

Emissions Inventory Development for Floyd County

Emissions inventories for Floyd County were developed for attainment year 2007 and future years 2017 and 2023. Direct PM_{2.5} emissions and PM_{2.5} precursor emissions (SO₂ and NO_x), as defined in the Clean Air Fine Particle Implementation Rule (72 FR 20586), were included in the inventories. The majority of the 2007 attainment year emissions inventory was prepared as part of SESARM's contracted Southeastern Modeling, Analysis, and Planning (SEMAP) project. The majority of the projected emissions inventories were prepared by Georgia EPD. The attainment year and future year emissions were prepared for four source categories using different methods. The four source categories are:

- Point sources (EGU and Non-EGU)
- Nonpoint sources (including fire)
- Nonroad mobile sources (including marine, aircraft and railroad)
- Onroad mobile sources

1.0 Attainment Year Point Sources

Emissions estimates for point sources in 2007 were obtained from SEMAP point source inventory v1.8. This inventory includes emissions estimates for 74 very large sources in 2007, 109 additional facilities in 2008, and 66 additional facilities in 2005, which were all submitted to EPA by the state of Georgia. This inventory also includes 19 facilities in CAMD database which were not included in the state submittal. For facilities with 2005 and 2008 emissions (but no 2007 emissions), 2007 emissions were estimated based on a linear interpolation between facility level 2005 and 2008 emissions on a pollutant-by-pollutant basis to calculate facility level 2007 emissions. For facilities with only 2008 data (no 2007 or 2005 data available), the SIC growth factors from the VISTAS Best&Final inventory were used to backcast 2008 reported emissions to 2007. For facilities with only 2005 data (no 2007 or 2008 data available), the SIC growth factors from the VISTAS Best&Final inventory were used to project 2005 reported emissions to 2007. After the above backcasting and projecting was performed, additional adjustments were made for facilities where only 2005 data were available and the facility did not operate in 2007 or operated for only part of 2007. Facilities that did not operate in 2007 were removed from the NIF files. For facilities that operated for part of 2007, the 2005 emissions were approximated for 2007 by multiply the 2005 emissions by a scaling factor of the number of days the facility operated in 2007 divided 365 days of full year operation. Also, the end date in the NIF EM and PE tables were changed to reflect the actual date that the facility ceased operation. In addition, PM augmentation was performed to generate missing emissions estimates for filterable and primary PM_{2.5}, filterable and primary PM₁₀, and condensable PM.

The SEMAP inventory went through review using EPA's Basic Format and Content Checker tool (EPA 2004) which was used to verify the data was in the correct format, to check for referential integrity and duplicate record issues, and to check certain fields for proper valid codes and ranges. This inventory also went through several rounds of quality assurance (QA) reviews by State and local (S/L) agencies, as well as a review by SEMAP stakeholders. For more information regarding the SEMAP point inventory, please refer to Appendix C-1.

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1.1 EGU Point Sources

Emissions estimates for EGU point sources in 2007 were obtained from SEMAP point source inventory v1.8. The only EGU point source in Floyd county is Plant Hammond (Units 1-4). Georgia Power provided updated PM and NH₃ emissions data for all Georgia Power facilities. The revised PM emission values include condensable emissions which were previously missing from the inventory.

Emissions in 2017 and 2023 were estimated using growth factors and control factors. Growth factors were calculated based on coal consumption records and forecasts for the Southeastern region in AEO2010. The SO₂ control factor due to Flue Gas Desulfurization (FGD) was assumed to be 95% according to the VISTAS 2012 Projection Emissions Inventory. The NO_x control factor due to Selective Catalytic Reduction (SCR) was assumed to be 82.5% according to the VISTAS 2012 Projection Emissions Inventory. The PM_{2.5} control factor due to FGD was assumed to be 50% according to Table 5.4-1 on page 5.4-24 of EPA document "Stationary Source Control Techniques Document for Fine Particulate Matter" (EC/R Incorporated, 1998). Table 1 contains control dates for Plant Hammond. Tables 2, 3, and 4 contain a list of unit-specific SO₂, NO_x, and PM emissions for 2007, 2017, and 2023 and the associated growth and control factors for Plant Hammond.

