



GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

AAPCA Best Practice: Georgia PSD Emissions Inventory

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BACKGROUND

- The issuance of air permits for new and modified Title V sources typically requires AERMOD modeling to determine if the proposed project will result in a violation of the NAAQS or PSD Increment.
- Inputs to the AERMOD model include meteorological data and emission parameters (emission rates, site elevation, stack locations, stack height, stack diameter, exit velocity, and exit temperature).
- If the modeled concentrations from the project alone are above the Significant Impact Levels (SILs), then cumulative NAAQS and PSD Increment modeling is required.
- Cumulative modeling requires the inclusion of emissions from offsite sources.



OFFSITE EMISSION INVENTORIES

- The process of developing an offsite emissions inventory typically involves a time consuming, project-specific, manual review of hard-copy files by the applicant.
- The new process involves an online, searchable, public, continuously updated electronic database and web application providing all the required emissions inventory data.



PROJECT DELIVERABLES

- **Data Quality Assurance Project Plan (QAPP)**
- **Short-Term (e.g., 1-hour and 24-hour) and Long-Term (e.g., annual) Emissions Averaging Procedure Documents**
- **Emission Inventory Data and Notebook**
- **Emissions Inventory Relational Database**
- **Online Interactive Emissions Inventory Web Application**



EMISSIONS DATABASE

- This database contains potential emissions for five pollutants (PM_{10} , $PM_{2.5}$, NO_x , SO_2 , and CO) for all Title V and Synthetic Minor sources in Georgia.
- The contractor initially populated the database with 389 Title V and 792 SM sources.
- The database is routinely updated by the GA EPD Stationary Source Permitting Program (SSPP) as new permits are issued.



POTENTIAL EMISSIONS

- The PSD inventory tool uses potential emissions, which was required by Appendix W at the time of development.
- Since then, Appendix W has been updated to allow the use of “typical actual” or “modified allowable” emissions. GA EPD evaluates these requests on a case-by-case basis.
- Therefore, our tool is generally more conservative than what EPA may allow for modeling.



SM SOURCES

- The inventory initially only included site-wide annual PTE emissions and no stack data.
- Stack data can be added to the inventory as SM sources are modeled by applicants.
- 98% of the SM PTE information was transcribed from agency compiled permit narratives.



TITLE V SOURCES

- The inventory included Unit-by-Unit release point (stack) specific PTE for short term (lb/hr), long term (lb/hr), and annual (tpy) emissions.
- All stack parameters (stack locations, stack height, stack diameter, exit velocity, and exit temperature) were taken from the 2011 NEI.
- 85% of the PTE information was transcribed from the facility's own PTE submittals.
- In cases where PTE information was not available, it was calculated and documented.
- Emergency engines, fugitive emissions, and VOC/HAP sources were excluded from the initial inventory.



ONLINE WEB APPLICATION


- The applicant can simply enter the location (lat/long or address) and search radius from the project location to get an Excel file and/or an AERMOD-ready input file containing all the captured facilities along with emission rates and stack parameters required for modeling.
- Missing stack parameters can be filled in by the applicant after consultation with GA EPD.



