# Appendix B

# Georgia Marketing Rule Revocation

## Technical Demonstration

In order to demonstrate that removal of Georgia Rule 39-3-1-.02(bbb), Georgia Marketing Rule, will still result in a decrease in VOC and NOx emissions over time and will not interfere with maintenance of the 1997 ozone NAAQS or attainment of the 2008 Ozone NAAQS, NOx and VOC emissions inventories were calculated for two different scenarios over time and compared with key emissions budgets/limits. Emission inventory years were 2008, 2010, 2013, 2016, 2024, 2030, and 2040.

One scenario quantifies emissions with the Georgia Marketing Rule in place and the other with the Rule removed. This is accomplished by using the two different Reid Vapor Pressure (RVP) limits of the two types of gasoline, one labeled "Georgia Gas" representing the Georgia Marketing Rule RVP requirements and the other, "conventional gas", which is the gasoline that would be used under Federal RVP requirements. The RVP for conventional gasoline is, on average, 0.8 psi higher than for Georgia Gas in the 13-county Atlanta area and 2.0 psi higher for the remaining seven counties in the Atlanta ozone NAA for the 1997 ozone NAAQS (RVP for conventional gas requirements is referenced in 40 CFR 80.27(a)(2)(i-ii) and 40 CFR 80.27(d)(1-2)) as well as the additional 25 county "area of influence" that completes the 45 county area. Therefore, the "Georgia Gas" case is based on model defaults, while the conventional gas case has the same inputs except the RVP is increased by 2.0 psi or 0.8 psi in the relevant county. In all scenarios, it is assumed all gasoline contains 10% ethanol. For instance, for the 13-county Atlanta region (13 county previous 1-hr ozone NAAQS nonattainment area consisting of Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglass, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale counties), the RVP for model years 2012 or later is 7.8 psi in the MOVES 2010b fuel default database (7.0 psi + 0.8 psi allocated from ethanol waiver). This is what is used for the "Georgia Gas" scenario. For the "Conventional Gas" scenario, RVP used would be 8.6 psi (7.8 psi RVP rule + 0.8 ethanol waiver) which is 0.8 psi higher than "Georgia Gas". For the remaining counties in the 45 county Georgia Gasoline Marketing Rule area, MOVES 2010b defaults and "Georgia Gas" scenario apply 7.7 psi (7.0 psi +0.7 psi allotted to ethanol waiver). In this case, 9.7 psi was used in the "Conventional Gas" scenario (9.0 psi + 0.7 psi allotted to ethanol waiver) which is 2.0 psi higher than "Georgia Gas". The sulfur content requirement is the same for Georgia Gas and Conventional Gas and is illustrated by MOVES 2010b defaults listing the same sulfur content for all gasoline in Georgia. For ozone NAAQS, model runs were conducted using the scenario of weekday traffic and typical summer conditions (July) to provide the highest possible NOx and VOC emission levels and greatest sensitivities to changes in RVP.

Demonstrating non-interference using this conservative approach allows for the assumption of non-interference in all other cases with regards to the ozone NAAQS and removal of the Georgia Marketing

Rule. There was also an analysis comparing NOx emissions with and without the Georgia Gasoline Rule for confirmation of non-interference with the PM2.5 NAAQS and in this case July was used as a dummy month and annualized input data into the emissions model were inputted. This data originated from input used with the PM2.5 maintenance plan submittal. See methodology sections below for further details on MOVES 2010b inputs and fuels.

For clarification, the emissions were calculated in 25, 13, 7, and 2 county groupings for the analysis of impacts of GA Marketing rule removal on Georgia attaining the 2008 ozone NAAQS and maintain attainment of the 1997 ozone NAAQS. For PM2.5 NAAQS, 13, 7 and 2 county groups were used as well as for Putnam county. The reason for the groupings is that the inputs used for modeling were aggregated in such a matter to reflect the common regulatory requirements and that transportation crosses county lines. There was no need to change these groupings (except for adding 25 counties and disaggregating 2 counties from the 7 county group) since it is data that has gone through QA/QC, disaggregation had limited benefit except when absolutely necessary (e.g. for 2 counties), and these inputs in these groupings were used in SIP and transportation conformity work related to the ozone and PM2.5 NAAQS of concern.

The aggregated groupings are as follows:

a. 13 counties: Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, Rockdale
b. 7 counties: Barrow, Bartow, Carroll, Hall, Newton, Spalding, Walton
c. 2 counties (disaggregated from 7 counties): Bartow, Newton
d. 25 counties: Banks, Butts, Chattooga, Clarke, Dawson, Floyd, Gordon, Haralson, Heard, Jackson, Jasper, Jones, Lamar, Lumpkin, Madison, Meriwether, Monroe, Morgan, Oconee, Pickens, Pike, Polk, Putnam, Troup, Upson
e. Portion of Putnam county in NAA (soon to be maintenance area) for 1997 PM2.5 NAAQS

For a proper, complete demonstration of non-interference with maintenance of the 1997 ozone NAAQS, the key budgets/limits in which emissions must not exceed in these scenarios are the 2008 15% Reasonable Forward Progress Plan (RFP) SIP MVEB, and 2024 Atlanta ozone maintenance plan MVEB.

The 2008 MVEB is used because it represents the maximum level of mobile emissions where it can still be claimed that emissions levels will be not interfere with attainment (or maintenance of attainment) of the 1997 or 2008 ozone NAAQS. In this appendix, we further demonstrate that 2008 baseline levels from the Atlanta ozone maintenance plan are used because it represents MOVES-based emissions levels for the year Atlanta attained the 1997 ozone NAAQS. This additional demonstration further proves that future emissions never return to the pre-2008 levels. The 2024 MVEB from the Atlanta ozone maintenance plan is used because it represents the maximum level of mobile emissions allowed after 2024 to further assure continued attainment of the 1997 ozone NAAQS.

In this demonstration, years 2024, 2030 and 2040 would be compared to the2024 motor vehicle emission budgets (MVEB) established by the Atlanta ozone maintenance SIP, with safety margin included, while all years will be compared to the 2008 MVEB. The same years and methodology applies to the PM2.5 NAAQS analyses as well. The exception is that 2013 is not used for the PM2.5 case due to lack of data. Also, PM2.5 is annualized where the RVP differences are only realized during ozone season whereas for the remainder of the year the Georgia gasoline and conventional gasoline are virtually identical. This incorporation of non-ozone season fuel blend is why PM2.5 annualized NOx differences are going to be smaller than NOx associated with ozone. The main narrative provides all the details regarding the results of the comparison between "Georgia Gas" and "Conventional Gas" scenarios for the PM2.5 NAAQS demonstration. Section 6 of the main narrative contains the demonstration of non-interference with Atlanta's attainment of the 2008 NAAQS ozone standard through the use of offsets. No further details were required for this appendix regarding results.

Figures 1a-b display the results of running these two scenarios for both the "Georgia Gas" and the conventional gas cases. The difference in the two lines is nearly indistinguishable showing how Georgia Marketing Rule removal will not significantly affect these trends or the magnitude of emissions. In both the "Georgia Gas" and conventional gas cases the NOx and VOC emissions after 2012 are well below the 2008 MVEB or 2008 ozone maintenance plan levels with emissions from 2024-2040 never exceeding the 2024 ozone maintenance plan MVEB. Tables 1a and 1b quantify these results for the conventional gas case, further illustrating how emissions with conventional gas after 2008 never exceed these limits. The 2008 Ozone Maintenance Plan baseline year (or can be called "attainment year") is added for additional comparison.