Table 1. EGU Control Dates for Plant Hammond (AIRS 11500003)

POINTID	NO _x Control		SO ₂ Control		Other Controls
	Actual Operation	Required Operation rule (sss)	Actual Operation	Required Operation rule (sss)	
SG01	NC	NC	5/1/2008	12/31/08	Electrostatic precipitator (ESP)
SG02	NC	NC	5/1/2008	12/31/08	Electrostatic precipitator (ESP)
SG03	NC	NC	5/1/2008	12/31/08	Electrostatic precipitator (ESP)
SG04	2002, 5/1/2008*	12/31/08	5/1/2008	12/31/08	Electrostatic precipitator (ESP)

* Starting in 2002, SCR was operated during the ozone season. Year-round operation (required by rule (sss)) started May 1, 2008.

NC = no control

Table 2. SO₂ emissions projection calculations for EGU point sources (tons)

POINTID	2007 (tons)	2017			2023		
		Growth Factor	Control Factor	Emissions	Growth Factor	Control Factor	Emissions
SG01	6028.200	1.013	95%	305.446	1.050	95%	316.338
SG02	6047.400	1.013	95%	306.419	1.050	95%	317.346
SG03	6147.900	1.013	95%	311.511	1.050	95%	322.620
SG04	29585.300	1.013	95%	1499.073	1.050	95%	1552.530

Table 3. NO_x emissions projection calculations for EGU point sources (tons)

POINTID	2007 (tons)	2017			2023		
		Growth Factor	Control Factor	Emissions	Growth Factor	Control Factor	Emissions
SG01	1184.350	1.013		1200.209	1.050		1243.008
SG02	1187.590	1.013		1203.493	1.050		1246.409
SG03	1207.070	1.013		1223.234	1.050		1266.854

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SG04	3979.070	1.013	82.5% *	1028.442	1.050	82.5%*	1065.115
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* In 2007, this unit's SCR was operated during the ozone season only. The SCR will be operated year-round in 2017 and 2023. Therefore, the fraction of NO_x emissions during ozone season in 2007 was calculated using CEM data, and the SCR control factor for NO_x projections was applied to non-ozone season emissions only. According to CEM data, the SCR was operated from April to September in 2007.

Table 4. PM_{2.5} emissions projection calculations for EGU point sources (tons)

POINTID	2007 (tons)	2017			2023		
		Growth Factor	Control Factor	Emissions	Growth Factor	Control Factor	Emissions
SG01	99.560	1.013	50%	50.447	1.050	50%	52.246
SG02	100.302	1.013	50%	50.823	1.050	50%	52.635
SG03	101.673	1.013	50%	51.517	1.050	50%	53.354
SG04	270.463	1.013	50%	137.042	1.050	50%	141.929

1.2 Non-EGU Point Sources

Emissions estimates for non-EGU point sources in 2007 were obtained from SEMAP point source inventory v1.8, as described in the section for base year point sources. Emissions in future years 2017 and 2023 were estimated using SCC- and county-specific growth factors generated with the USEPA's Economic Growth Analysis System version 5.0 (EGAS 5.0). Appendix C-7 contains a summary of the SCC-specific growth factors for Floyd County. Tables 5, 6, and 7 contain a list of specific non-EGU point sources in Floyd County and facility-specific SO₂, NO_x, and PM emissions for 2007, 2017, and 2023. These emissions are not subject to additional controls in the future years 2017 and 2023.

