BOBBY JINDAL
GOVERNOR

PEGGY M. HATCH
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

March 18, 2016

Mr. Ron Curry
Regional Administrator
EPA Region VI/6RA
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202

RE: Revised Draft Baton Rouge Nonattainment Area 2008 8-hour Ozone National Ambient Air Quality Standard Redesignation Request and Maintenance Plan

Dear Mr. Curry:

The Louisiana Department of Environmental Quality hereby submits the enclosed revised draft 2008 8-hour Ozone National Ambient Air Quality Standard Redesignation Request and Maintenance Plan for the Baton Rouge Nonattainment Area.

The Department has included revisions to the document based on comment and review. Public notice of this revision will be published on March 20, 2016, in the Louisiana Register. A public hearing will be held upon request. The comment period ends on April 29, 2016.

Written comments should be directed to:

Tegan B. Treadaway
Administrator, Air Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

Should you have any questions, please contact Amanda Polito of the Air Permits Division at (225) 219-3389 or at amanda.polito@la.gov.

Sincerely,

Chuck C. Brown, Ph.D.
Secretary

Enclosure
CCB:APDP

EXECUTIVE SUMMARY

The Louisiana Department of Environmental Quality (LDEQ, Department) is submitting a formal request for redesignation to attainment for the 2008 8-hour Ozone National Ambient Air Quality Standard (NAAQS) and a maintenance plan for the 5-parish Baton Rouge Nonattainment Area (BRNA). This request is based on the monitoring data for the BRNA that shows a design value of 0.075 ppm or 75 ppb as of December 31, 2013. The Department attributes the attainment of the 2008 8-hour Ozone NAAQS to permanent and enforceable control measures that produced realized reductions and air quality improvements. In order to meet the requirements of Section 182(a)(1), the Department is submitting a 2011 emissions inventory with the redesignation request.

Section 107(d)(3)(E) of the 1990 Clean Air Act Amendments (CAAA) states that an area can be redesignated to attainment if all the following conditions are met.

- The US EPA has determined that the NAAQS have been attained.
- The applicable implementation plan has been fully approved by the US EPA under Section 110(k).
- The US EPA has determined that the improvement in air quality is due to permanent and enforceable reduction in emissions.
- The state has met all applicable requirements for the area under Section 110 and Part D.
- The US EPA has fully approved a maintenance plan, including a contingency plan, for the area under Section 175A.

The Department provides the necessary information in the following pages to show that all of the applicable requirements have been met. Included in this submission is also an approvable maintenance plan for the BRNA and a commitment to submit a second 10-year maintenance plan in eight years as required. The provided maintenance plan includes the following elements:

- Attainment Inventory;
- Maintenance Demonstration;
- Verification of Continued Attainment;
- Monitoring Network; and
- Contingency Plan.

Lastly, with this submittal the Department is also requesting approval of the updated motor vehicle emissions budget (MVEB).

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SECTION 1: GENERAL INFORMATION

1.1 PURPOSE

The Department is seeking redesignation of the BRNA to attainment for the 8-hour Ozone NAAQS under Section 107(d)(3)(E) of the CAAA, which states that the United States Environmental Protection Agency (US EPA) can redesignate an area to attainment if all of the following conditions are met.

- The US EPA has determined that the NAAQS have been attained.
- The applicable implementation plan has been fully approved by the US EPA under Section 110(k).
- The US EPA has determined that the improvement in air quality is due to permanent and enforceable reduction in emissions.
- The state has met all applicable requirements for the area under Section 110 and Part D.
- The US EPA has fully approved a maintenance plan, including a contingency plan, for the area under Section 175A.

The purpose of this State Implementation Plan (SIP) revision is to address all of these requirements, including the submittal of an 8-hour ozone maintenance plan that will fulfill the requirements under Section 175A of the CAAA and ensure that the BRNA continues to maintain attainment of the 2008 8-hour Ozone NAAQS through the horizon year 2027. This revision includes a commitment to submit a second 10-year maintenance plan in eight years as required and an updated MVEB that requires approval by EPA.

1.2 AREA DESCRIPTION

The BRNA is comprised of five parishes that make up the historical metropolitan statistical area (MSA): Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge. The parishes encompass 2204.54 square miles of land located in the southeastern part of Louisiana. The area straddles the Mississippi River and includes corridors for Interstates 10, 12 and 110, *see Figure 1.1*. The United States Census Bureau estimates the combined population of the five parishes in the BRNA at 757,234[1] people for 2014. Both Ascension and West Baton Rouge Parishes are two of the fastest growing parishes in the state.

The BRNA is diverse in its industrial makeup. According to the American Chemical Society, 16 of the top 50 American owned chemical firms in the United States[2] and 9 of the top 40 foreign owned firms[3] operate in the five parish area. East Baton Rouge Parish is home to the fourth

[1]United States Census Bureau: "Annual Estimates of the Resident Population: April1, 2010 to July 1, 2014." March 2015.
[2]Chemical & Engineering News: "Top 50 U.S. Chemical Producers." May 19, 2014.
[3]Chemical & Engineering News: "Global Top 50." July 28, 2014.

largest refinery in the country and at 561,500 barrels of distillation capacity per day, the BRNA represents 3.13% of the nation's total refining capacity.[4]

FIGURE 1.1: STATE MAP ILLUSTRATING THE BATON ROUGE OZONE NONATTAINMENT AREA

Ascension Parish is comprised of 291.6 square miles. The 2014 estimated population of Ascension Parish was 117,029.[1]

East Baton Rouge Parish is comprised of 455.7 square miles[1] and is where the state capitol, Baton Rouge, is located. Baton Rouge is the dominant center of business, culture, and finance within the area. East Baton Rouge Parish is the site of the Port of Baton Rouge; diversified industrial plants; over 150 industries including machine shops, foundries, steel fabrications, brick, concrete, cabinet works, ironworks, etc. The Port of Baton Rouge sits at the head of deepwater navigation on the Mississippi River and ranks 9th in the nation and 32nd in the world in annual total tonnage[5]. The 2014 estimated population of East Baton Rouge was 446,042. [1]

Livingston Parish is one of the earliest settled parishes in the state and is comprised of 648.1 square miles. The estimated population of Livingston Parish in 2014 was 105,653. [1]

Iberville Parish is one of Louisiana's original 19 parishes and is comprised of 618.7 square miles. The estimated population of Iberville Parish in 2014 was 33,327. [1]

West Baton Rouge Parish is the smallest parish in the state covering 191.2 square miles. It is located on the west bank of the Mississippi River, across from metropolitan Baton Rouge. In 2014, the estimated population of West Baton Rouge Parish was 25,085. [1]

[4]Unites States Energy Information Administration: "Refinery Capacity Report." June 25, 2014.
[5] The Port of Greater Baton Rouge: "Fast Facts."http://www.portgbr.com/fast-factsfaqs

1.3 OZONE BACKGROUND

1.3.1 1-HOUR OZONE IN THE BATON ROUGE AREA

Louisiana's parishes have historically been in compliance with the Ozone NAAQS except for the BRNA. US EPA first designated the BRNA as an ozone *nonattainment* area in 1978 (43 FR 8964, 8998). In 1991, the BRNA was designated *nonattainment* by operation of law, with the CAAA, and was classified as a *serious* ozone nonattainment area (56 FR 56694). The attainment date for the BRNA was November 15, 1999.

By operation of law contained in the CAAA, the failure of the BRNA to attain the standard was to be noticed by US EPA and the area was to be bumped-up to the next higher classification, *severe*. Recognizing that some areas may have difficulty in achieving attainment due to transport from another area, US EPA issued a guidance memorandum that allowed an area to retain its existing classification and receive a later attainment deadline if US EPA found that the area met all of its existing classification requirements, approved a demonstration that the area would attain but for transport from another area, and approved the attainment demonstration SIP with its associated elements[6].

The Department submitted the Post 1996 Rate of Progress, Attainment Demonstration, and Contingency Plan to US EPA and it was approved on July 2, 1999 (64 FR 35930). On May 9, 2001, US EPA proposed that the BRNA did not attain the ozone standard by November 15, 1999 and recommended the BRNA be bumped-up to the *severe* classification. In a letter dated May 10, 2001, Governor Foster requested an extension of the attainment date for the BRNA under the 1998 Extension Policy and committed to submit a revised SIP that met the criteria for the Extension Policy. On October 2, 2002, US EPA approved the revised attainment demonstration SIP and its associated elements, found the area met all of the serious area requirements, found there was transport from Texas affecting the BRNA's ability to reach attainment, and extended the attainment date for the BRNA to November 15, 2005, without reclassifying the area from *serious* to *severe*.

Following a ruling by the United States Court of Appeals for the Fifth Circuit vacating US EPA's Extension Policy which was used to extend the 1-hour ozone attainment deadline for the Beaumont-Port Arthur, Texas Area, US EPA withdrew its approval of the BRNA's revised attainment demonstration and granting of an extended attainment deadline; thus, reclassifying the BRNA by operation of law to *severe* on April 24, 2003 (68 FR 20077). This rule had an effective date of June 23, 2003.

The BRNA monitored attainment with the 1-hour NAAQS on December 31, 2008. Accordingly, the Department submitted a request for determination of attainment based on

[6] "Guidance on Extension of Air Quality Attainment Dates for Downwind Transport Area" (Richard D. Wilson, Acting Assistant Administrator for Air and Radiation issued July 16, 1998, [64 FR 14441, March 29, 1999])

US EPA's Clean Data Policy. On March 26, 2009, US EPA proposed a determination of *attainment* of the 1-hour ozone standard for the BRNA. A final determination was published in the Federal Register on February 10, 2010 (75 FR 6570).

1.3.2 8-HOUR OZONE IN THE BRNA

In 1997, US EPA promulgated a new, more protective standard for ozone based on an 8-hour average concentration; the standard was set at 0.08 ppm (62 FR 38856). On April 15, 2004, US EPA designated the BRNA as *nonattainment* and classified the area as *marginal* (69 FR 23858, April 30, 2004). This rule was effective June 15, 2004 and the BRNA was required to reach attainment by June 15, 2007.

On March 21, 2008 US EPA finalized its finding that the BRNA, by operation of law, was reclassified from a *marginal* to a *moderate* nonattainment area for 8-hour ozone effective on April 21, 2008 (73 FR 15087). This reclassification required the state to submit a SIP revision addressing the Clean Air Act's (CAA) pollution control requirements for moderate 8-hour ozone nonattainment area. The area's new attainment deadline was June 15, 2010.

The BRNA monitored attainment with the 1997 8-Hour NAAQS for ozone on December 31, 2008. Accordingly, LDEQ submitted a request for determination of attainment based on US EPA's Clean Data Policy. On June 25, 2010, US EPA proposed a determination of attainment of the 1997 8-Hour Ozone standard for the BRNA (75 FR 36316). A final determination was published in the Federal Register on September 9, 2010 (75 FR 54778).

At the request of the state, US EPA proposed to redesignate the BRNA to *attainment* on August 30, 2011 (76 FR 53852). The request was published for final approval on November 30, 2011 (76 FR 74000).

On July 11, 2007, US EPA proposed the 3rd NAAQS revision for ozone (72 FR 37818). In the final rule published on March 27, 2008, the primary and secondary standards were set at 0.075 ppm (73 FR 16436).

Effective July 20, 2012, Louisiana was designated *nonattainment* and classified as *marginal* when nonattainment designations were published in the Federal Register on May 21, 2012. As such, the state was required to meet an attainment date of December 31, 2015 (77 FR 30087).

As of December 31, 2013, and based upon complete, quality assured, certified ambient air monitoring data that showed the area monitored attainment for the 2008 8-hour Ozone NAAQS during the 2011-2013 monitoring period, the Department submitted a request for determination of *attainment* based on US EPA's Clean Data Policy. In concurrence, US EPA proposed and granted final approval on April 15, 2014 (79 FR 21139, 79 FR 21178).

1.4 LEGAL AUTHORITY

The Louisiana Environmental Quality Act, La.R.S. 30.2001, *et seq*., grants the secretary of the Department specific authority to adopt, amend, or repeal those rules and regulations that are deemed necessary for the protection of the state's environment. Further, this act provides the

secretary with the general power to assure compliance with applicable federal laws and regulations and to assume authority for those delegated programs that exist under the provision of the CAAA. Furthermore, on January 29, 2016, Governor John Bel Edwards appointed Chuck Carr Brown, Ph.D., Secretary of the Louisiana Department of Environmental Quality, as his designee to submit documents to the US EPA for approval and incorporation into the SIP for Louisiana, *see Appendix A*.

In accordance with La. R.S. 49.950 et seq., and to comply with 40 CFR 51.285 Public Notification, the Department published a notice seeking comment on this SIP revision on June 20, 2015, in the *Louisiana Register (Vo. 41, No. 6 page 1163)*. A public hearing concerning this proposed SIP revision was held at 1:30 pm on July 29, 2015 in the Galvez Building, Oliver Pollock Room C-111, located at 602 North Fifth Street in Baton Rouge, Louisiana 70802. The comment period ended on July 31, 2015. A copy of the notice is included in *Appendix B.* for review.

The Department has included revisions to the document based on comment and review. Public notice of this revision will be published on March 20, 2016, in the Louisiana Register. A public hearing will be held upon request. The comment period ends on April 29, 2016. A copy of the comments and subsequent responses as well as the notice is also included in *Appendix B.3, B.4, and B.5, respectively*.

SECTION 2: REDESIGNATION REQUIREMENTS

2.1 ATTAINMENT OF THE STANDARD

The BRNA ozone monitoring network currently consists of eight ambient air monitors, *see Figure 2.1.1*. Compliance with the 2008 8-Hour Ozone NAAQS is determined by the area's design value (DV) which is defined as the consecutive three-year average of each annual fourth-highest daily maximum 8-Hour ozone average in parts per billion (ppb). Data from this monitoring network, quality assured in accordance with 40 CFR 50 Appendix P, shows the area has monitored attainment of the 2008 8-Hour Ozone NAAQS during the 2011-2013 monitoring period with a DV of 75 ppb, which is equal to the attainment threshold. The BRNA achieved attainment of the standard two years ahead of the scheduled attainment date. US EPA concurred with this assessment by approving the Department's Clean Data Determination on April 15, 2014, *see Appendix C*. Further, quality assured data shows the 2014 DV for the BRNA has decreased to 72 ppb, *see Table 2.1.2.* The BRNA's continued effort to reduce ozone has resulted in a monitored decrease of 39 ppb since 1980, *see Figure 2.1.3.*

FIGURE 2.1.1: BRNA ACTIVE MONITORING NETWORK

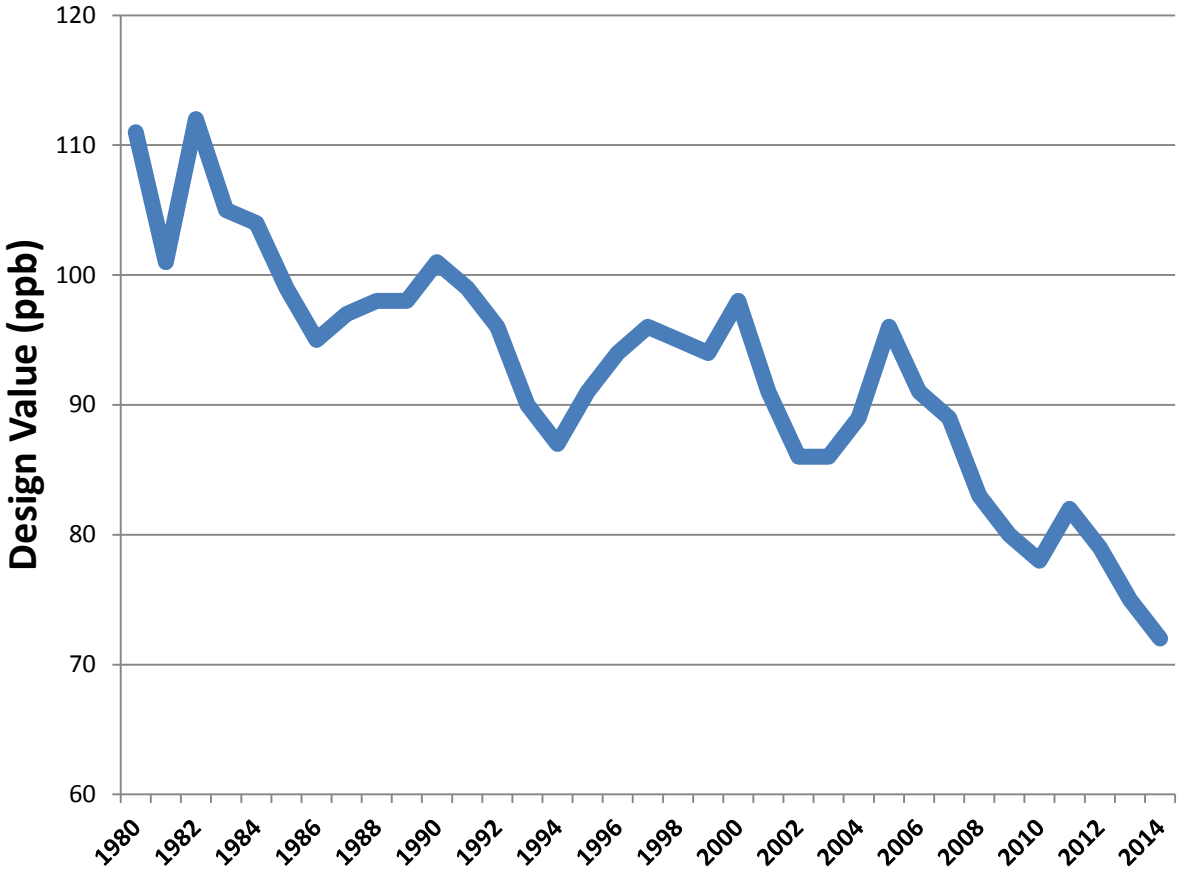
TABLE 2.1.2: BRNA MONITORS: 8-HOUR OZONE DESIGN VALUES 2008-2014

