



DEPARTMENT OF TRANSPORTATION  
AND ENVIRONMENTAL SERVICES

P. O. Box 178 – City Hall  
Alexandria, Virginia 22313

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October 28, 2004

Director  
Office of Air Regulatory Development  
Department of Environmental Quality  
629 East Main Street  
P.O. Box 10009  
Richmond, VA 23240

Re: City of Alexandria Comments on the Revised Draft State Operating Permit and the underlying consent decree to resolve Notice of Violations for Mirant, Potomac River Generating Station located at 1400 N. Royal Street Alexandria, Virginia

Dear Sir:

This letter is in response to the Public Hearing Notice and request for comments concerning the proposed state operating permit for the Mirant, Potomac River Generating Station located at 1400, North Royal Street in the City of Alexandria. The City's comments on the draft operating permit are detailed in Attachment I and a general summary of City's comments is provided in this letter. These comments are being submitted on behalf of the Mayor, the City Council and the City Manager.

A brief summary of the comments is provided below:

The comments oppose the issuance of an amended state operating permit before it is clear that the permit's conditions will ensure the Potomac River plant's compliance with all ambient air quality standards and all relevant state and federal air quality regulations. This means that, before any amended state permit may be issued, the results of the downwash study must be completed and any changes to the permit that are needed to ensure the plant's compliance with applicable standards and regulations must be made.

The comments state that the downwash study and its modeling analysis (described in the consent order between Mirant and DEQ) need to include a thorough assessment of all relevant toxic pollutants emitted by the Potomac River plant, including the metals, organic compounds and acid gases that are emitted by coal-combustion, and PM<sub>2.5</sub>. The comments also state that, for toxic emissions such as

mercury and other hazardous pollutants, the most protective health-based concentration criteria available must be applied when analyzing the modeling results.

The comments also question whether the Potomac River plant is in compliance with EPA's regulations for New Source Review, and state that, before any amended operating permit is issued or the consent decree is approved, a determination needs to be made whether or not the plant is in compliance with these regulations.

The comments request that additional NO<sub>x</sub> controls be added to the operating permit to units #1 and #2 at the Potomac River plant, or that units #1 and #2 not be operated at all on high ozone days.

The comments request that annual and daily NO<sub>x</sub> emission limits on the Potomac River plant be added as additional conditions of the operating permit.

Finally, the comments state that the proposed monitoring program (in and around the Potomac River plant) in the consent decree is inadequate, and that additional monitoring which fully meets monitoring guidelines issued by EPA must be required.

The City of Alexandria worked closely with VADEQ on inclusion of specific supplement environmental projects in the consent decree and therefore has a vested interest in their timely implementation. Therefore, we request that the proposed permit condition #24 requiring periodic status reports on Supplement Environmental Projects be amended to include the City of Alexandria as one of the agencies to receive these status reports.

The City appreciates the opportunity to submit these comments. If there are any questions concerning these comments, please contact William Skrabak, Chief, Division of Environmental Quality, at 703-838-4334.

Sincerely



Richard J. Baier, Director  
Transportation and Environmental Services

cc: The Honorable Mayor and Members of the City Council  
Philip Sunderland, City Manager  
William Skrabak, Chief, Division of Environmental Quality  
Robert Burnley, Director, VDEQ  
Jeffery A. Steers, Regional Director, NRO, VDEQ  
Members of the Mirant Community Monitoring Group

**CITY OF ALEXANDRIA  
COMMENTS**

**REVISED VIRGINIA STATE IMPLEMENTATION PLAN  
DRAFT STATE OPERATING PERMIT  
MIRANT POTOMAC POWER PLANT PERMIT**

**INTRODUCTION**

The City of Alexandria hereby submits its Comments in response to the Public Hearing Notice and request for comments concerning the revision to the Commonwealth of Virginia State Implementation Plan (“SIP”) consisting of a portion of a draft State Operating Permit (“SOP”) for the Potomac River Generating Station (“PRGS”) operated by Mirant Mid-Atlantic, LLC, (“Mirant”) and located at 1400 North Royal Street, Alexandria, Virginia. In reviewing the draft SOP, Alexandria’s primary interests are (i) the direct, adverse public health and other impacts on the residents of Alexandria from the emissions and related activities of the PRGS, and (ii) within the region, to avoid a disproportionate adverse impact on Alexandria neighborhoods and residents from such activities.

