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MEMORANDUM

TO: Meghan McGuinness and Meg Victor

FROM: David Sellers

RE: Revised State Acid Rain and EIA Heat Input Totals - 48 States and the District of Columbia

DATE: April 19, 2004

This memorandum documents the data sources and methodologies used by Perrin Quarles Associates, Inc. (PQA) to calculate state-by-state heat input totals from Acid Rain Program monitoring data and Energy Information Administration (EIA) data. A revised electronic spreadsheet file with budget tables (April14 State Heat Input 1999-2002.xls) has been sent separately by electronic mail on April 14, 2004. The spreadsheet worksheet budget tables are described in Table 1.

I. Acid Rain Program Heat Input Data

Acid Rain Program units annual heat input data (million Btus) for the 1999 to 2002 period were provided by EPA. The data set was created by querying EPA's Data and Maps database, and is contained in the Acid Rain Unit HI worksheet. The data are summarized by state in the Acid Rain HI worksheet.

Table 1:
April 14 State Heat Input 1999 - 2002: Worksheet Tables

Worksheet	Description
All EIA Fossil HI	Summarizes by state the 1999-2002 fossil fuel heat input (million Btus) calculated from EIA data for all plants with a generator with a nameplate capacity greater than 25 MW - fossil energy source.
Acid Rain HI	Summarizes by state the Acid Rain unit 1999-2002 heat input (million Btus) calculated from Acid Rain Program monitoring data.
EIA NonAcid Rain HI	Summarizes by state the 1999-2002 heat input (million Btus) calculated from EIA data for plants having a generator with a nameplate capacity greater than 25 MW - fossil energy source, and which did not report Acid Rain program heat input for the specific year.
Combined AR and EIA HI	Summarizes by state the 1999-2002 heat input (million Btus) from Acid Rain units and non-Acid Rain plants. The table combines the heat inputs for Acid Rain units and non-Acid Rain plants reported in the Acid Rain HI and EIA NonAcid Rain HI tables.
Exempt Cogen	Summarizes by state the 1999-2002 heat input (million Btus) from non-Acid Rain FERC qualifying cogeneration plants that may be exempt from an interstate air quality rule. Heat input from these plants are included in the All EIA Fossil HI table, EIA NonAcid Rain HI table, and Combined AR and EIA HI table.
Acid Rain Unit HI	Summarizes annual heat input data (million Btus) and pollutant data for each Acid Rain unit over the 1999-2002 period. Data set was provided by EPA and produced by a February 2004 query of EPA's Data and Maps database.
EIA Plant HI	Summarizes for each plant the 1999-2002 heat input (million Btus) calculated from EIA data for all plants having a generator with a nameplate capacity greater than 25 MW - fossil energy source. Includes Acid Rain program, FERC qualifying cogenerator, and NAICS code information. Plant identifier fields are described in Table 3.

II. EIA Annual Heat Input Data

The EIA annual fossil fuel heat inputs in the spreadsheet tables were calculated on a plant-level basis using fuel use and heat content information provided in various EIA databases and the Federal Energy Regulatory Commission (FERC) 423 database (see Table 2). Heat input was calculated at the plant level for plants having a generator with a nameplate capacity greater than 25 MW - fossil energy source. Plant-level calculations were performed because the EIA data format prevented unit-level calculations for combustion turbines in all years, and for non-utility boilers prior to 2001. Changes in EIA data reporting in 2001, which will be explained in more detail, resulted in different calculation methodologies for 1999 and 2000 heat input compared to 2001 and 2002 heat input. There is a drop-off in EIA heat input from 1999-2000 levels to 2001-2002 levels that may be because of the different methodologies.

A. EIA Heat Input Calculations

For utility units, annual heat inputs were calculated separately for boilers and turbines. The EIA-767 database was used for boilers. The database provides annual fuel quantity along with the corresponding heat content. The EIA-759 and FERC-423 databases were used to calculate heat input for utility combustion turbines. EIA-759 provides annual fuel quantity for all combustion turbines combined at a plant. To calculate heat input, the fuel quantity was matched with the fuel heat content reported for the plant in the FERC-423 database. Average FERC-423 fuel heat contents were used when there were no FERC-423 data for the fuel and plant. The EIA-759 is now called EIA-906.

The calculations for non-utility plants were performed in two different ways because of a change in EIA databases after 2000. The 1999 and 2000 heat inputs were calculated using the EIA-860B data with heat input first calculated by the fuel burned based on reported quantity and heat content, and then totaled for all fossil fuels.

Some plants reported both non-utility and utility data (plants that were sold to a non-utility at some point during the reporting year) in 1999 and 2000. In those cases, the higher of the two calculated plant heat inputs was used, which in most cases was the utility heat input.

The 2001 and 2002 non-utility data were calculated similarly to the utility calculations due to changes in EIA reporting. Combustion turbine heat inputs were calculated at the prime mover level, based on consumption data in the EIA-906 database and fuel heat content data from the 2000 EIA-860B database. The post-2000 EIA-860 database no longer has fuel heat content and consumption information for non-utilities. The data in EIA-906 correspond to the utility EIA-759/900/906 data, and contain the amount of fuel burned by prime mover type, but do not contain fuel heat content information. Therefore, average fuel contents were calculated based on all fuels used and

reported in the prior year 2000 EIA-860B, then applied to the EIA-906 fuel data to calculate heat input.