**Table 1a: Comparison of On-Road NOx Emissions With Conventional Gas**

| Year | 2008 RFP MVEB | 2024 Maintenance Plan SIP MVEB | Conventional Gas Emissions |
|---|---|---|---|
| | tpd | tpd | tpd |
| **2013** | 272.67 | N/A | 226.39 |
| **2016** | 272.67 | N/A | 172.44 |
| **2024** | 272.67 | 126 | 99.27 |
| **2030** | 272.67 | 126 | 93.27 |
| **2040** | 272.67 | 126 | 99.49 |

**Table 1b: Comparison of On-Road VOC Emissions With Conventional Gas**

| Year | 2008 RFP MVEB | 2024 Maintenance Plan SIP MVEB | Conventional Gas Emissions |
|---|---|---|---|
| | tpd | tpd | tpd |
| **2013** | 171.83 | N/A | 113.74 |
| **2016** | 171.83 | N/A | 90.32 |
| **2024** | 171.83 | 92 | 62.82 |
| **2030** | 171.83 | 92 | 60.42 |
| **2040** | 171.83 | 92 | 66.56 |

**Figure 1a**

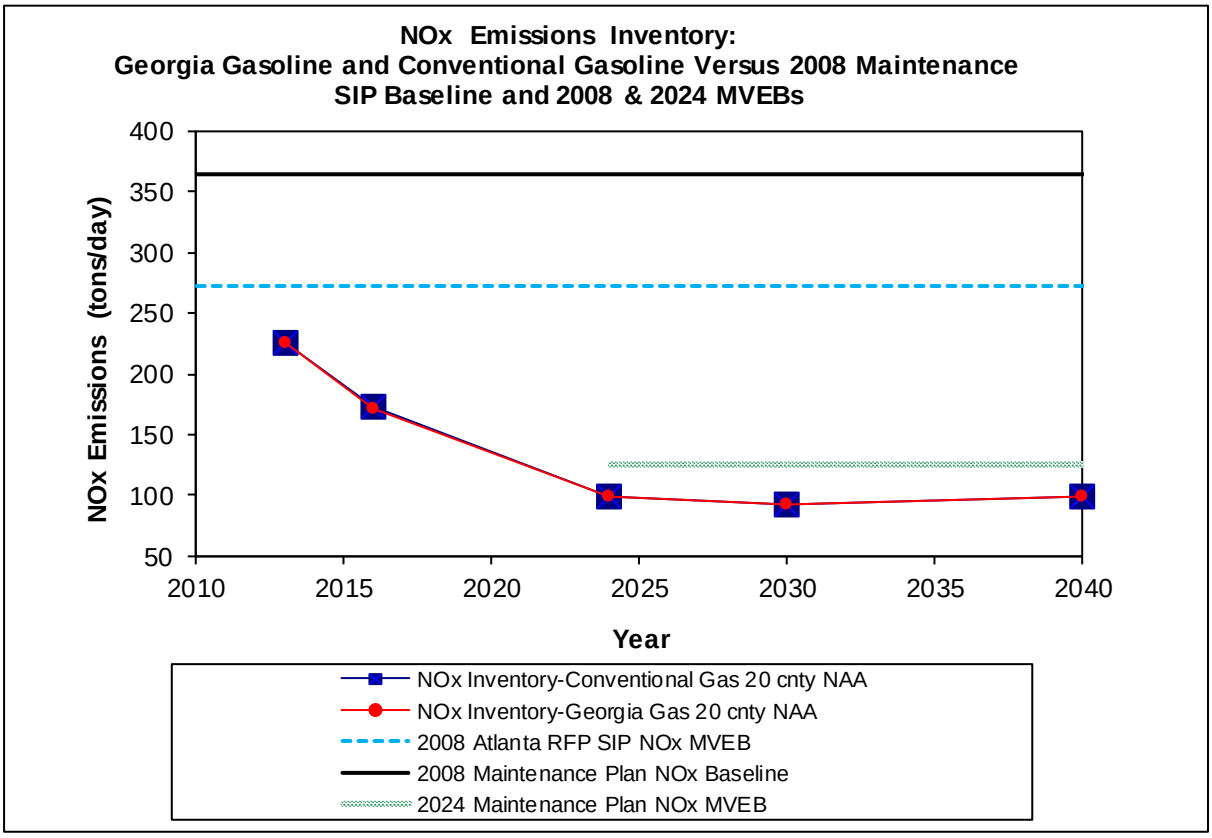
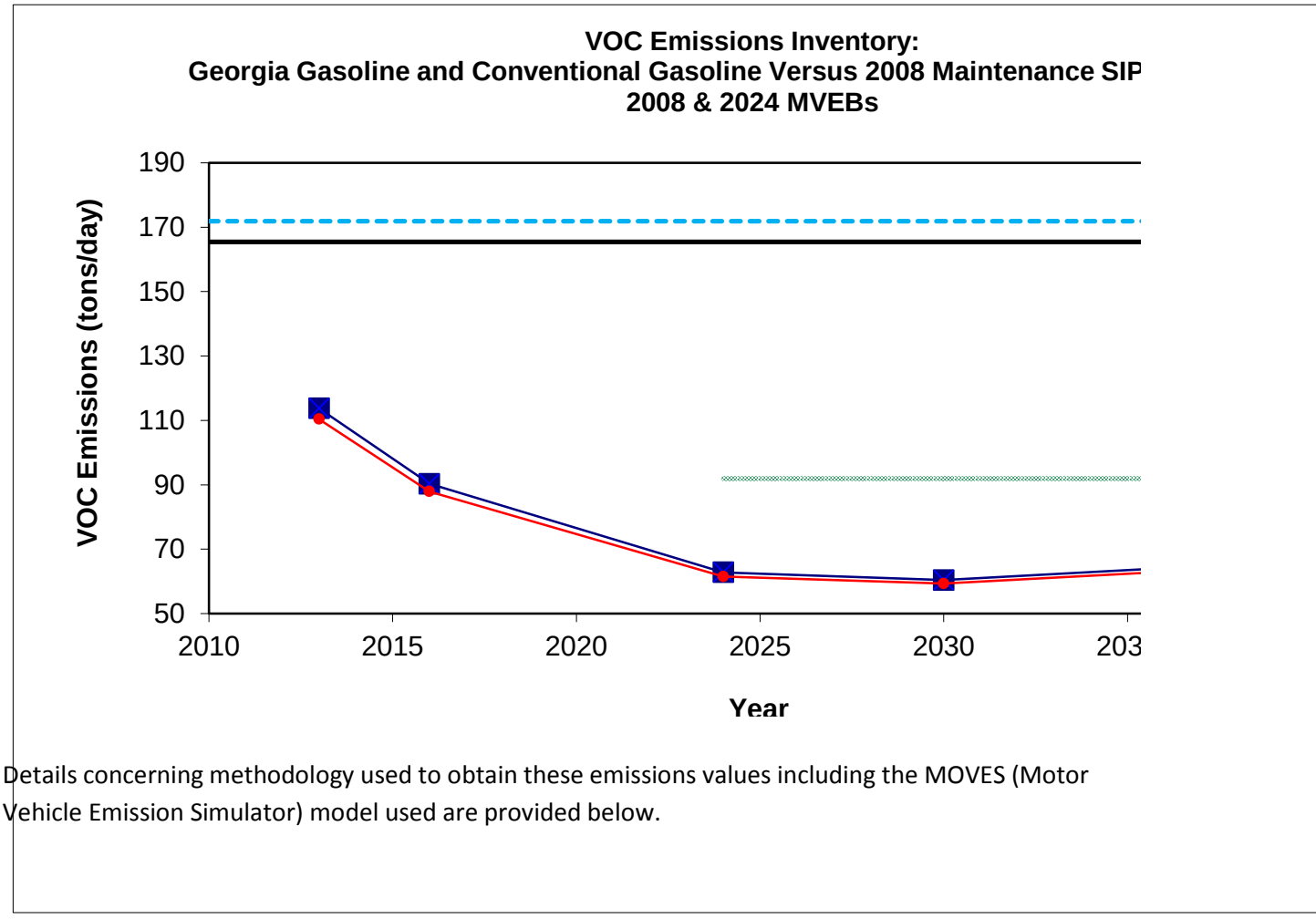


**Figure 1b**




Details concerning methodology used to obtain these emissions values including the MOVES (Motor Vehicle Emission Simulator) model used are provided below.

# Methods Used to Determine VOC and NOx Emissions Inventory for the 20-county Atlanta maintenance area for ozone and nonattainment area for PM2.5, as weall as the Georgia Marketing Rule 45-county Area of Influence

The MOVES (Motor Vehicle Emission Simulator version 2010b) was employed to calculate on-road mobile VOC and NOx emissions over the 20-county Atlanta maintenance area for ozone, 20-county nonattainment area for PM2.5 (plus portion of Putnam County) and the 45-county area of influence. In order to accomplish this task, a variety of inputs are required. These inputs are described below including how the data was collected for the years chosen in the technical demonstration. Any inputs not mentioned here used only the MOVES model defaults.

***Age Distribution***

The vehicle age distribution inputs for the former 1997 Atlanta ozone nonattainment area and current 1997 PM2.5 nonattainment area are the same as those used for our recently approved maintenance ozone SIP and recently submitted PM2.5 maintenance SIP for the Atlanta metropolitan area (ARC). Age distribution data has been developed from registration data from R.L. Polk & Co.'s National Vehicle Population Profile (current as of October 2002) and R.L Polk and Co.'s TIPNet (current as of March 2003). The input data was aggregated into representative 13-county and 7-county age distributions (e.g., each county in the 13-county area and each county in the 7-county area has the same age distribution).

