



WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION

Memorandum

TO: Powder River Basin Coal Mine Operators  
THROUGH: Dan Olson, Administrator, Air Quality Division  
FROM: B. Dailey, NSR Program Manager, Air Quality Division  
DATE: May 4, 2005  
RE: PRB Coal Mine Permitting Guidance

The following guidance is offered for preparation of permit applications for coal mines in the Powder River Basin (PRB). This memo is to provide applicants guidance with respect to the Division's permit application expectations due to increased particulate levels and on going development in the PRB. The information required per this guidance is in addition to the information that has been submitted with previous permit applications. Permit applications for revisions to the existing mines or for new mines in the PRB must address the following items:

**Dispersion Modeling:**

- A modeling analysis is required for annual  $PM_{10}$  and  $NO_x$  with the following considerations:
- ISCLT3 or other EPA guideline model required.
  - Meteorological data in the form of a joint frequency distribution (JFD) will be provided by the Division for each group of mines.
  - $PM_{10}$  and  $NO_x$  modeling analyses will include neighboring/regional sources.
  - $PM_{10}$  modeling analysis will consider model receptors on the LNCM border.
  - $NO_x$  modeling analysis will consider model receptors on the LNCM border, as well as a general receptor grid, based on applicant's significance area.
  - A  $NO_x$  significance analysis shall be submitted, which includes emissions from  $NO_x$  sources at the mine, including the rail loop(s), to develop the 1 microgram/cubic meter annual  $NO_x$  isopleth using a 500-meter resolution (receptor spacing). The receptors which fall inside of the 1 microgram/cubic meter isopleth constitute the general receptor grid.
  - Utilize the "Mine A/Mine B" policy for reporting annual  $PM_{10}$  and annual  $NO_x$  impacts.

- Provide a listing of the concentrations from each group of mines; identify the receptors where the maximum Mine A/Mine B impacts occur in the concentration plots.
- Submission of a table of point, area, and volume sources for each mine that were included in the modeling analysis. Related information shall include:
  - Emission rates for each modeled pollutant in gram/sec, lb/hr, and ton/year quantities.
  - Source locations in Universal Transverse Mercator (UTM) coordinates, including UTM Zone, UTM (X), UTM (Y), and Base Elevation.
  - Source release parameters for all operational scenarios in the permit application:

For Modeled Point Sources:

- Source ID Used in Modeling Analysis
- Stack Emission Rate
- Stack Release Height
- Stack Exhaust Temperature
- Stack Release Velocity
- Stack Exit (Inner) Diameter

For Modeled Area and Volume Sources:

- Source ID Used in Modeling Analysis
- Area Source Emission Rate
- Volume Source Emission Rate
- Source Release Height
- Length of Haul Road segments
- Initial Lateral Dimension (sigma-y) \*
- Initial Vertical Dimension (sigma-z) \*

\* Consult the ISCLT3 User's Guide Volumes I and II for procedures to estimate Area and Volume source dimensions.

Additionally, the applicant shall include a plot of the sources being modeled, including rail loops, haul roads, and mainline rail segments; the segments shall be identified on the plot such that they correspond to the Source ID used in the modeling analyses.

Emission Inventories:

- The PM<sub>10</sub> inventory will basically remain as has been previously done. The only revision should be to include dozer and water truck emissions in all inventories. If an emission factor for an activity is not available in the Wyoming emission factors, utilize AP-42 factors.
- The NO<sub>x</sub> inventory for surrounding mines, mainline railroads, highways, urban sources (towns), and point sources will be obtained from the 2000 NE Wyoming Inventory Database (Excel format). The NO<sub>x</sub> source inventory is through 5/1/01, and the emissions included in the spreadsheet under NAAQS 2000 should be utilized for additional sources. Due to the rapid Coal bed Methane (CBM) development in the PRB, applicants will be required to contact the Division for a current CBM NO<sub>x</sub> emissions inventory. The NAAQS 2000 emissions inventory represents potential emissions for the mines and point sources, and actual emissions for the mainline rail, rail loop, highway and urban sources.

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- The Wyoming Ambient Air Quality Standards (WAAQS) modeling analysis for NO<sub>x</sub> will include emissions due to blasting and diesel-fired mobile sources. Initially, the NO<sub>x</sub> emissions data for modeling these sources will be based on the NAAQS 2000 inventory database. As new coal mine permits are issued by the Division, applicants will be required to contact the Division to obtain the most current permit for neighboring mines to supplement the emissions inventory contained in the NAAQS 2000 database.
- Initially, the NO<sub>x</sub> emissions from each neighboring mine's rail loop(s) shall be modeled based on the NAAQS 2000 inventory. NO<sub>x</sub> emissions from the permit applicant's rail loop(s) shall be scaled to the permitted or proposed coal production rate based on the worst-case year(s) to be modeled. Applicants must provide the scaling ratios used in calculating the rail loop emissions.
- After a neighboring mine acquires a new permit that modifies the NO<sub>x</sub> emissions from their rail loops, subsequent applicants will be required to incorporate this new information in their modeling analysis, thereby superceding the rail loop emissions provided in the NAAQS 2000 inventory.
- Regional sources to include in the NO<sub>x</sub> modeling analysis will be determined using the rectangular source inventory areas, attached as Figure 1; the UTM coordinates for each of the three rectangular areas are also attached. The NO<sub>x</sub> inventory can be searched by UTM coordinates to determine the highway, mainline rail, and urban area sources to be incorporated into the modeling analyses. Applicants are required to contact the Division for a current point source emissions inventory.
- The NO<sub>x</sub> emissions from all regional power plants (Neil Simpson I and II, Neil Simpson turbines, WYGEN 1 and 2, Two Elk Unit 1, and Wyodak) must be included in the NO<sub>x</sub> modeling for any of the three rectangular source inventory areas.
- All permit applications shall contain the annual inventory parameters for NO<sub>x</sub> emission estimation and the NO<sub>x</sub> emissions estimates for the life of mine of the mine considered in the application.
- For modifications to existing mines, the permit application should contain an actual NO<sub>x</sub> inventory for the mine considered in the application based on the previous calendar year.
- The applicant shall submit a complete inventory of diesel- or gas-fired generators that are utilized within the mine seeking a permit. The inventory shall include: make, model, size of the generator, annual hours of operation, and type of service that the diesel- or gas-fired generator is employed, (i.e., light plants, water pumps, etc.). NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub> emissions from diesel- or gas-fired generators shall be quantified.
- Contact the Air Quality Division for specific guidance on modeling PM<sub>10</sub> emissions from diesel-fired combustion sources.
- The applicant shall provide the basis for emissions data for each mine represented in the modeling analyses, (i.e., Powder River Coal Company - Rawhide Mine - AQD Permit MD-703, July 2002).

