Prevention of Significant Deterioration Construction Permit Application

Class II Air Dispersion Refined Modeling Analysis

275-MW Coal-Fired Generation Facility
Greene County, Missouri
City Utilities of Springfield

CITY UTILITIES OF SPRINGFIELD

March 2004

Burns & McDonnell SINCE 1898

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Prepared for:

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Project No. 31568

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BURNS & McDONNELL ENGINEERING COMPANY
ENGINEERS-ARCHITECTS-CONSULTANTS

EXECUTIVE SUMMARY

Pursuant to the requirements of Missouri Regulation 10 CSR 10-6.060(8) and 40 CFR Part 52.21, City Utilities of Springfield (CU) is submitting this addendum to their Prevention of Significant Deterioration (PSD) permit application for a new nominal 275-megawatt (MW) electrical generation facility. The original PSD application, submitted in April 2003, did not contain the refined Class II area air quality analysis for particulate matter less than ten (10) microns in aerodynamic diameter (PM_{10}) or sulfur dioxide (SO_2). At the time, a full source inventory for the National Ambient Air Quality Standards (NAAQS) analysis was not yet available, and the refined Class II modeling was therefore not included in the original application. Since that time, CU has compiled the NAAQS source inventory and verified it with personnel at the Missouri Air Pollution Control Program (APCP).

Prior to the refined modeling analysis being performed, two changes were made to the particulate matter modeling setup. Two new processes were added to the Southwest Power Station (SWPS) Unit 2 site, both of which result in an increase in PM_{10} emissions only. The first process CU has opted to add is a new coal unloading station that includes a truck loading and hauling operation at the site. This new process will allow CU the ability to use the rail access at SWPS as an additional coal delivery point. CU intends to bring coal in via rail to the SWPS and then transport it via truck to the James River Station as necessary.

The second process that was added is a potential mercury control system. It was determined that SWPS Unit 2 may in the future be required to control mercury emissions. While at this time CU has not determined the level of control that will be required or the method used to control mercury from the new boiler, the current control technology that has the most widespread use is injection of powdered activated carbon (PAC). This is a fine talc-like material that, if used, will need to be trucked on-site and pneumatically conveyed into a storage silo. Additional emissions will arise from the haul road traffic as well as the pneumatic transfer points. The particulate emissions from the new coal unloading system as well as the potential PAC system are summarized in Table ES-1 and the appropriate construction permit forms are located in Appendix A.

Table ES-1: PM_{10} Potential Emission Rates for New Processes

Emission Point ID	Activity	Potential Emissions (lb/hr)	Potential Emissions (tpy)
E119	New railcar dump of raw coal	0.0066	0.03
E120	New conveyor transfer to drive tower	0.0209	0.09
E121	New drop point onto coal pile	0.0267	0.12
E122	James River coal transfer to truck reclaim	0.0127	0.06
E123	James River conveyor transfer to truck loadout	0.0223	0.10
E124	James River coal transfer to underground conveyor	0.0027	0.01
E125	Coal haul road for James River coal	0.027	0.12
E126	Powdered activated carbon silo bin vent filter	0.11	0.47
E127	Powdered activated carbon haul road	0.016	0.07

With these new processes incorporated into the model, the PM_{10} significant impact area analysis was re-run and a new receptor field established. The results still indicated that a refined modeling analysis was necessary for PM_{10}, and a NAAQS analysis was performed. The results of the modeling analysis for both PM_{10} and SO_2 indicate that SWPS Unit 2 will not cause or contribute to an exceedance of the NAAQS or PSD Class II increment at any location where the new unit was modeled to have a significant impact. According to the draft "New Source Review Workshop Manual," no further modeling is required. Table ES-2 gives a summary of the modeling results and a comparison to the applicable standards.

Table ES-2: SO_2 and PM_{10} NAAQS Modeling Results

Pollutant	Emission Rate (lb/mmBtu)	Averaging Period	UTM Coordinates (meters)		Predicted Concentration† ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
			East	North		
PM_{10}	0.018	Annual	465226.69	4111822.25	35.82	50
	0.018	24-hour	465226.69	4111822.25	108.91	150
SO_2	0.12	Annual	465167.59	4112476.5	23.4	80
	0.12	24-hour	465714.8	4115708	142.4	365
	0.12	3-hour	472714.8	4120208	1,203.6	1,300*
	0.18	24-hour	465714.8	4115708	142.5	365
	0.83	3-hour	472714.8	4120208	1,203.6	1,300*

* Secondary standard
† Including Background

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