These representative county regions are used since people travel within each of these areas unrestricted by county boundaries so age distributions should be very similar throughout each region. These same two 13-county and 7-county age distributions were applied to all years analyzed in this technical demonstration since it is assumed that the age distribution does not change significantly from year to year. The 13-county and 7-county regions also represent the original 13 county ozone non-attainment area and the additional 7-counties brought into the non-attainment area (for a total of 20 counties, Putnam is included in the case of PM2.5, run similarly as the 25 counties were for the ozone case) with the 1997 8-hr based ozone NAAQS. For all the inputs, Fulton county is the representative county for the 13-county area; Bartow county for both the 7-county area, and the 45-county area of influence. For the 25 additional counties, a 139 county aggregated distribution was employed based on the same developed registration data from R.L. Polk & Co. (now I.H.S) as was used in the 1997 Atlanta 8-hour Ozone Attainment Demonstration submitted to EPA on October 21, 2009.

***Annual Average VMT (hpmsvtypeyear), Road Type, Distribution, and Hour VMT Fractions***

Atlanta Regional Council (ARC) Travel Demand Model (TDM) output provides road type distributions and overall annual average daily vehicle miles traveled (AADVMT) by Highway Performance Monitoring System (HPMS) functional class (urban restricted (with ramps), urban unrestricted (no ramps), rural

restricted, and rural unrestricted). The data needs to be split by vehicle class (motorcycles, passenger cars, light duty trucks etc.), which is done using data provided by the ***Georgia Department of Transportation (GDOT): Mileage By Route, Type, and Functional Classification Reports (445 Reports - 2008),*** through HPMS and defaults from the MOVES model database. This AADVMT (annual average daily vehicle miles traveled) data that is split by vehicle class is then used to calculate an annual average VMT (hpmsvtypeyear) by multiplying the AADVMT by 342 (instead of 365.25) to account for lower volume on weekends (same method used for SIPs and transportation conformity analyses based on an EPA converter). Vehicle miles traveled varies by hour of the day so hourly VMT fractions are needed and are provided by the ARC TDM. The TDM was calibrated using HPMS data from the Georgia Department of Transportation. The TDM networks available for Atlanta were 2008, 2010, 2016, 2024, 2030 and 2040 from which input values for 2013 was interpolated for annual average VMT and hour VMT fractions.

Data is aggregated into 13-county and 7-county representative area. Hour VMT fractions are assumed to be similar for the additional 25-county area as with the 7-county area which they border. For annual average, VMT calculations started with 2008 data from GDOT's 445 Reports (the sum of VMT for 25 counties) where these values were multiplied by vehicle splits in the 7-county area to get annual average VMT by vehicle type as required by MOVES. Indications are that vehicle splits between the 25-county area and the 7-county area would be similar as well as growth (25-county grown at same rate as 7-county). Putnam in the PM2.5 case is treated similarly to the 25 counties in the ozone case.

***Source Type Population***

Source type population data has been developed from registration data from R.L. Polk & Co.'s National Vehicle Population Profile (current as of October 2002) and R.L Polk and Co.'s TIPNet (current as of March 2003). This data through the help of EPA converters was modified from being sorted by MOBILE 6 vehicle types into being based on MOVES based vehicle types.

This data had already been "grown" from 2002-2003 values to 2007 values for use in Atlanta's transportation conformity analyses and application to SIP revisions. The data can be grown either based on human population growth trends over the time period or growth trends in vehicle population from the Georgia vehicle registration database (only trends can be used not exact numbers due to difficulty of matching vehicle types in the Georgia motor vehicle registration data to the vehicle types used in R.L Polk and Co's data). Atlanta data is aggregated into 13 county and 7 county representative areas.

Table 1 below lists the vehicle type and preferred method. Using this table is consistent with what has been used in the previous national emissions inventory (NEI) compilation and with regards to any SIP motor vehicle budget determinations with MOVES. As indicated in Table 1, human population is adequate for all vehicle types except motorcycles, buses and combination long haul trucks. For motorcycles and buses, ratio of vehicle population is used instead. For example, if source type population is grown from 2007 to 2009 then the 2007 data is multiplied by 2009 human population/2007 human population unless a bus or motorcycle where it will be multiplied by 2011 vehicle population/2009 vehicle population. For Atlanta, these human population ratios have already

been developed in a "Source Type Population Growth Table". For motorcycles and buses vehicle population ratios can be constructed from the "Georgia Statistics System – University of Georgia" website, www.georgiastats.uga.edu which organized by county all the Georgia vehicle registration data for public use. In this particular analysis source type population had already been developed using the above methodology for Atlanta for 2008, 2010, 2016, 2024, 2030 and 2040 through conformity determination reports and SIP development with 2013 data developed through linear interpolation between the 2010 and 2016 source type population. 2002 data was also available to provide a conformity baseline.

**Table 1. List of different growth factors used by vehicle types**

| Vehicle types | Growth factor |
|---|---|
| 11 (Motorcycles) | Georgia registration data, Motor cycles |
| 21 (Passenger cars) | Human Population |
| 31 (Passenger truck) | Human Population |
| 32 (Light commercial truck) | Human Population |
| 41 (Intercity Bus) | Georgia registration data, Buses |
| 42 (Transit Bus) | Georgia registration data, Buses |
| 43 (School Bus) | Georgia registration data, Buses |
| 51 (Refuse Truck) | Human Population |
| 52 (Single Unit Short Haul Truck) | Human Population |
| 53 (Single Unit Long Haul Truck) | Human Population |
| 54 (Motor Home) | Human Population |
| 61 (Combination Short Haul Truck) | Human Population |
| 62 (Combination Long Haul Truck) | Special methodology (see below) |

For all cases with vehicle type 62-long haul combination trucks, a special determination is required because these vehicles do not reside in the areas investigated but usually just pass through the area along interstate routes. So, local population and vehicle registration data is not going to help since these vehicles are not part of the local population or registered in the state, but how far they all travel while they are in Georgia and how much far an average vehicle travels yearly in the U.S. are helpful. Local annual average total VMT for vehicle type 62 and national annual average VMT per vehicle 62 are required (this latter term is directly from MOVES). MOVES national default total population and estimated local annual VMT of HPMS based vehicle type 60 are required as well for preliminary calculations. HPMS vehicle type 60 is the sum of MOVES vehicle type 61 and 62. The original data is in terms of HMPS vehicle type 60 as well and the goal here is to know what fraction of this VMT amount is from vehicle type 62 (filtering out vehicle type 61 in the process) on interstates with vehicles that could originate anywhere in the country.

This preliminary calculation is:

> *local annual average total VMT by vehicle type 62=*
> *HMPS vehicle type 60 local VMT x national default population vehicle type 62/(sum of national default population vehicle type 61+62))*

The final calculation is:

> *vehicle type 62 population=*
> *local annual average total VMT by vehicle 62/national average VMT per vehicle 62.*

HPMS vehicle type 60 local data used in this calculation is from TDM model-based annual VMT output data for the 20-county Atlanta region split by vehicle type based on MOVES defaults and HPMS counts.

For the additional 25-county area, the same principle was applied as for the 20 counties in the Atlanta area with the population data grown from 2002 to 2007. However, 2011 National Emissions Inventory population data was available to use which was derived by growing the 2007 data further to 2011. The 2007 and 2011 population data allowed for 2008 and 2010 values to be determined via linear interpolation. 2010 population was grown to 2013, 2016, 2024, 2030, and 2040 based on rate of growth of vehicle population observed for the 7 county Atlanta area (25 county ring is adjacent to the 7 county ring so growth should be equivalent) and used in this demonstration as well as other SIP and conformity work.

***Ramp Fraction and Road Type Distribution***

Atlanta Regional Commission (ARC)'s TDM model output provided road type distributions and ramp fractions based on travel networks developed by the ARC. Road fraction and road type distribution data were aggregated into 13-county and 7-county regions for the Atlanta data. 2013 data was linearly interpolated between 2010 and 2016 values for both ramp fraction and road type distribution. For the 25 county area, ramp fractions for the 7 county area was employed as well as for road type distribution (this local data approach assuming similar road characteristics with neighboring ring of counties viewed as superior to use of just MOVES defaults or other alternatives).

***Average Speed Distribution***

ARC TDM output provided average speed distribution by road type and source type aggregated into 13 and 7 counties. 2013 average speed distribution data for the Atlanta region were developed through linear interpolation between 2010 and 2016 values For the 25 additional counties, the 7-county average speed distribution was employed with this distribution assumed to not vary between these neighboring ringed areas (this local data approach is superior to just national MOVES defaults). Also, this assumption is conservative because there is likely more congestion in the 7 county area than 25 county area.