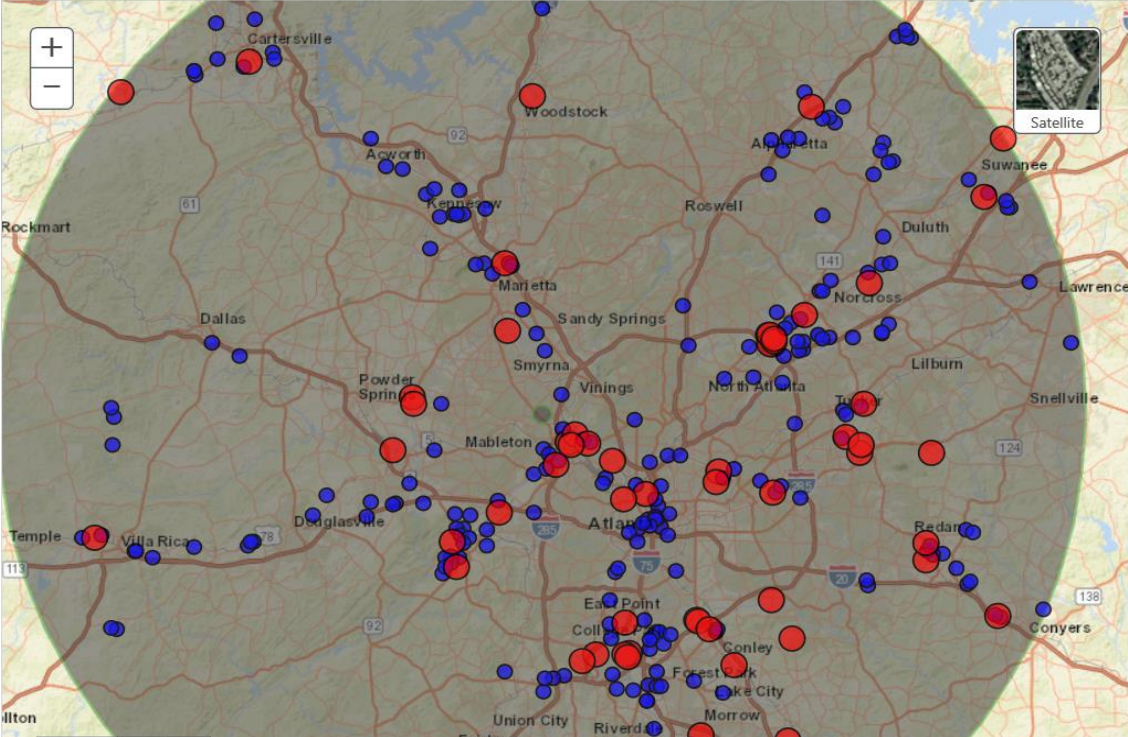
STREET VIEW MAP

Search by County:







Search by Address:
 KM

Location View: 