Table 5. SO₂ emissions projection for non-EGU point sources (tons)

PLANT ID	FACILITY NAME	2007	2017	2023
11500016	Temple-Inland - Rome Lumber Mill	0.000	0.000	0.000
11500021	Temple-Inland (Rome Linerboard Mill)	3337.490	3535.286	3675.321
11500077	Metal Container Corporation	0.071	0.079	0.086
11500095	Packaging Products Corporation	0.014	0.016	0.017
11500105	General Shale Brick, Inc. - Plant 40	129.011	160.740	181.929

Table 6. NO_x emissions projection for non-EGU point sources (tons)

PLANT ID	FACILITY NAME	2007	2017	2023
11500016	Temple-Inland - Rome Lumber Mill	0.000	0.000	0.000
11500021	Temple-Inland (Rome Linerboard Mill)	2591.150	2780.431	3025.787
11500077	Metal Container Corporation	13.359	14.903	16.230
11500095	Packaging Products Corporation	2.480	2.764	3.011
11500105	General Shale Brick, Inc. - Plant 40	0.000	0.000	0.000

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Table 7. PM_{2.5} emissions projection (tons)

PLANT ID	FACILITY NAME	2007	2017	2023
11500016	Temple-Inland - Rome Lumber Mill	0.018	0.022	0.025
11500021	Temple-Inland (Rome Linerboard Mill)	379.056	405.354	444.448
11500077	Metal Container Corporation	1.349	1.569	1.754
11500095	Packaging Products Corporation	0.200	0.223	0.243
11500105	General Shale Brick, Inc. - Plant 40	0.000	0.000	0.000

2.0 Nonpoint Sources

Emissions from nonpoint sources in 2007 were obtained from the SEMAP nonpoint source inventory v1.1 which was developed by Pechan. Pechan created a default 2007 nonpoint source inventory that includes all of the source categories covered by the 2008 nonpoint source NEI. For all source categories except industrial and commercial/institutional (ICI) fuel combustion, Pechan either directly incorporated emissions data from the 2008 nonpoint source NEI (when the NEI represented use of 2007 emissions activity data), or recalculated the NEI emission estimates to reflect 2007 activity levels (when the NEI reflected 2006 or 2008 activity levels) and/or to remove emissions associated with activity reflected in the point source inventory. For ICI fuel combustion, the 2008 nonpoint source NEI only developed emissions activity estimates, not emission estimates. Because of the potential importance of these source categories and the availability of methodological improvements, Pechan utilized an emissions estimation method for ICI fuel combustion incorporates a few refinements to the NEI method. These emissions were supplemented with carry-forward categories from 2005 GA CERR submission grown using EGAS. For more information regarding the SEMAP nonpoint inventory, please refer to Appendix C-2.

Emissions in future years 2017 and 2023 were estimated using SCC- and county-specific growth factors generated with the USEPA's Economic Growth Analysis System version 5.0 (EGAS 5.0). Appendix C-7 contains a summary of the SCC-specific growth factors for Floyd County. These emissions are not subject to additional controls in the future years 2017 and 2023.

Emissions from fires in 2007 were obtained from SEMAP final "actual" fire emissions inventory. This inventory was developed using 2007 burned area data submitted by states, as well as updated fuel consumption and emissions factors (MACTEC, SEMAP document is not available yet). Emissions in future years 2017 and 2023 were assumed to be the same as attainment year 2007.

3.0 Nonroad Mobile Sources

The nonroad sector is comprised of nonroad engines included in EPA's NONROAD model, such as recreational marine and land-based vehicles, farm, construction and industrial machinery, and lawn and garden equipment. This sector also includes engines not modeled in NONROAD, specifically aircraft, commercial marine vessels, and locomotives.

3.1 NONROAD Model Category

Emissions from NONROAD model source categories in 2007 were obtained from the SEMAP final nonroad mobile sources emissions inventory. These emissions were calculated using NMIM2008, which incorporates EPA's latest NONROAD model (NONROAD2008) released in April 2009, and reflects all

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of EPA's final nonroad standards to date. The county/monthly gasoline profile assignments in the CountyYearMonth table and the gasoline fuel profiles in the Gasoline table of the 2007 NMIM county-level database (NCD) was updated with data provided by the State of Georgia. For more information regarding the SEMAP nonroad inventory, please refer to Appendix C-2.

Emissions in future years 2017 and 2023 were also calculated using NMIM2008, using the same meteorological inputs as for 2007. Defaults in NMIM 2008 were used for other inputs in future years.