***I/M coverage***

The original 13 county Atlanta non-attainment area for the 1-hour based ozone NAAQS has an ongoing I/M program. The MOVES default database pertaining to Georgia starting in year 2002 were removed because the regular MOVES default databases have I/M information for Atlanta that are faulty; however this data is replaced by the input I/M coverage file. This local I/M data is provided from the Georgia EPD Mobile & Area Sources program's I/M unit. The 7-county area and the remaining 25 counties in the 45-county area of influence have no I/M program. Putnam County in the PM2.5 case was treating the same as the remaining 25 counties in the ozone case.

***County Year- Stage II vapor recovery efficiency***

For SIP work and transportation conformity assessments the state of Georgia has assumed, for the 13-county area, a vapor recovery efficiency of 81% during refueling with regards to any vapors released into the air. A 0% reduction in fuel spillage benefit has been determined. The 7-county area and remaining 25 counties in the 45-county area of influence (and Putnam in the PM2.5 case) have no program so the default value of 0 is used. Stage II vapor recovery is being phased out of the Atlanta area, however, this is because of redundancy with the On-Board Refueling Vapor Recovery (ORVR) systems in newer motor vehicles (EPA has declared ORVR in "widespread use" as of May 16, 2012 (77 FR 28772)), so no additional VOC emissions will be seen in future years (2016, 2024, 2030, 2040) from this action, so the efficiency was not changed in MOVES 2010b which does not take into account the replacement with ORVR (ORVR efficiency and widespread use in >81% of vehicles actually makes this efficiency assumption conservative).

***Fuel Type-Formulation***

For all years analyzed in this study, it was assumed that 100 percent of the gasoline supply contained 10% ethanol (E-10) and that the month investigated was July (typical summer day) to provide for maximum possible emissions values when applying the ozone NAAQS standard case. For the PM2.5 NAAQS analysis, the fuel was annualized where each fuel blend was divided into fractions of use throughout the year and then these fractions were applied to one fuel month (July was the dummy month to match the ozone runs). The default fuel supply files from MOVES were modified to reflect this ethanol assumption for 2008 and 2010 model years (the rest already assumed in MOVES to be all E-10).

The default values for MOVES for fuel supply/formulation that are used here for this demonstration are the same values utilized in the approved ozone maintenance SIP and submitted PM2.5 maintenance SIP as well as all FHWA approved Atlanta area conformity determinations (CDRs) since MOVES has been employed. By making these choices, a demonstration of non-interference in this case would assure that removal of the Georgia Marketing Rule would not interfere with attainment and conformity in all other cases. For the Georgia Gas case, nothing else was modified in the fuel supply or fuel formulation MOVES

default database. For the conventional gas case, the RVP in the fuel formulation table was modified to reflect the 0.8 (13 county 1-hr ozone NAAQS nonattainment area consisting of Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglass, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale counties) and 2.0 RVP increase (rest of the area analyzed) with Georgia Marketing Rule removal. The input data is usually grouped into 13, 7, and 25 counties which represent the ozone attainment status within the 45 county Georgia Marketing Rule area (13 counties from old 1-hr ozone NAAQS NAA, 7 counties added to 13 county area for 1997 8-hr ozone NAAQS NAA (now maintenance, rest attainment). In the case of PM2.5 there is just the 20 county NAA plus a portion of Putnam County that are of concern, although fuel property differences require groupings of 13 and 7 counties (plus Putnam) for PM2.5 as well.
The fuel blends in detail are illustrated in the Tables 2a-2c for ozone NAAQS and 2d-2e for PM2.5 NAAQS below (yellow areas are where fuel blend was changed from GA gasoline to conventional gasoline):

Table 2a. Fuel for Years 2013, 2016, 2024, 2030, and 2040.

| | 13 Counties | | | 7 Counties | | Remaining 25 Counties** | | |
|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 3847 | 3847 | 20011 | 30 | 3838 | 3838 | 20011 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 7.8 | 8.6 | 0 | 0 | 7.7 | 9.7 | 0 | 0 |
| Sulfur Level | 22.5787 | 22.5787 | 11 | 0 | 22.5787 | 22.5787 | 11 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 26.6551 | 26.6551 | 0 | 0 | 26.6551 | 26.6551 | 0 | 0 |
| Olefin Content | 6.47 | 6.47 | 0 | 0 | 6.47 | 6.47 | 0 | 0 |
| Benzene Content | 0.6325 | 0.6325 | 0 | 0 | 0.6325 | 0.6325 | 0 | 0 |
| e200 | 50.7634 | 50.7634 | 0 | 0 | 50.7634 | 50.7634 | 0 | 0 |
| e300 | 88.5038 | 88.5038 | 0 | 0 | 88.5038 | 88.5038 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | |
| Cetane Index | | | | | | | | |
| PAH Content | | | | | | | | |
| T50 | 198.258 | 198.258 | 0 | 0 | 198.258 | 198.258 | 0 | 0 |
| T90 | 304.392 | 304.392 | 0 | 0 | 304.392 | 304.392 | 0 | 0 |

* 12 means "E-10 gasoline: Gasoline with 9-10% ethanol content", 20 means diesel, 30 means natural gas.
** Zeroes in this column indicate that these variables do not apply in emissions calculations for this non-gasoline fuel.

Table 2b. Fuel Year 2010 (Assuming all E-110) Used to Help Illustrate Trends.

| | 13 Counties | | | | 7 Counties | | | | Remaining 25 Counties*** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 3135 | 3135 | 20011 | 30 | 3124 | 3124 | 20011 | 30 | 3130 | 3130 | 20011 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 7.48571 | 8.28571 | 0 | 0 | 7.41429 | 9.41429 | 0 | 0 | 7.41429 | 9.41429 | 0 | 0 |
| Sulfur Level | 30 | 30 | 11 | 0 | 30 | 30 | 11 | 0 | 30 | 30 | 11 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 28.5165 | 28.5165 | 0 | 0 | 28.5165 | 28.5165 | 0 | 0 | 28.5165 | 28.5165 | 0 | 0 |
| Olefin Content | 6.47 | 6.47 | 0 | 0 | 6.47 | 6.47 | 0 | 0 | 6.47 | 6.47 | 0 | 0 |
| Benzene Content | 0.64 | 0.64 | 0 | 0 | 0.64 | 0.64 | 0 | 0 | 0.8 | 0.8 | 0 | 0 |
| e200 | 47.7167 | 47.7167 | 0 | 0 | 47.7167 | 47.7167 | 0 | 0 | 47.7167 | 47.7167 | 0 | 0 |
| e300 | 86.3913 | 86.3913 | 0 | 0 | 86.3913 | 86.3913 | 0 | 0 | 86.3913 | 86.3913 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | | | | | |
| Cetane Index | | | | | | | | | | | | |
| PAH Content | | | | | | | | | | | | |
| T50 | 204.476 | 204.476 | 0 | 0 | 204.476 | 204.476 | 0 | 0 | 204.476 | 204.476 | 0 | 0 |
| T90 | 313.994 | 313.994 | 0 | 0 | 313.994 | 313.994 | 0 | 0 | 313.994 | 313.994 | 0 | 0 |

* 12 means "E-10 gasoline: Gasoline with 9-10% ethanol content", 20 means diesel, 30 means natural gas.

** Zeroes in this column indicate that these variables do not apply in emissions calculations for this non-gasoline fuel.

***Only difference between 7 and 25 county fuels is benzene content which has zero impact on VOC and Nox emissions future fuel. and this benzene difference is not seen in any current or future fuel.