Monitor Year	2006 - 2008	2007 - 2009	2008 - 2010	2009 - 2011	2010 - 2012	2011 - 2013	2012 - 2014
Baker*	79	73	72				
Bayou Plaquemine	79	75	73	74	75	71	65
Capitol	75	72	73	77	76	72	69
Carville	81	78	73	77	76	75	69
Dutchtown	83	78	75	77	76	71	67
French Settlement	79	78	75	76	74	72	71
Grosse Tete*	80	75	71				
LSU	80	80	78	82	79	75	72
Port Allen	78	73	71	72	71	68	65
Pride	77	74	72	72	72	69	66

**At the request of the Department[7], US EPA approved the decommissioning of the Baker and Grosse Tete monitors on October 29, 2010[8]. These two monitors ranked among the lowest in the Baton Rouge area regarding ozone concentrations, and the closing of these two sites helped enable the best use of resources. The monitors were decommissioned on November 10, 2010.*

[7]Hatch, Peggy M. Letter to Dr. Al Armendariz. August 9, 2010. TS
[8]Edlund, Carl E., P.E.. Letter to Peggy M. Hatch. October 20, 2010. TS

FIGURE 2.1.3: BRNA DESIGN VALUES 1980-2014



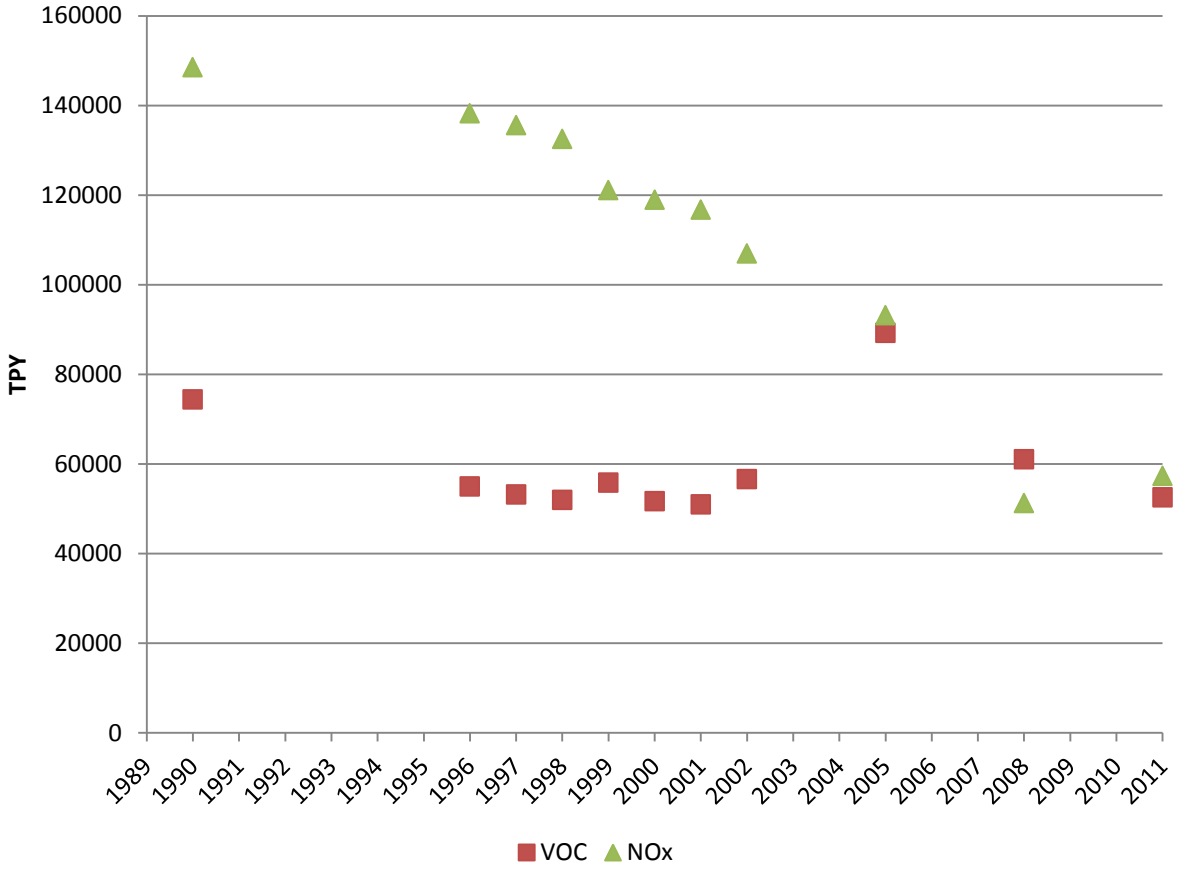
2.2 SIP APPROVABILITY

The SIP for the BRNA must be fully approved by US EPA under Section 107(d)(3)(E)(ii) and (v) of the CAAA. To meet that requirement, LDEQ is submitting a 2011 emissions inventory which can be found in *Section 4* of this request. The plan was deemed administratively complete by operation of law on December 7, 2013 per 40 CFR 51 Appendix V 1.2. Previously, EPA has approved SIP revisions for the BRNA addressing the other Section 182(a) requirements for marginal ozone nonattainment areas.

2.3 PERMANENT AND ENFORCEABLE EMISSIONS REDUCTIONS

The BRNA has experienced improved air quality over the past several years as evidenced by decreases in ozone precursor emissions reported to the NEI, *Figure 2.3.1*. Since the promulgation of the CAA, volatile organic compounds (VOC) and oxides of nitrogen (NOx) have decreased. The reductions are due to permanent and enforceable reductions in NOx and VOC emissions through control strategies implemented in the area.

FIGURE 2.3.1 BRNA NEI PRECURSOR EMISSIONS



**For the purposes of comparison between data sets, biogenic emissions were removed from 2008 and 2011 data sets, see Section 3.3 Nonpoint Sources for discussion.*

The strategies implemented in the BRNA include, but are not limited to, the following:

Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements: On February 10, 2000, US EPA enacted additional regulations that required automakers to manufacture and sell lower-emitting vehicles and required refineries to make cleaner, lower sulfur gasoline which would in turn improve the efficiency of catalytic converters and result in lower NOx emissions. (65 FR 6698)

Tier 3 Vehicle Emission and Fuel Standards Program: On April 28, 2014 US EPA further reduced both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles and further reduced sulfur levels in gasoline allowing the vehicle's catalyst to work more efficiently. (79 FR 23414)

Clean Air Highway Diesel Rule: As a part of US EPA's Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements published January 18, 2001, US EPA mandated a 97 percent reduction in the sulfur content of highway diesel fuel, from a

level of 500 parts per million (ppm) to 15 ppm. This action is estimated to account for the removal of 2.6 million tons of NOx emissions each year. (66 FR 5002)

Mobile Sources Air Toxics (MSAT) Rule: On February 26, 2007, US EPA finalized the rule to reduce hazardous air pollutants from mobile sources. The rule limits the benzene content of gasoline and reduces toxic emissions from passenger vehicles and gas cans. EPA estimates that in 2030 this rule would reduce total emissions of mobile source air toxics by 330,000 tons and VOC emissions (precursors to ozone and PM2.5) by over 1 million tons. (72 FR 8428).

Nonroad Source Controls: US EPA promulgated emission standards for all types of nonroad engines, equipment, and vehicles. These standards apply separately for individual source categories including aircraft, compression-ignition (CI) engines, large spark-ignition (SI) engines, locomotives, marine CI engines, marine SI engines and vessels, recreational engines and vehicles, and SI engines 19 kilowatts (kW) and below. Examples of the promulgated regulations include the following:

Heavy-duty Onboard Diagnostic Rule (74 FR 8310, published February 24, 2009);
Small SI and Marine SI Engine Rule (73 FR 59034, published October 8, 2008);
Locomotive and Commercial Marine Rule (73 FR 25098, published May 6, 2008); and
Clean Air Nonroad Diesel Rule (69 FR 38957, published June 29, 2004).

Regulation of sources includes emission limits for hydrocarbons (HC), carbon monoxide (CO), NOx, and particulates in the case of diesel vehicles.

National Volatile Organic Compound Emission Standards for Consumer Products: US EPA issued final regulations on September 11, 1998 to control VOC emissions from household consumer products, such as cleaning products, personal care products, and a variety of insecticides. (63 FR 48819)

National Organic Compound Emission Standards for Architectural Coatings: US EPA published the architectural coatings rule on September 11, 1998. This rule limits the amount of VOC that manufacturers and importers of architectural coatings can put into their products thereby reducing the amount emitted to the atmosphere. The rule also has container labeling requirements for architectural coatings. (63 FR 48848)

Stage I Vapor Recovery: US EPA promulgated 40 CFR 63 Subpart CCCCCC on January 10, 2008. The rule applies to existing or new gasoline dispensing facilities (GDF) that are area sources and requires these facilities to employ methods to minimize emission of VOCs during the delivery of product to a GDF. Control methods include the use of submerged fill pipes and vapor balancing systems. It is anticipated that this rule with result in a reduction of about 50,000 tons of VOCs. (73 FR 1945)

The Department has also submitted the following SIP elements that show implementation of the rules promulgated by the state to allow for enforceable control strategies in the BRNA.

LAC 33:III.Chapter 22 Control of Emissions of Nitrogen Oxides (NOx): LDEQ promulgated the NOx Control Rule in 2002. The rule established emission factors for reducing emissions from

boilers, heaters, furnaces, turbines, and internal combustion engines at affected facilities. The rule also established requirements for permits, compliance, recordkeeping and reporting. These regulations were approved by US EPA on July 5, 2011 (76 FR 38977).

Stage II Vapor Recovery: The CAAA requires at 42 U.S.C. 7401 all gasoline dispensing facilities located in areas classified as extreme, severe, serious, or moderate nonattainment of the 1-hour ozone standard, to have Stage II vapor recovery systems in place and operational. Stage II vapor recovery has provided volatile organic compound (VOC) reductions in ozone nonattainment area. Louisiana adopted La. R.S. 30:2051 and promulgated LAC 33:III.2132 to require implementation of Stage II recovery systems for facilities dispensing motor vehicle fuel in the BRNA.

Vehicle Inspection and Maintenance (I/M) Program: Louisiana Legislature approved Act 576 of the 1999 Regular Session on June 30, 1999 which authorized an I/M program for the control and abatement of motor vehicle emissions in the BRNA. The State's program requires that all 1980 and newer gasoline powered light-duty vehicles and light and heavy-duty trucks, that are registered or required to be registered in the five parish area, including fleets, are subject to annual inspection and testing which consists of inspecting the vehicle's safety equipment, a visual anti-tampering check of the emissions system, a gas cap integrity test, On-Board Diagnostic testing.

These SIP elements have been approved by US EPA and published in the Federal Register. The SIP elements along with the Federal Register notice information and approval dates are listed in *Table 2.3.2.* The list of the associated rules promulgated by the state and the facilities in the BRNA to which they are applicable are found in *Appendix H*.

TABLE 2.3.2 BRNA SIP ELEMENTS

SIP ELEMENT	PAGE NUMBER	APPROVAL DATE	DATE SUBMITTED
PARALLEL PROCESSING OF REVISIONS TO LAC 33:III.2123 ORGANIC SOLVENTS WITH THE CTG SIP SUBMITTAL	76 FR 30924	2/7/2011	12/2/2011
VOC RACT CONTROL TECHNIQUE GUIDELINES	76 FR 30924	12/2/2012	8/31/2010
SECTION 185 DETERMINATION TERMINATION-BATON ROUGE NONATTAINMENT AREA	76 FR 39775	7/7/2011	5/18/2010
VEHICLE INSPECTION/MAINTENANCE PROGRAM	71 FR 66113	11/13/2006	5/5 /2006
CLEAN FUEL FLEET PROGRAM SIP	60 FR 54305	10/23/1995	5/16/1994
PAMS SIP FOR THE BR OZONE NONATTAINMENT AREA	61 FR 31037	6/19/1996	9/10/1993
VOC RACT CATCH-UPS	61 FR 38591	7/25/1996	4/13/1993
EMISSION STATEMENT APPROVAL 919	60 FR 2016	1/6 /1995	3/3/1992
ALTERNATIVE EMISSION REDUCTION (BUBBLE) PLAN FOR DOW CHEMICAL, USA LA DIV, PLAQUEMINE, LA	59 FR 50502	10/4/1994	
RACT FIX-UP APPROVAL (CHAPTERS 1, 21, & 61)	59 FR 23166	5/5/1994	
STAGE II VAPOR RECOVERY PROGRAM SIP	59 FR 14114	3/25/1994	
PARTIAL APPROVAL OF CHAPTER 21 VOC REGS SPECIFIC TO AUTOMOBILE & LIGHT TRUCK SURFACE COATING (2123.C.6 & D.3 - 02/20/90) AS PART OF THE POST 1987 SIP REVISIONS	55 FR 36811	9/7/1990	

2.4 REQUIREMENTS UNDER SECTION 110 AND PART D

LDEQ satisfies the requirements of Section 110(a)(2)(I) and Part D, Section 182(a), for the BRNA by submitting the 2011 base year emissions inventory (EI) for the area in *Section 4* and by previously submitting nonattainment SIP revisions for the area. The table below lists the Section 110(a)(2)(I) and Part D requirements for the BRNA.

Baton Rouge SIP Requirement	EPA Approval
Emissions Inventory	Section 4
Emissions Statement	January 6, 1995 (60 FR 2014)
Marginal Area Nonattainment New Source Review Rules	October 10, 1997 (62 FR 52948)

The remainder of this SIP revision is intended to fulfill the maintenance requirements in Section 175A of the CAAA.

SECTION 3: EMISSIONS INVENTORY

3.1 OVERVIEW

Section 182(a)(1) and (3) of the CAAA and the Air Emissions Reporting Requirements (AERR) require that EIs be prepared for ozone nonattainment areas. Because ozone is photochemically produced in the atmosphere when NOx and VOC mix in the presence of sunlight, information on sources of these precursor pollutants must be compiled. The EI identifies the types of emission sources present in the area, the amount of each pollutant emitted, and the types of processes and control devices employed at each plant or source category. The EI provides data for a variety of air quality planning tasks, including:

- establishing baseline emission levels;
- calculating emission reduction targets;
- developing control strategies for achieving the required emission reductions;
- providing emissions inputs into air quality simulation models; and
- tracking actual emission reduction against the established emission growth and control budgets.

The NOx and VOC EI for an area is summarized from the estimates developed for four general source categories of emissions: point, nonpoint, onroad mobile, and nonroad mobile. LDEQ utilized data from the US EPA 2011 National Emissions Inventory (NEI), Version 2 as the baseline emissions inventory to identify the level of emissions in the area during the period of monitored attainment and satisfy the requirement of 40 CFR 182(a)(1). The 2011 NEI is the most comprehensive and up to date inventory available and includes the triennial data submitted to US EPA by LDEQ. An in-depth discussion on the development of the 2011 baseline emissions can be found in *Appendix F*.

3.2 POINT SOURCES

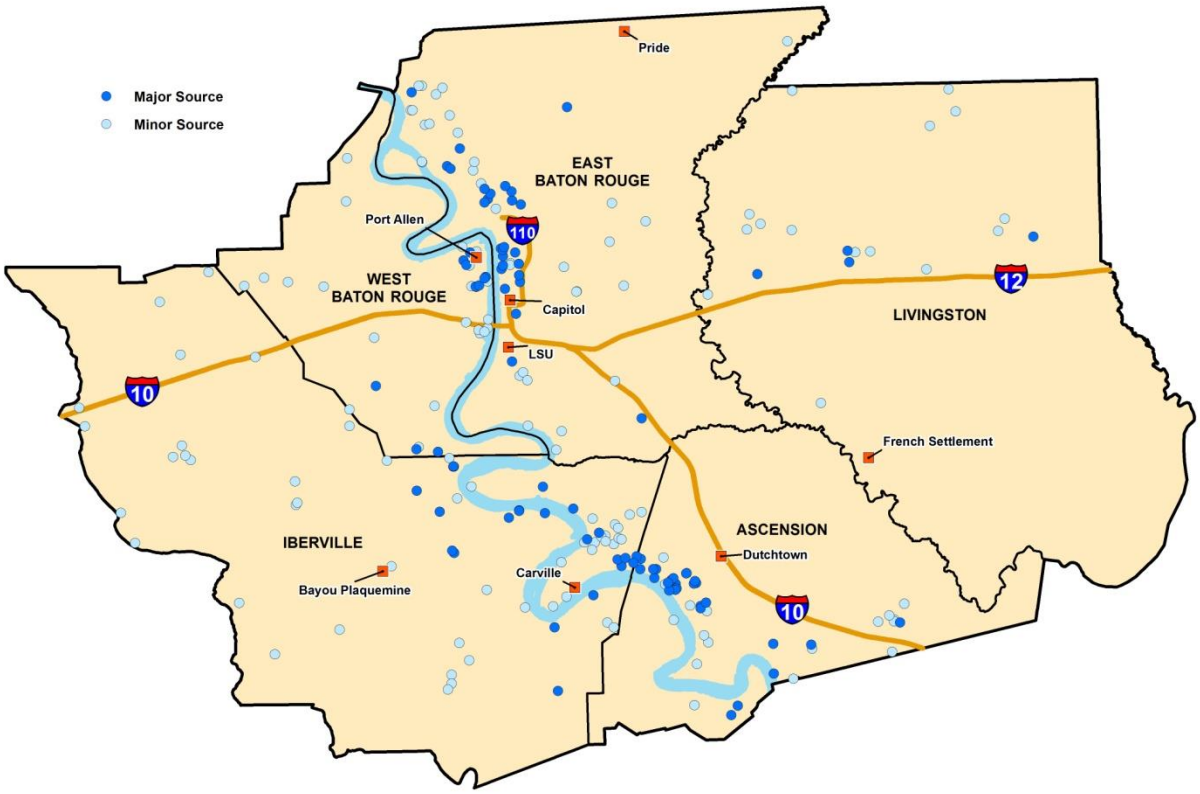
The state of Louisiana compiles a statewide EI for point sources on an annual basis. For the purpose of EI, point sources that emit 100 tons or more per year of a criteria pollutant meet the reporting threshold. In the BRNA all sources that emit 25 tons of NOx or 10 tons of VOC are required to report. Each of the facilities meeting these emissions criteria submit complete EI reports which contain site-specific data in conformance with US EPA guidance for ozone maintenance areas. A list of the 230 point sources, located in the BRNA as of May 15, 2015, is included in *Appendix G* and visually represented in *Figure 3.2.1*.