Alexandria is opposed to the implementation of the draft SOP in its present form. As set out in more detail below, there are numerous deficiencies in the draft SOP and the proposed Consent Decree that may have adverse effects on the health and welfare of the residents of Alexandria. The draft SOP fails to ensure that the emissions of oxides of nitrogen (“NOx”) from the PRGS will allow the facility to comply with ambient air quality standards. It also relies on assumptions that do not accommodate potential excessive NOx emissions. Further, there is no showing that the PRGS satisfies federal guidelines for air toxic pollutants or reduces as much as possible the fugitive dust from the plant’s operations. In addition, there is no clear demonstration that the establishment a Mirant “system” of power plants (*i.e.*, what the proposed Consent Decree describes as System-Wide” for the PRGS and the Morgantown, Dickerson and Chalk Point power plants in Maryland) and the system-wide regulation of NOx emissions will actually achieve the requirements of Virginia’s SIP or necessarily result in improved air quality for Alexandria. While it is believed that the system- wide NOx reductions will provide greater air quality benefits for the City of Alexandria and Northern Virginia, DEQ should demonstrate through modeling that these system-wide reductions will provide greater air quality benefits to the City, as well as the region.

This draft SOP should not proceed without a full assessment of the PRGS’s comprehensive compliance with air quality requirements.

**BACKGROUND**

The Mirant PRGS is located in a densely populated urban area, adjacent to the Potomac River and surrounded by and in close proximity to residential communities. It is an outdated coal-fired generating plant that predates the federal Clean Air Act, thereby

avoiding certain requirements intended to promote compliance with air quality standards. The PRGS is highly inefficient with stack heights well below what are usually necessary to satisfy current ambient air quality standards. Mirant also has filed for protection under the bankruptcy laws, an action that raises concerns about its long-term viability and its ability to implement any environmental improvements.

Alexandria has expressed, on numerous occasions, its concerns with the impacts on the surrounding communities and on the city as a whole of such a plant in precisely that location. On June 22, 2004, the Alexandria Mayor and City Council adopted a long term strategy for the cessation of the operations of the PRGS at its current location and for the utilization of the site in a manner more compatible with the city's residential communities. The draft SOP, as well as the proposed Consent Decree, while not directly furthering this strategy, provide the opportunity for Alexandria to promote the implementation of its strategy and the protection of its citizens. For this purpose, Alexandria engaged an independent consultant, Ms. Maureen Barrett of AERO Engineering Services, who, in close coordination with Alexandria's technical staff, has provided the framework for a scientific and technical evaluation of the draft SOP and, as a related matter, the proposed Consent Decree, on which these comments are based.

### TECHNICAL COMMENTS

- 1. Screening modeling using estimated plant data shows that the PRGS's air impacts exceed federal and Virginia Ambient Air Quality Standards ("AAQS"). The proposed SOP is deficient because it does not define permit terms that constrain the PRGS to a plant and operating configuration that will necessarily produce compliance with AAQS and the 1-hour NO<sub>x</sub> guideline. Therefore, an additional condition should be added to the operating permit that requires that the PRGS comply with all AAQS, including NO<sub>x</sub>; in addition, DEQ should withhold issuance of the SOP until after the downwash study, required under the Consent Order, has been completed and any corrective actions have been implemented and have demonstrated AAQS compliance.**

Virginia's regulations for the control and abatement of air pollution state that "ambient air quality standards define levels of air quality which, allowing an adequate margin of safety, are necessary to protect the public health" (9 VAC 5 Chapter 30). Although the PRGS source may have not been required to demonstrate compliance with AAQS at the time of its construction, there should not be a waiver in this situation from the requirement to apply AAQS as the bases for effective and reasonable management of local and regional air resources.

It is likely that for many years and perhaps decades, the PRGS's emissions have far exceeded, and continue to exceed, the allowable ambient levels that Virginia administers as necessary limits for the protection of public health. Table 1 shows the results using US EPA's SCREEN3 to predict the PRGS's maximum impacts of NO<sub>x</sub>, PM<sub>10</sub> and SO<sub>2</sub> on the surrounding communities using estimated stack and emission

characteristics derived from conversations with DEQ personnel, visual inspection and US EPA data (eGRID). These results show that PRGS's impacts exceed, in most cases by several times, the ambient air quality standards and health-based guideline value for NOx.<sup>1</sup>

It is important to note that these predicted impacts may err on the side of under-prediction because 1) these values do not reflect PRGS's ability to emit more than these assumed values for annual emissions; for example, the facility emitted 7,060 tons of NOx in 1996 and 5,693 tons in 2000 while Table 1's values reflect 5,000 tons per year of NOx, and 2) short-term limits will likely be much higher than the assumptions of Table 1 because the proposed State Operating Permit places no constraints on the facility's no short-term limits.