Table 2c. Fuel for Year 2008 (Assuming all E-10) Used to Help Illustrate Trends.

| | 13 Counties | | | | 7 Counties | | | | Remaining 25 Counties*** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 2334 | 2334 | 20043 | 30 | 2323 | 2323 | 20043 | 30 | 2329 | 2329 | 20043 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 7.17143 | 7.97143 | 0 | 0 | 7.12857 | 9.12857 | 0 | 0 | 7.12857 | 9.12857 | 0 | 0 |
| Sulfur Level | 28.1775 | 28.1775 | 43 | 0 | 28.1775 | 28.1775 | 43 | 0 | 28.1775 | 28.1775 | 43 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 30.3779 | 30.3779 | 0 | 0 | 30.3779 | 30.3779 | 0 | 0 | 30.3779 | 30.3779 | 0 | 0 |
| Olefin Content | 6.47 | 6.47 | 0 | 0 | 6.47 | 6.47 | 0 | 0 | 6.47 | 6.47 | 0 | 0 |
| Benzene Content | 0.94 | 0.94 | 0 | 0 | 0.94 | 0.94 | 0 | 0 | 1.09 | 1.09 | 0 | 0 |
| e200 | 44.67 | 44.67 | 0 | 0 | 44.67 | 44.67 | 0 | 0 | 44.67 | 44.67 | 0 | 0 |
| e300 | 84.2788 | 84.2788 | 0 | 0 | 84.2788 | 84.2788 | 0 | 0 | 84.2788 | 84.2788 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | | | | | |
| Cetane Index | | | | | | | | | | | | |
| PAH Content | | | | | | | | | | | | |
| T50 | 210.694 | 210.694 | 0 | 0 | 210.694 | 210.694 | 0 | 0 | 210.694 | 210.694 | 0 | 0 |
| T90 | 323.596 | 323.596 | 0 | 0 | 323.596 | 323.596 | 0 | 0 | 323.596 | 323.596 | 0 | 0 |

* 12 means "E-10 gasoline: Gasoline with 9-10% ethanol content", 20 means diesel, 30 means natural gas.

** Zeroes in this column indicate that these variables do not apply in emissions calculations for this non-gasoline fuel.

***Only difference between 7 and 25 county fuels is benzene content which has zero impact on VOC and Nox emissions future fuel and this benzene difference is not seen in any current or future fuel.

Table 2d. Fuel for Years 2016, 2024, 2030, and 2040

Summer Months (33.3% of the year, months 6,7,8, and 9)

| | 13 Counties | | | | 7 Counties | | | |
|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 3847 | 3847 | 20011 | 30 | 3838 | 3838 | 20011 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 7.8 | 8.6 | 0 | 0 | 7.7 | 9.7 | 0 | 0 |
| Sulfur Level | 22.5787 | 22.5787 | 11 | 0 | 22.5787 | 22.5787 | 11 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 26.6551 | 26.6551 | 0 | 0 | 26.6551 | 26.6551 | 0 | 0 |
| Olefin Content | 6.47 | 6.47 | 0 | 0 | 6.47 | 6.47 | 0 | 0 |
| Benzene Content | 0.6325 | 0.6325 | 0 | 0 | 0.6325 | 0.6325 | 0 | 0 |
| e200 | 50.7634 | 50.7634 | 0 | 0 | 50.7634 | 50.7634 | 0 | 0 |
| e300 | 88.5038 | 88.5038 | 0 | 0 | 88.5038 | 88.5038 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | |
| Cetane Index | | | | | | | | |
| PAH Content | | | | | | | | |
| T50 | 198.258 | 198.258 | 0 | 0 | 198.258 | 198.258 | 0 | 0 |
| T90 | 304.392 | 304.392 | 0 | 0 | 304.392 | 304.392 | 0 | 0 |

Table 2d. (Continued) Fuel for Years 2016, 2024, 2030, and 2040
Fall/Spring Months (41.7% of the year, months 3,4,5,10, and 11) Where Georgia Gas and Conventional Gas are Identical

| | 13 Counties | | | | 7 Counties | | | |
|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 3846 | 3846 | 20011 | 30 | 3837 | 3837 | 20011 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 10.1143 | 10.1143 | 0 | 0 | 10.0571 | 10.0571 | 0 | 0 |
| Sulfur Level | 23.9192 | 23.9192 | 11 | 0 | 23.9192 | 23.9192 | 11 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 24.4686 | 24.4686 | 0 | 0 | 24.4686 | 24.4686 | 0 | 0 |
| Olefin Content | 7.09571 | 7.09571 | 0 | 0 | 7.09571 | 7.09571 | 0 | 0 |
| Benzene Content | 0.611071 | 0.611071 | 0 | 0 | 0.611071 | 0.611071 | 0 | 0 |
| e200 | 52.8114 | 52.8114 | 0 | 0 | 52.8114 | 52.8114 | 0 | 0 |
| e300 | 88.2882 | 88.2882 | 0 | 0 | 88.2882 | 88.2882 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | |
| Cetane Index | | | | | | | | |
| PAH Content | | | | | | | | |
| T50 | 194.079 | 194.079 | 0 | 0 | 194.079 | 194.079 | 0 | 0 |
| T90 | 305.372 | 305.372 | 0 | 0 | 305.372 | 305.372 | 0 | 0 |

Table 2d. (Continued). Fuel for Years 2016, 2024, 2030, and 2040
Winter Months (25% of the year, months 1,2, and 12) Where Georgia Gas and Conventional Gas are Identical

| | 13 Counties | | | | 7 Counties | | | |
|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 3836 | 3836 | 20011 | 30 | 3836 | 3836 | 20011 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 13.2 | 13.2 | 0 | 0 | 13.2 | 13.2 | 0 | 0 |
| Sulfur Level | 25.7066 | 25.7066 | 11 | 0 | 25.7066 | 25.7066 | 11 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 21.5534 | 21.5534 | 0 | 0 | 21.5534 | 21.5534 | 0 | 0 |
| Olefin Content | 7.93 | 7.93 | 0 | 0 | 7.93 | 7.93 | 0 | 0 |
| Benzene Content | 0.5825 | 0.5825 | 0 | 0 | 0.5825 | 0.5825 | 0 | 0 |
| e200 | 55.5422 | 55.5422 | 0 | 0 | 55.5422 | 55.5422 | 0 | 0 |
| e300 | 88.0009 | 88.0009 | 0 | 0 | 88.0009 | 88.0009 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | |
| Cetane Index | | | | | | | | |
| PAH Content | | | | | | | | |
| T50 | 188.506 | 188.506 | 0 | 0 | 188.506 | 188.506 | 0 | 0 |
| T90 | 306.678 | 306.678 | 0 | 0 | 306.678 | 306.678 | 0 | 0 |

* 12 means "E-10 gasoline: Gasoline with 9-10% ethanol content", 20 means diesel, 30 means natural gas.
** Zeroes in this column indicate that these variables do not apply in emissions calculations for this non-gasoline fuel.

Table 2e. Fuel for Year 2008 (Assuming All E-10) Used to Illustrate Trends.
Summer Months (33.3% of the year, months 6,7,8, and 9)

| | 13 Counties | | | | 7 Counties | | | |
|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 2334 | 2334 | 20043 | 30 | 2323 | 2323 | 20043 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 7.17143 | 7.97143 | 0 | 0 | 7.12857 | 9.12857 | 0 | 0 |
| Sulfur Level | 28.1775 | 28.1775 | 43 | 0 | 28.1775 | 28.1775 | 43 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 30.3779 | 30.3779 | 0 | 0 | 30.3779 | 30.3779 | 0 | 0 |
| Olefin Content | 6.47 | 6.47 | 0 | 0 | 6.47 | 6.47 | 0 | 0 |
| Benzene Content | 0.94 | 0.94 | 0 | 0 | 0.94 | 0.94 | 0 | 0 |
| e200 | 44.67 | 44.67 | 0 | 0 | 44.67 | 44.67 | 0 | 0 |
| e300 | 84.2788 | 84.2788 | 0 | 0 | 84.2788 | 84.2788 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | |
| Cetane Index | | | | | | | | |
| PAH Content | | | | | | | | |
| T50 | 210.694 | 210.694 | 0 | 0 | 210.694 | 210.694 | 0 | 0 |
| T90 | 323.596 | 323.596 | 0 | 0 | 323.596 | 323.596 | 0 | 0 |

Table 2e. (Continued) Fuel for Year 2008

Fall/Spring Months (41.7% of the year, months 3,4,5,10, and 11) Where Georgia Gas and Conventional Gas are Identical

| | 13 Counties | | | | 7 Counties | | | |
|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 2333 | 2333 | 20043 | 30 | 2322 | 2322 | 20043 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 9.62531 | 9.62531 | 0 | 0 | 9.6008 | 9.6008 | 0 | 0 |
| Sulfur Level | 29.13 | 29.13 | 43 | 0 | 29.13 | 29.13 | 43 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 28.1796 | 28.1796 | 0 | 0 | 28.1796 | 28.1796 | 0 | 0 |
| Olefin Content | 7.09571 | 7.09571 | 0 | 0 | 7.09571 | 7.09571 | 0 | 0 |
| Benzene Content | 0.871429 | 0.871429 | 0 | 0 | 0.871429 | 0.871429 | 0 | 0 |
| e200 | 47.4849 | 47.4849 | 0 | 0 | 47.4849 | 47.4849 | 0 | 0 |
| e300 | 84.13 | 84.13 | 0 | 0 | 84.13 | 84.13 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | |
| Cetane Index | | | | | | | | |
| PAH Content | | | | | | | | |
| T50 | 204.949 | 204.949 | 0 | 0 | 204.949 | 204.949 | 0 | 0 |
| T90 | 324.273 | 324.273 | 0 | 0 | 324.273 | 324.273 | 0 | 0 |