Exempt CO PM25 PM10 SO2 NOx

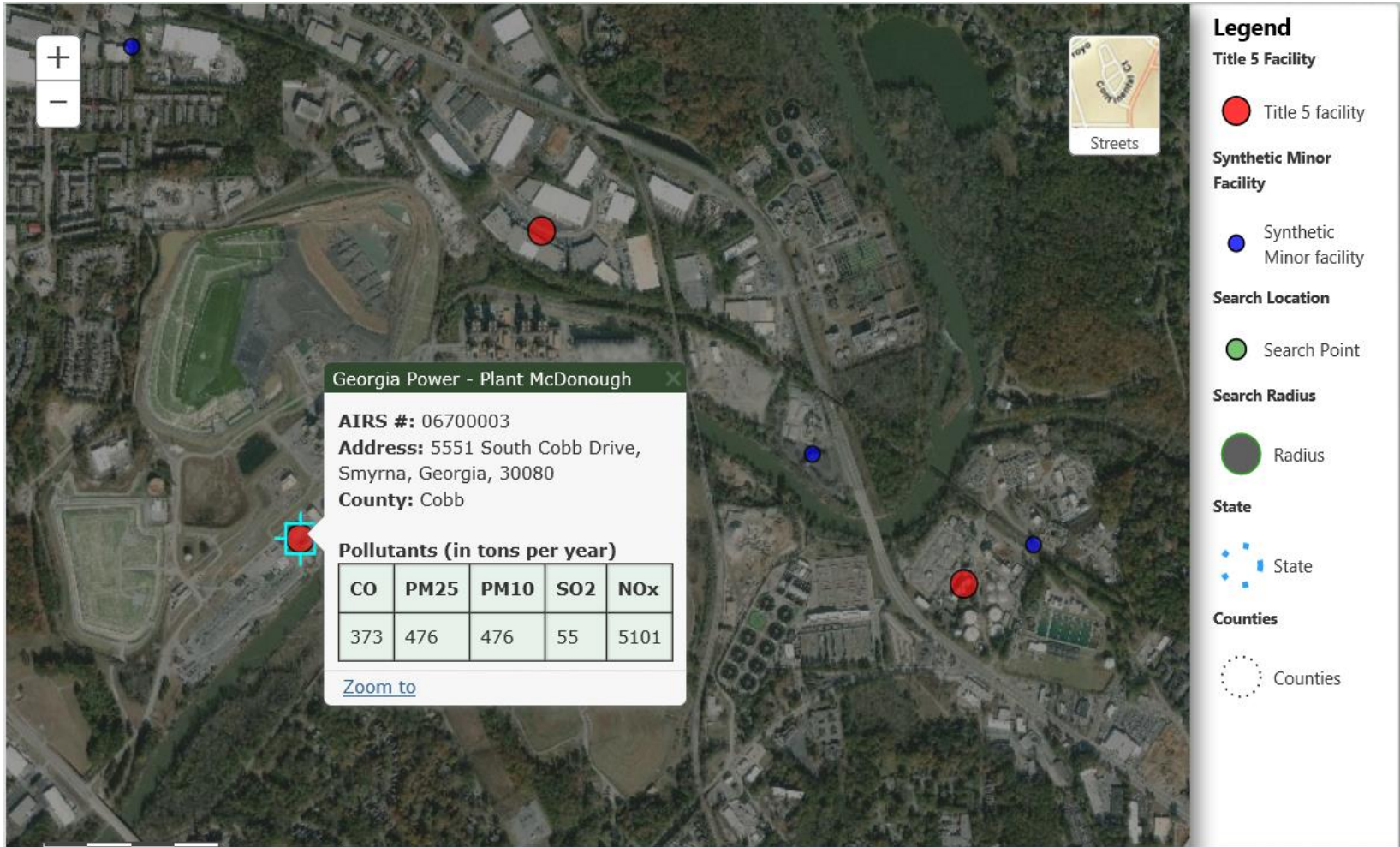


Legend

- Title 5 Facility**
 -  Title 5 facility
- Synthetic Minor Facility**
 -  Synthetic Minor facility
- Search Location**
 -  Search Point
- Search Radius**
 -  Radius
- State**
 -  State
- Counties**
 -  Counties



SATELLITE MAP





EXCEL FILE

- Contains eight worksheets: (1) “Search Information”, (2) “SM”, (3) “TV short term”, (4) “TV long term”, (5) “Exempt”, (6) “Increment SM”, (7) “Increment TV”, and (8) “Q over d”.
- “Q over d” (i.e., Q/d) information is provided, where Q =emissions (tons/year) and d =distance (km).
- $Q/d < 10$ can be used by the applicant to exclude some offsite sources from the cumulative analysis.
- All data sources and calculations are documented in a Notebook.