The reporting requirements for the nonattainment areas are in accordance with those of the CAAA and LAC 33:III.918 and 919 – Recordkeeping and Annual Reporting and Emissions Inventory. Emissions data provided by the facilities are estimates of actual emissions for the facility during the previous calendar year. Actual measurement with continuous emissions monitoring systems (CEMS) or approved stack testing shall be used for reporting of emissions from an emissions point when such data exists. In the absence of CEMS or stack test data,

emissions shall be calculated using methods found in the most recent edition, as of December 31 of the current reporting year, of US EPA's Compilation of Air Pollution Emission Factors (AP-42), calculations published in engineering journals, and/or US EPA or department-approved estimation methodologies.

LDEQ submits annual updates to US EPA for point sources and triennial updates for all sources in accordance with 40 CFR Part 51 Subpart A – Air Emissions Reporting Requirements (AERR).

FIGURE 3.2.1: POINT SOURCES SUBMITTING EIS



3.3 NONPOINT SOURCES

Nonpoint sources, also known as area sources, are represented as many small, individually unidentified points of air pollution emissions within a specified geographical area. These small-scale industrial, commercial, and residential sources that generate emissions are too numerous or too small to be addressed individually and include, but are not limited to, activities such as fuel combustion, dry cleaning, bakeries, graphic arts, auto refinishing, product storage, agriculture activities, and consumer product usage. Emission factors used to estimate emissions are developed and applied for the aggregate source categories. Biogenic VOC emissions are also included in the nonpoint source category.

In 2008 US EPA began including biogenic emissions or emissions that come from natural sources into the nonpoint source category. The emissions, previously reported in a separate sector, are included as "Biogenics – Vegetation and Soil." NOx emissions are categorized as Source Classification Code (SCC) 2701220000 while SCC 2701200000 represents emissions for carbon dioxide, VOC and 3 VOC hazardous air pollutants: formaldehyde, acetaldehyde and methanol. In order to appropriately compare historical EI data, pre-2008, to post-2008 data, these biogenic source categories must be removed.

3.4 ONROAD MOBILE SOURCES

Onroad mobile vehicles are light and heavy duty, gasoline and diesel automobiles and trucks that travel primarily on public highways. Onroad mobile emissions are pollutants emitted from motor vehicles during driving operation and while parked. Onroad mobile emissions estimates within the nonattainment area were developed based on parish-specific inputs provided by the Department of Transportation and Development and the Capitol Region Planning Commission. Emissions from the refueling of motor vehicles at service stations, Stage 2 refueling, are included under nonpoint source emissions.

3.5 NONROAD MOBILE SOURCES

Nonroad mobile sources are often included as nonpoint sources because of the number and size of sources. Nonroad mobile sources include, but are not limited to, railroad locomotives, aircraft and airport support equipment, commercial and recreational marine vessels, construction equipment, agricultural equipment, commercial and residential lawn equipment, and recreational vehicles.

SECTION 4: ATTAINMENT INVENTORY

Louisiana emissions for 2011 were extracted from the US EPA 2011 National Emissions Inventory (NEI), version 2.[9] The table below summarizes the 2011 NOx and VOC emission totals by source category which comprises the baseline inventory for the BRNA. As previously discussed, biogenic emissions have been removed from the non-point category and emissions totals.

TABLE 4.1.1 2011 BASELINE EMISSIONS (TONS/DAY)

	NOx				Emission
	Nonpoint	**Nonroad**	**Onroad**	**Point**	**Total**
Ascension	3.1	5.5	5.2	20.9	**34.7**
East Baton Rouge	7.8	8.6	18.6	24.8	**59.9**
Iberville	2.9	7.7	2.7	25.6	**38.9**
Livingston	1.5	1.0	8.4	0.2	**11.0**
West Baton Rouge	1.9	4.5	3.5	2.7	**12.5**
BRNA Total	**17.1**	**27.3**	**38.4**	**74.2**	**157.0**
	VOC				**Emission**
	Nonpoint	**Nonroad**	**Onroad**	**Point**	**Total**
Ascension	20.7	1.0	2.8	8.5	**32.9**
East Baton Rouge	30.8	3.4	10.2	15.1	**59.4**
Iberville	18.5	0.9	1.1	7.2	**27.7**
Livingston	8.5	2.1	4.1	0.9	**15.7**
West Baton Rouge	4.1	1.2	1.0	2.0	**8.3**
BRNA Total	**82.6**	**8.7**	**19.2**	**33.6**	**144.0**

[9] 2011 National Emissions Inventory, Version 2. U.S. Environmental Protection Agency, Office of Air Quality, Planning, and Standards, Emission Inventory Group. Released December 12, 2014. Downloaded December 16, 2014.

SECTION 5: MAINTENANCE DEMONSTRATION

5.1 DEMONSTRATION REQUIREMENT

The maintenance plan must demonstrate that the area will remain in compliance with the 2008 8-hour Ozone NAAQs for the ten year period following the effective date of designation. The end projection year for the maintenance plan is ten (10) years from the effective date of the attainment demonstration and two (2) years after US EPA approval. The maintenance demonstration is satisfied if the state demonstrates that future emissions are less than the attainment or baseline inventory. The state has demonstrated future compliance through the use of a projected precursor pollutant emissions inventory, modeled ozone concentrations, and local emission trends.

5.2 PROJECTED EMISSIONS INVENTORIES

US EPA accepted tools, datasets, and methodologies were applied to develop a conservative 2027 projected inventory of NOx and VOC from the 2011 baseline inventory presented in *Section 4*. The future year projection includes all anthropogenic source sectors emitting ozone precursors. As with the baseline inventory presented in *Section 4*, biogenic emissions were not included in the projected inventory.

In-depth discussions on the methodology for the development of point, nonpoint, onroad, and nonroad emissions, and other considerations as well as reference documentation can be found in sections 2, 3, and 4 of the Technical Support Document - Future Year Emission Inventory Projections for the Baton Rouge 5-Parish Ozone Nonattainment Area, *see Appendix F,* and Technical Support Document - Refined Area and Point Source Category Future Emissions, *see Appendix K*.

Louisiana is committed to maintaining current point source emission control measures for VOC and NOx after the BRNA area is redesignated to attainment. Therefore after redesignation, LDEQ will continue to implement the Prevention of Significant Deterioration (PSD) program. Although offsets are not required by the CAA, LDEQ has elected to retain the offset requirements under LAC 33:III.504.M as an anti-backsliding measure, align the netting and significant net increase trigger values with those for marginal nonattainment areas, and set the offset ratio at 1 to 1, *see Appendix J AQ355*.

These projections fail to account for the effects of controls via regulation, rule effectiveness, rule penetration, or technology improvements, etc. discussed in *Section 7*. Although the effects of controls should be considered, the effects are not quantified.

TABLE 5.2.1 2027 PROJECTED EMISSIONS (TPD)

	NOx				Emission
	Nonpoint	Nonroad	Onroad	Point	Total
Ascension	3.2	2.7	2.2	20.9	**29.0**
East Baton Rouge	8.1	5.6	4.6	24.8	**43.0**
Iberville	3.0	4.0	0.7	25.6	**33.2**
Livingston	1.7	0.6	2.6	0.2	**5.0**
West Baton Rouge	1.9	2.3	0.9	2.7	**7.8**
BRNA Total	**17.9**	**15.2**	**11.0**	**74.2**	**118.2**
	VOC				**Emission**
	Nonpoint	**Nonroad**	**Onroad**	**Point**	**Total**
Ascension	26.6	0.6	2.5	8.5	**38.2**
East Baton Rouge	31.9	3.0	5.0	15.1	**54.9**
Iberville	18.4	0.5	0.4	7.2	**26.5**
Livingston	11.6	1.1	3.1	0.9	**16.6**
West Baton Rouge	4.2	0.9	0.4	2.0	**7.4**
BRNA Total	**92.7**	**6.1**	**11.4**	**33.6**	**143.6**

TABLE 5.2.2 SUMMARY OF PROJECTED EMISSIONS (TPD)

	2011		2022		2027		Δ2011-2027	
	NOX	VOC	NOX	VOC	NOX	VOC	NOX	VOC
Nonpoint	37.7	83.9	17.9	90.5	17.9	92.7	-19.8	8.6
Nonroad	6.8	7.4	12.6	6.5	15.2	6.1	8.4	-1.3
Onroad	38.4	19.2	14.4	13.0	11.0	11.4	-27.4	-7.8
Point	74.2	33.6	74.2	33.6	74.2	33.6	0.0	0.0
Total	**157.0**	**144.0**	**119.0**	**143.5**	**118.2**	**143.6**	**-38.8**	**-0.4**

The projected emissions inventory shows a continued decrease in NOx and VOC emissions.

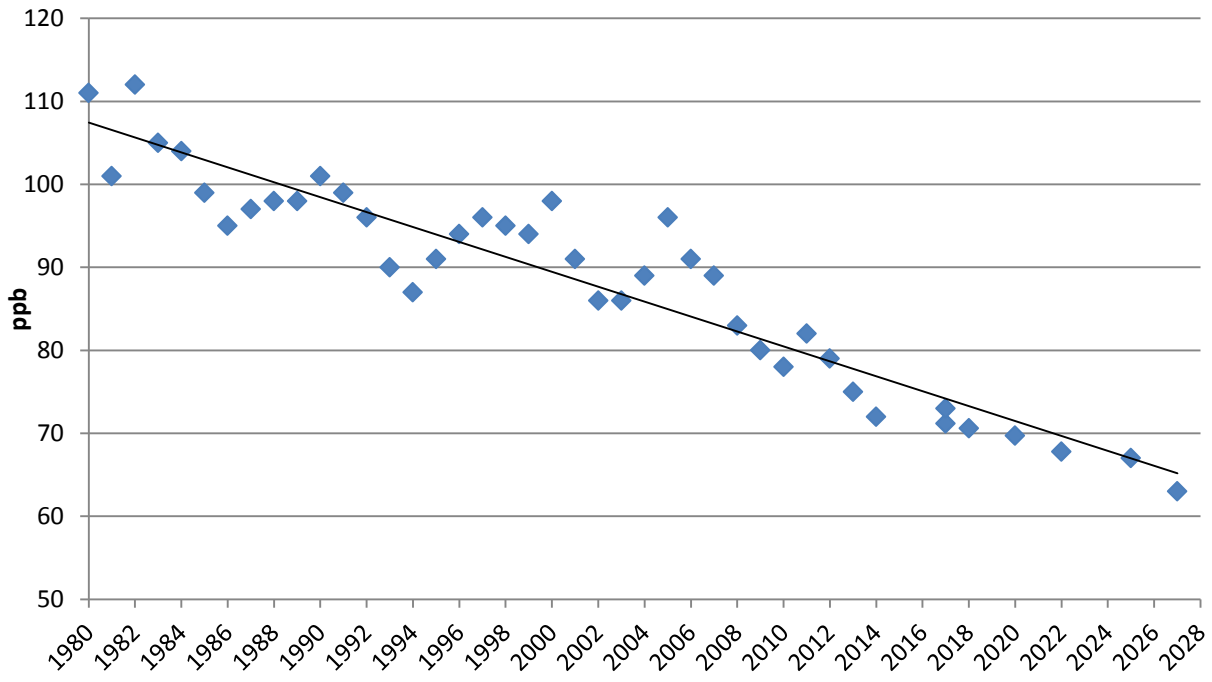
5.3 MONITORED AND MODELED OZONE CONCENTRATION

Projected ozone concentrations from several US EPA and LDEQ modeling efforts were compiled to develop projected ozone design values through 2027. These modeling projects and the resulting projected ozone design values are listed in listed in *Table 5.3.1*. These values, combined with the monitored design values clearly demonstrate the maintenance of the standard through 2027, see Figure 5.3.2. The projected ozone concentrations indicate a clear downward trend in ozone and are consistent with the downward trend in historical monitor data.

TABLE 5.3.1 BRNA PROJECTED OZONE DESIGN VALUE SOURCES

Source	Projected Year	Average Design Value (ppb)
EPA. Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS) (August 4, 2015, 80 FR 46271) and Updated Air Quality Modeling Technical Support Document for the 2008 Ozone NAAQS Transport Assessment and Ozone Design Values, August 2015.	2017	71.2
LDEQ. Photochemical Modeling for the Louisiana 8-Hour Ozone State Implementation Plan, August 2013.	2017	73
EPA. Information on the Interstate Transport "Good Neighbor" Provision for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) under Clean Air Act (CAA) Section 110(a)(2)(D)(i) (January 22, 2015 memo) and Air Quality Modeling Technical Support Document for the 2008 Ozone NAAQS Transport Assessment, January 2015.	2018	70.6
EPA. Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone, September 2015.	2025	67

FIGURE 5.3.2: BRNA MONITORED AND PROJECTED DESIGN VALUES 1980-2027*



**Design values from 1980-2015 as well as projected data discussed in Table 5.3.1 were used to linearly interpolate projected design values of 69ppb and 67ppb for 2020 and 2022, respectively, and linearly extrapolate a projected design value of 63ppb for 2027.*

5.4 DEMONSTRATION SUMMARY

Independently, each discussion supports the Department's request for redesignation to attainment. The 2027 emissions inventory projections reveal a net decrease of 38.8 and 0.4 tons per day in NOx and VOC, respectively. The 2027 projected monitored design values indicate a decrease of 19.01 ppb of monitored ozone. Both the emissions projections and modeled ozone concentrations clearly demonstrate compliance with the with the 2008 8-hour Ozone NAAQs for greater than the ten year period following the effective date of designation.

The culmination of these efforts solidifies the Department's argument and serves as substantial weight of evidence in the redesignation approval.

SECTION 6: MONITORING NETWORK

The monitoring sites in the BRNA have operated in accordance with the requirements of 40 CFR 58 and the US EPA-approved Quality Assurance Program Plan. The 8-hour Ozone NAAQS is 75 ppb and based on a rolling 8-hour average sample.

The BRNA monitored attainment of the standard during the 2011–2013 monitoring period with a DV of 75 ppb. The monitoring network for the BRNA currently consists of 8 monitors located throughout the area, *see Table 6.1.1 and Figure 2.1.1*.

TABLE 6.1.1 BRNA OZONE MONITORS

AQS NUMBER	MONITOR	PARISH
220470009	Bayou Plaquemine	Iberville
220330009	Capitol	East Baton Rouge
220470012	Carville	Iberville
220050004	Dutchtown	Ascension
220630002	French Settlement	Livingston
220330003	LSU	East Baton Rouge
221210001	Port Allen	West Baton Rouge
220330013	Pride	East Baton Rouge

The Department is committed to keeping an adequate monitoring network in place throughout the maintenance period. The monitors will be used to detect if and when appropriate levels have been exceeded for contingency measure triggering purposes. Louisiana commits to continue to operate an appropriate air quality monitoring network in accordance with 40 CFR 58.

SECTION 7: VERIFICATION OF CONTINUED ATTAINMENT

The state has implemented enforceable emission control regulations to ensure continued maintenance of the 2008 Ozone NAAQS. Control measures also have been developed, promulgated, and implemented at the federal level to reduce ozone-forming emissions of NOx and VOC. Development and subsequent implementation of other federal measures will result in additional emission reductions of NOx and VOC during the 10-year maintenance period. Federal measures which have been implemented or are currently in some phase of implementation include, but are not limited to:

- Various New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP)to control NOx and VOC
- Tier 2 – Motor Vehicle Emission Standards and Gasoline Sulfur Control Requirements (65 FR 6697)
- Tier 3 – Motor Vehicle Emission and Fuel Standards (79 FR 23414)
- Tier 4 – Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements – Tier 4(66 FR 5002)
- Control of Emissions from Nonroad Diesel Engines and Fuels (69 FR 38958)
- Cross-State Air Pollution Rule (CSAPR) (79 FR 71663)
- Control of Air Pollution From Aircraft and Aircraft Engines; Proposed Emission Standards and Test Procedures (76 FR 45012)
- Carbon Pollution Emission Guidelines for Existing Stationary Sources: EGUs (electric generating units) in Indian Country and U.S. Territories (79 FR 34829)

Louisiana will continue to operate an ambient ozone monitoring network to verify continued attainment of the 8-hour Ozone NAAQS. The air monitoring results will reveal changes in the ambient air quality as well as assist Louisiana in determining whether or not implementation of any contingency measures is necessary. The state will continue to work with US EPA through the air monitoring network review process, as required by 40 CFR 58, to determine:

1) the adequacy of the ozone monitoring network;

2) if additional monitoring is needed; and

3) when monitoring can be discontinued.

Air monitoring data will continue to be quality assured according to federal requirements.