<b>Table 1. Preliminary Screening Model Results of PRGS's Compliance with Health-based 9 VAC 5 Chapter 30's Ambient Air Quality Standards and CAL EPA 1-hour NOx Guideline<sup>2</sup></b>					
Pollutant	Avg. Period	Max. Modeled Conc. ( $\mu/m^3$ )	Estimated Backgrnd.C onc. ( $\mu/m^3$ )	Total Conc. ( $\mu/m^3$ )	Allowable Conc. ( $\mu/m^3$ )
N02	1-hour (guide.)	4,008 to 10,690			
	Annual	200. to 533.	20.	220 to 553.	100
PM10	24-hour	194. to 518.	50	244. to 568.	150
	Annual	24. to 64.	20	44. to 84.	50
SO2	3-hour	8,943. to 23,877.	150.	9,093 to 24,027.	1300
	24-hour	4,472. to 11,940.	75.	4,547. to 12,015.	365
	Annual	558. to 1,489.	10.	568. to 1,499.	80

It is also likely that for several wind directions the PRGS building itself, or the Marina Towers structure, produce a cavity effect on emissions from the short stacks. For

<sup>1</sup> This analysis includes the NOx 1-hour guideline to assess compliance with health-based AAQS; for example, Cal EPA and Vermont use a value of 472 micrograms per cubic meter. The California Air Resources Board is currently reviewing this 1-hour guideline value to determine if it adequately protects children.

<sup>2</sup> **Table 1 Notes:** (a) All values are based on approximate annual emissions from facility based on DEQ and US EPA records (NOx: 5000 tons, approximated; PM10: 606 tons in year 2003; SO2: 13,947 tons from year 2000); (b) Range of values derives from two stack height and building height scenarios used in the analysis; one of a 120 foot stack and 90 foot building height; the other a 144 foot stack and 98 foot building; (c) Longer-term values were derived from the 1-hour screening result using US EPA's recommended conversion values; (d) A receptor was placed at a height representative of the higher floors at Marina Towers, *i.e.*, at 80 feet; and (e) All emissions were assumed to occur from one stack; however, for a north-westerly wind direction, which includes Marina Towers in a downwind direction, the stacks are aligned to some extent.

this situation, short-term impacts could be several times greater than those shown in Table 1. Section 123 of the federal Clean Air Act defines Good Engineering Practice stack height as “the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies or wakes which may be created by the source itself, nearby structures or nearby terrain obstacles.” The United States Environmental Protection Agency (“EPA”) has promulgated regulations that allow one to determine GEP height for a stationary source.<sup>3</sup> (40 CFR Part 51.) For PRGS, this GEP height equals approximately 225 feet to 250 feet,<sup>4</sup> versus the approximately 120 to 140 foot stack in current operation. Thus, each of the stacks at PRGS is approximately 100 feet lower than a stack designed to a height that is necessary to ensure that emissions do not result in excessive concentrations of pollutants in the vicinity of the source.

Mirant should determine the plant and emissions configurations that will allow it to comply with AAQS and the NO<sub>x</sub> 1-hour guideline, and the draft SOP should define this configuration as a permit requirement. All configurations should be included as options.

- 2. The air impacts by the PRGS’s toxic air emissions may exceed federal guidelines. The draft SOP should define permit terms that constrain the PRGS to a plant and operating configuration that ensures that the facility’s toxic emissions will comply with the most protective health-based concentration criteria available.**

Virginia DEQ uses the worker-based threshold limit values defined by the American Conference of Governmental and Industrial Hygienists as a basis, and scales these to define ambient guideline levels for impacts of air toxic pollutants (9VAC5-60-230. “Significant Ambient Air Concentration Guidelines,” dated June 14, 2004). However, many states and US EPA use more protective health-based guidelines based on the Integrated Risk Information System and the Reference Concentrations that derive from it.<sup>5</sup> DEQ and Mirant should determine the plant and emissions configurations that will allow the PRGS to comply with the most protective health-based concentration criteria available, and the draft SOP should define this configuration as a permit requirement. DEQ and Mirant should also use the more conservative concentrations as part of downwash study Mirant is required to undertake as part of the downwash Consent Order.

- 3. The environmental projects within the draft SOP do not include several of the recommendations of Mirant’s own consultant for reducing fugitive dust impacts. The draft SOP should include all of these recommendations,**

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<sup>3</sup> “New Source Review Workshop Manual, Prevention of Significant Deterioration and Non-attainment Area Permitting,” US EPA, October, 1990.

<sup>4</sup> Without access to exact building dimensions one cannot properly calculate GEP height; however this value is a fair representation of value of GEP height based on a building height in the 90 to 100 foot range.