EXAMPLE EXCEL FILE

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	Name	Facility Description	Type	Address	County	Stack	Stack Description	Lat	Long	Zone (m)	UTME (m)	UTMN (m)	Elev (ft)	NOx (lb/hr)	CO (lb/hr)	SO2 (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	H (ft)	T (ft)	V (ft/s)	D (ft)
2	Chemical Products Corp	Inorganic Chemical Manuf.	TV	102 Old Mill Road, Cartersville, Georgia 30130	Bartow	1	Cleaver Brooks Boiler	34.150470	-84.785280	16	704182	3781056	737	3.28	2.76	5.40	0.38	0.38	55.0	400	25.0	3.00
3						2	ABCO Boiler	34.150470	-84.785280	16	704182	3781056	737	1.65	1.38	2.71	0.19	0.19	55.0	400	25.0	3.00
4						3	Nebraska Boiler	34.150440	-84.785300	16	704180	3781053	737	6.39	5.37	8.10	0.73	0.73	50.0	450	55.0	2.50
5						4	West Kiln	34.150590	-84.785430	16	704168	3781069	737	4.86	12.4	25.9	0.71	0.71	195	400	54.0	4.00
6						5	East Kiln	34.150590	-84.785430	16	704168	3781069	737	8.88	22.6	47.3	1.30	1.30	195	400	54.0	4.00
7						6	Rotary Dryer	34.150940	-84.786130	16	704103	3781106	737	1.84	0.72	4.68	10.4	10.4	48.0	300	13.0	2.00
8						7	South Spray Dryer	34.150760	-84.786270	16	704090	3781086	737	1.22	0.48	3.12	9.49	9.49	48.0	300	35.0	1.40
9						8	Barium Chloride Dryer	34.150830	-84.786350	16	704083	3781094	737	0.93	0.37	2.41	8.56	8.56	30.0	250	12.0	1.70
10						9	South Calcliner	34.150790	-84.786160	16	704100	3781090	737	4.98	1.96	12.7	12.8	12.8	45.0	400	50.0	2.30
11						10	North Kiln	34.151670	-84.786030	16	704110	3781188	737	8.88	22.6	27.1	2.26	2.26	190	400	20.0	5.00
12						11	Barium Metaborate Dryer	34.150530	-84.787580	16	703970	3781058	737	1.03	0.41	2.68	9.50	9.50	25.0	250	64.0	1.00
13						12	Claus Plant	34.151670	-84.786030	16	704110	3781188	737	0.49	0.12	3.17	0.08	0.08	190	400	20.0	5.00
14	Georgia Power - Plant Bc	Power Generation	TV	317 Covered Bridge Road, Cartersville, Ga 30130	Bartow	1	Steam Generator Unit 1	34.125110	-84.923068	16	691298	3778208	727	944	179	1902	249	199	675	125	67.2	43.8
15						2	Steam Generator Unit 2	34.125830	-84.922220	16	691298	3778208	727	792	168	1785	234	187	675	125	67.2	43.8
16						3	Steam Generator Unit 3	34.125576	-84.923206	16	691932	3778085	727	949	201	2140	276	165	675	125	64.7	48.1
17						4	Steam Generator Unit 4	34.125830	-84.921390	16	691932	3778085	727	945	200	2129	275	164	675	125	64.7	48.1
18						5	Startup Boiler 3	34.125556	-84.919167	16	691893	3778033	727	4.70	1.74	0.07	1.42	1.42	60.0	322	60.0	7.00
