PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

PERMIT SUMMARY SHEET

Permit No.: 2090008

Source Name: Kansas City Kansas Board of Public Utilities, Nearman Creek Power Station

Source Location: 4240 N. 55th St, Kansas City, Kansas 66104

Area Designation

K.A.R. 28-19-350, Prevention of significant deterioration of air quality, affects new major sources and major modifications to major sources in areas designated as "attainment" or "unclassifiable" under section 107 of the Clean Air Act (CAA) for any criteria pollutant. The State of Kansas is classified as attainment for the National Ambient Air Quality Standards (NAAQS) for all the criteria pollutants.

The Kansas City, Kansas area in Wyandotte County, Kansas, where this modification is taking place, is currently in attainment or unclassifiable for all pollutants. As such, the PSD program, as administered by the State of Kansas under K.A.R. 28-19-350, will apply to the proposed project.

Project Description

The Kansas City, Kansas Board of Public Utilities (BPU) operates the Nearman Creek Power Station, located at 4240 North 55th St. in Kansas City, Kansas, within Wyandotte County, in northeastern Kansas. The existing facility is an electric generating station with two generating units. Nearman Unit 1 (N1) is a baseload 261 MW unit, powered by a wall-fired dry bottom boiler burning Powder River Basin coal. A second generating unit (CT4) is an 86 MW, natural gas/fuel oil-fired simple cycle combustion turbine that provides peaking power.

BPU plans to reduce NO_x emissions on N1 through the use of a new Low NO_x Combustion System comprised of low NO_x burners, overfire air, underfire air, boundary air, and wing port air combustion control methods.

Significant Applicable Air Emission Regulations

The Nearman Creek Power Station is subject to the Kansas City Ozone Maintenance Plan, under which the facility is required to lower its NO_x emissions using reasonably available control technology (RACT).

This source is subject to Kansas Administrative Regulations relating to air pollution control. The application for this permit was reviewed and evaluated for compliance with the following applicable regulations:

1) K.A.R. 28-19-300. Construction Permits and Approvals. Requires "Any person who proposes to construct or modify a stationary source or emissions unit shall obtain a construction permit before commencing such construction or modification."

2) K.A.R. 28-19-350 Prevention of significant deterioration of air quality. "The provisions of K.A.R. 28-19-350 shall apply to the construction of major stationary sources and major modifications of major stationary sources in the areas of the state designated as an attainment area or an unclassified area for any pollutant under the procedures prescribed by section 107(d) of the federal clean air act (42 U.S.C. 7407 (d))."

Air Emissions from the Project

The potential-to-emit of at least one of the PSD regulated pollutants from the existing Nearman Creek Power Station exceeds 100 tons per year. Hence, Nearman Creek Power Station is considered to be a major stationary source under provisions of K.A.R. 28-19-350.

The total projected emissions increases from the proposed modification are listed in Table 2-5 of Section 2 and detailed out in Appendix B of the application. Proposed projected emissions increases of carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter (PM), PM with a diameter less than 10 microns (PM_{10}), PM with a diameter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), volatile organic compounds (VOC), lead, sulfuric acid mist (H_2SO_4), fluorides, hydrogen sulfide (H_2S), total reduced sulfur, and carbon dioxide equivalent (CO_2e) were compared with the Significant Emission Rates for PSD applicability for the criteria and non-criteria pollutants. The projected emissions increase is above the PSD significance level for CO and will be reviewed under the PSD regulations. NOx emissions will be greatly reduced under this modification.

Hence, this project will be a major modification of an existing major stationary source resulting in a net significant increase of CO. This project will be subject to the various aspects of K.A.R. 28-19-350 such as the use of best available control technology, ambient air quality analysis, and additional impacts upon soils, vegetation and visibility.

The proposed NO_x emissions reduction project is described in Section 2 of the application. The uncontrolled potential-to-emit used for BACT analysis of the project uses Riley Power's (manufacturer's) calculations for a total 200 ppm, which equates to approximately 0.17 lb/mmBtu for CO emissions increase after the modification. The manufacturer has guaranteed the project will reduce NO_x emissions to 0.26 lb/mmBtu or less. These values are shown in Table 2-1 of Section 2 of the application.

