

## Documentation of ERTAC EGU CONUS 2.3

February 20, 2015

The ERTAC EGU committee develops reference runs for the continental United States (CONUS). CONUS 2.3 is the current reference run for base year 2011. This run was complete in October, 2014 and run by VADEQ. This is the first use of growth factors based on AEO2014. The contact person for questions about the run is Doris McLeod (804-698-4197). Prior reference runs for 2011 were as follows:

2.2 – Run in June 2014. Same as 2.1 This run included major updates to the UAF and Control files received as of March 31, 2014. This is the first use of the new code 1.01. Growth rates were from AEO2013.

2.1L1 – Run in April 2014. Same as 2.1 except this run included updates from Midwest to UAF and control file for Indiana, Illinois, Wisconsin, Michigan and Ohio primarily for coal fired units received dated March 3, 2014.

2.1 – Run in March 2014. This run included updates to the UAF and control file from SE, MW, NE: NY (including NY Astoria (ORIS 8905), RACT and other rule changes) CT, NH, MD, NJ, VA, KY (including new information on the federal TVA consent agreement). UAF updated with adequate data to calculate an ertac heat rate. Negative values in CAMD replaced with zero. An adjustment to implement zero growth for the Boiler gas was included. Combustion turbines and combined cycle units were adjusted in the 2.1 factors to account for the boiler-gas generation.

2.0 – Run in January 2014. This run was the first using base year 2011. In addition, the Midwest states provided updates to the UAF and control files. These updates were completed by the Northeast in prior runs.

A single reference run using base year 2007 was created and titled 1.7.

The inputs used to develop the CONUS2.2 runs are shown in the following table:

ERTAC File Name	VERSION	2.2
	<b>CODE:</b>	<b>1.01</b>
NA	Base Year	2011
	Future projection years	2018,
	Scenarios run by ERTAC EGU leadership	
	Overview of improvements over previous runs	Major update to UAF and Controls. Deadline for submittal: August 24, 2014.
camd_hourly_base.csv	Hourly CAMD CEM data	
ertac_initial_uaf.csv	Unit Availability File	UAF_2.3_10-28-2014.csv
ertac_control_emissions.csv	Control File	Con_2.3-10-28-2014.csv; ConS_2.3_10-28-2014.csv
ertac_growth_rates.csv	Growth File	Gro_2.3_2018.csv
NA	Average Annual Growth Source	AEO 2014
NA	Peak Growth Source	
NA	EMM to NERC Crosswalk	
ertac_input_variables.csv	Input Variables File	IV_2.3_2018_10-28-2014.csv
ertac_hourly_noncamd.csv	Hourly CEM data replacing data in CAMD	
group_total_listing.csv	Aggregation scheme for multi-state caps	Group_2.3_10-28-2014.csv
state_total_listing.csv	Aggregation scheme for state level caps	Group_2.3_10-28-2014.csv
NA	Notes	Run complete in October 2014

The follow are clarifying notes:

- UAF:
  - For the 2.3 Reference case the documentation UAF called **2011BASEUnit\_Availability\_v2.3\_13\_14September82014\_code1.01.zip** was used.
  - Significant changes were made to address units without enough base year data to calculate variables and other issues. These fixes are detailed in the document **My changes for 2\_3 from Wendys file.docx**. The following are the major changes:
    - Deleted ORIS 2723 IDs 11C and 12C for NC.
    - Added in ORIS/Unit ID information for the following facility/units for states that don't typically report: ORIS 465, ID 4 (CO); ORIS 1248, IDs CT-1, CT-2, CT-3, CT-4 (KS); ORIS 2790, CT6 (ND); ORIS 56237, CT03, CT04 (UT)
    - Changed ORIS 6253, IDs P30 through P37 to nonEGUs as they caused a crash in MROZ for the Oil category.
    - Deleted ORIS 994802 and 994804 for TX as they are on hold. Changed 994803 ORIS codes to 58001 and changed 1 and 2 to CTG1 and CTG2. Changed 994801 ORIS code to 58005 (all TX units)
    - Changed 993404 to 56963 and renumbered 1 and 2 to E101 and E102.
    - Changed 992601, Unit IDs N2601 and N2602 to ORIS 58427, Unit IDs 100 and 200.
    - Changed 4937 U1 and U2 to CT-1 and CT-2.
    - Removed the coal-to-gas conversion units for the nonEGU ORIS 992 as they caused a crash.
    - Removed 994810 as it was a biomass unit and wouldn't be grown.
    - Updated the RFCW and MROE regional boundaries to RFWZ and MROZ according to the files sent by R. Lopez called **ERTAC\_MROE corrected Region\_adjustment\_Summary2.xlsx**.
    - Updated the following MI new combined cycle units' HR to 7,500 btu/kw-hr from 10,000 btu/kw-hr: ORIS 10745, N2604, N2605; ORIS 992601, N2601, N2602; ORIS 992603, N2603; ORIS 992605, N2608, N2909.
    - Changed the fuel/unit type from SC to CC for the following ORIS/Unit IDs based on info from MI: 55088 GT2100 and GT3100.
- Controls File:
  - For the 2.3 Reference case, the documentation controls file called **2011BASEControl File v2.3\_13\_14September 82014\_code1\_01.zip** was used.