19	Printpack Inc	Commercial printing	TV	297 Andrew Way, Villa Rica, Georgia 30180	Carroll	1	Combustion Sources	33.742643	-84.945764	16	690291	3735497	1089	6.38	4.83	0.04	0.46	0.46				
20	Atlanta Gas Light Compa	Natural Gas Liquefaction	TV	12860 East Cherokee Drive, Ball Ground, (Cherokee		1	Compressor Turbine	34.279550	-84.366610	16	742420	3796292	1154	2.10	5.18	0.22	0.42	0.42	36.0	918	25.1	5.00
21						2	Boil-off Compressor No. 1	34.279680	-84.366690	16	742412	3796306	1154	2.49	2.77	0.00	0.09	0.09	40.0	1200	35.2	0.70
22						3	Boil-off Compressor No. 2	34.279780	-84.366660	16	742415	3796317	1154	2.49	2.77	0.00	0.09	0.09	40.0	1200	35.2	0.70
23						4	Generator Engine No. 1	34.279990	-84.366820	16	742399	3796340	1154	2.11	2.11	0.00	0.08	0.08	18.0	1200	35.2	0.70
24						5	Generator Engine No. 2	34.280020	-84.366760	16	742405	3796343	1154	2.11	2.11	0.00	0.08	0.08	18.0	1200	35.2	0.70
25						6	Generator Engine No. 3	34.279870	-84.366380	16	742440	3796328	1154	2.11	2.11	0.00	0.08	0.08	18.0	1200	35.2	0.70
26						7	Generator Engine No. 4	34.279920	-84.366390	16	742439	3796333	1154	2.11	2.11	0.00	0.08	0.08	18.0	1200	35.2	0.70
27						8	Generator Engine No. 5	34.280030	-84.366750	16	742406	3796345	1154	2.35	9.41	0.00	0.16	0.16	20.0	1060	79.4	1.20
28						9	Rest of Facility	34.276647	-84.373028	16	741837	3795954	1154	4.70	5.87	0.02	0.28	0.28				
29	Pine Bluff Landfill	Municipal Solid Waste Lan	TV	13809 East Cherokee Drive, Ball Ground, (Cherokee		1	Landfill - Flare 1	34.270039	-84.386266	16	740637	3795190	1123	7.01	15.0	1.39	1.69	1.69	36.4	1200	69.7	1.00
30						2	Landfill - Flare 2	34.270039	-84.386266	16	740637	3795190	1123	6.80	37.1	1.39	1.69	1.69	42.3	1200	63.7	1.00
31						3	Landfill - Flare 3	34.270039	-84.386266	16	740637	3795190	1123	5.68	30.9	1.26	1.39	1.39	42.0	1200	54.7	1.00
32	Sherwin-Williams Co	Paint Manufacturing Facilit	TV	6795 South Main Street, Morrow, Georgia	Clayton	1	Boiler 1	33.569070	-84.345280	16	746423	3717535	959	2.86	1.68	10.1	0.47	0.47	30.0	600	30.0	2.00
33						2	Boiler 2	33.571499	-84.342707	16	746655	3717811	959	1.43	0.84	5.07	0.24	0.24				
34						3	Rest of Facility	33.571499	-84.342707	16	746655	3717811	959	—	—	—	4.41	4.41				
35	Griffin Industries, Inc.	Rendering Plant	TV	4413 Tanner Church Road, Ellenwood, GA	Clayton	1	Johnson boiler	33.633758	-84.313813	16	749159	3724785	879	5.42	3.39	1.25	0.53	0.41	35.8	430	72.2	2.30