On June 3, 2010, the U.S. Environmental Protection Agency (EPA) issued the final Greenhouse Gas (GHG) Tailoring Rule (75 FR 31514). This rule established the thresholds for GHG emissions under the PSD permit program for new and existing industrial facilities. GHGs are a single air pollutant defined as the aggregate group of the following six gases:

- carbon dioxide (CO_2)
- nitrous oxide (N_2O)
- methane (CH_4)
- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulfur hexafluoride (SF_6)

Starting in January 2011, only sources currently subject to the PSD permitting program (i.e., those that are newly-constructed or modified in a way that significantly increases emissions of a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD. For those affected facilities, only GHG emissions increases of 75,000 tpy or more of total GHG, on a carbon dioxide equivalent (CO_2e) basis, would need to determine the Best Available Control Technology (BACT) for their GHG emissions.

PSD does not apply to the GHG emissions from this proposed project. Even though the proposed modification is considered a major modification under the PSD permit program and BPU is required to obtain a PSD permit (called an "anyway source"), the potential emissions increase of GHGs from the modification are zero ton/yr on a CO_2e basis.

Best Available Control Technology (BACT)

BACT requirement applies to each new or modified affected emissions unit and pollutant emitting activity. Also, individual BACT determinations are performed for each pollutant emitted from the same emission unit. Consequently, the BACT determination must separately address, for each regulated pollutant with a significant emissions increase at the source, air pollution controls for each emissions unit or pollutant emitting activity subject to review. BPU was required to prepare a BACT analysis for KDHE's review according to the process described in Attachment A. KDHE's evaluation of the BACT for the proposed Emission Reduction Project's analysis is presented in Attachment B.

KDHE has concurred with the BPU for the following:

BACT for Carbon Monoxide is 0.17 lb/mmBtu, thirty day rolling average, including periods of startup and shutdown. BACT for CO is good combustion practices.

Ambient Air Impact Analysis

The owner or operator must demonstrate that allowable emission increases from the proposed facility, in conjunction with all other applicable emissions increases or reductions, would not cause or contribute to air pollution in violation of:

1) any national ambient air quality standard (NAAQS) in any air quality control region; or
2) any applicable maximum allowable increase over the baseline concentration in any area (increment).

BPU used the EPA approved SCREEN3 model to evaluate the impacts of CO that will result from the project at Nearman Unit 1 for 1-hour CO and 8-hour CO. BPU's evaluation was reviewed by KDHE using Lakes Environmental's Screen View program, which incorporates SCREEN3 in its calculations.

The emission rate, point location, and stack parameters for the emission source used in the model were based on the data presented in the permit application. These input data are shown in the table below.

Stack Parameters and CO Emission Rate – BPU, Nearman Unit 1

Source	Stack height (ft)	Stack diameter (ft)	Exit velocity (ft/s)	Exit temp. (°F)	CO emission rate (lb/hr)
N1	400	23.3	44	305	1,216.5

Emissions from this unit are based on a 0.50 lb/MMBtu emission rate and Unit 1's heat input rate of 2,433 MMBtu/hr

After a review of the appropriate satellite imagery and land use data obtained from the U.S. Geological Survey (USGS), it was concluded that the area is "rural" for air modeling purposes.

External meteorological data is not required in the SCREEN3 (Screen View) model. Instead, for the Full Meteorology option selected, the model examines a range of stability classes and wind speeds to identify the worst-case meteorological conditions.

The Nearman Unit 1 generating unit stack height exceeds 65 meters; therefore, the model's Building Downwash option was selected and the building dimensions supplied by BPU were used for the model run.

The significant impact level (SIL) and pre-application monitoring thresholds for CO and Nearman 1 results from the preliminary analysis are shown in the following table.

Significance Determination Table - BPU, Nearman Unit 1

Pollutant	Averaging Period	Operating Scenario	Maximum Predicted Concentration ($\mu g/m^3$)	Modeling Significant Impact Level (SIL) ($\mu g/m^3$)	Exceeds SIL?	Pre-application Monitoring Threshold Concentration ($\mu g/m^3$)	Exceeds Monitoring Threshold?
CO	8-hour	100% Load	136.6	500	No	575	No
	1-hour	100% Load	195.1	2,000	No	N/A	N/A

The modeled impacts for the proposed facility fall below the pre-application monitoring threshold, as well as the modeling significant impact level (SIL), for 8-hour CO and 1-hour CO.