LDEQ will continue to submit annual updates to US EPA for point sources and triennial updates for all sources in accordance with 40 CFR Part 51 Subpart A – Air Emissions Reporting Requirements (AERR). Louisiana will also make comparisons of the EI data submitted on an annual and triennial basis to the NEI with the emission growth data submitted in this plan to ensure emission reductions continue the downward trend.

SECTION 8: CONTINGENCY PLAN

8.1 CONTINGENCY IMPLEMENTATION

Section 175A maintenance plan requirements include contingency measures that are capable of promptly addressing any violation of the NAAQS that might occur. The contingency plan ensures that contingency measures are adopted expeditiously once they are triggered.

The contingency plan for the ozone maintenance area is triggered upon monitoring a violation of the 2008 8-hour Ozone NAAQS. A violation occurs when the design value of the area exceeds 0.075 ppm on one or more monitors in the network over the 3 year data collection period. Implementation of contingency measures will occur within 24 months of the triggering event.

Implementation of the contingency plan involves analysis of data to determine the cause of the violation. If, after this analysis is complete, the state determines that the violation was caused by events that can be controlled within the state's jurisdiction through regulatory actions, the state will determine the appropriate measures for implementation in the area and implement such measures within the 24 month period as suggested by US EPA guidance.

Determination of the appropriate contingency measure(s) for implementation will involve the following actions:

- Identification of potential sources for emission reductions;
- Identification/evaluation of prospective control measures;
- Initiation of stakeholder process; and
- Implementation of contingency measures through promulgation of appropriate control rules adhering to public notice and comment requirements.

8.2 CONTINGENCY MEASURES

Contingency measures to be considered for implementation will include, but will not be limited to, extending the applicability of the state's NOx control rule LAC 33:III.2202 to include the months of April and October each year. Currently, the provisions of Chapter 22 apply during the ozone season, May 1 to September 30, of each year. Reducing NOx emissions during April and October will further reduce high ozone days in the area. The state will also consider other measures deemed appropriate at the time as a result of advances in control technologies. These measures may include lowering of the NOx emission factors of LAC 33:III.2205.D and/or requiring more stringent monitoring of elevated flares.

Other possibly contingency measures that may be considered include:

- diesel retrofit/replacement initiatives;
- programs or incentives to decrease motor vehicle use;
- implementation of fuel programs, including incentives for alternative fuels;
- employer-based transportation management plans;

- anti-backsliding ordinances; and
- programs to limit or restrict vehicle use in areas of high emissions concentration during periods of peak use.

SECTION 9: MOTOR VEHICLE EMISSION BUDGET

Transportation conformity is required under the CAAA Section 176(c). The US EPA's transportation conformity rules, 40 CFR 51.390 and 40 CFR 93.100- 40 CFR 93.129, address emissions from on-road mobile sources and establish the criteria and procedures to ensure that projects federally funded under Title 23 U.S.C. or the Federal Transit Act are consistent and conform with the state's air quality plan (SIP).

The MVEB establishes a cap on motor vehicle-related emissions that cannot be exceeded by predicted transportation system emissions. The budget acts as a cap on emissions in the year for which it is defined, and for all subsequent years until revised. On July 9, 2013, the LDEQ in conjunction with US EPA, US Department of Transportation (US DOT), Louisiana Department of Transportation and Development (LDOTD), and Capital Region Planning Commission (CRPC), adopted an air quality conformity analysis that was based on the MVEB established in the Baton Rouge 8-hour Maintenance Plan with a budget year 2022. This budget was formed using the Mobile6.2 model and approved on November 30, 2011 in 76 FR 74000, *see Appendix I*.

The Baton Rouge Metropolitan Planning Organization (MPO), CRPC, and LDOTD, in cooperation with the Federal Highway Administration (FHWA) and LDEQ, utilized the interagency consultation process outlined in Louisiana's transportation conformity regulations, LAC 33:III.Chapter 14, to update the 2022 MVEB and prepare the 2027 MVEB. Interagency consultation meetings were held to discuss and agree upon an appropriate methodology to produce the budget. The most recent emissions inventory was run with the US EPA's MOVES2010b. While this model is more conservative than the former Mobile6.2, MOVES2010b on-road emissions estimates decline substantially over time for NOx and VOC due to fleet turnover ever with expected annual growth in vehicle miles traveled (VMT). With this submittal, LDEQ proposes the revised MVEB for 2022 as well as the 2027 MVEB as indicated in *Table 9.1 and Table 9.2,* respectively.

TABLE 9.1 PROPOSED REVISED 2022 NOX AND VOC MVEB

Pollutant	TPD
NOx	14.37
VOC	13.19

TABLE 9.2 PROPOSED 2027 NOX AND VOC MVEB

Pollutant	TPD
NOx	10.95
VOC	11.55

Modeling protocols and other details relative to the production of the MVEB is found in *Appendix F*. Interagency concurrence memos are included as *Appendix I.*

APPENDIX A: LEGAL AUTHORITY

Office of the Governor
State of Louisiana

JOHN BEL EDWARDS
GOVERNOR

P.O. Box 94004
BATON ROUGE, LOUISIANA 70804-9004
(225) 342-7015
GOV.LA.GOV

January 29, 2016

Mr. Ron Curry
Regional Administrator
U. S. Environnemental Protection Agency
Mail Code: (6-RA)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Re: Designee for State Implementation Plan Purposes

Dear Mr. Curry:

As Governor of the state of Louisiana, I hereby appoint Chuck Carr Brown, Secretary of the Louisiana Department of Environmental Quality, as my designee to submit documents to the EPA for approval and incorporation into the State Implementation Plan for Louisiana pursuant to Section 110 of the Federal Clean Air Act and EPA's implementing regulations in 40 CFR Part 51.

Thank you for your assistance in the matter.

Sincerely,

John Bel Edwards
Governor

cc: Chuck Carr Brown, Ph.D., Secretary LDEQ
Mark Hansen, Planning Section Chief, EPA

APPENDIX B: PUBLIC NOTICE DOCUMENTS

B.1 PUBLIC NOTICE - JUNE 20, 2015

Potpourri

POTPOURRI

Department of Environmental Quality
Office of Environmental Services
Air Permits Division

Baton Rouge Nonattainment Area Redesignation Request and 2008 8-hour ozone National Ambient Air Quality Standard Maintenance Plan

Under the authority of the Louisiana Environmental Quality Act, R.S. 30:2001 et seq., the secretary gives notice that the Office of Environmental Services, Air Permits Division will submit a proposed redesignation request and ozone maintenance plan for the 2008 8-hour ozone national ambient air quality standard for the Baton Rouge nonattainment area, which includes Ascension, East Baton Rouge, Iberville, Livingston and West Baton Rouge Parishes. The redesignation request is being submitted as required under section 107(d)(3)(E) of the 1990 Clean Air Act amendments; the ozone maintenance plan is being submitted as required under section 175A of the 1990 CAAA. (1506Pot2)

Public Comments

All interested parties are invited to submit written comments concerning the redesignation request and maintenance plan for the Baton Rouge area no later than 4:30 p.m., July 31, 2015, to Vivian Aucoin, Office of Environmental Services, P.O. Box 4313, Baton Rouge, LA 70821-4313, or by email to vivian.aucoin@la.gov.

Public Hearing

A public hearing will be held at 1:30 p.m. on July 29, 2015, at the Galvez Building, Oliver Pollock Conference Room located at 602 North Fifth Street, Baton Rouge, LA 70802. Should individuals with a disability need an accommodation in order to participate, please contact Vivian Aucoin at the number or address listed below. Interested persons are invited to attend and submit oral comments on the proposal.

A copy of the proposal may be viewed on the LDEQ website or at LDEQ headquarters at 602 North Fifth Street, Baton Rouge, LA 70802.

Herman Robinson, CPM
Executive Counsel

1506#026

~~**POTPOURRI**~~

~~**Department of Environmental Quality**~~
~~**Office of the Secretary**~~
~~**Legal Division**~~

~~Louisiana Water Quality Management Plan~~
~~Volume 4: Basin and Subsegment Boundaries~~

~~Under the authority of the Environmental Quality Act, R.S. 30:2071 et seq., the secretary gives notice that procedures have been initiated to amend volume 4 of the Louisiana water quality management plan (WQMP). (1506Pot1)~~

~~The WQMP, required by sections 208 and 303 of the Clean Water Act, must be periodically reviewed and updated according to federal regulations. The Louisiana Department of Environmental Quality (LDEQ) reports on water quality in the state by basin subsegment. Volume 4 of the WQMP, which describes the subsegment delineations, hydrology, and geography of the state, has been reviewed and revised to ensure that subsegments are distinct and consistent representations of the state's hydrology.~~

~~A use attainability analysis (UAA) was conducted in the eastern Lower Mississippi River Alluvial Plains (LMRAP) ecoregion for review of the dissolved oxygen (DO) water quality criteria. An ecoregion-based approach was used for the refinement of the DO criteria and the findings are presented in the supporting documentation for WQ091, which is being proposed concurrently with this potpourri. The ecoregion-based approach resulted in 21 new subsegments based on watersheds. In addition, some subsegments within the eastern LMRAP, Southern Plains Terrace and Flatwoods, and Coastal Deltaic Marshes ecoregions underwent boundary and description revisions. Other errors and inconsistencies in subsegment boundaries were addressed. These include correcting topological errors and updating boundaries to more closely match current physical conditions. The changes are being incorporated into LAC 33:IX.1123, Table 3. The purpose of this revision to volume 4 of the WQMP is to update the subsegment descriptions and delineations to be consistent with LAC 33:IX.Chapter 11. The draft documents are available for review from LDEQ's website, http://www.deq.louisiana.gov/portal/divisions/waterpermits/waterqualitystandardsassessment.aspx.~~

B.2 PUBLIC HEARING TRANSCRIPT

DEPARTMENT OF ENVIRONMENTAL QUALITY

Baton Rouge Nonattainment Area Redesignation Request and 2008 8-hour Ozone National Ambient Air Quality Standard Maintenance

Emission Reduction Credits Banking Program

Emission Offsets

Dissolved Oxygen Criteria Revisions for Eastern Lower Mississippi River Alluvial Plains Ecoregion

Log Numbers: 1506Pot2, AQ353, AQ354, WQ091

The public hearing in the above titled matters was taken at the Department of Environmental Quality, 602 North Fifth Street, Galvez Building, Oliver Pollock Conference Room, Baton Rouge, Louisiana, beginning at 1:30 p.m. on July 29, 2015.

BEFORE: Jennifer Pickett, Certified Stenomask Reporter, in and for the State of Louisiana.

H E A R I N G

MS. HAM:

Good afternoon. My name is Susan Ham. I'm employed by the Louisiana Department of Environmental Quality. I'll be serving as hearing officer this afternoon to receive comments regarding proposed amendments to the air and water regulations as well as a potpourri item.

The comment period for these amendments began on June 20, 2015, when the notice of intent was published in the *Louisiana Register*. The comment period will close at 4:30 p.m., July 31, 2015, for the potpourri item, August 5, 2015 for the air regulations and with regard to the water regulation, WQ091, LDEQ granted a request for a 30 day extension of the comment period. WQ091 will now close at 4:30 p.m. September 4, 2015. It would be helpful to us if all oral comments received today were followed up in writing.

This public hearing provides a forum for all interested parties to

present comments on the proposed changes. This hearing is not being conducted in a question and answer format. Please remember that the purpose of this public hearing is to allow you, the public, an opportunity to express your thoughts concerning today's proposed amendments.

I'll ask that each person commenting please come up and sit at the front table and begin by stating his or her name and their affiliation for the record.

The first amendment is designated by the Log Number AQ353.

LAC 33:III.Chapter 6 currently precludes sources located in EPA-designated attainment areas from participating in the emissions banking program. This rulemaking will allow owners or operators of stationary sources located in certain attainment areas to apply for emission reduction credits (ERC). On December 17, 2014, the Environmental Protection Agency

(EPA) proposed to revise the primary and secondary national ambient air quality standards, NAAQS, for ozone to a level within the range of 0.065 to 0.070 parts per million, ppm, this can be found at 79 federal register, 75234. EPA is required by a federal court order to finalize its proposal no later than October 1, 2015. Based on current design values, LDEQ anticipates that up to 17 parishes would be designated as ozone nonattainment areas should the standard be set at 0.070 ppm. If the final standard is less than 0.070 ppm, as many a 13 additional parishes could receive a nonattainment designation. Because LAC 33:III.Chapter 6 currently precludes sources located in EPA-designated attainment areas from participating in the emissions banking program, owners or operators of stationary sources located in only five of the parishes described above (i.e. Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge) have

had the ability to bank creditable reductions in NOX and VOC emissions. In order to encourage prompt reductions in NOX and VOC emissions that will be needed to comply with the revised ozone NAAQS (and to address future scenarios analogous to this), LDEQ will amend Chapter 6 to allow an owner or operator of a stationary source located in an area currently designated as attainment, but which is not in compliance with the new or revised NAAQS, to bank creditable reductions in emissions of the noncompliant pollutants that are realized on or after the date the new or revised NAAQS as it's promulgated.

Does anyone care to comment on this regulation?

MR. GRAHAM:

Good afternoon. My name is Henry Graham with the Louisiana Chemical Association, LCH and trade association and chemical manufacturers for the State of Louisiana. Some of our members are currently located in the Baton Rouge

ozone nonattainment area and some of our members are in an adjacent parishes near the attainment area and would be affected by this proposed rule. LCA supports the adoption of AQ353, we believe it's in the best interest to encourage reductions sooner rather than later and for some of these areas that are very close, that are currently in attainment right now but depending on the promulgation of the standard in October will come back into nonattainment. We believe that rather than waiting for several years for the redesignation process to take place that the facilities can start to make reductions earlier and having an emission banking credit program will allow them to do that and at the same time provide the additional requirements and flexibility that the State needs to maintain the program that it has now. We've seen early reductions in the benefit of early reductions we believe have helped us along the way to

achieving the 2008 standard. We believe that staying ahead of the game with these rules will help us with the future standard. We will be submitting written comments in support of AQ353. Thank you.

MS. HAMM:

Anyone else care to comment on AQ353? If not, the hearing on AQ353 is closed. The next amendment is designated by the Log Number AQ354.

This rulemaking will allow for increases of one ozone precursor, NOX or VOC, to be offset with decreases of the other ozone precursor at the ratio dictated by photochemical modeling, subject to approval of LDEQ and the Environmental Protection Agency. However, the approved ratio must be no less stringent than as specified in Table 1 of LAC 33:III.504, currently 1.10 to 1 for marginal ozone nonattainment areas. In order to construct a new major stationary source or major modification in a nonattainment

area, LDEQ's Nonattainment New Source Review (NNSR) procedures under LAC 33:III.504 require the owner or operator to offset the increase in emissions of the nonattainment pollutants resulting from the new construction or modification. Currently, for all regulated pollutants other than PM2.5, emission reductions claimed as offset credit must be from decreases of the same regulated pollutant or pollutant class for which the offset is required. For example, increases in NOX emissions must be offset with decreases in NOX emissions; increases in VOC emissions must be offset with decreases in VOC emissions. However, in ozone nonattainment areas, both NOX and VOC are regulated as precursors to ozone. Accordingly, when a project triggers NNSR for ozone, reductions in either NOX or VOC emissions can satisfy the requirement that offsets provide a net air quality benefit, provided they are applied at the proper ratio as

determined by photochemical models such as the Comprehensive Air quality Model with Extensions, CAMx. As stated above, this rulemaking will allow for increases of one ozone precursor, NOX or VOC, to be offset with decreases of the other ozone precursor at the ratio dictated by photochemical modeling, subject to approval of LDEQ and EPA. However, the approved ratio must be no less stringent than as specified in Table 1 of LAC 33:III.504, currently 1.10 to 1 for marginal ozone nonattainment areas.

Henry, do you care to comment?

MR. GRAHAM:

Thank you, again, my name is Henry Graham with the Louisiana Chemical Association. LCA is in support of AQ354, we believe it provides the needed flexibility to address reductions in VOCs, particularly nonattainment areas. As you may be aware the nonattainment areas during the 1990s after the Clean Air Act was passed, our initial work was done on reduction of VOC, volatile

organic compounds. That work resulted in us coming very close to meeting the one hour attainment standard by the end of that decade. However, with the reductions that were made and the changes in the standard then the control of NOXs became the primary concern. That's were we have been for the past 15 years or so, is in a NOX reduction mode. As a result of that we have made some potential progress but we recognize the ratio of NOX to VOCs is critical and at different points in time the control strategy may have to involve controlling one or the other or both. As a result of that we also have found some companies may need flexibility, they may have projects they are able to do with one pollutant, more cost effective and this would make it easier for them to make the demonstrations necessary and still provide the adequate margin of safety that the department needs to get additional reductions and get us into ozone attainment. Again, we will be

submitting written comments in support of AQ354. Thank you.