36						2	Cleaver Brooks boiler	33.633854	-84.313687	16	749170	3724796	879	4.39	2.74	1.01	0.43	0.33	35.3	430	67.7	2.00
37						3	Regenerative Thermal Oxidize	33.633157	-84.309564	16	749555	3724729	879	0.40	0.34	8.47	—	—	40.0	230	44.8	2.70
38						4	Rest of Facility	33.633157	-84.309564	16	749555	3724729	879	—	—	—	0.36	0.34				
39	Hartsfield-Jackson Intern	Operation of an airport and	TV	6000 North Terminal Parkway, Atrium Suit	Clayton	1	Boiler 1	33.641700	-84.447434	16	736740	3725352	1032	1.90	3.98	0.90	1.12	1.12	75.0	425	0.10	9.50
40						2	Boiler 2	33.641700	-84.447434	16	736740	3725352	1032	1.90	3.98	0.70	1.12	1.12	75.0	425	0.10	9.50
41						3	Boiler 3	33.641700	-84.447434	16	736740	3725352	1032	1.90	1.85	0.70	0.52	0.52	75.0	425	0.10	9.50
42						4	Concourse E Boiler #1	33.641700	-84.447434	16	736740	3725352	1032	1.90	5.08	1.35	1.43	1.43	56.0	425	0.10	8.00
43						5	Concourse E Boiler #2	33.641700	-84.447434	16	736740	3725352	1032	1.90	3.96	1.35	1.11	1.11	56.0	425	0.10	8.00
44						6	Concourse E Boiler #3	33.641700	-84.447434	16	736740	3725352	1032	1.90	3.96	1.35	1.11	1.11	56.0	425	0.10	8.00
45	Delta Air Lines Inc - Atlan	Airport ground support ope	TV	Hartsfield-Jackson International Airport, A	Clayton	1	Boiler 0723	33.643300	-84.413900	16	739846	3725607	952	1.20	0.71	21.3	0.20	0.20	30.5	402	24.6	3.00
46						2	Boiler 0724	33.643300	-84.413900	16	739846	3725607	952	1.20	0.71	21.3	0.20	0.20	30.5	402	24.6	3.00
47						3	Boiler 4875	33.643300	-84.413900	16	739846	3725607	952	0.36	0.21	6.34	0.06	0.06	3.20	402	24.7	3.00
48						4	Rest of Facility	33.643300	-84.413900	16	739846	3725607	952	0.75	0.23	0.00	0.00	0.00	20.0	68.0	60.0	1.00
49	Atlanta Gas Light Compa	Liquefied Natural Gas Prodi	TV	7790 Highway 85, Riverdale, Georgia 3027	Clayton	1	Vaporizer Heater No. 1	33.547684	-84.411661	16	740319	3715007	977	0.20	0.07	0.00	0.01	0.01				
50						2	Vaporizer Heater No. 2	33.547684	-84.411661	16	740319	3715007	977	0.20	0.07	0.00	0.01	0.01				
51						3	Vaporizer Heater No. 3	33.547684	-84.411661	16	740319	3715007	977	0.20	0.07	0.00	0.01	0.01				
52						4	Vaporizer Heater No. 4	33.547684	-84.411661	16	740319	3715007	977	0.20	0.07	0.00	0.01	0.01				
53						5	Vaporizer Heater No. 5	33.547684	-84.411661	16	740319	3715007	977	0.20	0.07	0.00	0.01	0.01				
54						6	Vaporizer Heater No. 6	33.547684	-84.411661	16	740319	3715007	977	0.20	0.07	0.00	0.01	0.01				



