occur on the days when highest 24-hour $SO_2$ impacts are predicted from these three units. For this modeling of Units 1, 2 and 4, Mirant identified all the days in years 2000-2004 during which the top twenty-five 24-hour $SO_2$ concentrations were predicted for each year. Mirant then recorded the 24-hour monitored $SO_2$ concentration on these days and ranked them. The highest monitored 24-hour $SO_2$ concentration during these five years was 53 μg/m$^3$. This value was used in the NAAQS compliance assessment shown in Table 3-2.

As shown in Table 3-2, the highest second highest 3-hour average $SO_2$ concentration is 960 μg/m$^3$. This concentration is below the 1,300 μg/m$^3$ 3-hour NAAQS. The highest, second highest 24–hour average concentration is 357 μg/m$^3$. This concentration is below the 365 μg/m$^3$ 24-hour NAAQS. Finally, the highest annual average concentration of 60 μg/m$^3$ is below the 80 μg/m$^3$ annual NAAQS.

### 3.2.2 $PM_{10}$ Results

Table 3-2 presents results of modeling $PM_{10}$ emissions from Units 1, 2 and 4 plus all other non-combustion sources at PRGS. The highest, second highest 24-hour average concentration is 144 μg/m$^3$. This concentration is below the 150 μg/m$^3$ 24-hour NAAQS. The highest annual average concentration of 41 μg/m$^3$ is below the 50 μg/m$^3$ annual NAAQS.

### 3.2.3 Nitrogen Oxides (as $NO_2$) Results

Table 3-2 presents results of modeling NOx emissions from Units 1, 2 and 4. Maximum total $NO_2$ concentrations are predicted to be 93 μg/m$^3$. This concentration is below 100 μg/m$^3$ annual NAAQS.

## 3.3 Modeling Results for Cycling Units 1, 2 and Baseload Unit 5

### 3.3.1 $SO_2$ Results

Highest second highest 3-hour and 24-hour impacts and highest annual average impacts for each year are presented in Table 3-3. Modeled impacts are added to the highest monitored background concentrations for comparison with the NAAQS. The monitored background for the 24-hour average was 60.3 μg/m$^3$. This represented the highest, second highest concentration over the three year (2002-2004) period used in the August 2005 report. Mirant reviewed daily monitored concentrations for the entire 5-year period and determined that the highest monitored background concentrations do not occur on the days when highest 24-hour $SO_2$ impacts are predicted from these three units. For this modeling of Units 1, 2 and 5, Mirant identified all the days in years 2000-2004 during which the top twenty-five 24-hour $SO_2$ concentrations were predicted for each year. Mirant then recorded the 24-hour monitored $SO_2$ concentration on these days and ranked them. The highest monitored 24-hour $SO_2$ concentration during these five years was 42 μg/m$^3$. This value was used in the NAAQS compliance assessment shown in Table 3-3.

As shown in Table 3-3, the highest second highest 3-hour average $SO_2$ concentration is 833 μg/m$^3$. This concentration is below the 1,300 μg/m$^3$ 3-hour NAAQS. The highest, second highest 24–hour average concentration is 294 μg/m$^3$. This concentration is below the 365 μg/m$^3$ 24-hour NAAQS. Finally, the highest annual average concentration of 52 μg/m$^3$ is below the 80 μg/m$^3$ annual NAAQS.

### 3.3.2 $PM_{10}$ Results

Table 3-3 presents results of modeling $PM_{10}$ emissions from Units 1, 2 and 5 plus all other non-combustion sources at PRGS. The highest, second highest 24-hour average concentration is 144 μg/m$^3$. This concentration is below the 150 μg/m$^3$ 24-hour NAAQS. The highest annual average concentration of 42 μg/m$^3$ is below the 50 μg/m$^3$ annual NAAQS.

### 3.3.3 Nitrogen Oxides (as $NO_2$) Results

Table 3-3 presents results of modeling NOx emissions from Units 1,2 and 5. Maximum total $NO_2$ concentrations are predicted to be 83 μg/m$^3$. This concentration is below 100 μg/m$^3$ annual NAAQS.

## 3.4 Conclusions

Modeling results indicate that cycling Units 1, 2, operating with one baseload unit in the mode described in Section 2.0, produces ambient air concentrations that are better than the NAAQS for $SO_2$, $PM_{10}$ and $NO_2$.