MS. HAMM:

Does anyone else care to comment on AQ354? If not, the hearing on AQ354 is closed. The next amendment is designated by the Log Number WQ091. The dissolved oxygen, or DO, criteria are being revised, where appropriate, in water quality subsegments in the eastern Lower Mississippi River Alluvial Plains (LMRAP) Ecoregions based on an ecoregion approach; Table 3 in LAC 33:IX.1123 is being revised accordingly. The proposed DO criteria revisions are the result of the findings presented in the Use Attainability Analysis of Inland Rivers and Streams in the Eastern Lower Mississippi River Alluvial Plains Ecoregion for Review of Dissolved Oxygen Water Quality Criteria, which was technically approved by EPA Region 6 on November 25, 2013. Except where the DO criteria have previously been revised, the current Louisiana DO water quality

standards are the nationally-recommended criteria of 5 mg/L for freshwater and marine waters, and 4 mg/L for estuarine waters. However, natural, physical conditions such as, lack of slope, low flow, and high temperature in Louisiana prevent many Louisiana water bodies from attaining the nationally-recommended DO standards. The eastern LMRAP Ecoregion is one such area where levels of DO in surface waters are naturally low and the nationally recommended DO criteria are not attainable throughout the year. Therefore, based on the findings presented in the above referenced Use Attainability Analysis, the DO criteria for inland streams are being revised to 2.3 mg/L for the months of March through November; for the months of December through February the DO criteria for inland streams will remain as 5.0 mg/L. Boundaries for 42 subsegments within the eastern LMRAP, the Southern Plains Terrace and Flatwoods, the Terrace Uplands, and the Coastal Deltaic Marches

Ecoregions are being refined based on watersheds; these boundaries refinements resulted in the delineation of 21 new subsegments. In addition, descriptions to some subsegments are also being revised, as necessary. These changes are reflected in the revisions to Table 3 in LAC 33:IX.1123. Supporting documentation for the proposed rule consists of two documents, the first, Use Attainability Analysis of Inland Rivers and Streams in the Eastern Lower Mississippi River Alluvial Plains Ecoregion for Review of Dissolved Oxygen Water Quality Criteria. The second document is the Louisiana Water Quality Standards Ecoregions. Inaccurate water quality criteria can result in erroneous use impairment decisions that impact many of the state's water quality programs (i.e., assessments, total maximum daily load determinations, wastewater permitting, and implementation of best management practices). Therefore, it is important

to establish appropriate and protective dissolved oxygen criteria that support fish and wildlife propagation. A Use Attainability Analysis (UAA) was conducted to inform the development of ecoregion-based DO criteria in the eastern portion of the Lower Mississippi River Alluvial Plains Ecoregion. The eastern LMRAP Use Attainability Analysis is a continuation of the process which began with a Memorandum of Agreement in 2008 between the U.S. Environmental Protections Agency and LDEQ that resulted in the Use Attainability Analysis of Barataria and Terrebonne Basins for Revision of Dissolved Oxygen Water Quality Criteria. Does anyone care to comment of this amendment? If not, the hearing on WQ091 is closed.

The next item is designated by the Log Number 1506Pot2. Under the authority of the Louisiana Environmental Quality Act, R.S. 30:2001 et seq., the secretary has given notice that the Office of Environmental Services, Air

Permits Division will submit a proposed Redesignation Request and Ozone Maintenance Plan for the 2008 8-hour ozone National Ambient Air Quality Standard for the Baton Rouge Nonattainment Area, which included Ascension, East Baton Rouge, Iberville, Livingston and West Baton Rouge Parishes. The Redesignation Request is being submitted as required under section 107(d)(3)(E) of the 1990 Clean Air Act Amendments; the Ozone Maintenance Plan is being submitted as required under section 175A of the 1990 CAAA. Does anyone care to comment on this request? If not, the hearing on 1506Pot2 is closed. I'd like to thank you for your attention and participation. This hearing is closed.

THE HEARING ENDED AT 1:48 P.M.

R E P O R T E R ' S P A G E

I, Jennifer Pickett, Certified Court Reporter, in and for the State of Louisiana, the officer, as defined in Rule 28 of the Federal Rules of Civil Procedure and/or Article 1434(b) of the Louisiana Code of Civil Procedure, before whom this sworn testimony was taken, do hereby state on the record:

That due to the interaction in the spontaneous discourse of this proceeding, dashes (--) have been used to indicate pauses, changes in thought, and/or talk overs; that same is the proper method for a Court Reporter's transcription of proceeding, and that the dashes (--) do not indicate that words or phrases have been left out of this transcript.

Also, any words and/or names which could not be verified through reference material have been denoted with the phrase "(inaudible)."

_____

Jennifer Pickett, C.C.R.

29011

C E R T I F I C A T I O N

I, Jennifer Pickett, Certified Court Reporter in and for the State of Louisiana, Certificate No. 29011, which is current and in good standing, as the officer before whom this testimony was taken, do hereby certify that the above and foregoing was taken under the authority of R.S. 37:2554; that the foregoing was taken by the undersigned as hereinbefore set forth in the foregoing pages; that it was reported by me in the stenomask method, was prepared and transcribed by me or under my personal direction and supervision, and is a true and correct transcript to the best of my ability and understanding; and that I am informed about the complete arrangement, financial or otherwise, with the person or entity making arrangements for deposition services; and that I have acted in compliance with La. Code of Civil Procedure Article 1434; that I have no actual knowledge of any prohibited employment or contractual relationship, direct or indirect, between a court reporting firm and any party litigant in this matter nor is there any such relationship between myself and a party litigant in this matter. I am not related to counsel or to the parties herein, and I am in no way concerned with the outcome thereof.

_____ _____

Jennifer Pickett, C.C.R./date
29011

B.3 COMMENTS TO PROPOSAL

Baton Rouge
CLEAN AIR COALITION

July 20, 2015

Cheryl S Nolan
Administrator, Air Permits Division
P.O. Box 4413
Baton Rouge, LA 70821-4313

SUBJECT: Comments on Draft 2008 Baton Rouge Nonattainment Area 8-hour Ozone National Ambient Air Quality Standard Redesignation Request and Maintenance Plan

Dear Ms. Nolan,

The Baton Rouge Clean Air Coalition (BRCAC) stakeholders wish to commend the Louisiana Department of Environmental Quality (LDEQ) for the preparation of a very good Redesignation Request and Maintenance Plan for the Baton Rouge ozone nonattainment area. The Baton Rouge area has made remarkable progress in improving its air quality under very challenging circumstances and deserves to be recognized for this progress with formal EPA designation to attainment of the national 2008 8-hour ozone standard.

Although not specifically addressed in the document, BRCAC would like to remind LDEQ and EPA that air quality improvement efforts for the Baton Rouge area have been and are continuing to be supported by significant community volunteer efforts. BRCAC has been active in the region's ozone attainment efforts for over two decades. BRCAC, Captial Region Planning Commission, and Louisiana Clean Fuels work cooperatively in the EPA Ozone and PM Advance program to implement measures designed to reduce air pollution. Local industries participate in Ozone Action Days and have provided significant financial and technical support for DEQ's regional ozone modeling effort. Although not required by regulation, considerable research into areas such as highly reactive VOCs, IR camera leak detection, and marine vessel emissions has been done in the Baton Rouge area. The many voluntary efforts to improve Baton Rouge air quality is chronicaled in our first EPA Advance report that can be found at: http://www.epa.gov/ozoneadvance/pdfs/20131220batonrouge.pdf. Furthermore, BRCAC along with LDEQ is currently evaluating an innovative emission reduction credit strategy that could potentially yield significant new emissions reductions.

We trust that EPA will review and approve the submittal expeditiously.

Sincerely,

Mike D. McDaniel

Mike D. McDaniel, Ph.D.
Executive Director

7060 Braswell Lane, Ethel, LA 70730
www.brcleanair.com
Phone: (225) 683-4425
brcleanair@Gmail.com

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

JUL 31 2015

Cheryl S. Nolan
Administrator, Air Permits Division
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

Dear Ms. Nolan,

We have reviewed the proposed "2008 Baton Rouge Nonattainment Area 8-hour Ozone National Ambient Air Quality Standard Redesignation Request and Maintenance Plan." We are very pleased that the Baton Rouge area is monitoring attainment of the 2008 ozone standard. Enclosed are our comments on the proposed redesignation request and maintenance plan.

As you know, the requirements for redesignating the Baton Rouge ozone nonattainment area to attainment are found in Clean Air Act section 107(d)(3)(E). These are:

1. The area has attained the 2008 ozone air quality standard
2. EPA has fully approved the applicable implementation plan for the Baton Rouge area
3. The air quality improvement is due to permanent and enforceable emissions reductions
4. EPA has fully approved a maintenance plan, including a contingency plan, for the area which provides for maintenance of the standard for at least 10 years after redesignation
5. The State has met all requirements applicable to the Baton Rouge area under section 110 and part D of the Clean Air Act

As reflected in our comments, we are concerned that the proposed redesignation request and maintenance plan does not fully meet all of these requirements, particularly in the areas of:

- 2011 Base Year Emissions Inventory
- Demonstration of continued maintenance of the standard, including the Emissions Inventories used
- Motor Vehicle Emissions budget

Thank you for the opportunity to comment on the proposed revision. We would appreciate the opportunity to review the revised draft redesignation request and maintenance plan to confirm that we are in agreement that it will meet the redesignation requirements. Such agreement will benefit both of our agencies as we consider further actions for the Baton Rouge area. If you have questions regarding any of these comments, please feel free to contact me or have your staff contact Wendy Jacques at (214) 665-7395.

Sincerely yours,

Guy Donaldson, Chief
Air Planning Section (6PD-L)

Enclosure

cc: Tegan Treadaway, Louisiana Department of Environmental Quality
Vivan H. Aucoin, Louisiana Department of Environmental Quality

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Enclosure

Comments on the Proposed 2008 Baton Rouge Nonattainment Area 8-hour Ozone National Ambient Redesignation Request and Maintenance Plan

General comments

Please ensure that the Baton Rouge ozone redesignation request and maintenance plan is consistent with EPA guidance found in the September 4, 1992 EPA memo "Procedures for Processing Requests to Redesignate Areas to Attainment". The guidance memo can be found at www.epa.gov/ttn/oarpg/t5/memoranda/redesignmem090492.pdf.

Emissions Inventories

In section 3.1 we recommend that you replace the reference to Clean Air Act section 110(a)(2)(B) with a reference to section 182(a)(1) and (3). We also recommend you discuss how the area will meet the requirement for a periodic emissions inventory. The section should also clearly identify that you are using the 2011 emissions inventory to meet the requirements of section 182(a)(1).

The Clean Air Act requires that SIP inventories be based on the most current information and applicable models that are available when a SIP is developed (October 7, 2014, 79 FR 60343). The latest MOVES (Motor Vehicle Emission Simulator) model must be used for calculating on road emissions. A further discussion of MOVES is below.

As the emissions inventories were not properly developed they must be redone. We would expect that the emissions inventory for the nonattainment year (2010) would be higher than those for the attainment year (2011). Such is not the case in the proposed emissions inventories. In redoing the emissions inventories State should ensure and certify that the emissions inventories for all source categories use the most current information and were developed in accordance with EPA methodologies. More discussion on emissions inventories is below.

MOVES

The January 2015 Technical Support Document (TSD) "Future Year Emission Inventory Projections for the Baton Rouge 5-Parish Ozone Nonattainment Area" explains (pg. 1, pg. 229 of the entire document) that MOVES2010b was used for development of on-road emissions estimates, because although an initial version of MOVES2014 was available, testing of the model in combination with other circumstantial accounts from EPA indicated some remaining technical issues with the initial version. The TSD also notes "the fact that EPA is allowing a two-year grace period on the use of MOVES2010b" as a reason for use of MOVES2010b.

EPA's October 7, 2014 Official Release of MOVES2014 for SIPs and Transportation Conformity (79 FR 60343) does establish a two-year grace period for its use, but not with regard to SIP development. The two-year grace period before the MOVES2014 emission model is required to be used applies to new regional emissions analyses and new hot-spot analyses for transportation conformity determinations, not SIP development. The official release specifies that MOVES2014 should be used in ozone, CO, PM, and nitrogen dioxide (NO2) SIP development as expeditiously as possible, as there is no grace period for the use of MOVES2014 in SIPs.

It shall be noted that use of MOVES2010b for 2022 and 2027 on-road projections will not capture emissions reductions from the implementation of Tier 3 emission & fuel standards, heavy-duty engine and vehicle GHG regulations, and the second phase of light-duty vehicle GHG regulations.

Demonstration of Permanent and Enforceable Improvement in Air Quality

Please clearly identify those state and federal regulations that led to reduced emissions in the area from the nonattainment emissions inventory (2010). Again please note it appears the attainment inventory of 2011 is actually higher than the 2010 inventory (see Table 4.3.1). Attainment resulting from temporary reductions in emission rates or unusually favorable meteorology would not qualify as an air quality improvement due permanent and enforceable emission reductions.

Clean Air Act Section 110 and Part D Requirements

Please remove the current narrative on section 110 requirements as it is not relevant. We have not determined whether the State has met the statewide section 110 infrastructure SIP requirements for the 2008 ozone standard, including the requirement for interstate transport. In its place we recommend you reference section 110(a)(2)(I) which states that the SIP shall "in the case of a plan or plan revision for an area designated as a nonattainment area, meet the applicable requirements of part D (relating to nonattainment areas)."

Please remove the narrative on Part D requirements and replace it with a discussion of how the area has met the Clean Air Act section 182 marginal ozone nonattainment requirements. A short table listing the relevant marginal ozone nonattainment area requirements similar to Table 2 of 2009 ozone "Baton Rouge Ozone Nonattainment Area Redesignation Request and Maintenance Plan" submitted for the 1997 ozone standard would be useful.

Emissions Inventories and Maintenance Demonstration

As we noted above the emissions inventories need to be redone. For the emissions inventories that are intended to demonstrate that the 2008 ozone standard will be maintained LDEQ must:

- Review and update the methods for estimating future projections of emissions
- Use one methodology for calculating future projections of emissions
- Break out the emissions for each year based on source category (point, nonpoint, on road mobile and offroad mobile)

- Provide emissions for 2014, 2020 and 2023
- Update the emissions inventories for 2010, 2011, 2017 and 2027

The current projections listed in table 4.3.1 show that nitrogen oxide and volatile organic compound emissions for 2027 would be greater than those for the nonattainment year of 2010, which brings into question whether the ozone standard will be maintained. Reviewing and updating the methods for estimating future projections of emissions should lead to better estimates of emissions projections. Using one methodology for projecting future emissions allows for a valid comparison of emissions for different years. Breaking out emissions for each year by source category, as was done in tables 5 and 6 of the 2009 redesignation request and maintenance plan, will provide information on which source categories are expected to decrease and which are expected to increase. Providing emissions for 2014, 2020 and 2023 will allow for a more complete picture for emissions and help ascertain whether the area will continue to maintain the 2008 ozone standard through 2027. We note that for the 2009 redesignation request and maintenance plan, the emissions inventories covered the years 2006, 2008, 2012, 2016, and 2020. We are hopeful that an update of the emissions inventories will clearly demonstrate that the 2008 ozone standard will be maintained through 2027.

Additionally, the emissions inventories should be for anthropogenic emissions (point, nonpoint, on road mobile and off road mobile source categories).

Motor Vehicle Emissions Budgets

As per 40 CFR 93.118(e)(4)(iii), Motor Vehicle Emissions Budgets (MVEBs) must be clearly identified as such in a submitted maintenance plan. Although LDEQ has indicated to EPA Region 6 via phone discussion that the maintenance plan's proposed NOx and VOC MVEBs for 2022 and 2027 are provided in Table 2-4 of the January 2015 TSD (pg. 237 of the entire document), the SIP-specific purpose of these projections is not clearly established. LDEQ must identify the proposed 2022 and 2027 MVEBs within the submittal's Section 5: Maintenance Demonstration discussion.

KEAN | MILLER LLP
ATTORNEYS AT LAW

TOKESHA COLLINS-WRIGHT, PARTNER
PH 225.382.3426 DIRECT FAX 225.215.4183
TOKESHA.COLLINS@KEANMILLER.COM

July 31, 2015

Vivian Aucoin
Louisiana Department of Environmental Quality
Office of Environmental Services
P.O. Box 4313
Baton Rouge, LA 70821-4313

Re: Comments of the Louisiana Chemical Association on Baton Rouge Nonattainment Area Redesignation Request and 2008 8-hour ozone National Ambient Air Quality Standard Maintenance Plan, **Docket 1506Pot2**
Our File No.: 3645-329

Dear Ms. Aucoin,

On behalf of the Louisiana Chemical Association, we are submitting the attached comments to be included in the official administrative record of these proceedings. If you have any questions, please let me know.

Thank you for your assistance and consideration of these comments.

Very truly yours,

Tokesha Collins-Wright

CC: Henry Graham

T 225.387.0999 | F 225.388.9133
II City Plaza | 400 Convention Street Suite 700 | Baton Rouge, LA 70802
Post Office Box 3513 | Baton Rouge, LA 70821
keanmiller.com

Comments of the Louisiana Chemical Association on

Baton Rouge Nonattainment Area Redesignation Request and 2008 8-Hour Ozone National Ambient Air Quality Standard Maintenance Plan Docket 1506Pot2

I. Introduction

The Louisiana Chemical Association ("LCA") is a nonprofit Louisiana corporation composed of 63 member companies with over 100 chemical manufacturing plant sites in Louisiana. LCA members employ over 24,000 persons in Louisiana, who not only work in the communities their companies call home – they live there, too. LCA members are committed to excellence in safety, health, security and environmental performance, and to earning their "license to operate." Over 30 of LCA's members have plant sites located within the Baton Rouge Ozone Nonattainment Area (the "Baton Rouge Area"), which consists of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge Parishes.

The members of LCA have been key partners with the Louisiana Department of Environmental Quality ("LDEQ") and the United States Environmental Protection Agency ("EPA") to plan for and to achieve attainment with the National Ambient Air Quality Standard ("NAAQS") for ozone within the area. These members are proud of the progress that has been made in the Baton Rouge Area with respect to achieving Clean Air Act ("CAA") standards. The Baton Rouge Area is in attainment of the 2008 8-hour ozone standard and has been since 2013.[1] This achievement was accomplished two years ahead of the EPA schedule, and it represents an impressive achievement given the Baton Rouge area's growth in manufacturing, support facilities and mobile sources.