**PM<sub>10</sub> Background Concentration:**

- Given the ongoing development in the Powder River Basin (PRB), coal mine applicants will need to submit and justify a background PM<sub>10</sub> concentration with each permit application.

**Short-Term Particulate Standards:**

- A discussion of ambient air quality monitoring data from the applicant's mine is to be included. This discussion shall include a summary of the data for the previous three (3) years, along with accompanying coal and overburden production statistics. A map showing current locations of ambient and meteorological monitoring sites in relation to pit areas, disturbed acreage, overburden spoils, haul roads, the current LNCM boundary, and proposed LNCM boundary (as applicable) are to be included.
- The application should contain a discussion of ambient air quality monitoring data from the designated group of neighboring mines for the previous three years. A demonstration shall be provided to show that modifications to the applicant's mining operations will not cause or contribute to ambient violations at neighboring mine's monitoring sites.

Historical ambient monitored PM<sub>10</sub> concentrations can be acquired from the AIRS database. If current monitored data is required, or additional monitored data is required that is not in the AIRS database, the applicant should contact Judy Shamley in the Sheridan field office for additional ambient monitored data.

**Equipment Description:**

- The application should contain the following equipment descriptions:
  - A complete list of all major mining equipment, including size, that are utilized by the mine at current production rates. A list of the additional equipment necessary to meet the increased or modified permit levels, including size, is required.
  - The number and size of water trucks in use for current production levels, and the frequency that water or dust suppressant controls are applied to the haul roads. Discuss normal operating procedures for water trucks (e.g., the mine has a fleet of 5 water trucks, but they only operate 3 and the remaining 2 are backup equipment). Future plans for additional water trucks as part of any production increase should be addressed.

**Open Acreage:**

- The application must include a discussion of the land status for the current year and for the years modeled. In the discussion, include a table that summarizes disturbed acreage as follows:
  - Topsoil stripping (include areas stripped for sediment control and diversions)
  - Topsoil piles - assume piles from previous year and current year as disturbed

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- Reclaimed areas - assume previous and current year reclamation as disturbed acreage
  - Overburden stockpile areas
  - Mine facility areas (excluding buildings and treated areas)
  - All roads in the mine permit area
  - Active coal pit areas
- Maps are to be submitted that delineate the various disturbance areas and the size of the areas should be noted on the maps. (Areas listed in disturbed acreage table should be included on the maps).

**BACT:**

- The application must address the BACT requirements of Chapter 6, Section 2(c)(v). The application shall include a discussion of all dust mitigation measures currently employed at the mine with justification that the measures comply with the BACT requirements of the regulations. Future plans for any additional control strategies or revisions to control strategies, as part of any production increase or mine plan change, should be detailed.
- The application must include a discussion of the dust control program for the previous three years as well as the current dust control program. The discussion should include the amount of water and chemical dust suppressant applied to treated roads, active work areas, stockpiles, or open acreage. The application should contain a description of the chemical dust suppressant used and the manufacturer's description of recommended application rates. Also, a summary of the total length of roads watered and total length of roads treated with chemical dust suppressants for the previous three years shall be included. A map(s) is to be included that details which roads or areas were watered and which roads or areas were treated with chemicals for the current year. Future plans for any additional control strategies, as part of any production increase or mine plan change, should be detailed.
- The application should address BACT measures to be employed on open acreage. Reclamation procedures and reclamation rates should be addressed. Potential controls from temporary reclamation or treatment of open areas should be addressed. Future plans for any additional control strategies, as part of any production increase or mine plan change, should be detailed.
- The application must summarize the dust control measures utilized at the coal preparation plant. Any modifications or new coal preparation facilities will require a demonstration that proposed controls represent BACT. Include documentation that emission sources in the prep plant are compliant with existing permit conditions such as stack tests, opacity observations, etc.

**Miscellaneous:**

- Submission of an action plan for those mines that have continuous monitors shall be included. The plan should include strategies to follow in case of high readings. The plan shall consider mitigation practices established to go into effect, if hourly

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concentrations are greater than  $X \mu\text{g}/\text{m}^3$  or the 24-hr avg. is greater than  $Y \mu\text{g}/\text{m}^3$ , for example.

- The applicant shall submit a map which identifies the locations of ambient and meteorological monitors at the mine seeking a permit; the coordinate locations of the monitors should also be provided, and referenced using UTM and/or latitude/longitude coordinates. Changes in monitor locations shall be provided in future permit applications.
- Submission of a mitigation plan dealing with coal fires shall be included. The plan shall include notification and record keeping regarding fires, (i.e., the duration of the fire, when the fire started and how long it took to extinguish it, and what actions were taken to suppress the fire.