## Table 3-1 AERMOD Modeling Results
## Units 1,2 Cycling between Maximum and Minimum Loads, Unit 3 at Maximum Load

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | M | deg | m | m |
| 2000 | $SO_2$ | 3-hour | 687 | 238.4 | 925 | 1300 | 322770.8 | 4298791.5 | 182.7 | 349 | 6.1 | 39.6 |
| | | 24-hour | 340 | 21.0 | 361 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 46 | 15.7 | 62 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2001 | $SO_2$ | 3-hour | 688 | 238.4 | 926 | 1300 | 322770.8 | 4298791.5 | 182.7 | 349 | 6.1 | 39.6 |
| | | 24-hour | 296 | 21.0 | 317 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 51 | 15.7 | 67 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2002 | $SO_2$ | 3-hour | 704 | 238.4 | 943 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 314 | 21.0 | 335 | 365 | 322770.8 | 4298791.5 | 182.7 | 349 | 6.1 | 39.6 |
| | | Annual | 44 | 15.7 | 59 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2003 | $SO_2$ | 3-hour | 561 | 238.4 | 800 | 1300 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |
| | | 24-hour | 272 | 21.0 | 293 | 365 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |
| | | Annual | 32 | 15.7 | 48 | 80 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |
| 2004 | $SO_2$ | 3-hour | 621 | 238.4 | 859 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 238 | 21.0 | 259 | 365 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |
| | | Annual | 36 | 15.7 | 51 | 80 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |

**Table 3-1 Cont.**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | m | deg | m | m |
| 2000 | PM10 | 24-hour | 89 | 45 | 134 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 17 | 21 | 38 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2001 | PM10 | 24-hour | 99 | 45 | 144 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 18 | 21 | 39 | 50 | 322880.8 | 4298542.5 | 102.7 | 133 | 6.7 | 0.0 |
| 2002 | PM10 | 24-hour | 83 | 45 | 128 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 18 | 21 | 39 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2003 | PM10 | 24-hour | 82 | 45 | 127 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 20 | 21 | 41 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2004 | PM10 | 24-hour | 71 | 45 | 116 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 19 | 21 | 40 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |

**Table 3-1 Cont.**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | m | deg | m | m |
| 2000 | $NO_2$ | Annual | 43 | 48.9 | 92 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2001 | $NO_2$ | Annual | 48 | 48.9 | 97 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2002 | $NO_2$ | Annual | 40 | 48.9 | 89 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2003 | $NO_2$ | Annual | 32 | 48.9 | 81 | 100 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |
| 2004 | $NO_2$ | Annual | 35 | 48.9 | 84 | 100 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |

NOx concentrations were multiplied by 0.75 to obtain NO2 estimates in accordance with USEPA guidelines.

**Table 3-2 AERMOD Modeling Results**

**Units 1, 2 Cycling between Maximum and Minimum Loads, Unit 4 at Maximum Load**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | M | deg | m | m |
| 2000 | $SO_2$ | 3-hour | 587 | 238.4 | 825 | 1300 | 322770.8 | 4298791.5 | 182.7 | 349 | 6.1 | 39.6 |
| | | 24-hour | 291 | 53.0 | 344 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 39 | 15.7 | 55 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2001 | $SO_2$ | 3-hour | 722 | 238.4 | 960 | 1300 | 322770.8 | 4298791.5 | 182.7 | 349 | 6.1 | 39.6 |
| | | 24-hour | 270 | 53.0 | 323 | 365 | 322770.8 | 4298791.5 | 182.7 | 349 | 6.1 | 39.6 |
| | | Annual | 44 | 15.7 | 60 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2002 | $SO_2$ | 3-hour | 687 | 238.4 | 926 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 304 | 53.0 | 357 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 38 | 15.7 | 53 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2003 | $SO_2$ | 3-hour | 509 | 238.4 | 748 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 194 | 53.0 | 247 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 20 | 15.7 | 36 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2004 | $SO_2$ | 3-hour | 557 | 238.4 | 795 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 179 | 53.0 | 232 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 28 | 15.7 | 44 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |

