

Downloading AVERT Files for Use in SMOKE

U.S. Environmental Protection Agency
State Energy and Environment Program





Downloading AVERT Files for Use in SMOKE Overview

- The AVERT Main Module can produce output files for the **Sparse Matrix Operator Kernel Emissions (SMOKE)** modeling system, which is designed to create gridded, speciated, hourly emissions for input into air quality models such as CMAQ, REMSAD, CAMX and UAM
- For more information about SMOKE, visit <https://www.cmascenter.org/smoke/>
- This training refers to the Excel version of the AVERT Main Module

Downloading AVERT Files for Use in SMOKE

Select a Filepath

- AVERT's SMOKE text file generation can be found in Step 4: Display Outputs
- After running a scenario, double-click the blue box to select the location where you would like to save the files

Midwest, 2019 AVERT

Step 4: Display Outputs

Summary tables

- Annual regional impacts
- Impact data for top ten peak days
- Annual impact data by county
- Monthly impact data by county
- Daily NOx impact data by county

Charts and figures

- Map of generation and emissions changes
- Hourly impacts by week
- Monthly impacts by selected geography
- Signal-to-noise diagnostic

COBRA text file generation

Enter a filepath, then click the button to save a COBRA text file.

NOTE
Please be patient. This calculation may take up to twenty minutes to run on older machines.

Generate COBRA text files

SMOKE text file generation

Enter a filepath, then click the button to save SMOKE text files.

NOTE
Please be patient. This calculation may take up to twenty minutes to run on older machines.

Generate SMOKE text files

Welcome

1. Regional Data File

2. Set Energy Impact Profile

3. Run Impacts

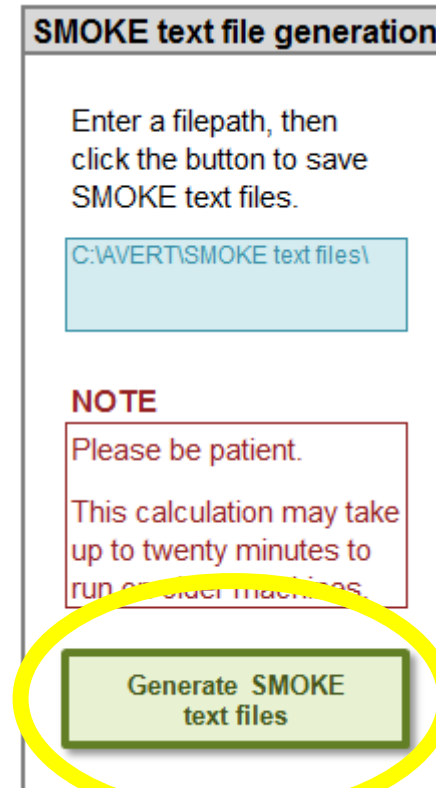
4. Display Outputs

← Back

← Start new scenario

Downloading AVERT Files for Use in SMOKE Generate SMOKE Text Files

- After entering a filepath, click the button labeled “Generate SMOKE text files”



SMOKE text file generation

Enter a filepath, then click the button to save SMOKE text files.

C:\AVERT\SMOKE text files\

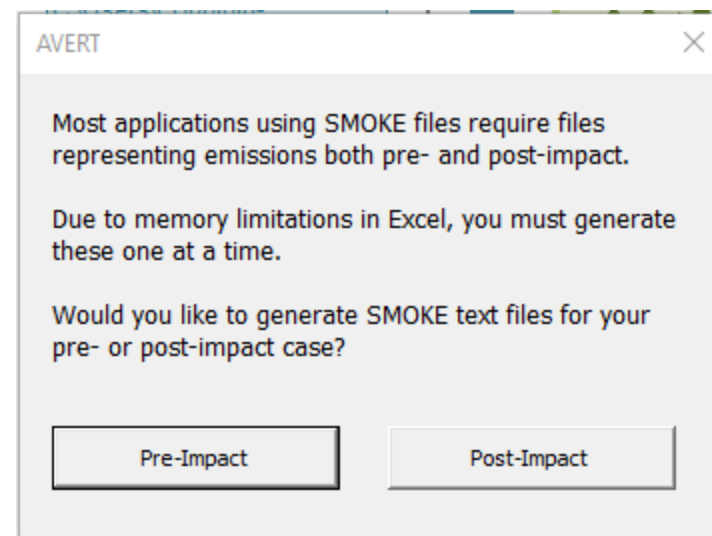
NOTE

Please be patient.
This calculation may take up to twenty minutes to run on older machines.