The Louisiana Register Potpourri notice that is the subject of these comments addresses the requirements necessary for full redesignation of the Baton Rouge Area to the status of attainment with the currently implemented 8-hour NAAQS for ozone. The LCA supports LDEQ's proposed redesignation of the Baton Rouge Area to attainment in accordance with §107(d)(3)(E) of the CAA (42 U.S.C. §7407(d)(3)(E)). That provision allows for redesignation to attainment provided that the following requirements are satisfied:

(1) The Administrator determines that the area has attained the applicable NAAQS based on current air quality data;
(2) The Administrator has fully approved the applicable state implementation plan for the area under section 110(k) of the CAA;
(3) The Administrator determines that the improvement in air quality is due to permanent and enforceable emission reductions resulting from implementation of the applicable SIP, Federal air pollution control regulations, and other permanent and enforceable emission reductions;
(4) The Administrator has fully approved a maintenance plan for the area meeting the requirements of section 175A of the CAA; and,

[1] *See* Federal Register Notice of Clean Data determination. 79 Fed. Reg. 21,139 (April 15, 2014).

(5) The state containing the area has met all requirements applicable to the area under section 110 and part D of the CAA.

LDEQ's Potpourri Notice titled "Baton Rouge Nonattainment Area Redesignation Request and 2008 8-Hour Ozone National Ambient Air Quality Standard Maintenance Plan," docket 1506Pot2, is designed to solicit comment on LDEQ's proposed demonstration of attainment with the 8-hour ozone standard.

The comments below demonstrate how the LDEQ proposal for the Baton Rouge Area meets each of these requirements for an attainment demonstration and full redesignation. These comments are offered in support of LDEQ's request for redesignation. However, in certain comments, LCA is requesting that LDEQ provide supplemental materials to EPA to further support the proposed full redesignation.

II. The Baton Rouge Area Meets All Requirements for Redesignation to Attainment.

A. Demonstration of Attainment

The Baton Rouge Area met the 8-hour ozone NAAQS design value for the 2011-2013 period. Under EPA regulations at 40 C.F.R. Part 50, the 8-hour ozone standard is attained when the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentrations is less than or equal to 0.075 ppm (i.e., less than or equal to 0.075666 ppm, truncated to 0.075 ppm, based on data rounding conventions specified in Appendix P of 40 C.F.R. Part 50) over the most recent three-year period at all monitors in an area. Such supporting data must meet a minimum data completeness requirement. The completeness and data quality requirements (specified in Appendix P of 40 C.F.R. Part 50) for ozone data supporting a determination of attainment and a redesignation to attainment is met when the annual average percent of days with valid ambient monitoring data is greater than 90 percent for the ozone seasons during the three-year period, with no single year with less than 75 percent data completeness during the ozone season.

As part of the June 20, 2015, ozone redesignation request, LDEQ submitted summarized ozone monitoring data indicating the top four daily maximum 8-hour ozone concentrations for each monitoring site in the Baton Rouge Area during the 2011-2013 period. These summarized worst-case ozone concentrations are part of the quality-assured ozone data collected in this area and recorded in the federal Air Quality System ("AQS"). The annual fourth-high 8-hour daily maximum concentrations for each year during the 2011-2013 period, along with the 3-year averages, are summarized in Table 1 below.

Table 1.--Annual Design Values[2] for 8-Hour Ozone Concentrations in Parts Per Million ("ppm") for the Baton Rouge Area

[2] The design value is the average of the annual fourth-high daily maximum 8-hour average ozone concentrations measured and recorded at each monitor.

Monitor Site	2009-2011 Design value (ppb)	2010-2012 Design value (ppb)	2011-2013 Design value (ppb)	2012-2014 Design value (ppb)
Bayou Plaquemine	74	75	71	65
Capitol	77	76	72	69
Carville	77	76	75	69
Dutchtown	77	76	71	67
French Settlement	76	74	72	71
LSU	82	79	75	72
Port Allen	72	71	68	65
Pride	72	72	69	66

* Highlighted areas show where monitor's design value was in compliance with the 8-hour standard.

The monitored ozone concentrations for 2011-2013 show that the entire Baton Rouge Area has attained the 8-hour ozone standard, as the design value for all 8 monitors is below $\leq$ 75 ppb. The design value for the area for 2011-2013 was 75 ppb, based upon the Carville and LSU monitors. The data collected at these monitoring sites show that the area satisfies the CAA requirement that the ozone standard must be attained at all monitoring sites in the area. The 2012-2014 design value for the area is 72 ppb, based upon the LSU monitor. Further, preliminary ozone monitoring data during 2015 year-to-date indicates that all monitors in the Baton Rouge Area continue to attain the ozone NAAQS. In fact, in a review of the table, it should be noted that air quality at each monitor has continued to improve over the entire time period.

In the EPA's Clean Data determination for the Baton Rouge Area, 79 Fed. Reg. 21139 (April 15, 2014), EPA stated that the data in Table 1 for 2011-2013 meets the data completeness and quality assurance requirements of the rules. However, LDEQ's proposed redesignation request documentation does not specifically state this fact with regard to the 2014 period. LCA therefore believes that LDEQ should provide a statement to EPA, and/or amend Section 2.1 of the redesignation document, to specifically confirm that the monitoring data for 2014 is completed quality assured, and certified such that it meets the data requirements under Part 50, Appendix P.

Per guidance from EPA concerning redesignation requests and per 40 C.F.R. Part 58, LDEQ must commit to continue ozone monitoring in this area as part of the state's ozone maintenance plan. LDEQ specifically made this commitment in Section 6.1 of its redesignation document; thus satisfying this legal requirement. Also, an additional requirement of Part 58 is that LDEQ must commit to working with EPA prior to altering the existing monitoring network if changes become necessary in the future. LDEQ specifically made this commitment in Section 7 of its redesignation document; thus satisfying this legal requirement.

Therefore, EPA should promptly make a finding that the ozone monitoring data submitted by the State of Louisiana provide an adequate demonstration that the Baton Rouge Area has attained the 2008 8-hour ozone NAAQS and continues to meet that standard.

B. The SIP for the Baton Rouge Area is Fully Approvable Under §110(k) of the CAA

The Baton Rouge Area initially was designated as a marginal nonattainment area under the 2008 8-hour ozone standard, with a deadline of December 31, 2015, within which to achieve attainment.[3] The area attained the standard in 2013, well before the December 31, 2015, deadline.

The applicable SIP for the Baton Rouge Area must be fully approved under Section 110(k) in order to allow redesignation to attainment. This section of the CAA contains the requirements for SIP completeness, deadlines, full, partial and conditional approval, and disapproval. It is clear that approval action on SIP elements and the redesignation request may occur simultaneously. An area cannot be redesignated if a required element of its plan is the subject of a disapproval, a finding of failure to submit, or to implement the SIP, or partial, conditional, or limited approval. However, SIPs must be fully approved only with respect to applicable requirements. Thus, in order for the Baton Rouge Area to be redesignated, LDEQ must demonstrate that the SIP meets all requirements of CAA § 110 and Part D that were applicable.

LCA believes that the currently effective SIP, along with pending SIP revision submittals by LDEQ to EPA Region 6, fully satisfy all 8-hour applicable requirements.

1. Basic Infrastructure SIP Requirements Under CAA §110(a)

LDEQ submitted the 2008 Ozone Infrastructure SIP on June 4, 2013. The plan was deemed administratively complete by operation of law on December 7, 2013.[4] In its Redesignation Request, LDEQ lists each of the Section 110 requirements and discusses how the state has met these requirements.

The LCA believes that the State of Louisiana has made submissions that satisfy the basic program requirements for managing ozone air quality. As such, LCA believes that the LDEQ SIP satisfies all of the infrastructure elements required by §110(a) of the CAA.

2. Applicable Eight-Hour Requirements

The CAA requirements for a marginal ozone nonattainment area are set forth below:

(1) Emissions Statement (CAA Section 182(a)(3)(B))
(2) A Baseline Emissions Inventory (CAA Section 182(a)(1))

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[3] 77 Fed. Reg. 30,088, 30,125 (May 21, 2012).

[4] EPA had previously published a finding that Louisiana did not timely submit the infrastructure SIP, but acknowledged that many states missed the initial deadline due to EPA delay in promulgating rules to implement the 2008 ozone NAAQS. *See* 78 Fed. Reg. 2882, January 15, 2013. However, that notice was to start a 24-month "clock" for EPA to promulgate a Federal Implementation Plan (FIP) for Louisiana (and 24 other states) in the event that the state did not submit a SIP revision to correct the deficiency before a FIP was promulgated. Because Louisiana did submit a SIP revision to address the deficiencies noted by EPA in June 2013, no FIP is warranted.

(3) Provisions for reasonable available control technology ("RACT") (CAA Section 182(a)(2)(A))
(4) Nonattainment New Source Review ("NNSR") program (CAA Section 182(a)(2)(C))
(5) Nitrogen oxide ("NOx") and volatile organic compound ("VOC") emissions offset of 1.1 to 1 for major source permits (CAA Section 182(a)(4))
(6) Transportation Conformity Requirements (CAA Section 176(c))

The LCA supports LDEQ's analysis of these requirements contained in Docket 1506Pot2 and in its SIP submittals (which have been cited in its Redesignation Request). However, the LCA believes that LDEQ should supplement its submittal to EPA as discussed in the following sections in order to provide even further support for the redesignation request.

C. The Improvement in Air Quality Is Due to Permanent and Enforceable Emission Reductions

The LCA supports LDEQ's conclusion stated in Section 2.3 of the Redesignation Request that the air quality improvement in the Baton Rouge Area is due to permanent and enforceable reductions in VOC and NOx emissions that have resulted from implementation of the SIP, federal air control regulations, and other enforceable reductions. The changes documented by LDEQ in its request are reductions in anthropogenic (man-made or man-based) sources in the area, occurring between 2002 and 2014. The 8-hour inventories submitted to EPA demonstrate the significant decreases in VOC and NOx emissions.

A significant degree of emission reductions within the Baton Rouge Area resulted from the NOx control rule, LAC 33:III.2201 adopted by LDEQ in 2002, which required reductions from major sources by May 1, 2005. The rule was later amended to lower the applicability threshold from 50 tons/year ("TPY") NOx to 25 TPY NOx. (This amendment was submitted by LDEQ in a SIP revision to EPA Region 6 for review in May 2005 due to the anti-backsliding requirements of the Phase I 8-Hour Ozone Implementation Rule.[5] Chapter 22 was approved as part of the Louisiana SIP on July 5, 2011. *See* 76 Fed. Reg. 38,977. The rule was projected to result in 40 Tons Per Day ("TPD") NOx emission reductions. In addition, LDEQ implemented rules to lower the applicability threshold for a number of VOC control regulations from 50 TPY to 25 TPY or lower. These regulatory amendments were submitted as a proposed SIP revision to EPA Region 6 on May 9, 2005, and were approved by EPA on July 5, 2011. *See* 76 Fed. Reg. 38,977, 38,979.

[5] In 1991, the Baton Rouge Area was designated nonattainment of the 1-hour ozone standard, by operation of law, and was classified as a serious ozone nonattainment area. 56 Fed. Reg. 56,694 (Nov. 6, 1991).The 1-hour ozone standard was revoked by EPA in 2004, effective on June 15, 2005; however, under the EPA's Phase I Transition Rule, to prevent anti-backsliding areas designated nonattainment for the 1-hour standard at the time of the 8-hour designations remained subject to certain control measures that applied by virtue of the 1-hour classification. At the time of the 1997 8-hour ozone designation to nonattainment, the Baton Rouge Area was classified as severe under the 1-hour standard. The Baton Rouge Area monitored attainment with the 1-hour NAAQS as of December 31, 2008. Accordingly, LDEQ submitted a request for determination of attainment based on EPA's Clean Data Policy. On March 26, 2009, EPA proposed a determination of attainment of the 1-hour ozone standard for the BRNA. A final determination was published in the Federal Register on February 10, 2010 (75 Fed. Reg. 6,570).

The history of the Baton Rouge Area has been one of continued progress in emissions reductions for ozone precursors. From 2002 to 2007 there was a reduction of 16,415 TPY of NOx emissions from point sources subject to inventory reporting, which equated to a reduction of approximately 45 TPD.[6] During the same period, the reduction in point source VOC emissions was 2,167 TPY or about 5.9 TPD. This information provided supporting evidence of substantial NOx and VOC reductions in line with the projected impacts of the rules.

However, LDEQ's current Redesignation Request is not accompanied by an emission inventory comparison to specifically quantify the NOx and VOC reductions that have occurred since 2007. LCA encourages LDEQ to include a more robust discussion in the Redesignation Request to support the contention that NOx and VOC emissions reductions are permanent and enforceable.

There have been substantial reductions in mobile source emissions due to LDEQ's continued implementation of the Vehicle I/M program and due to EPA fuel and vehicle regulations. LDEQ received full approval from EPA for its low enhanced I/M program in 2002.[7] The program included gas cap testing and visual anti-tampering checks on 1980 and newer gasoline-fueled cars and trucks weighing less than 10,000 lbs (gross vehicle weight rating). On-board diagnostic ("OBD") testing is conducted on 1996 and newer vehicles. Annual emission testing is conducted using a decentralized network of certified motor vehicle inspection stations.

EPA enacted a number of federal fuel and vehicle regulations that have led to permanent and enforceable reductions in emissions. These include the EPA Tier II rules, enacted on February 10, 2000. This rule required automakers to manufacture and sell lower-emitting cars and refineries to make cleaner, lower sulfur gasoline. Lower sulfur gasoline improves the efficiency of catalytic converters, thereby resulting in lower NOx emissions. The rules were phased in between 2004 and 2009. EPA estimated that by the time these rules were fully implemented, NOx emission reductions would be approximately 77% for passenger cars, 86% for smaller SUVs, light trucks, and minivans, and 65-95% reductions for larger SUVs, vans, and heavier trucks compared to pre-Tier II levels.[8] EPA estimated that VOC emission reductions from Tier II, when fully implemented were approximately 12% for passenger cars, 18% for smaller SUVs, light trucks, and minivans, and 15% for larger SUVs, vans, and heavier trucks compared to pre-rule levels.[9]

On April 28, 2014, EPA enacted Tier III rules, which are set to reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. 79 Fed. Reg. 23,414. The tailpipe standards include different phase-in schedules that vary by vehicle class but generally phase in between model years 2017 and 2025. In addition to the gradual phase-in schedules, other flexibilities include credits for early compliance and the ability to offset some higher-emitting vehicles with extra-clean models.

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[6] LDEQ Request for Redesignation of

[7] *See* Final Rule at 67 Fed. Reg. 60594 (Sept. 26, 2002).

[8] *See* Fact Sheet entitled, "EPA's Program for Cleaner Vehicles and Cleaner Gasoline," Dec. 1999, available at http://www.epa.gov/tier2/documents/f99051.pdf. *See also* U.S. Department of Transportation Federal Highway Administration: Transportation Air Quality Facts and Figures January 2006: Emission Standards: Federal Emissions Standard, available at http://www.fhwa.dot.gov/environment/air_quality/publications/fact_book/page14.cfm.

[9] *Id*.

EPA estimates that when the Tier III rules are fully implemented, NOx emissions will be reduced by 10% by 2018 and by 25% by 2030.[10] EPA estimates that VOC emission reductions will be 3% by 2018 and 16% by 2030. While the Tier III rules have not yet been phased in, the standards have been finalized and will commence beginning in 2017; future NOx and VOC emissions will be lower as a result. For this reason, LCA believes that LDEQ should revise the Redesignation Request to include a discussion of the Tier III rules.

Under the EPA Ultra-low Sulfur Diesel Requirements for Highway Vehicles program, beginning June 1, 2006, refiners started producing diesel fuel for use in highway vehicles with a sulfur content of no more than 15 ppm. At the terminal level, highway diesel fuel sold as low sulfur fuel was required to meet the 15 ppm sulfur standard as of July 15, 2006. For retail stations and fleets, highway diesel fuel sold as low sulfur fuel met the 15 ppm sulfur standard by October 15, 2006. These reductions have helped the area achieve attainment and are permanent, enforceable measures.

The LCA supports LDEQ's position that EPA-enacted Non-Road Source Controls have resulted in emission reductions that are permanent and enforceable and that additional reductions will come in future years. As noted by LDEQ, these include the following four federal off-road measures:

> (1) Non-road Diesel Engines – Two rules under this category have resulted and will continue to result in emission reductions. The final rule on control of emissions from non-road diesel engines was published on October 23, 1998 (63 Fed. Reg. 205). The rule was established to reduce emissions from non-road diesel engines and equipment by establishing stringent new emissions standards and requirements to ensure that engines maintain their level of emission performance as they age, to provide compliance flexibility to engine and equipment manufacturers, and to establish a voluntary program to encourage the introduction of low-emitting engines. In June 2004, EPA finalized the Clean Air Non-road Diesel Rule which requires stringent pollution controls on diesel engines used in industries such as construction, agriculture, and mining that will result in a reduction in NOx emissions. In addition, beginning in 2007, sulfur levels in non-road diesel fuels were reduced by 99 percent from current levels (from approximately 3,000 ppm now to 15 ppm in 2010). In the case of locomotive and marine diesel fuel, the second step will occur in 2012. The rule also requires engine manufacturers to use advanced clean technologies, similar to catalytic technologies used in passenger cars. New engine standards took effect, based on engine horsepower, in 2008.
>
> (2) Marine Spark-Ignition Engines – The final rule for control of emissions from new, gasoline, spark-ignition marine engines was published on October 4, 1996 (61 Fed. Reg. 194). The rule established, beginning in 1998, more stringent standards for manufacture of engines used in outboards, personal watercraft, and jet boats.
>
> (3) Marine Compression-Ignition Engines – The final rule for control of emissions from new, compression-ignition, marine diesel engines, equal to or greater than 37 kilowatts,

[10] *See* Fact Sheet entitled, "◦EPA Sets Tier 3 Motor Vehicle Emission and Fuel Standards," available at http://www.epa.gov/otaq/documents/tier3/420f14009.pdf.

was published on December 29, 1999 (64 Fed. Reg. 249). The rule sets emission standards for engines and took effect between 2004 and 2007, depending on engine size.