**Table 3-2 Cont.**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | m | deg | m | m |
| 2000 | PM10 | 24-hour | 90 | 45 | 135 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 17 | 21 | 38 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2001 | PM10 | 24-hour | 99 | 45 | 144 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 17 | 21 | 38 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2002 | PM10 | 24-hour | 83 | 45 | 128 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 18 | 21 | 39 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2003 | PM10 | 24-hour | 82 | 45 | 127 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 20 | 21 | 41 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2004 | PM10 | 24-hour | 82 | 45 | 127 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 19 | 21 | 40 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |

**Table 3-2 Cont.**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | m | deg | m | m |
| 2000 | $NO_2$ | Annual | 39 | 48.9 | 88 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2001 | $NO_2$ | Annual | 44 | 48.9 | 93 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2002 | $NO_2$ | Annual | 38 | 48.9 | 87 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2003 | $NO_2$ | Annual | 24 | 48.9 | 73 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2004 | $NO_2$ | Annual | 29 | 48.9 | 78 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |

NOx concentrations were multiplied by 0.75 to obtain NO2 estimates in accordance with USEPA guidelines.

**Table 3-3 AERMOD Modeling Results**
**Units1,2 Cycling between Maximum and Minimum Loads, Unit 5 at Maximum Load**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | M | deg | m | m |
| 2000 | $SO_2$ | 3-hour | 543 | 238.4 | 781 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 252 | 42.0 | 294 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 31 | 15.7 | 47 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2001 | $SO_2$ | 3-hour | 585 | 238.4 | 824 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 245 | 42.0 | 287 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 36 | 15.7 | 52 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2002 | $SO_2$ | 3-hour | 595 | 238.4 | 833 | 1300 | 322763.3 | 4298799.5 | 192.1 | 347 | 6.5 | 39.6 |
| | | 24-hour | 247 | 42.0 | 289 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 29 | 15.7 | 45 | 80 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2003 | $SO_2$ | 3-hour | 519 | 238.4 | 757 | 1300 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | 24-hour | 179 | 42.0 | 221 | 365 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 0.0 |
| | | Annual | 19 | 15.7 | 35 | 80 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |
| 2004 | $SO_2$ | 3-hour | 500 | 238.4 | 738 | 1300 | 322770.8 | 4298791.5 | 182.7 | 349 | 6.1 | 39.6 |
| | | 24-hour | 177 | 42.0 | 219 | 365 | 322880.8 | 4298542.5 | 102.7 | 133 | 6.7 | 0.0 |
| | | Annual | 22 | 15.7 | 38 | 80 | 322854.0 | 4298627.0 | 51.0 | 73 | 5.0 | 0.0 |

**Table 3-3 Cont.**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | m | deg | m | m |
| 2000 | PM10 | 24-hour | 90 | 45 | 135 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 17 | 21 | 38 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2001 | PM10 | 24-hour | 99 | 45 | 144 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 17 | 21 | 38 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2002 | PM10 | 24-hour | 83 | 45 | 128 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 18 | 21 | 39 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2003 | PM10 | 24-hour | 83 | 45 | 128 | 150 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| | | Annual | 21 | 21 | 42 | 50 | 322810.6 | 4298329.0 | 283.1 | 179 | 10.6 | 0.0 |
| 2004 | PM10 | 24-hour | 71 | 45 | 116 | 150 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| | | Annual | 19 | 21 | 40 | 50 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |

**Table 3-3 Cont.**

| Year | Pollutant | Averaging Period | AERMOD-PRIME | Monitored Background | AERMOD-PRIME + Background | NAAQS | Impact Location | | Distance | Direction | Ground Elevation | Flagpole Elevation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations ($\mu g/m^3$) | | | | X (m) | Y (m) | m | deg | m | m |
| 2000 | $NO_2$ | Annual | 30 | 48.9 | 79 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2001 | $NO_2$ | Annual | 34 | 48.9 | 83 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2002 | $NO_2$ | Annual | 28 | 48.9 | 77 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2003 | $NO_2$ | Annual | 21 | 48.9 | 70 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |
| 2004 | $NO_2$ | Annual | 23 | 48.9 | 72 | 100 | 322787.7 | 4298786.0 | 174.8 | 354 | 4.6 | 39.6 |

NOx concentrations were multiplied by 0.75 to obtain NO2 estimates in accordance with USEPA guidelines.