Table 2e. (Continued) Fuel for Year 2008

Winter Months (25% of the year, months 1,2, and 12) Where Georgia Gas and Conventional Gas are Identical

| | 13 Counties | | | | 7 Counties | | | |
|---|---|---|---|---|---|---|---|---|
| | GA Gas | Conv. Gas | Diesel** | Nat. Gas** | GA Gas | Conv. Gas | Diesel** | Nat. Gas** |
| Fuel Formulation ID | 2321 | 2321 | 20043 | 30 | 2321 | 2321 | 20043 | 30 |
| FuelSub type ID* | 12 | 12 | 20 | 30 | 12 | 12 | 20 | 30 |
| RVP | 12.8971 | 12.8971 | 0 | 0 | 12.8971 | 12.8971 | 0 | 0 |
| Sulfur Level | 30.4 | 30.4 | 43 | 0 | 30.4 | 30.4 | 43 | 0 |
| ETOH Volume | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 |
| MTBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ETBE Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TAME Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aromatic Content | 25.2486 | 25.2486 | 0 | 0 | 25.2486 | 25.2486 | 0 | 0 |
| Olefin Content | 7.93 | 7.93 | 0 | 0 | 7.93 | 7.93 | 0 | 0 |
| Benzene Content | 0.78 | 0.78 | 0 | 0 | 0.78 | 0.78 | 0 | 0 |
| e200 | 51.2381 | 51.2381 | 0 | 0 | 51.2381 | 51.2381 | 0 | 0 |
| e300 | 83.9318 | 83.9318 | 0 | 0 | 83.9318 | 83.9318 | 0 | 0 |
| Vol To Wt Percent Oxy | 0.3488 | 0.3488 | 0 | 0 | 0.3488 | 0.3488 | 0 | 0 |
| BioDiesel Ester Volume | | | | | | | | |
| Cetane Index | | | | | | | | |
| PAH Content | | | | | | | | |
| T50 | 197.29 | 197.29 | 0 | 0 | 197.29 | 197.29 | 0 | 0 |
| T90 | 325.174 | 325.174 | 0 | 0 | 325.174 | 325.174 | 0 | 0 |

* 12 means "E-10 gasoline: Gasoline with 9-10% ethanol content", 20 means diesel, 30 means natural gas.

** Zeroes in this column indicate that these variables do not apply in emissions calculations for this non-gasoline fuel.

***Meteorology:***

The same meteorological assumptions regarding temperature and relative humidity were employed here as in the Atlanta maintenance plan for the 1997 8-hr ozone NAAQS which is "typical July" (based on July 2008) and the submitted Atlanta maintenance plan for the 1997 annual PM2.5 NAAQS (annualized meteorology based on 2008). For the 25 county area Floyd&Bartow county meteorology (2008, typical July and same year as the other groupings) was applied which is a good fit since the average maximum temperatures are a little higher (and relative humidity a little lower) than Atlanta. Although Atlanta is in the center of the 25 county ring and would make a good average, we chose this approach since it includes one of the 25 counties, is conservative (higher emissions), and makes sure we took into account the slightly higher influence of the southern warmer counties near Macon.

Extra Notes:

For Putnam county, the whole county was run in MOVES with emissions calculated based on the above input methodologies and then a fraction (0.164) was applied to the nonattainment portion, the fraction identical to what was applied in the submitted PM2.5 maintenance plan (represents fraction of Putnam county's population residing in NAA portion). Heard county is also in the NAA, but has no regular vehicular traffic so no emissions are assessed to it.
Other variables for MOVES inputs were taken directly from inputs used in the relevant maintenance plan for the relevant NAAQS.

# Methodology for 15-county Non-Attainment Area Aggregated Input Data Collection for This Analysis

The Atlanta area was designated nonattainment in 1991 for 13-counties for the 1990 1-hour ozone standard: Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale.

On April 30, 2004, EPA designated 20-counties as nonattainment area under the 1997 8-hour ozone standard. The eight-hour ozone nonattainment area encompasses the 13-counties of the former 1-hour ozone nonattainment area plus seven additional "ring" counties. These 7-counties included the counties of Barrow, Bartow, Carroll, Hall, Newton, Spalding, and Walton.
On May 21, 2012, EPA published a final rule in the federal register designating a new 15-county Atlanta area marginal nonattainment for the 2008 8-hour Ozone National Ambient Air Quality Standard. The 15-county area includes the counties of Bartow, Cherokee, Clayton, Cobb, Coweta, Dekalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, and Rockdale.

This section of the document shows the methodology used to aggregate input data from 15 counties for the Georgia Marketing Analysis for the Rule Removal SIP.
Data was aggregated into input files for the new 15-county NAA for the 2008 8-hr ozone NAAQS by the following steps:

Emissions information already compiled and interpolated for the 13-county area in the TDM network was kept as it was, since the 13-county area is a subset of the 15 counties. However, the data for two counties, Bartow and Newton, would need to be disaggregated from the 7-counties data.

For the 2 counties, it was assumed that the characteristics were similar to the 7 counties (hence why it was okay for them to be aggregated to the other 5 in the first place) so distributions for the 2 counties were identical as were used as inputs for the 7-county case. Inputs included average speed distributions, age distributions, road type distributions, vmt fractions (hour, day and month), ramp fractions, inspection and maintenance program (there was none), and meteorology (same geographic area). Two inputs that required a reanalysis were vehicle population and annual average daily vehicle miles traveled (AADVMT). National Emissions Inventory (NEI) data for 2011 for Bartow and Newton counties were combined and used as initial values. Initial 2011 values were “grown” to produce input values for 2013, 2016, 2024, 2030, 2040 (the same years as for the 1997 ozone NAAQS analysis except only focusing on the present and future year impacts) by multiplying the 2011 vehicle population and AADVMT by the percent increase in these variables between model network years for the 7-county area. Fuel blend for the 2 counties had to take into account a 2.0 psi increase with Georgia Gasoline removal and not 0.8 because they were not in the former nonattainment area for the now revoked 1-hr ozone NAAQS so the RVP rule for general conventional gasoline (9.0 psi + 1.0 psi ethanol waiver) areas applies there.

In order to grow the inputs from 2011 to 2013, an assumption had to be made to rely on a trend from 2010 to 2013 since there was no 2011 network and that the trend would not vary significantly between these years. The MOVES model was run with the 2 county inputs for the Georgia Gas and conventional gasoline cases for each year and pollutant.

By adding the 13-county and the 2-county emissions together for each pollutant (NOx and VOCs) for each year for the Georgia gasoline and conventional gasoline cases, Georgia EPD was able to illustrate impact of removal of Georgia Marketing Rule for the current non-attainment area in place for the 2008 ozone NAAQS.

# Total Inventory Analysis

In Georgia's Redesignation Request and Maintenance Plan for the Atlanta 1997 8-hour Ozone Nonattainment Area and 1997 PM2.5 Nonattainment Area, it was demonstrated that future (through 2024) total NOx and VOC emissions from all identified sources remained well below the emissions levels calculated in 2008, the year Atlanta attained the 1997 8-hour ozone and PM2.5 NAAQS ("Attainment Inventory"). A similar demonstration is made below to illustrate how removal of the Gasoline Marketing Rule will not impact Atlanta's ability to maintain total emissions well below the Attainment Inventory. In fact, Figures 4a-b, 5 and Tables 4a-b, 5 not only confirm that conventional gas emissions remain below the Attainment Inventory, but also show how:

- The difference between the Attainment Inventory and future total emissions with both Georgia and conventional gasoline increase over time
- Emissions decrease over time for both the Georgia Gasoline and Conventional Gasoline case (Gasoline Marketing rule removed along with more stringent conventional gasoline nonattainment area RVP requirements still in place for 13 counties)
- Total emissions as depicted by lines and points are nearly indistinguishable between the Georgia Gasoline and Conventional Gasoline case

Most of the emission years used for the demonstration in the Maintenance Plan for the Atlanta 1997 8-hour Ozone and PM2.5 Nonattainment Areas (2008, 2014, 2017, 2020, and 2030) differed from the years applied in this Gasoline Marketing Rule analysis (2008, 2010, 2013, 2016, 2024, 2030, 2040) which is based on the network years available in the ARC TDM. To match the years and provide a good comparison, emissions for the Georgia Gasoline and conventional gasoline cases were interpolated between TDM years to match up with the Maintenance Plan inventory years. The total emissions for a given year in the Maintenance Plan demonstration (beyond the attainment year) are the same as the total emissions inventory in the Georgia Gasoline case since Georgia Gasoline was the fuel formulation used in the Maintenance Plan. The total emissions including Georgia Gasoline and the increase in emissions from switch over to conventional gas were added together to obtain a total inventory for conventional gasoline.