Generate SMOKE text files

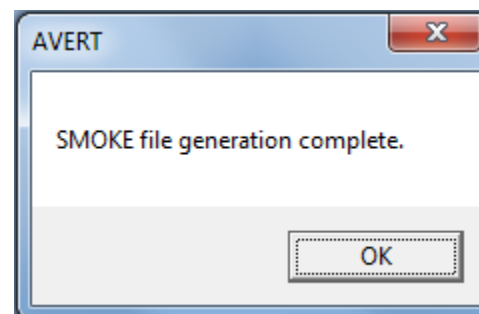
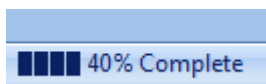
Downloading AVERT Files for Use in SMOKE Generate SMOKE Text Files

- A dialog box will appear asking you whether you want to generate SMOKE files for your pre-impacts or post-impacts case



Downloading AVERT Files for Use in SMOKE Generate SMOKE Text Files

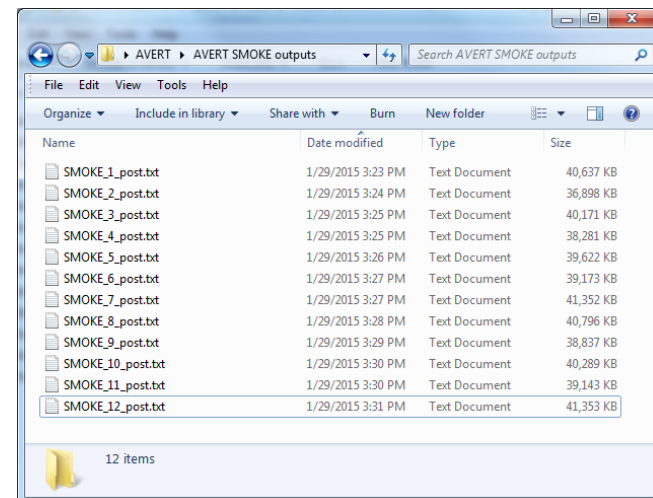
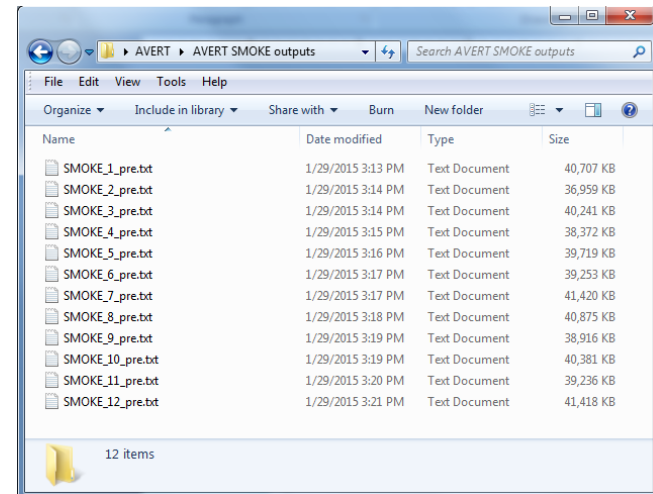
- After you select either pre-impacts or post-impacts, the file generation process begins, marked by an indicator in the task bar at the lower left-hand corner of the window.
- A dialog box will appear when the process is complete. If you want both pre-impacts and post-impacts files, repeat the process.



Downloading AVERT Files for Use in SMOKE

Locate SMOKE Text Files

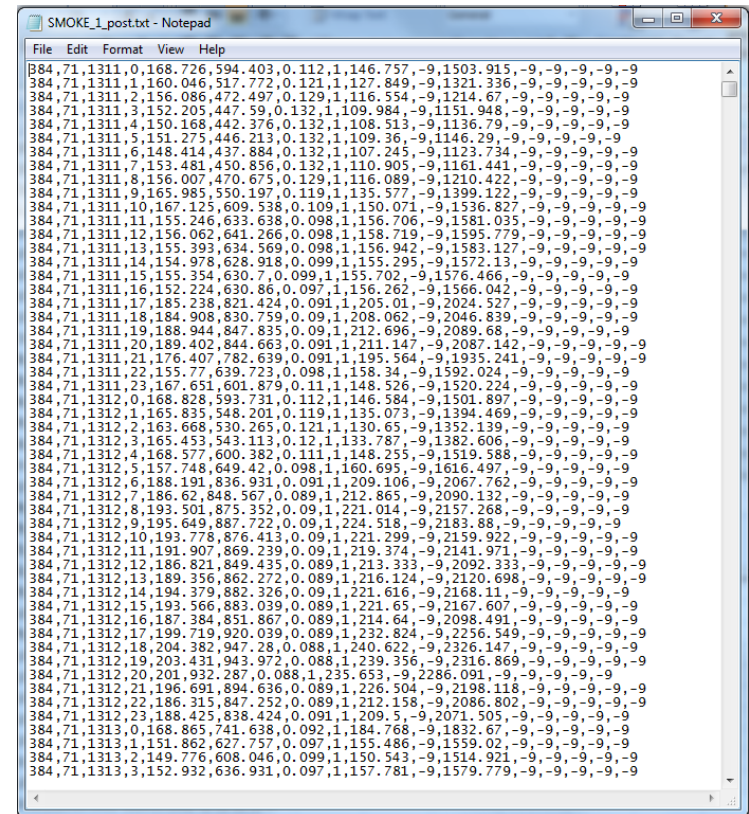
- The SMOKE output files will appear in the folder that you selected on slide 3 (Step 4: Display Outputs)
- Files are now ready for use in SMOKE