(4) Locomotives and Locomotive Engines – The final rule for control of emissions from locomotives and locomotive engines was published on April 16, 1998 (63 Fed. Reg. 73). The rule sets emission standards for engines and includes a variety of compliance and enforcement provisions and regulations concerning the preemption of certain state and local controls for locomotives.

While LDEQ also stated that two other EPA national rules constitute permanent and enforceable measures resulting in emissions reductions, LDEQ did not discuss these rules other than citing them by title: National Volatile Organic Compound Emission Standards for Consumer Products and the National Organic Compound Emission Standards for Architectural Coatings ("AIM rule"). The Consumer Products Rule was enacted in September 1998 and established VOC content standards for 24 categories of household consumer. The requirements were phased-in from December 1998 through December 1999.[11] The AIM rule was enacted in August 1998, and became applicable to architectural coatings manufactured after August 15, 1999. It established a VOC content limit for each of the 61 categories of architectural coatings. EPA's Fact Sheet indicated that it was expected to reduce emissions of VOCs by 113,500 tons per year, nationwide, representing a 20 percent reduction from 1990 levels.[12]

LCA also believes that LDEQ should discuss the impact of the Mobile Sources Air Toxics ("MSAT") Rule in its redesignation materials submitted to EPA. This rule was enacted in February 26, 2007.[13] Under this rule, EPA issued a final rule to reduce hazardous air pollutants from mobile sources. Among these requirements in the rule are new standards to reduce non-methane hydrocarbon exhaust emissions from new gasoline-fueled passenger vehicles, more stringent evaporative emissions standards for new passenger vehicles and establishing standards that will limit hydrocarbon emissions that evaporate from and permeate through portable fuel containers such as gas cans. Because this rule has the co-benefit of reducing VOC emissions, LDEQ should also discuss the impact of this rule in its submittal to EPA for redesignation.

LCA also believes that LDEQ should supplement its submittal to EPA with a discussion of any federal Maximum Achievable Control Technology Standards enacted pursuant to 40 C.F.R. Part 63 that are effective within the area, in particular those that have become effective since the implementation of the 8-hour ozone standard. These regulations have a co-benefit of reducing VOC emissions.

That the emission reductions observed through 2014 are continuing is also verified by 2015 monitoring data. As of July 1, 2015, the design values for all monitors within the Baton Rouge Area were well below 75 ppb. These design values are as follows:

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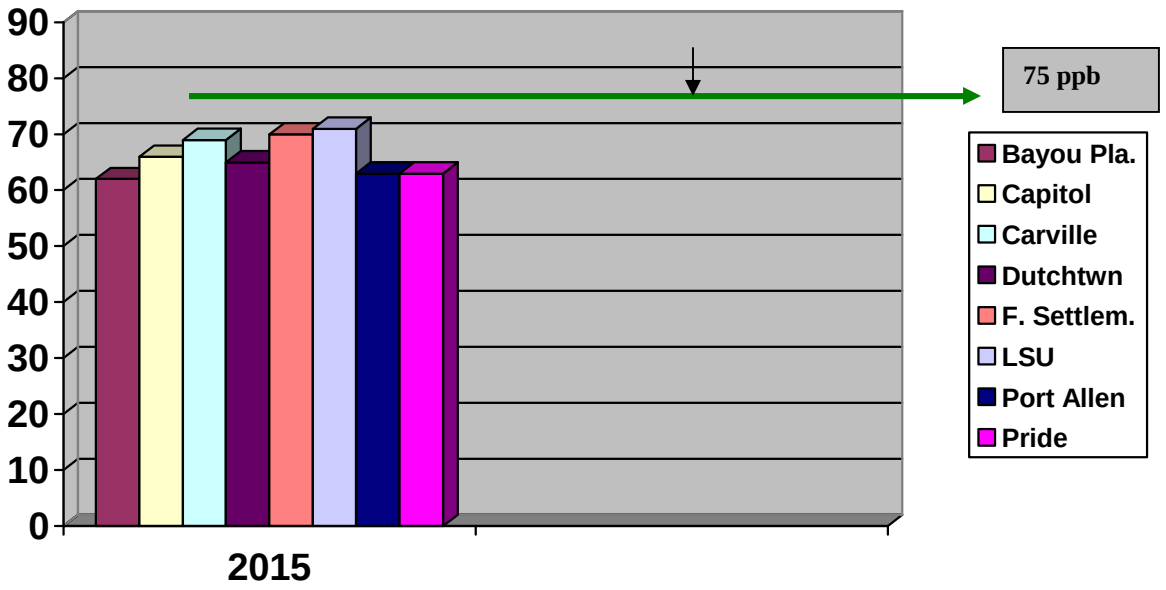
[11] See the following for the rule and implementation information at http://www.epa.gov/ttnatw01/183e/cp/cppg.html
[12] See Fact Sheet, regulations and implementation information at http://www.epa.gov/ttnatw01/183e/aim/aimpg.html
[13] See http://www.epa.gov/oms/toxics.htm.



Finally, LCA believes that LDEQ should supplement the Redesignation and Maintenance SIP Revision request with a VOC and NOx trend analysis. An ozone design value trend analysis is provided, but a trend analysis for NOx and VOC emissions since 1990 would also be helpful. LCA believes the redesignation request should be updated to demonstrate the significant reductions in VOC and NOx emissions that have occurred since the adoption of the Clean Air Act amendments of 1990. Such information would demonstrate the total VOC and NOx emissions reductions in the Baton Rouge Area. Further, as indicated in LDEQ's supporting materials, further reductions are also likely to occur both through SIP measures and additional federal regulatory provisions that are yet to be completely phased in.

D. The Proposed Maintenance Plan Fully Meets the Requirements of §175A of the CAA

LDEQ submitted a SIP revision request to provide for maintenance of the 8-hour ozone NAAQS in the Baton Rouge area. LCA believes that the LDEQ proposal satisfies §175A of the CAA. This section requires that the maintenance plan must demonstrate continued attainment of the applicable NAAQS for at least 10 years after EPA redesignates the area to attainment. Within 8 years after the redesignation, Louisiana must submit a revised maintenance plan which demonstrates that maintenance of the standard will continue for another 10 years following the initial 10 year maintenance period. The maintenance plan must contain contingency measures, along with a schedule for implementation, to assure prompt correction of any future NAAQS violations.

Guidance from EPA indicates that the ozone maintenance plan should address the following items:

(1) The attainment VOC and NO_X emissions inventories;

(2) a maintenance demonstration showing maintenance for the first 10 years of the maintenance period;
(3) a commitment to maintain the existing monitoring network;
(4) factors and procedures to be used for verification of continued attainment; and
(5) a contingency plan to prevent and/or correct a future violation of the NAAQS.

1. Attainment Inventories

Section 4 of the Redesignation Request concerns the attainment inventory. LDEQ provides a description of the NOx and VOC emissions inventories, projected emissions inventories, and a summary of categories NOx and VOC emissions for the area. Modeled projections indicate that the Baton Rouge will continue to attain the 2008 ozone standard.

2. Maintenance Demonstration

LCA believes that the LDEQ proposed Maintenance SIP demonstrates maintenance of the 8-hour ozone NAAQS through 2023 (ten years after the 2013 attainment year) by documenting current and projected VOC and NO_X emissions. The information demonstrates that future emissions of VOC and NO_X will remain at or below the attainment year emission levels. Although the maintenance demonstration need not be based on modeling,[14] the modeling provided by LDEQ as Appendices E and F to the Redesignation Request supports the conclusion that the area will continue to maintain the standard. The modeling specifically addresses 2017 and projects attainment. See also comments in Section III below.

3. Commitment to maintain the existing monitoring network

Section 6.1 of the Redesignation Request describes the 8 ambient ozone monitors located within the Baton Rouge Area (see Table 6.1.1 and Figure 2.1.1). As this section also states that LDEQ will continue to maintain an ambient ozone monitoring network in conformance with 40 C.F.R. Part 58, LDEQ has satisfied CAA § 175A.

4. Factors/Procedures to Verify Continued Attainment

LDEQ indicated in Section 7 of the Redesignation Request that it would use two means to verify continued attainment. The primary means would be use of the ambient air monitoring network. Secondarily, LDEQ indicated that it would compare emissions inventory data to the National Emissions Inventory ("NEI") every three years to ensure that the observed downward trend in emissions continues.

5. Contingency Plan

The maintenance plan must identify the contingency measures to be considered for possible adoption, a schedule and procedure for adoption and implementation of the selected contingency measures, and a time limit for action by the state. The proposal by LDEQ does these things, thus satisfying these legal requirements.

[14] *See*, for example, 59 Fed. Reg. 60,577, 60,578 (Nov. 25, 1994).

LCA supports LDEQ's proposed contingency measure, which seeks to extend the LAC 33:III.Chapter 22 NOx requirements to two additional months beyond the current rule. Currently, the provisions of Chapter 22 apply only during the ozone season (May 1st to September 30th). Under the proposed contingency measure, the Chapter 22 requirements would apply from April to October. Such measures are important, and, as discussed below, in the Baton Rouge Area, NOx controls are more effective than are VOC control.

While LCA supports the proposed contingency measure, LCA believes that LDEQ should expand upon its discussion in this area by citing source material that supports the effectiveness of a NOx control strategy. This discussion should refer to the following documentation that supports a NOx control strategy:

- September 24, 2001, request by the State of Louisiana to EPA to rescind the CAA §182(f) NO_X exemption for the Baton Rouge ozone nonattainment area along with the photochemical modeling results submitted to EPA to support that request.

- The December 31, 2001, request by the State of Louisiana to EPA for a revision to the Baton Rouge SIP requesting rescission of the transportation conformity NO_X exemption based on this photochemical modeling.

- December 31, 2001, request by the State of Louisiana to EPA for a revision to the vehicle I/M SIP for the Baton Rouge area to address the I/M NO_X requirements. The SIP included a revised program design intended to meet the Federal low enhanced I/M performance standard for both VOC and NO_X.

- EPA's Rescission of the Sections 182(f) and 182(b)(1) Exemptions to the Nitrogen Oxides (NOx) Control Requirements for the Baton Rouge Ozone Nonattainment Area, 67 Fed. Reg. 30638 (May 7, 2002).

- The photochemical grid modeling submitted to EPA in the Attainment Demonstration materials associated with 1506Pot2 and any other modeling information, reports, and correspondence with EPA concerning appropriate control strategy for the Baton Rouge area.

Additionally, LCA suggests that LDEQ add additional potential contingency measures from which to select, based upon the circumstances. Because implementation of potential contingency measures would not be expected to take place until well in the future, the identification of specific detailed measures may not be practical or desired at this time. The most appropriate contingency measures may be significantly different from the measures mentioned below due to technological, societal, economic, and political factors that are not predicted at this time. Thus, instead of a definitive commitment to implement a temporal extension of LAC 33:III.2201, LDEQ should list that as a likely contingency measure, but should also list other potential contingency measures as well.

Because LDEQ rulemaking procedures generally allow passage of a rule in less than 6 months, LDEQ would have time within the 24 month period to evaluate the cause of the exceedance and tailor the appropriate contingency measure to the most effective ozone reduction

strategy. These could include: Agreed to Orders with point sources or currently unregulated barge sources, extending RACT to smaller sources, diesel retrofits, truck idling requirements for mobile sources, consumer product requirements, and the like.

E. Louisiana Has Met All Requirements Applicable to the Area Under §110 and Part D of the CAA

LCA believes that the materials provided by LDEQ in these proposed actions demonstrate that LDEQ has met all requirements applicable to the Baton Rouge Area under Section 110 and Part D of the Clean Air Act. The Baton Rouge Area continues to meet all applicable requirements outlined in 1997 8 hour ozone maintenance plan. The state continues to implement control measures and enforce all applicable rules including anti-backsliding provisions.

III. LCA Supports the Modeling Prepared for LDEQ

LCA asserts that the modeling conducted for LDEQ provide ample support for LDEQ's application for redesignation of the Baton Rouge Area to attainment with the 8-hour ozone standard, as well as the likelihood of continued attainment. While such modeling is not required as part of this redesignation package, it should be considered as additional support. A technical support document detailing and analyzing the photochemical modeling used to support the Baton Rouge Area's 8-hour ozone SIP, dated August 2013, was prepared by ENVIRON International Corporation and Eastern Research Group, Inc. for LDEQ. The study included Weather Research and Forecasting ("WRF") meteorological, episodic emissions ("EPS3"), and ozone ("CAMx") simulations conducted during September and October 2010. The overall technical approach used was established in modeling protocol documents previously developed, which had followed the latest modeling guidance published by EPA and relating to 8-hour ozone attainment demonstrations.

The WRF meteorological modeling was conducted from August through October 2010 to cover the LDEQ 36, 12, and 4 km photochemical modeling domains. WRF output was used to prepare meteorological inputs for the CAMx photochemical model. Because CAMx model performance depends on the accuracy of meteorology, predicted wind, temperature, and precipitation patterns on the 4 km grid were evaluated against available measurement data across Louisiana. Emphasis was placed on the 16 dates when 8-hour ozone exceeded 75 ppb from at least one ozone monitor in the State – August 3; September 3, 13-16, 20, and 30; and October 7-10 and 16-19.

The emissions processing used EPS3 to convert the 2010 emissions inventory into the formats needed by CAMx. The emissions data was based on information provided by LDEQ, Louisiana Department of Transportation and Development ("DOTD"), and the Capitol Region Planning Commission ("CRPC"). The 2017 emissions estimates were based on projections developed from numerous sources. New facilities and expansion projects at existing facilities (e.g., adding new units, expanding capacity, etc.) were included in the future year emissions projections. Economic and population data was used to project emissions from area and non-road sources. Projections for mobile sources were based traffic volume data and transportation

demand modeling. Emissions from biogenic and offshore sources were held constant at their 2010 levels.

The CAMx photochemical model was used to simulate ozone levels in the Baton Rouge Area during the period of September—October 2010 ("the Base Year"). Predictions of ozone, NOx, and VOC precursors were compared to actual measurements recorded at the ten AQS monitoring sites and four Photochemical Assessment Monitoring ("PAMS") within the Baton Rouge Area in order to establish the reliability of CAMx 8-hour ozone modeling. A series of "developmental runs" were conducted to improve model performance and to characterize sensitivity to changes in various model inputs, such as emissions, meteorological, and boundary conditions inputs.

CAMx was then run to obtain 2017 data. This modeling was based on the Base Year modeling configuration, except that the 2010 emissions data was replaced with the 2017 emissions projections. Daily 8-hour ozone concentrations were extracted from the CAMx model for both the Base Year and 2017 simulations. These modeled concentrations were applied to EPA's Modeled Attainment Test Software ("MATS") model, which used the inputs to project the 2017 ozone design values from the observation-based 2010 DV at each of the monitoring sites.

For the case where CAMx was provided on-road mobile emissions data estimated from parish-level monitored Highway Performance Monitoring System ("HPMS") vehicle miles traveled ("VMT") data, the 2017 DV projection was below the 75 ppb 8-hour ozone standard at each of the monitoring sites. When the on-road mobile emissions was instead estimated from transportation demand model activity, the 2017 DV projection remained under the 75 ppb 8-hour ozone standard at each of the sites.

LMOGA
LOUISIANA MID-CONTINENT
OIL AND GAS ASSOCIATION

730 NORTH BOULEVARD, BATON ROUGE, LOUISIANA 70802 • TELEPHONE (225) 387-3205 FAX (225) 344-5502

July 31, 2015

Ms. Vivian Aucoin
Office of Environmental Services
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313

RE: Comments of the Louisiana Mid-Continent Oil and Gas Association on the Proposed Baton Rouge Area Ozone Redisignation - Log No. 1506Pot2

Dear Ms. Aucoin:

The Louisiana Mid-Continent Oil and Gas Association appreciates the opportunity to comment on the Proposed Emission Baton Rouge Area Ozone Redisignation (Log No. 1506Pot2) which appeared in the June 20, 2015 Louisiana Register. Mid-Continent is an industry trade association which represents individuals and companies who together produce, transport, refine and market crude oil, natural gas and petroleum products in Louisiana and the Gulf of Mexico. Several Mid-Continent members, including two major refineries, operate in the Baton Rouge area and are therefore affected by this action.

Mid-Continent members actively participate in various local regional coalitions (including the Baton Rouge Clean Air Coalition) and Mid-Continent supports the comments of these groups as well as the Louisiana Chemical Association, to the effect they do not conflict with these comments.

Mid-Continent supports the proposed ozone redesignation. Mid-Continent staff as well as member company staff has expended significant man-hours and monetary resources to get to this point. This support has been consistent since the original ozone one-hour designation decades ago. It is that support, with the assistance of others that has led the Baton Rouge area to be in compliance with all EPA ozone and other EPA promulgated air quality standards to date. The support includes monetary assistance to enhance the ozone modeling efforts of the DEQ and support for rules beyond Clean Air Act minimum requirements when justified scientifically. This support will continue with regards to any future air quality standards promulgated by the EPA.

Once again, Mid-Continent appreciates the opportunity to submit these comments.

Sincerely;

Richard T. Metcalf
Director of Environmental Affairs

B.4 RESPONSE TO COMMENTS

Response to Comment

Draft 2008 Baton Rouge Nonattainment Area 8-hour Ozone
National Ambient Air Quality Standard Redesignation Request and Maintenance Plan

Comment 1: Commenter requests that monitored data used to support redesignation show the continuing downward trend indicating continued improvement of air quality.