<sup>5</sup> Office of Research and Development, National Center for Environmental Assessment, US EPA.

**including, but not limited to, (i) maintenance of the coal piles to reduce side slopes and lower the overall height; (ii) covers for ash transport trucks; and (iii) an EPA-approved perimeter monitoring program.**

The settled dust study proposed in the Environmental Projects of the proposed Consent Decree at PRGS does not qualify as an EPA-approved, *i.e.*, EPA reference, method for determining compliance with the ambient air quality standards for PM<sub>10</sub> and PM<sub>2.5</sub>. While the settled dust may provide useful information concerning fugitive dust at the property line, it will not determine whether PM<sub>10</sub> and PM<sub>2.5</sub> concentrations comply with AAQS. The draft SOP and the downwash study should specify terms by which Mirant will determine through modeling the location of the maximum predicted impacts for each of PM<sub>10</sub> and PM<sub>2.5</sub>, and demonstrate, with EPA-approved monitors at these locations, compliance with the AAQS. In addition to the proposed environmental projects, the draft SOP should include requirements for ash truck covers and coal pile side-slope and height reduction practices, as set out in Mirant's consultant's report entitled "Fugitive Dust Review" (CH2M Hill, July 20, 2001).

- 4. The original Possum Point power plant in Northern Virginia is similar to the existing PRGS facility. Its size was approximately 500 MW, all units were coal-fired, and all units were constructed in about 1965 or earlier. The Possum Point plant has since been converted from a coal-fired plant to an efficient gas-fired plant, in part due to a settlement with the Department of Justice and US EPA to resolve charges that the operator failed to obtain a New Source Review ("NSR") permit for the facility (economizer and drafting) upgrades. Before approval of the proposed Consent Decree related to this draft SOP, Mirant should provide to DEQ fuel use and other pertinent records since approximately 1985 to establish that no physical changes were performed which resulted in emissions increases or otherwise triggered NSR requirements. This draft SOP should not go forward before a full assessment has been made of the PRGS's compliance with all air quality requirements.**

Possum Point in Northern Virginia, operated by Virginia Power, converted to natural gas as part of its NSR violation settlement<sup>6</sup>. As part of that settlement, the facility will also install SCR on eight of its plants, resulting in reductions of NOx of 60,400 tons. Its penalties included a 5.3 million dollar civil penalty, and 13.9 million dollar required expenditure on environmental projects. The PRGS facility is a similarly-aged and similarly-sized facility to the original Possum Point facility. It does not seem likely that PRGS has not undergone some physical modifications since its construction date. These modifications may also have allowed it to increase its capacity and should therefore be assessed against New Source Review thresholds. For example, EPA records show that the facility's annual heat input increased between 1996 and 2000 from 19.7 million MMBtu per year to 26.1 million MMBtu per year, about a 30% increase [US EPA, eGRID]. Before issuing the SOP, DEQ, EPA and Department of Justice should review fuel use and power production records and other pertinent records to determine if

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<sup>6</sup> "Fact Sheet, Virginia Electric Power Company, Clean Air Act Civil Settlement," April, 2003, [www.epa.gov/compliance/resources/cases/civil/caa](http://www.epa.gov/compliance/resources/cases/civil/caa).

physical changes occurred at the PRGS that could account for these or any other emission increases.

- 5. With the proposed NO<sub>x</sub> emission controls for Mirant, the draft SOP does not demonstrate that it will achieve Virginia's SIP requirement.**

The permit term that Mirant violated was required by the Virginia SIP as a control measure to achieve compliance with the Washington, D.C. metropolitan statistical area one-hour ozone standard. This proposed SOP and the related Consent Decree relax the PRGS's limits significantly by allowing the PRGS to emit from 731 to 456 more tons of NO<sub>x</sub> in the ozone season through the years 2010 and beyond. DEQ should require Mirant to demonstrate with ozone modeling that the draft SOP's proposed NO<sub>x</sub> rates for the Mirant "system" are more beneficial for Alexandria, Northern Virginia, and the Washington Non-attainment area than requiring that PRGS be constrained to an ozone season NO<sub>x</sub> limit of 1,019 tons.

The SOP should establish an annual NO<sub>x</sub> limit for PRGS, so that NO<sub>x</sub> budget constraints for the Mirant "system" before the implementation of SCR cannot be met through shifting NO<sub>x</sub> emissions to PRGS.