Figure 4a: **Comparison of Total NOx Emissions With Conventional Gas versus Emissions Limits**

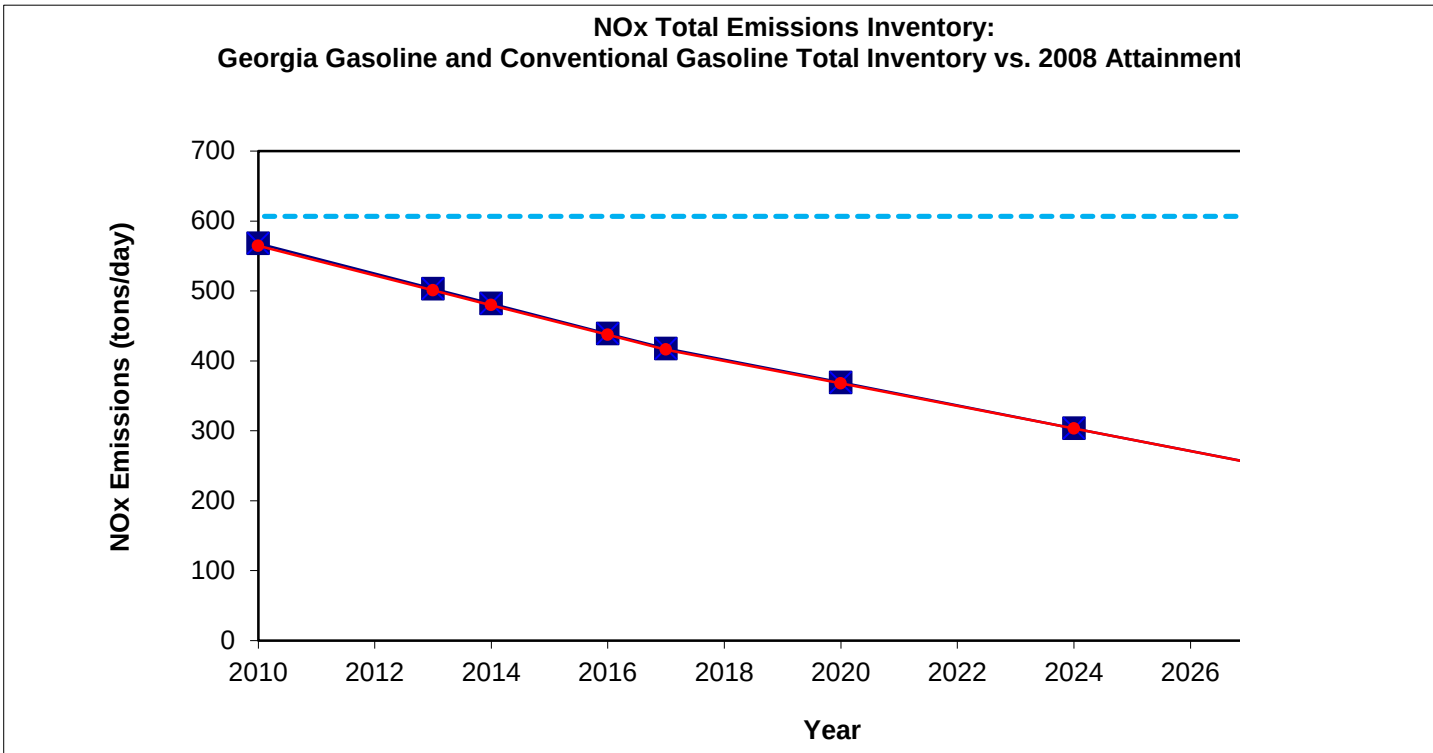



**Table 4a: Comparison of Total NOx Emissions With Conventional Gas versus Emission Limits**

| Year | Total 2008 Attainment Inventory | Total Emissions Inventory Georgia Gasoline | Total Emissions Inventory Conventional Gasoline | The Margin: 2008 Attainment Inventory - Total Emissions using Georgia Gasoline | Margin allotted to switch to conventional gasoline | % of Margin allotted to switch to conventional gasoline | Remaining Margin: 2008 Attainment Inventory - Total Emissions using Conventional Gasoline |
|---|---|---|---|---|---|---|---|
| | tpd | Tpd | tpd | tpd | tpd | % | tpd |
| **2010** | 606.78 | 564.39 | 566.20 | 42.39 | 1.81 | 4.27 | 40.58 |
| **2013** | 606.78 | 500.80 | 502.11 | 105.98 | 1.32 | 1.24 | 104.67 |
| **2014** | 606.78 | 479.60 | 480.77 | 127.18 | 1.17 | 0.92 | 126.01 |
| **2016** | 606.78 | 437.21 | 438.07 | 169.57 | 0.87 | 0.51 | 168.71 |
| **2017** | 606.78 | 416.01 | 416.84 | 190.77 | 0.83 | 0.43 | 189.94 |
| **2020** | 606.78 | 367.67 | 368.40 | 239.11 | 0.73 | 0.30 | 238.38 |
| **2024** | 606.78 | 303.19 | 303.35 | 303.59 | 0.16 | 0.05 | 303.43 |
| **2030** | 606.78 | 206.47 | 206.55 | 400.31 | 0.08 | 0.02 | 400.23 |

Difference between the Attainment Inventory and Total Emissions using Georgia Gasoline is referred to as “The Margin” since this is like a safety margin between actual emissions and the level at which an increase in emissions would lead to concerns over resulting nonattainment. This margin increases to over 400 tons/day of NOx by 2030 with the increase in emissions with Gasoline Marketing rule removal less than 0.1 tons/day or just 0.02% of the margin. By 2040 there is no difference in NOx emissions between Georgia Gas and conventional gas.