3.2 Marine, Aircraft, and Locomotives

Emissions from commercial marine vessels (CMV), aircraft, and locomotives in 2007 were obtained from SEMAP final nonroad mobile sources emissions inventory. For more information regarding the SEMAP marine, aircraft, and locomotives inventory, please refer to Appendix C-2 (Pechan, 2010). Growth and control factors that were used to develop future year emissions were provided by Pechan. For more information regarding the SEMAP marine, aircraft, and locomotives growth and control factors, please refer to Appendix C-5.

2007 CMV emissions in the SEMAP inventory were based largely on EPA's 2008 NEI, and then were adjusted to represent 2007. Growth factors for residual CMVs were developed using average annual growth rates in USEPA regulatory impact analysis (RIA) to support their category 3 engine rulemaking. Growth factors for diesel engine CMV emissions were based on fuel consumption forecasts published by EIA. Control factors were developed using information from USEPA's RIA. There were no CMV emissions in Floyd County.

2007 aircraft emissions in the SEMAP inventory were primarily based on EPA's 2008 NEI, which were back-cast to 2007 using approach operations by airport and aircraft type compiled from the FAA's Air Traffic Activity Data System (ATADS) (FAA, 2010). Growth factors for all aircraft engine and airport-related SCCs were based on landing and take-off operation (LTO) projections available from the Federal Aviation Administration's Terminal Area Forecasts (TAF) (FAA, 2010). Growth rates for military aircraft were held constant at 2007 levels. No control factors have been applied to aircraft for criteria pollutant forecasts. Tables 8, 9, and 10 contain a list of specific aircraft sources in Floyd County and SCC-specific SO₂, NO_x, and PM emissions for 2007, 2017, and 2023 and the associated growth factors.

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Table 8. SO₂ emissions projection for Aircraft (tons)

State Facility Identifier	Facility Name	SCC	Description	2007	2017		2023	
					Growth Factor	Emissions	Growth Factor	Emissions
2GA8	SHANNON FLIGHT STRIP	2275050011	General Aviation - Piston	0.011	0.881	0.010	0.904	0.010
2GA8	SHANNON FLIGHT STRIP	2275050012	General Aviation - Turbine	0.004	0.881	0.004	0.904	0.004
53GA	DAWSON FIELD	2275050011	General Aviation - Piston	0.009	0.881	0.008	0.904	0.008
53GA	DAWSON FIELD	2275050012	General Aviation - Turbine	0.003	0.881	0.003	0.904	0.003
RMG	RICHARD B RUSSELL	2275001000	Military Aircraft	0.003	1.000	0.003	1.000	0.003
RMG	RICHARD B RUSSELL	2275050011	General Aviation - Piston	0.070	0.881	0.062	0.904	0.064
RMG	RICHARD B RUSSELL	2275050012	General Aviation - Turbine	0.027	0.881	0.024	0.904	0.025

Table 9. NO_x emissions projection for Aircraft (tons)

State Facility Identifier	Facility Name	SCC	Description	2007	2017		2023	
					Growth Factor	Emissions	Growth Factor	Emissions
2GA8	SHANNON FLIGHT STRIP	2275050011	General Aviation - Piston	0.073	0.881	0.065	0.904	0.066
2GA8	SHANNON FLIGHT STRIP	2275050012	General Aviation - Turbine	0.029	0.881	0.025	0.904	0.026
53GA	DAWSON FIELD	2275050011	General Aviation - Piston	0.056	0.881	0.050	0.904	0.051
53GA	DAWSON FIELD	2275050012	General Aviation - Turbine	0.022	0.881	0.019	0.904	0.020
RMG	RICHARD B RUSSELL	2275001000	Military Aircraft	0.029	1.000	0.029	1.000	0.029
RMG	RICHARD B RUSSELL	2275050011	General Aviation - Piston	0.458	0.881	0.403	0.904	0.414
RMG	RICHARD B RUSSELL	2275050012	General Aviation - Turbine	0.178	0.881	0.157	0.904	0.161

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Table 10. PM_{2.5} emissions projection for Aircraft (tons)