EXAMPLE AERMOD FILE

```
** Georgia EPD PSD Database output
** Pollutant: SO2
** SHORT TERM EMISSION RATES
**
** Source Location **
**
**      ID      TYPE      UTM EAST (m)  UTM NORTH (m)  Elevation (m)
** 01500002, Pandel Inc
SO LOCATION ST1 POINT 703005.00  3780627.01  231
** 01500007, New Riverside Ochre
SO LOCATION ST2 POINT 705634.96  3782071.98  223
** 01500018, Shaw Industries Group Inc Plant 13
SO LOCATION ST3 POINT 700655.99  3781323.04  211
** 01500021, CIMBAR PERFORMANCE MINERALS
SO LOCATION ST4 POINT 705788.27  3781452.37  215
** 01500047, Shaw Industries Group Inc Plant 11/12
SO LOCATION ST5 POINT 703983.02  3785183.05  244
** 01500090, Matthews, C.W., Plt 06
SO LOCATION ST6 POINT 710071.97  3787983.98  318
** 01500124, Eco-Energy Distribution - Atlanta
SO LOCATION ST7 POINT 698493.11  3780136.37  206
** 04500044, Flowers Baking
SO LOCATION ST8 POINT 6090913.81  3735735.22  331
** 04500055, Matthews C W Contracting Co Inc
SO LOCATION ST9 POINT 692031.41  3726913.85  339
** 05700023, Pilgrims Pride Corporation
SO LOCATION ST10 POINT 730281.49  3786765.66  324
** 06300012, International Paper Company
SO LOCATION ST11 POINT 741700.02  3722506.98  296
** 06300021, Clayton Cnty Wb Casey
SO LOCATION ST12 POINT 744193.99  3711561.95  269
** 06300023, Clorox Products Manufacturing Co
SO LOCATION ST13 POINT 742399.80  3723911.09  306
** 06300041, PCCR USA
SO LOCATION ST14 POINT 742473.85  3722398.98  310
** 06300048, Fort Gillem
SO LOCATION ST15 POINT 745811.65  3723002.57  303
** 06300090, TOTO USA, Inc.
SO LOCATION ST16 POINT 745769.86  3716951.90  283
** 06300102, Southern Regional Medical Center
SO LOCATION ST17 POINT 742267.04  3718409.13  264
** 06300107, Baldwin Paving Co Inc Plt 2
SO LOCATION ST18 POINT 740254.75  3722000.00  280
** 06300109, Matthews C W Contracting Co Inc Plt 56
SO LOCATION ST19 POINT 741574.96  3721022.95  267
** 06300148, Delta Fight Products, LLC
SO LOCATION ST20 POINT 741747.76  3726001.38  300
** 06700001, Compass Chemical International LLC
SO LOCATION ST21 POINT 731430.78  3744849.73  270
** 06700009, Matthews C W Contracting Co Inc Plt 03
SO LOCATION ST22 POINT 723112.02  3766941.01  319
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** 15100025, Transcontinental Gas Pipe Line Company, LLC
SO LOCATION ST409 POINT 754915.63  3718028.44  237
SO LOCATION ST410 POINT 754916.79  3718019.59  237
SO LOCATION ST411 POINT 754918.83  3718012.98  237
SO LOCATION ST412 POINT 754920.86  3718006.38  237
SO LOCATION ST413 POINT 754922.95  3717997.55  237
SO LOCATION ST414 POINT 754925.02  3717989.84  237
SO LOCATION ST415 POINT 754927.98  3717983.26  237
SO LOCATION ST416 POINT 754930.04  3717975.54  237
SO LOCATION ST417 POINT 754932.10  3717967.83  237
SO LOCATION ST418 POINT 754944.53  3717954.84  237
SO LOCATION ST419 POINT 754949.52  3717941.65  237
SO LOCATION ST420 POINT 754952.54  3717932.85  237
SO LOCATION ST421 POINT 754955.56  3717924.05  237
SO LOCATION ST422 POINT 754959.54  3717914.16  237
SO LOCATION ST423 POINT 754961.64  3717905.34  237
SO LOCATION ST424 POINT 754916.39  3717859.74  237
SO LOCATION ST425 POINT 754981.61  3718027.97  237
SO LOCATION ST426 POINT 754982.63  3718024.67  237
SO LOCATION ST427 POINT 754984.60  3718020.28  237
** 24700033, Tegrant Diversified Brands, Inc.
SO LOCATION ST428 POINT 773727.93  3730028.56  284
SO LOCATION ST429 POINT 773728.76  3730031.92  284
SO LOCATION ST430 POINT 773717.67  3730030.49  284
** Source Parameters **
**      QS (g/s)      H (m)      T (K)      V (m/s)      D (m)
SO SRCPARAM ST1 1.726E-03  10.0  293  15.0  0.50
SO SRCPARAM ST2 1.151E-03  10.0  293  15.0  0.50
SO SRCPARAM ST3 2.733E+00  10.0  293  15.0  0.50
SO SRCPARAM ST4 1.204E-01  10.0  293  15.0  0.50
SO SRCPARAM ST5 2.802E+00  10.0  293  15.0  0.50
SO SRCPARAM ST6 1.989E+00  10.0  293  15.0  0.50
SO SRCPARAM ST7 2.301E-04  10.0  293  15.0  0.50
SO SRCPARAM ST8 2.877E-03  10.0  293  15.0  0.50
SO SRCPARAM ST9 2.808E+00  10.0  293  15.0  0.50
SO SRCPARAM ST10 1.985E-01  10.0  293  15.0  0.50
SO SRCPARAM ST11 1.838E+00  10.0  293  15.0  0.50
SO SRCPARAM ST12 7.120E-01  10.0  293  15.0  0.50
SO SRCPARAM ST13 7.192E-01  10.0  293  15.0  0.50
SO SRCPARAM ST14 2.877E-04  10.0  293  15.0  0.50
SO SRCPARAM ST15 4.516E-02  10.0  293  15.0  0.50
SO SRCPARAM ST16 1.381E-03  10.0  293  15.0  0.50
SO SRCPARAM ST17 2.848E+00  10.0  293  15.0  0.50
SO SRCPARAM ST18 2.854E+00  10.0  293  15.0  0.50
SO SRCPARAM ST19 2.284E+00  10.0  293  15.0  0.50
SO SRCPARAM ST20 8.055E-03  10.0  293  15.0  0.50
SO SRCPARAM ST21 5.351E-01  10.0  293  15.0  0.50
SO SRCPARAM ST22 1.631E+00  10.0  293  15.0  0.50
SO SRCPARAM ST23 7.911E-01  10.0  293  15.0  0.50