The Virginia NO<sub>x</sub> Budget rule states that "the trading mechanism...allows sources to purchase NO<sub>x</sub> allowances until such time as they choose to retrofit or replace or shut down older equipment that may not operate as efficiently as new equipment."<sup>7</sup> The PRGS is a highly in-efficient plant with stacks that are designed to meet Federal Aviation Administration guidelines in the 1950 time frame, not to meet ambient air quality requirements that the majority of electrical generating facilities in the US are constrained to meet. By allowing Mirant to both use allowances to meet its Virginia emission requirements and to operate outside of the constraints of compliance with the health-based AAQS and toxic impact guidelines, this draft SOP provides an unfair market advantage to Mirant over the newer, more-efficient electrical generating facilities that Virginia should be promoting.

- 6. The modeling analysis proposed in the Consent Order should include a thorough assessment of compliance with toxic pollutants, including the metals, organic compounds and acid gases emitted by coal-combustion and acid gases, and PM<sub>2.5</sub>.**

Currently, the modeling analysis proposed by Mirant includes only an assessment of ambient air impacts of SO<sub>2</sub>, NO<sub>2</sub>, CO, PM<sub>10</sub> and mercury. The EPA's AP-42 (Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I, September, 1998) shows that bituminous coal combustion is associated with high emissions of metals (arsenic, cadmium, lead, antimony, selenium, manganese, beryllium, cobalt, chromium), acid gases (hydrogen chloride and hydrogen fluoride) and organic compounds (dioxins, furans and poly-aromatic hydrocarbons). These should all be assessed against health-

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<sup>7</sup> Ibid.

based allowable ambient levels that are determined to be the most-protective standards available.

The modeling analysis also does not propose a demonstration with  $PM_{2.5}$  standards. Although DEQ has not defined procedures for showing compliance with this standard, this does not provide Mirant relief from the requirement of demonstrating that the facility will not contribute to a violation of this standard. Mirant should propose their own method for predicting their impact on  $PM_{2.5}$  ambient concentrations. At a minimum, Mirant can propose a Gaussian dispersion model to estimate the impact of the primary component of  $PM_{2.5}$ , and make a best engineering estimate of the secondary component of the  $PM_{2.5}$  based on the source category's composition of profiles at receptors (see "Guidance for Demonstrating Attainment of Air Quality Goals for  $PM_{2.5}$  and Regional Haze," Draft, Jan. 2, 2001, US EPA).

- 7. The air quality compliance demonstration by the PRGS should be as rigorous as the demonstration of compliance that is required of any new facility. Therefore, Mirant should include major sources plus background sources in determining compliance with standards. It should also include the coal yard (coal and fly ash fugitive and point emissions in the coal yard, i.e., baghouses on silos) within the  $PM_{10}$  and  $PM_{2.5}$  compliance demonstration.**

Currently, Mirant does not propose that interacting sources be included within its modeling demonstration. The significant impact area of the PRGS for each of the modeled pollutants should be determined, and any major source within that significant impact area should be included as an interacting source within the PRGS compliance demonstration. The coal and ash yards' fugitive and point sources (baghouses on silos, for example) should also be included in the  $PM_{10}$  and  $PM_{2.5}$  modeling analysis. Model impacts should be predicted to the extent of the PRGS's significant impact area for each pollutant.

- 8. Local and regional ozone exceedences occur episodically on days that are hot and, as a result, when power demand is high. It is precisely on these days when the maximum control of emissions of  $NO_x$  is most important. Therefore, all units at the PRGS should be subject to  $NO_x$  controls. Also, daily  $NO_x$  emission limits should be set for the PRGS and the Mirant system as a whole.**

Under the proposed SOP and Consent Decree, units #1 and #2 go uncontrolled with respect to  $NO_x$  emissions. The City believes these units should, therefore, not be permitted to operate on those days where air quality is forecast to exceed the ozone AAQS (Code Red days). This is the City's preference; in the alternative, additional  $NO_x$  controls should be required in the SOP and Consent Decree. Specifically, the installation of low  $NO_x$  burners and SOFA should be required to be installed on units #1 and #2 of the PRGS. In the case of PRGS, it is on forecasted high ozone (code red) days when these two units are most likely to be operated, which is why it is important to not allow the units to go uncontrolled with respect to  $NO_x$  emissions.

In addition, as mentioned, ozone exceedences are episodic in nature. As a result of the use of seasonal caps, there is no NOx emissions limit on those days when NOx control is most needed and important. Therefore, the SOP and the consent decree should establish and require daily NOx emission limits for PRGS and the Mirant system derived from the proposed seasonal limits.

### **CONCLUSION**

For the foregoing reasons, the City of Alexandria contends that the draft SOP should not be issued in its current form.