Non-utility plants began reporting the EIA-767 form for boilers in 2001, so the EIA-767 fuel quantity and heat content data were calculated on a boiler-specific basis for non-utility boilers having a generator with a nameplate capacity greater than 25 MW for 2001 and 2002.

It is important to note that the heat input calculated for all combustion turbine units (and for non-utility boilers prior to 2001) may contain heat input for generators under 25 MW. There was no way to segregate the fuel use for smaller units from the plant or prime mover level data.

The better segregation of non-utility boiler data after 2001 may account for some of the drop-off in EIA plant heat input when comparing 2001-2002 to 1999-2000. It also appears that not all of the non-utility boilers serving an affected generator were represented in the 2001 and 2002 data, but we estimate the magnitude of this missing data at about 1% of the total annual heat input (based on comparisons to the 1999-2000 methodology).

B. Exempt FERC Qualifying Cogenerators

The proposed transport rules contain an exemption for FERC-qualifying cogenerators that do not sell more than 33% of the potential generating capacity to the grid. FERC-qualifying cogenerator plants were identified based on information in the 1999 and 2000 EIA-860B and 2002 EIA-860 databases. Potential exempt facilities were identified by calculating the ratio of annual sales to potential capacity [plant nameplate capacity times 8,760] for FERC-qualifying cogenerators in the 1999 and 2000 EIA-860B databases. Sales data were no longer available with consolidation to a single EIA-860 database after 2000. A plant was flagged as potentially exempt in the EIA Plant HI worksheet if the ratio did not exceed 0.33 in 1999 and 2000, and the plant was not subject to the Acid Rain Program.

Plants identified as FERC-qualifying cogenerators in the 2002 EIA-860 were also flagged in the EIA Plant HI worksheet. Plant-identifying fields in the EIA Plant HI worksheet are described in Table 3.

Table 2:
EIA and FERC Databases Used in EIA Heat Input Calculations

Database	Description
EIA-860 (Utility and Non-utility 2001-2002)	Plant- and generator-level data for power plants owned and operated by electric utilities and non-utilities. Includes generator nameplate, energy source, and FERC cogenerator status. Does not include electricity delivered to a utility by a non-utility plant.
EIA-860A (Utility 1999-2000)	Plant- and generator-level data for electric power plants owned and operated by electric utilities. Includes generator nameplate capacity and energy source.
EIA-860B (Non-utility 1999-2000)	Plant- and generator-level data, including specific information about generators and plant-level fuel usage and heat content, qualifying facility status, and electricity delivered to a utility for non-utility electric power plants.
EIA-759/900/906 (Utility all years and Non-utility 2001-2002)	Monthly and annual data on generation and fuel consumption at the power plant and prime mover level. Non-utility plants began reporting this data in 1999. No heat content data.
EIA-767 (Utility all years and Non-utility 2001-2002)	Monthly and annual steam-electric plant data from organic-fueled or combustible renewable steam-electric plants with a generator nameplate rating of 10 or more megawatts. Non-utilities began reporting EIA-767 beginning in 2001. Includes monthly generator generation and boiler fuel consumption and heat content.
FERC-423 (Utility all years)	Monthly deliveries of fossil fuels to utility, and now non-utility, generating facilities. Included are the specific energy source, quantity of fuel delivered, the Btu content, sulfur content, ash content, coal state and county of origin, coal mine type (surface/underground), as well as the supplier of fuel. Includes facilities with a fossil-fueled nameplate generating capacity of 50 or more megawatts.
Note: Databases were downloaded from EIA's electricity website: http://www.eia.doe.gov/cneaf/electricity/page/data.html	

Table 3:
Plant Identification Fields in the EIA Plant HI Worksheet

Field	Description
ORIS Code	EIA ORIS Code
Acid Rain OBIS	Plant ORIS Code in CAMD database. Some plants have different EIA and CAMD ORIS Codes (e.g., Richard Gorsuch in Ohio).
CAMD Facility ID	Unique plant ID in CAMD database.
Facility Name	Name in CAMD database or EIA database.
Exempt FERC Cogen (H and I $\leq$0.33)	This field flags plants which have a FERC-qualifying cogenerator, and which have a ratio of annual sales to potential generation (nameplate x 8,760) no greater than 0.33 in 1999 or 2000.
2002 860 FERC Cogen	This field flags plants which have a FERC-qualifying cogenerator based on the 2002 EIA-860 database.
1999 FERC Cogen Sales Ratio	Ratio of annual sales to potential generation (nameplate x 8,760) calculated for plants with a FERC-qualifying cogenerator based on the 1999 EIA-860B database.
2000 FERC Cogen Sales Ratio	Ratio of annual sales to potential generation (nameplate x 8,760) calculated for plants with a FERC-qualifying cogenerator based on the 2000 EIA-860B database.
2002 860 NAICS	NAICS code for the plant from the 2002 EIA-860 database.

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