SO SRCPARAM ST24 2.877E-04  10.0  293  15.0  0.50
SO SRCPARAM ST25 1.927E+00  10.0  293  15.0  0.50
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COST & TIME

- This project was initially requested by one of our industrial stakeholder groups.
- The cost and time savings associated with putting together PSD permit applications and the reduction in time for GA EPD to issue PSD permit applications were discussed with other industrial stakeholder groups.
- The initial cost of this project was \$326,000 with an additional annual fee of \$12,000/year for web hosting and system maintenance.
- GA EPD was able to pass the cost of this project along to our industries by increasing annual Title V \$/ton permit fees with a guarantee that this project would be funded.
- The project took approximately 18 months to complete.



APPLICANT BENEFITS

- Inventory data can now be collected by the applicant in seconds as opposed to days/weeks/months.
- There is a significant reduction in the time and cost (~33% reduction) for the applicant to develop a permit application that requires an offsite emissions inventory.
- The applicant has more certainty that their offsite emissions inventory will be approved since it was developed by the same Agency that will be reviewing and approving the permit application.
- The applicant can quickly and easily examine multiple airsheds and modeling scenarios to find the optimal location to build their project or determine which location is best for expansion.



STAFF BENEFITS

- Previously, GA EPD permit modelers spent 25-50% of their time reviewing, validating, and correcting offsite emission inventories.
- Now they spend less than 1% of their time reviewing, validating, and correcting offsite emission inventories.
- This results in much quicker modeling reviews by the permit modelers and gives them additional time to analyze the modeling results in more detail.



ADDITIONAL BENEFITS

- The offsite emissions inventory is continuously becoming more accurate with each interaction between GA EPD and the permit applicants.
- If the applicant finds an issue with an offsite emissions rate or stack parameters, they can work with GA EPD to update the incorrect values with the correct values in the PSD inventory tool.
- That way, when the next application in the same area pulls an emissions inventory, they will get the updated emissions inventory rather than having to identify and fix the same problem each time.



SUSTAINABILITY

- This project did require an initial investment of time and money. However, the increased productivity outweighs this initial investment.
- The contractor initially populated the relational database with 389 Title V and 792 SM sources.
- Since then, the GA EPD SSPP has been routinely updating the database as new permits are issued.
- Currently, the web hosting and system maintenance are done by a contractor.
- GA EPD is in the process of evaluating options to bring this work in-house.



TRANSFERABILITY

- GA EPD used a contractor to develop the online PSD inventory tool and populated the database.
- The emissions inventory relational database and online interactive web application can be transferred from Georgia to other states free of charge.
- However, a big part of this project involved populating the database with state-specific emissions and stack parameters and documenting the data sources and emission calculations. This part of the project would need to be performed by each individual state with in-house resources or by a contractor.
- The Georgia emissions inventory database is routinely updated in-house as new permits are issued by the GA EPD SSPP. Other states could easily perform routine updates with existing staff and in-house resources.



UNIQUENESS

- GA EPD does not know of any other on-line interactive PSD emission inventory databases with mapping capabilities and the ability to directly produce AERMOD input files with a single mouse click.
- Applicants are amazed at how quickly they can develop offsite emission inventories for their projects. We have been told by our applicants with facilities in multiple states and consultants that work in multiple states that our process is significantly quicker, easier, and cheaper compared to other states.



WEBSITE

- The Georgia online PSD inventory tool is located at:
 - <https://psd.gaepd.org/inventory/>
 - Please feel free to try it out!!
- The “PSD Modeling Inventory Webpage User Guidance v. 1.03” is located at:
 - <https://psd.gaepd.org/inventory/Home/Help>



CONTACT INFORMATION

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