Downloading AVERT Files for Use in SMOKE

About File Format

- Files are generated in Continuous Emissions Modeling (CEM) format—a format recognized by SMOKE
- Files have a .txt extension and can be viewed in a text editor such as Notepad
- Each row represents a single hour of data
- Values are comma-separated



```

File Edit Format View Help
B84,71,1311,0,168.726,594.403,0.112,1,146.757,-9,1503.915,-9,-9,-9,-9,-9
B84,71,1311,1,160.046,517.772,0.121,1,127.849,-9,1321.336,-9,-9,-9,-9,-9
B84,71,1311,2,156.086,472.497,0.129,1,116.354,-9,1214.67,-9,-9,-9,-9,-9
B84,71,1311,3,152.205,447.59,0.132,1,109.984,-9,1151.948,-9,-9,-9,-9,-9
B84,71,1311,4,150.168,442.376,0.132,1,108.513,-9,1136.79,-9,-9,-9,-9,-9
B84,71,1311,5,151.275,446.213,0.132,1,109.36,-9,1146.29,-9,-9,-9,-9,-9
B84,71,1311,6,148.414,437.884,0.132,1,107.245,-9,1123.734,-9,-9,-9,-9,-9
B84,71,1311,7,153.481,450.856,0.132,1,110.905,-9,1161.441,-9,-9,-9,-9,-9
B84,71,1311,8,156.007,470.675,0.129,1,116.089,-9,1210.422,-9,-9,-9,-9,-9
B84,71,1311,9,165.985,550.197,0.119,1,133.577,-9,1399.122,-9,-9,-9,-9,-9
B84,71,1311,10,167.125,609.538,0.109,1,150.071,-9,1536.827,-9,-9,-9,-9,-9
B84,71,1311,11,155.246,633.638,0.098,1,156.706,-9,1581.035,-9,-9,-9,-9,-9
B84,71,1311,12,156.062,641.266,0.098,1,158.719,-9,1595.779,-9,-9,-9,-9,-9
B84,71,1311,13,155.393,634.569,0.098,1,156.942,-9,1583.127,-9,-9,-9,-9,-9
B84,71,1311,14,154.978,628.918,0.099,1,155.295,-9,1572.13,-9,-9,-9,-9,-9
B84,71,1311,15,155.354,630.7,0.099,1,155.702,-9,1576.466,-9,-9,-9,-9,-9
B84,71,1311,16,152.224,630.86,0.097,1,156.262,-9,1566.042,-9,-9,-9,-9,-9
B84,71,1311,17,185.238,821.424,0.091,1,205.01,-9,2024.527,-9,-9,-9,-9,-9
B84,71,1311,18,184.908,830.759,0.09,1,208.062,-9,2046.839,-9,-9,-9,-9,-9
B84,71,1311,19,188.944,847.835,0.09,1,212.696,-9,2089.68,-9,-9,-9,-9,-9
B84,71,1311,20,189.402,844.663,0.091,1,211.147,-9,2087.142,-9,-9,-9,-9,-9
B84,71,1311,21,176.407,782.639,0.091,1,195.564,-9,1935.241,-9,-9,-9,-9,-9
B84,71,1311,22,155.77,639.723,0.098,1,158.34,-9,1592.024,-9,-9,-9,-9,-9
B84,71,1311,23,167.651,601.879,0.11,1,148.526,-9,1520.224,-9,-9,-9,-9,-9
B84,71,1312,0,168.828,593.731,0.112,1,146.584,-9,1501.897,-9,-9,-9,-9,-9
B84,71,1312,1,165.835,548.201,0.09,1,135.073,-9,1394.469,-9,-9,-9,-9,-9
B84,71,1312,2,163.668,530.265,0.121,1,130.65,-9,1352.139,-9,-9,-9,-9,-9
B84,71,1312,3,165.453,543.113,0.12,1,133.787,-9,1382.606,-9,-9,-9,-9,-9
B84,71,1312,4,168.577,600.382,0.111,1,148.255,-9,1519.588,-9,-9,-9,-9,-9
B84,71,1312,5,157.748,649.42,0.098,1,160.695,-9,1616.497,-9,-9,-9,-9,-9
B84,71,1312,6,188.191,836.931,0.091,1,209.106,-9,2067.762,-9,-9,-9,-9,-9
B84,71,1312,7,186.62,848.567,0.089,1,212.865,-9,2090.132,-9,-9,-9,-9,-9
B84,71,1312,8,193.501,875.352,0.09,1,221.014,-9,2157.268,-9,-9,-9,-9,-9
B84,71,1312,9,195.649,887.722,0.09,1,224.518,-9,2183.88,-9,-9,-9,-9,-9
B84,71,1312,10,193.778,876.413,0.09,1,221.299,-9,2159.922,-9,-9,-9,-9,-9
B84,71,1312,11,191.907,869.239,0.09,1,219.374,-9,2141.971,-9,-9,-9,-9,-9
B84,71,1312,12,186.821,849.435,0.089,1,213.333,-9,2092.333,-9,-9,-9,-9,-9
B84,71,1312,13,189.356,862.272,0.089,1,216.124,-9,2120.698,-9,-9,-9,-9,-9
B84,71,1312,14,194.379,882.326,0.09,1,221.616,-9,2168.11,-9,-9,-9,-9,-9
B84,71,1312,15,193.65,883.039,0.089,1,219.65,-9,2167.607,-9,-9,-9,-9,-9
B84,71,1312,16,187.384,851.867,0.089,1,214.64,-9,2098.491,-9,-9,-9,-9,-9
B84,71,1312,17,199.719,920.039,0.089,1,232.824,-9,2256.549,-9,-9,-9,-9,-9
B84,71,1312,18,204.382,947.28,0.088,1,240.622,-9,2326.147,-9,-9,-9,-9,-9
B84,71,1312,19,203.431,943.972,0.088,1,239.356,-9,2316.869,-9,-9,-9,-9,-9
B84,71,1312,20,201.932,287.088,1,235.652,-9,2286.091,-9,-9,-9,-9,-9
B84,71,1312,21,196.691,894.636,0.089,1,226.504,-9,2198.118,-9,-9,-9,-9,-9
B84,71,1312,22,196.318,847.212,0.089,1,212.158,-9,2086.802,-9,-9,-9,-9,-9
B84,71,1312,23,188.425,838.424,0.091,1,209.5,-9,2071.505,-9,-9,-9,-9,-9
B84,71,1313,0,168.865,741.638,0.092,1,184.768,-9,1832.67,-9,-9,-9,-9,-9
B84,71,1313,1,151.862,627.757,0.097,1,155.486,-9,1559.02,-9,-9,-9,-9,-9
B84,71,1313,2,149.776,608.046,0.099,1,150.543,-9,1514.921,-9,-9,-9,-9,-9
B84,71,1313,3,152.932,636.931,0.097,1,157.781,-9,1579.779,-9,-9,-9,-9,-9