State Facility Identifier	Facility Name	SCC	Description	2007	2017		2023	
					Growth Factor	Emissions	Growth Factor	Emissions
2GA8	SHANNON FLIGHT STRIP	2275050011	General Aviation - Piston	0.184	0.881	0.162	0.904	0.167
2GA8	SHANNON FLIGHT STRIP	2275050012	General Aviation - Turbine	0.072	0.881	0.063	0.904	0.065
53GA	DAWSON FIELD	2275050011	General Aviation - Piston	0.142	0.881	0.125	0.904	0.128
53GA	DAWSON FIELD	2275050012	General Aviation - Turbine	0.055	0.881	0.049	0.904	0.050
RMG	RICHARD B RUSSELL	2275001000	Military Aircraft	0.077	1.000	0.077	1.000	0.077
RMG	RICHARD B RUSSELL	2275050011	General Aviation - Piston	1.150	0.881	1.014	0.904	1.040
RMG	RICHARD B RUSSELL	2275050012	General Aviation - Turbine	0.447	0.881	0.394	0.904	0.404

2007 locomotive emissions in the SEMAP inventory were obtained from the Eastern Regional Technical Advisory Committee for Class I and Class II/III line haul locomotives and railyards. Passenger and commuter rail line emissions were grown from EPA's 2002 NEI to 2007. For Class I and Class II/III line haul and diesel switchyard operations, Pechan calculated growth factors based on freight rail sector fuel consumption forecasts. For passenger and commuter rail, growth factors were developed from national forecasts of intercity rail diesel consumption, and commuter rail diesel consumption. Control factors were based on US EPA's locomotive engine RIA and associated emission factor guidance. Tables 11, 12, and 13 contain a list of specific locomotive sources in Floyd County and SCC-specific SO₂, NO_x, and PM emissions for 2007, 2017, and 2023 and the associated growth and control factors.

Table 11. SO₂ emissions projection for Locomotives (tons)

SCC	Description	2007	2017			2023		
			Growth Factor	Control Factor	Emissions	Growth Factor	Control Factor	Emissions
2285002006	Class I	5.998	1.02	95.80	0.256	1.08	95.87	0.266
2285002010	Yard	0.427	1.02	95.80	0.018	1.08	95.87	0.019

Table 12. NO_x emissions projection for Locomotives (tons)

SCC	Description	2007	2017			2023		
			Growth Factor	Control Factor	Emissions	Growth Factor	Control Factor	Emissions
2285002006	Class I	526.634	1.02	34.86	348.409	1.08	52.00	271.928
2285002010	Yard	48.403	1.02	17.27	40.668	1.08	30.92	35.967

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Table 13. PM_{2.5} emissions projection for Locomotives (tons)

SCC	Description	2007	2017			2023		
			Growth Factor	Control Factor	Emissions	Growth Factor	Control Factor	Emissions
2285002006	Class I	18.442	1.02	53.97	8.621	1.08	69.84	5.983
2285002010	Yard	1.474	1.02	30.77	1.037	1.08	43.08	0.903

4.0 Onroad Mobile

SO₂, NO_x and PM_{2.5} emissions from onroad mobile sources in 2007 and 2023 were developed by the Georgia Department of Transportation using MOVES2010a. MOVES was run at the county level for Floyd County in inventory mode for a July day in Year 2007 and 2023. Average 2007 annual daily meteorological inputs were used in both runs. Best available local data for MOVES inputs such as vehicle population, vehicle miles traveled (VMT) by source types, road type distribution, speed distributions, ramp fractions, hourly VMT fractions and age distribution were used. Please refer to Appendix C-3 for more detailed information.

5.0 QA/QC

Detailed QA/QC efforts for point and fire sources were documented in MACTEC's 2009 Quality Assurance Project Plan (Appendix C-8), and QA/QC efforts for nonroad and area sources can be found in E.H. Pechan's 2009 QAPP (Appendix C-9). Onroad mobile source emissions were provided by the Georgia Department of Transportation, and were reviewed by running MOVES independently at Georgia EPD. All MOVES input files have been carefully checked.

References

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