Additional Impact Analysis

Commercial, Residential, and Industrial Growth

This project is located in Kansas City, Kansas in an area zoned as industrial. Because the project will not create additional generating capacity, it will not have an effect upon the industrial growth in the immediate area. There will be an increase in the local labor force during the construction phase of the project. It is anticipated that most of the labor force during the construction phase will commute from nearby communities. This labor force increase will be temporary and short-lived, and will not result in permanent commercial and/or residential growth occurring in the vicinity of the project.

Given the expected population of the commuting workforce, the fact that during the construction period most workers will be onsite for less than the total construction period, and an abundance of hotel and other short-term lodging options in Kansas City, it is unlikely that any substantial part of the construction workforce would choose to relocate during the construction period. Therefore, anticipated housing growth due to the

project will be minimal or nonexistent, and is not expected to have a significant impact on air quality.

Finally, because the maximum model-predicted CO concentrations for the proposed project are well below the regulatory significant impact levels, air pollutant concentrations in the region resulting from this project are expected to comply with the ambient air quality standards when the proposed project becomes operational. Therefore, from an air quality impact standpoint, the proposed project is consistent with the balanced growth demonstrated by Wyandotte County to date.

Visibility Impairment

An additional visibility impact analysis may be used to determine if the air emission increases associated with a proposed PSD project will have an impact on Class II sensitive areas such as state parks, wilderness areas, or scenic sites and overlooks. Visibility impairment is a function of the emissions of primary particulate matter, NO_x (including NO_2), elemental carbon (soot), and primary sulfate (SO_4). This project will substantially decrease the emissions of NO_x, thereby improving visibility over current conditions. As CO, not a visibility impairing pollutant, is the only pollutant with an emission increase, the project is not predicted to negatively impact visibility.

Federally designated Class I areas are afforded special protection in the air permitting process. Generally, Class I area visibility analyses are only conducted for projects located within 100 km of a Class I area. The Nearman facility is located approximately 312 km from the closest Class I area, Hercules-Glades Wilderness Area in Missouri. Another Class I area in relatively close proximity to the Nearman facility is the Upper Buffalo Wilderness Are in Arkansas, approximately 378 km from the Nearman facility. As the proposed project results in a substantial decrease in NOx emissions and no increase in any other visibility-impairing pollutants, a visibility analysis was not required.

Impacts on Vegetation

EPA's *New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting* (http://www.epa.gov/ttn/nsr/gen/wkshpman.pdf) states that the analysis of air pollution impacts on vegetation should be based on an inventory of plant species found in the significant impact area (SIA). Since the emissions from the proposed project did not result in any exceedences of the significant impact levels (SILs), no SIA exists for it. Therefore, an area with a 3 km radius centered at the facility was chosen for this analysis. A review of information gathered from topographic maps and imagery concluded there are no state parks or designated sensitive areas within this 3 km area.

The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) was queried to determine the inventory of plant species for Wyandotte County,

Kansas and Platte County, Missouri. (See http://plants.usda.gov/adv_search.html). This query resulted in a list containing approximately 1,500 species.

Unlike fauna, CO does not poison vegetation, although very high concentrations can reduce the rate of photosynthesis. According to the EPA document *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals* (1980, viewable at http://www.deq.state.va.us/air/assessments/dispersion/_documents/A_Screening_Procedure_for_the_Impacts_of_Air_Pollution_Sources.pdf), for the most sensitive vegetation a CO concentration of 1,800,000 µg/m3 (1-week averaging period) could potentially reduce the photosynthetic rate. The maximum model-predicted 1-hr CO impact of 195.1 µg/m3 produced by the proposed project is significantly lower than this screening level, even at a conservative 1 hr averaging period. Consequently, no adverse impacts to vegetation due to the proposed project are expected from CO emissions.

Impacts on Soils

A soil inventory was completed by BPU within the 3 km radius study area surrounding the facility. The soil survey was obtained from the NRCS. The different soil classification series that were found to be in excess of 1 percent of the total study area are listed in the table below.

Soil Inventory for BPU – Nearman Study Area	
Gosport-Sogn complex	Made land
Haynie silt loam	Nodaway silt loam
Haynie silt loam. Clayey substratum	Onawa silty clay loam
Kennebee silt loam	Onawa soils
Knox complex	Parkville silty clay loam
Knox silt loam	Sarpy-Hanie complex
Knox silty clay loam	Snead-Rock outcrop complex
Knox-Urban land complex	Waldron silty clay loam
Ladoga silt loam	Water
Leta silty clay	Wiota silt loam

Data taken from the Natural Resources Conservation Service's Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/) for the 6x6 km domain centered at the Nearman facility.