- Edits were made to state data that seemed to be typos and a detailed listing may be found in **My changes for 2\_3 from Wendys files.docx**.
- Major changes are as follows:
  - Moved the NOx controls from the controls file to the seasonal controls file for the following GA units: ORIS 703: 1BLR, 2BLR, 3BLR, 4BLR; ORIS 708: 4; ORIS 710: 4A, 4B, 5A, 5B, 6A, 6B; ORIS 6052: 1, 2; ORIS 6257: 1, 2, 3, 4. Also, did this for 2 VA units: ORIS 3797: 4, 5.
  - Added 2790, unit ID CT6, with a NOx rate of 0.044 lbsl/mmbtu based on information from ND.
  - Deleted out the following ORIS as they are no longer in the UAF; 994802, 994804; Deleted out the following ORIS/Units as they are no longer in the UAF: 2723, 11C & 12C; Deleted out the following ORIS/Units as they are already controlled in 2011 and appear to have the incorrect ORIS assigned, based on the facility name (NCEMC-Hamlet): ORIS 2712, IDs ES-6-A, ES-6-B
  - Changed the NOx rates for the units listed in NY's email attachment called **CONUS\_V2 2 2018\_NYSDEC\_revisions.xlsx**.

ORIS	Unit ID	Facility	NY Revised NOx Rate
2516	4	Northport	<b>0.0573</b>
2490	20	Arthur Kill	<b>0.0894</b>
2516	3	Northport	<b>0.1094</b>
2511	10	E F Barrett	<b>0.0798</b>
2490	30	Arthur Kill	<b>0.0906</b>
2500	10	Ravenswood Generating Station	<b>0.0662</b>
2516	2	Northport	<b>0.1006</b>
2500	30	Ravenswood Generating Station	<b>0.0822</b>
2516	1	Northport	<b>0.0977</b>
2500	20	Ravenswood Generating Station	<b>0.0700</b>
2511	20	E F Barrett	<b>0.0481</b>
2517	4	Port Jefferson Energy Center	<b>0.0573</b>

ORIS	Unit ID	Facility	NY Revised NOx Rate
2517	3	Port Jefferson Energy Center	0.1094

- Growth Rate File:
  - For the 2.3 Reference case, growth rates found in spreadsheet **Gas\_Adj\_AEO2014\_NERC2013 Growth Rates v4 method 1 and method2.xlsx**, tab **Gas-Adj Ref 2014 M1** were used with the following exceptions:
    - NYLI and NYCW growth rates were based on the same spreadsheet but used the tab called **New GR**.
    - MROZ and RFWZ annual growth rates were based on the 2018 growth rates in the spreadsheet called **FullTranslationWI\_Regions\_AdjustmentAEO2014.xlsx**, tab **Core Index for MROZ &**.
    - RFCM, MROZ, and MROW peak growth rates for combined cycle were set to 1.3 based on LADCO, Wisconsin, and Michigan input.
    - SRGW peak growth rate for oil was set to 2.0 to ameliorate an extremely high peak rate, per LADCO.
  - RFCM, MROZ, and MROW combined cycle transition hours peak->formula set to 200; formula-> nonpeak set to 2000 based on LADCO, WI, and MI input. All other transition hours remain at default levels.
  - For the 2028 estimates, to reduce the number of GDUs created solely for peak hour demand deficits, the following additional changes were made to the growth file:
    - The following regions/fuel-unit types had their peak rates set to 1.3 and their transition hours set to 200 and 2000: CAMX, combined cycle; NWPP, combined cycle; RFWZ, combined cycle; SRCE, combined cycle; SRGW, combined cycle
    - NYUP Coal had the peak rate set at 1.3.
- Input Variables:
  - Removed the specified facilities for new units from SRVC.
  - Changed CAMX, SRVC, SRSE, FRCC, and NEWE to 75<sup>th</sup> percentile for new CCs and SCs (NEWE CC was already at 75<sup>th</sup> for 2.2).
  - Added MROZ and RFWZ, and deleted MROE and RFCW.
  - Changed capacity Demand Deficit Review from 400 to 3000 for all regions and fuel/unit types.
- NonCAMD Hourly File:

- Replaced all negative emissions values and load values with zero.
- Added a full year of data for the ORIS 8906 (Astoria) Unit IDs 30, 40, and 50—summed the reheat and superheat reported data to create the pseudo units.
- Added a full year of data for 7839 (Ladysmith) Unit 5, which is equivalent to that reported in 2011 for 7838 (Remington) Unit 5. 7838, 5 does not exist and this was a 2011 CAMD reporting error.
- Group and State Files are unchanged from 2.2 (Group contains both CAIR and CSAPR levels)