**Figure 4b: Comparison of Total VOC Emissions with Conventional Gas versus Emissions Limits.**

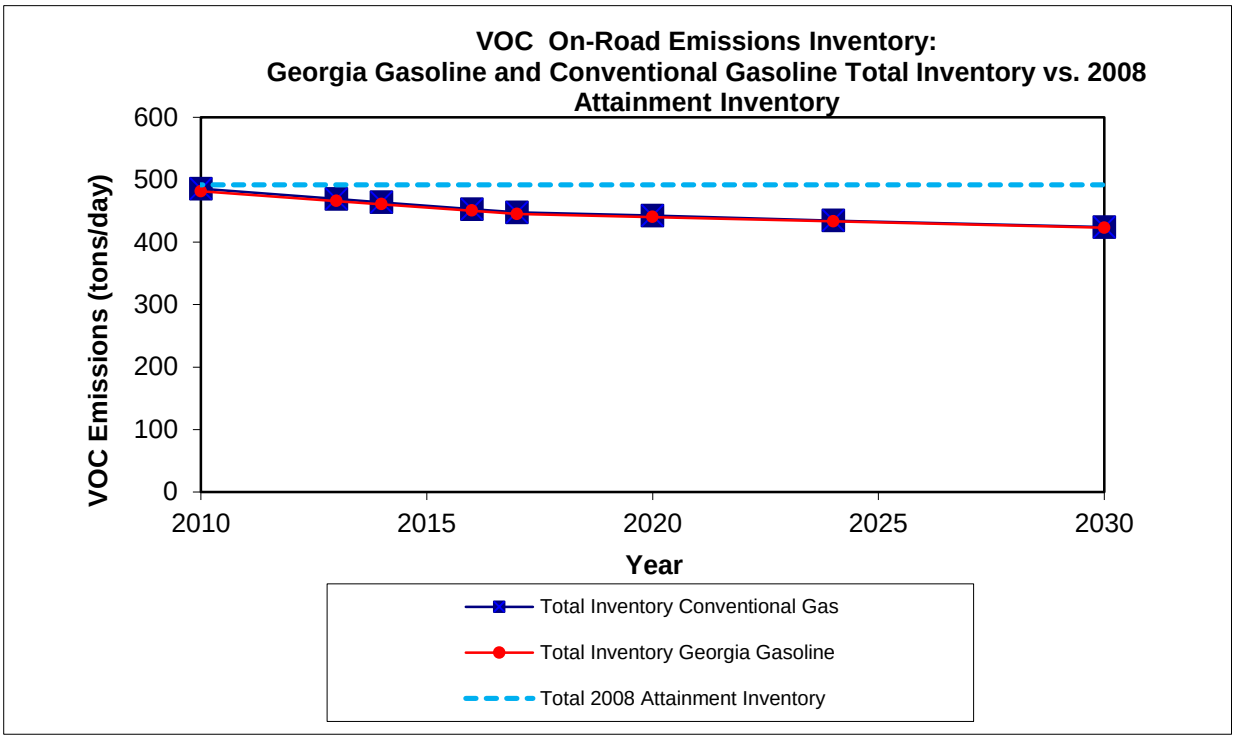


**Table 4b: Comparison of Total VOC Emissions with Conventional Gas versus Emissions Limits**

| Year | Total 2008 Attainment Inventory | Total Emissions Inventory Georgia Gasoline | Total Emissions Inventory Conventional Gasoline | The Margin: 2008 Attainment Inventory - Total Emissions using Georgia Gasoline | Margin allotted to switch to Conventional Gasoline | % of Margin allotted to switch to Conventional Gasoline | Remaining Margin: 2008 Attainment Inventory - Total Emissions using Conventional Gasoline |
|---|---|---|---|---|---|---|---|
| | tpd | tpd | tpd | tpd | tpd | % | tpd |
| **2010** | 491.82 | 481.47 | 485.57 | 10.35 | 4.10 | 39.57 | 6.25 |
| **2013** | 491.82 | 465.94 | 469.29 | 25.88 | 3.35 | 12.93 | 22.53 |
| **2014** | 491.82 | 460.76 | 463.79 | 31.06 | 3.03 | 9.76 | 28.03 |
| **2016** | 491.82 | 450.41 | 452.80 | 41.41 | 2.39 | 5.77 | 39.02 |
| **2017** | 491.82 | 445.23 | 447.60 | 46.59 | 2.37 | 5.08 | 44.22 |
| **2020** | 491.82 | 440.23 | 442.57 | 51.59 | 2.34 | 4.54 | 49.25 |
| **2024** | 491.82 | 433.35 | 434.66 | 58.47 | 1.31 | 2.24 | 57.16 |
| **2030** | 491.82 | 423.03 | 424.10 | 68.79 | 1.07 | 1.56 | 67.72 |

Difference between the Attainment Inventory and Total Emissions using Georgia Gasoline is referred to as “The Margin” since this is like a safety margin between actual emissions and the level at which an increase in emissions would lead to concerns over resulting nonattainment. This margin increases to over 67.72 tons/day of VOC by 2030 with the increase in emissions with Gasoline Marketing rule removal near 1.1 tons/day or just 1.5% of the margin.

**Figure 5: Comparison of Total PM2.5 Emissions with Conventional Gas versus Emissions Limits**

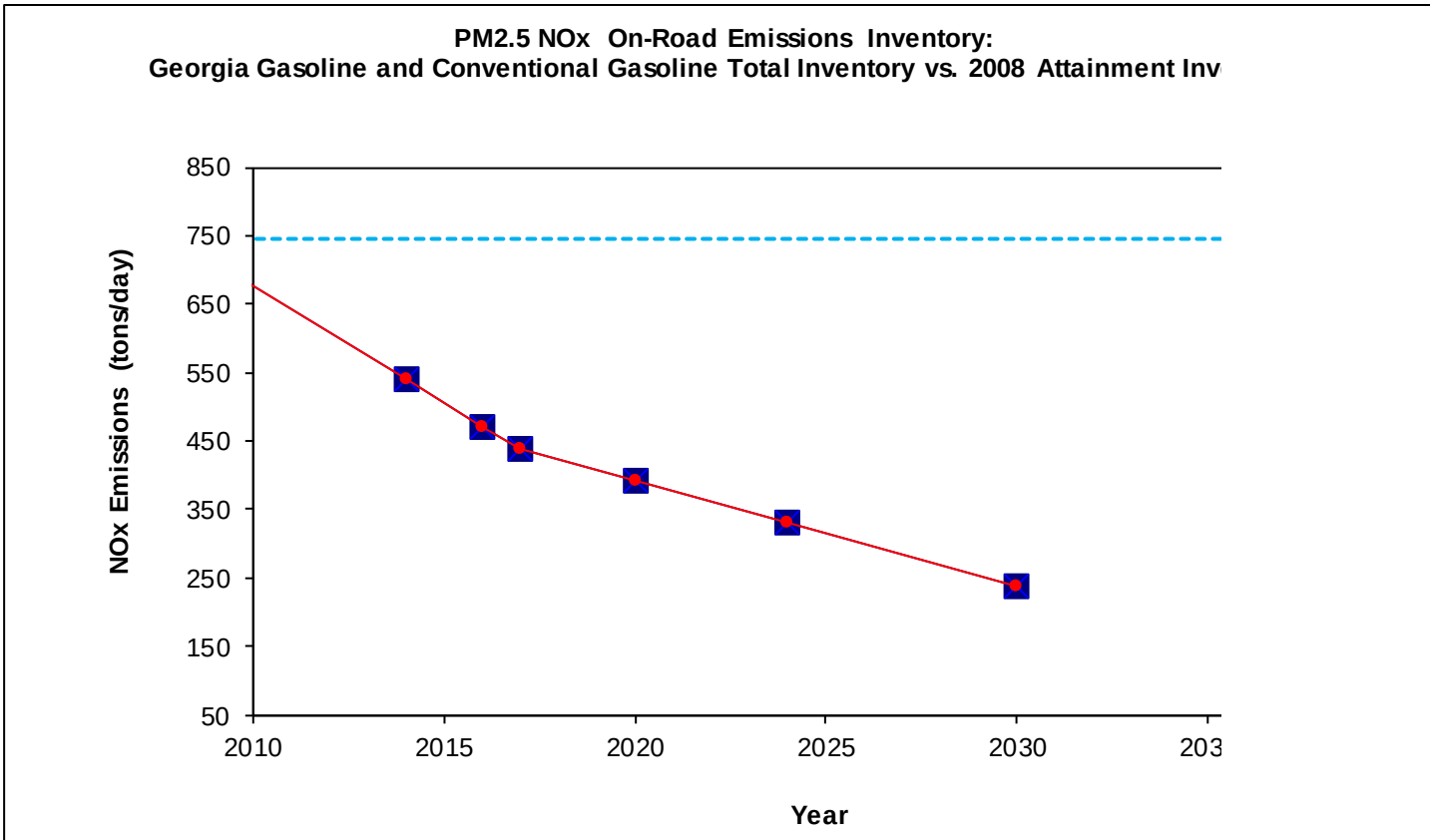



**Table 5: Comparison of Total PM2.5 Emissions with Conventional Gas versus Emissions Limits**

| Year | Total 2008 Attainment Inventory | Total Emissions Inventory Georgia Gasoline | Total Emissions Inventory Conventional Gasoline | The Margin: 2008 Attainment Inventory - Total Emissions using Georgia Gasoline | Margin allotted to switch to conventional gasoline | % of Margin allotted to switch to conventional gasoline | Remaining Margin: 2008 Attainment Inventory - Total Emissions using Conventional Gasoline |
|---|---|---|---|---|---|---|---|
| | tpd | tpd | tpd | tpd | tpd | % | tpd |
| **2014** | 743.92 | 539.48 | 539.80 | 204.44 | 0.32 | 0.15 | 204.12 |
| **2016** | 743.92 | 471.44 | 471.72 | 272.48 | 0.28 | 0.10 | 272.20 |
| **2017** | 743.92 | 437.42 | 437.68 | 306.50 | 0.26 | 0.08 | 306.24 |
| **2020** | 743.92 | 391.43 | 391.66 | 352.49 | 0.23 | 0.07 | 352.26 |
| **2024** | 743.92 | 330.22 | 330.27 | 413.70 | 0.05 | 0.01 | 413.65 |
| **2030** | 743.92 | 238.40 | 238.44 | 505.52 | 0.04 | 0.01 | 505.48 |

The margin in this PM2.5 case increases to over 500 tons/day of NOx by 2030 with the increase in emissions with Gasoline Marketing rule removal  less than 0.04 tons/day or less than 0.01% of the margin. By 2040 there is no difference in PM2.5 NOx emissions between Georgia Gas and conventional gas.