```


Downloading AVERT Files for Use in SMOKE

About File Format

Comma-separated fields in CEM format:

| Position | Name | Type | Description |
|----------|----------------|--------------|---|
| A | ORISID | Char (6) | DOE Plant Identification Code (required) (should match the same field in the PTINV file in ORL format) |
| B | BLRID | Char (6) | Boiler Identification Code (required) (should match the same field in the PTINV file in ORL format) |
| C | YYMMDD | Int | Date of data in YYMMDD format (required) |
| D | HOUR | Integer | Hour value from 0 to 23 |
| E | NOXMASS | Real | Nitrogen oxide emissions (lbs/hr) (required) |
| F | SO2MASS | Real | Sulfur dioxide emissions (lbs/hr) (required) |
| G | NOXRATE | Real | Nitrogen oxide emissions rate (lbs/MMBtu) (not used by SMOKE) |
| H | OPTIME | Real | Fraction of hour unit was operating (optional) |
| I | GLOAD | Real | Gross load (MW) (optional) |
| J | SLOAD | Real | Steam load (1,000 lbs/hr) (optional) |
| K | HTINPUT | Real | Heat input (mmBtu) (required) |
| L | HTINPUTMEASURE | Character(2) | Code number indicating measured or substituted, not used by SMOKE |
| M | SO2MEASURE | Character(2) | Code number indicating measured or substituted, not used by SMOKE |
| N | NOXMMEASURE | Character(2) | Code number indicating measured or substituted, not used by SMOKE |
| O | NOXRMEASURE | Character(2) | Code number indicating measured or substituted, not used by SMOKE |
| P | UNITFLOW | Real | Flow rate (ft ³ /sec) for the Boiler Unit (optional; must be present for all records or not any records – not yet used by SMOKE) |
| Q | PM25MASS | Real | PM _{2.5} emissions (lbs/hr) (optional) |

Excerpted from the SMOKE User's Manual, found at www.cmascenter.org/smoke



Downloading AVERT Files for Use in SMOKE

More Information

- AVERT User Manual, found at www.epa.gov/avert
- SMOKE User's Manual, found at www.cmascenter.org/smoke