Response 1: *Table 2.1.2: BRNA Monitors: 8-Hour Ozone Design Values 2008-2014* has been revised to indicate the continuing downward trend which shows continuous air quality improvement.

Comment 2: Commenter requests a specific statement clarifying the EPA Clean Data Determination published at 79 FR 21139 on April 15, 2014.

Response 2: *Section 2.1 Attainment of the Standard* has been revised accordingly.

Comment 3: Commenter supports the analysis of CAA requirements; however, commenter believes that the analysis should provide a more complete analysis to support the redesignation request.

Response 3: An emissions summary of NOx and VOC was added as *Figure 2.1.3: BRNA Design Values and Figure 2.3.1: BRNA Precursor Emissions.*

Comment 3b: Commenter requests a VOC and NOx trend analysis beginning with 1990 through 2014.

Response 3b: The LDEQ has included additional explanation and summary charts to demonstrate the continual downward trend of NOx and VOC emissions for the BRNA from 1990 through 2014.

Comment 4: Commenter supports the proposed contingency measures.

Response 4: The Department appreciates the support.

Comment 4b: Commenter requests expanded discussion of contingency measures.

Response 4b: LDEQ has reviewed the section discussing contingency and has concluded that the contingency plan presented in the redesignation request is adequate.

Comment 4c: Commenter suggests the addition of potential contingency measures.

Response 4c: LDEQ has reviewed the section discussing contingency and has concluded that the contingency plan presented in the redesignation request is adequate.

Comment 5: Commenter requests that redesignation submittal is consistent with EPA guidance distributed September 4, 1992.

Response 5: The Department has reviewed the guidance and believes that it is consistent with the submittal.

Comment 6: Commenter suggests that reference to Clean Air Act section 110(a)(2)(B) be corrected and replaced with section 182(a)(1) and (3). We also recommend you discuss how the area will meet the requirement for a periodic emissions inventory. The section should also clearly identify that you are using the 2011 emissions inventory to meet the requirements of section 182(a)(1).

Response 6: The citation has been corrected.

Comment 6b: Commenter requests a discussion of the periodic emissions inventory requirement and to clearly identify what inventory is being used.

Response 6b: *Section 7: Verification of Continued Attainment* discuss how the Department will meet the requirements of 40 CFR Part 51 Subpart A – Air Emissions Reporting Requirements.

Comment 7: Commenter put forward that the latest versions of models should be used when developing a SIP.

Response 7: LDEQ used the most current EPA approved version that was available at the time the data was compiled.

Comment 8: Commenter indicated that the base year emissions inventory was compiled incorrectly and suggested that it be revised accordingly.

Response 8: The Department has reviewed and revised the 2011 baseline emissions inventory accordingly.

Comment 9: Commenter argues that the LDEQ did not use the most current mobile model.

Response 9: At the time this project commenced, the Department used the most current approved mobile model. Further the use of this model does not hinder the future maintenance of the area at 75 ppb.

Comment 10: Commenter requests that both federal and state regulations that led to attainment of the NAAQS be clearly identified.

Response 10: The Department has revised the SIP to reflect the pertinent federal and state regulations.

Comment 11: Commenter suggests that certain narrative outlining Section 110 of the CAA be replaced with discussion of Section 182.

Response 11: The SIP has been revised to reflect this discussion.

Comment 12: Commenter suggested that the Department revise the emissions inventories and maintenance demonstration such that both would be more reflective of a downward trend in precursor emissions to show that the 2008 Ozone NAAQs would be maintained.

Response 12: The Department has reviewed and revised the emissions inventories and maintenance demonstration to better reflect the continued use of anti-backsliding regulations to maintain the 2008 Ozone NAAQs. This revision is contained in the most recent revision dated March 20, 2016.

Comment 13: Commenter suggests that the SIP clearly identify the Motor Vehicle Emissions Budget.

Response 13: The SIP has been revised to clearly reflect the motor vehicle emissions budget.

Comment Number	Commenters
1, 2, 3	LCA and LMOGA
4, 5	LCA
6 – 13	EPA Region 6

B.5 PUBLIC NOTICE - MARCH 20, 2016

POTPOURRI

Department of Environmental Quality
Office of Environmental Services
Air Permits Division

Baton Rouge Nonattainment Area Redesignation Request and
2008 8-Hour Ozone National Ambient Air Quality Standard Maintenance Plan

Under the authority of the Louisiana Environmental Quality Act, R. S. 30:2001 et seq., the secretary gives notice that the Office of Environmental Services, Air Permits Division will submit a proposed Redesignation Request and Ozone Maintenance Plan for the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS) for the Baton Rouge Nonattainment Area (BRNA), which includes the parishes of Ascension, East Baton Rouge, Iberville, Livingston and West Baton Rouge. The Redesignation Request is being submitted as required under section 107(d)(3)(E) of the 1990 Clean Air Act Amendments (CAAA); the Ozone Maintenance Plan is being submitted as required under section 175A of the 1990 CAAA. (1603Pot1)

All interested parties are invited to submit written comments concerning the Redesignation Request and Maintenance Plan for the Baton Rouge Area no later than 4:30 p.m., April 29, 2016, to Vivian Aucoin, Office of Environmental Services, P.O. Box 4313, Baton Rouge, LA 70821-4313, or by email to vivian.aucoin@la.gov. A public hearing will be held upon request. The deadline for requesting a public hearing is April 4, 2016.

A copy of the proposal may be viewed on the LDEQ website or at LDEQ headquarters at 602 North 5th Street, Baton Rouge, Louisiana 70802.

Herman Robinson, CPM
General Counsel

APPENDIX C: 2008 OZONE INFRASTRUCTURE SIP

BOBBY JINDAL
GOVERNOR

PEGGY M. HATCH
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

Mr. Ron Curry, Administrator
US EPA Region 6 (6-AR)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RE: 2008 Ozone Infrastructure SIP

Dear Mr. Curry:

In accordance with Section 110(a)(1) and (2) of the Clean Air Act Amendments of 1990, the state of Louisiana is pleased to provide the State Implementation Plan (SIP) Infrastructure Checklist for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) along with proof of publication.

This submittal substantiates that the State has adequate provisions to prohibit air pollutant emissions from within the State that:

1.) Significantly contribute to nonattainment of the NAAQS
2.) Interfere with maintenance of the NAAQS
3.) Interfere with measures required to prevent significant deterioration of air quality; and
4.) Interfere with measures required to protect visibility in any other State.

If you or your staff have any questions concerning this submittal, please contact Ms. Tegan Treadaway, Air Permits Division, Administrator at (225) 219-3408 or Tegan.Treadaway@la.gov.

Sincerely

Peggy M. Hatch

Peggy M. Hatch
Secretary

Date: June 4, 2013

c: Guy Donaldson, EPA Region 6
Carrie Paige, EPA Region 6

Post Office Box 4301 • Baton Rouge, Louisiana 70821-4301 • Phone 225-219-3953 • Fax 225-219-3971
www.deq.louisiana.gov

Louisiana SIP Infrastructure Checklist
2008 Ozone National Ambient Air Quality Standards Revision

THE CLEAN AIR ACT
TITLE I—AIR POLLUTION PREVENTION AND CONTROL
PART A—AIR QUALITY AND EMISSION LIMITATIONS
SECTION 110—IMPLEMENTATION PLANS

Section 110(a)(1) and (2)

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
§110(a)(1)	Each State shall, after reasonable notice and public hearings, adopt and submit to the Administrator, …, a plan which provides for implementation, maintenance, and enforcement of such primary standard in each air quality control region (or portion thereof) within such State. In addition, such State shall adopt and submit to the Administrator (either as a part of a plan submitted under the preceding sentence or separately) …, a plan which provides for implementation, maintenance, and enforcement of such secondary standard in each air quality control region (or portion thereof) within such State. Unless a separate public hearing is provided, each State shall consider its plan implementing such secondary standard at the hearing required by the first sentence of this paragraph.		Louisiana submitted to EPA State Implementation Plan (SIP) Revisions that dealt with the Ozone NAAQS. A SIP revision for the "Baton Rouge Severe Area Rule Update" was submitted on June 15, 2005 and approved by EPA on July 5, 2011 (see 76 FR 38990). Louisiana submitted (January 7, 2008) a letter to EPA certifying that the 1997 8-Hour SIP Infrastructure requirements were satisfied in accordance with Section 110(a)(1) and (2) of the CAA. EPA approved the Infrastructure elements on July 19, 2011 (see 76 FR42549). The SIP plans: "Baton Rouge Ozone Area Redesignation Request and Maintenance"; "Baton Rouge 1997 8-Hour Moderate Reclassification"; and "Baton Rouge Nonattainment Redesignation and Maintenance Plan Technical Amendment to Section 5, Attainment Inventory and Supporting Appendix E documentation" were submitted August 31, 2010

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
			and approved by EPA on November 30, 2011 (see 76 FR 74000).
§110(a)(2)(A) Emission Limits and Other Control Measures	Each implementation plan submitted by a State under this Act shall be adopted by the State after reasonable notice and public hearing. Each such plan shall—include enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of this Act;	La. R.S. 30:2054; LAC 33:III Chapters 2, 5,9, 21 and 22.	Louisiana has approved and implemented rules that provide for adequate coverage of this requirement.
§110(a)(2)(B) Ambient Air Quality Monitoring/Data System	provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to— (i) monitor, compile, and analyze data on ambient air quality, and (ii)upon request, make such data available to the Administrator;		Louisiana operates an approved air quality monitoring network consistent with EPA regulations (40 CFR 50.4). Under LDEQ's Grant Work Plan, the department monitors, compiles, and analyzes the data for Ozone. Currently there are twenty-four (24) Ozone monitors in the state with an additional monitor planned for Alexandria, Louisiana, with the finalization of the 2008 Ozone Standard. Current Louisiana air quality monitoring network implements the 8-hour Ozone NAAQS. Air monitoring data can be accessed through the following websites: http://www.deq.louisiana.gov/portal/DIVISIONS/Assessment/AirFieldServices/AmbientAirMonitoringProgram/AmbientAirMonitoringDataandReports.aspx

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
			http://www.deq.louisiana.gov/portal/DIVISIONS/Assessment/AirFieldServices/AmbientAirMonitoringProgram/AirMonitoringData.aspx LDEQ reports the air quality data to EPA on a quarterly basis.
§110(a)(2)(C) Program for Enforcement of Control Measures	include a program to provide for the enforcement of the measures described in subparagraph (A), and regulation of the modification and construction of any stationary source within the areas covered by the plan as necessary to assure that national ambient air quality standards are achieved, including a permit program as required in parts C and D;	LAC 33:III Chapter 1, 3, 5, 7, 9, 14, 21 and 22[1]	Louisiana has approved and implemented rules that provide for adequate coverage of this requirement. Louisiana operates an EPA-approved air permitting program for major and minor sources. The PSD program applies to all NSR pollutants, including greenhouse gases (GHG) and $PM_{2.5}$. The GHG rule (AQ315) was promulgated in the Louisiana Register on April 20, 2011 and submitted to EPA for approval on December 21, 2011.[2] LDEQ revised LAC 33:III.509, Prevention of

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[1] Chapter 1 – General Provisions
Chapter 3 – Regulatory Permits
Chapter 5 – Permit Procedures
Chapter 7 –Ambient Air Quality
Chapter 9 – General Regulations on Control of Emissions and Emission Standards
Chapter 14 – Conformity
Chapter 21 – Control of Emission of Organic Compounds
Chapter 22 – Control of Emission of Nitrogen Oxides (NO_x)

[2] Submitted 12/21/2011. Pending EPA approval

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
			Significant Deterioration with substantive changes to rule AQ 328ft. The rule was finalized in the Louisiana Register on December 20, 2012 and submitted to EPA for SIP approval on February 7, 2013.[3]
§110(a)(2)(D) Interstate Transport	contain adequate provisions— (i) prohibiting, consistent with the provisions of this title, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will— (i)(I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard, or (i)(II) interfere with measures required to be included in the applicable implementation plan for any other State under part C to prevent significant deterioration of air quality or to protect visibility, (ii) insuring compliance with the applicable requirements of sections 126 and 115 (relating to interstate and international pollution abatement);	LAC 33:III.506	Louisiana has submitted and EPA has approved the CAIR SIPs for both SO2 and NOx for the 1997 8 Hour Ozone NAAQS Both of these SIPs meet the requirements of Sec 110(a)(2)(D). See 72 FR 39741/72 FR 55064.* *On August 21, 2012, the U.S. Court of Appeals vacated the 2011 Cross-State Air Pollution Rule (CSAPR) and also ordered the EPA to "continue administering CAIR pending the promulgation of a valid replacement." In a November 19, 2012, Memorandum by EPA Assistant Administrator Gina McCarthy, EPA stated that CAIR emission reductions are permanent and enforceable until any "further proceedings in the CSAPR case are resolved or … until a valid replacement rule is developed …" While the SIPs may be revised following the outcome of EPA's petition and/or an interstate transport rule replacement, the controls that have been installed under CAIR will remain in place in accordance with LAC 33:III. 905, which states that when air pollution control facilities have been installed on a property "they shall be used and diligently maintained in proper working order

[3] Submitted 2/7/2013. Pending EPA approval.

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
			whenever any emissions are being made which can be controlled by the facilities, even though the ambient air quality standards in affected areas are not exceeded." As it relates to the 2008 8-Hour Ozone NAAQS EPA does not presently view section 110 (a)(2)(D)(i)(I) (significant contribution to nonattainment prong and interference with maintenance prong) as a "required submission" consistent with the D.C. Circuit Court's opinion in EME City Generation v. EPA, 696 F.3d7,31 (D.C. cir 2012). In that opinion, the D.C. Circuit Court concluded that a SIP submission to address Section 110(a)(2)(D)(i)(I) cannot be considered a "required" SIP submission until EPA has first quantified a state's obligation regarding transported pollutants. Louisiana submitted a Regional Haze SIP June 13, 2008.[4] The Regional Haze SIP contains measures that will assist with reducing visibility impairment. The PSD program applies to all NSR pollutants, including greenhouse gases (GHG) and $PM_{2.5}$. The GHG rule (AQ315) was promulgated in the Louisiana Register on April 20, 2011 and submitted to EPA for approval on December 21, 2011. LDEQ revised LAC 33:III.509, Prevention of Significant Deterioration with substantive changes to rule AQ 328ft. The rule was finalized in the Louisiana Register on December 20, 2012 and

[4] Submitted 6/13/2008. Pending EPA approval.

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
			submitted to EPA for SIP approval on February 7, 2013.
§110(a)(2)(E) Adequate Resources	provide (i) necessary assurances that the State (or, except where the Administrator deems inappropriate, the general purpose local government or governments, or a regional agency designated by the State or general purpose local governments for such purpose) will have adequate personnel, funding, and authority under State (and, as appropriate, local) law to carry out such implementation plan (and is not prohibited by any provision of Federal or State law from carrying out such implementation plan or portion thereof), (ii) requirements that the State comply with the requirements respecting State boards under section 128, and (iii) necessary assurances that, where the State has relied on a local or regional government, agency, or instrumentality for the implementation of any plan provision, the State has responsibility for ensuring adequate implementation of such plan provision;	La. R.S. 30:2011 et seq. La. R.S. 30:2014	Louisiana works closely with the various stakeholder groups upon the announcement of new national ambient air quality standards; the LDEQ participates in an advisory capacity in the Baton Rouge Clean Air Coalition. Louisiana has no local governmental entities that have air pollution control capacity.

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
§110(a)(2)(F) Stationary Source Monitoring System	require, as may be prescribed by the Administrator— (i) the installation, maintenance, and replacement of equipment, and the implementation of other necessary steps, by owners or operators of stationary sources to monitor emissions from such sources, (ii) periodic reports on the nature and amounts of emissions and emissions-related data from such sources, and (iii) correlation of such reports by the State agency with any emission limitations or standards established pursuant to this chapter, which reports shall be available at reasonable times for public inspection;	LAC 33:III Chapter 9	The SIP pertaining to stationary source emissions monitoring was submitted to EPA on November 15, 1994 and was approved on February 6, 1995 (60 FR 02014). The most recent revisions were submitted on September 14, 2004 and November 9, 2007 and approved on July 5, 2011 (see 76 FR 38977). This SIP revision meets the requirements set forth in §110(a)(2)(F).
§110(a)(2)(G)	provide for authority comparable to that in section 303 and adequate contingency plans to implement such authority;	LAC 33:III.Chapter 56	The "Prevention of Air Pollution Emergency Episodes" provision was promulgated by LDEQ on December 20, 1987. Revisions were made to the SIP in January 1988, and approved on March 8, 1989 (54 FR 09795).

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
§110(a)(2)(H)	provide for revision of such plan— (i) from time to time as may be necessary to take account of revisions of such national primary or secondary ambient air quality standard or the availability of improved or more expeditious methods of attaining such standard, and (ii) except as provided in paragraph (3)(C), whenever the Administrator finds on the basis of information available to the Administrator that the plan is substantially inadequate to attain the national ambient air quality standard which it implements or to otherwise comply with any additional requirements established under this Act;	La R.S. 30:2011, La. R.S. 30:2054	LDEQ revises the SIP, as necessary, to comply with changes to the national ambient air quality standard or findings of inadequacies.
§110(a)(2)(J)	meet the applicable requirements of section 121 (relating to consultation), section 127 (relating to public notification), and part C (relating to prevention of significant deterioration of air quality and visibility protection);	LAC 33:III.509 (PSD and Visibility); LAC 33:III.531 Public Notice and Affected State Notice	Louisiana works with the Federal Land Manager on PSD projects and permits. The PSD program applies to all NSRpollutants, including greenhouse gases (GHG) and $PM_{2.5}$. The PSD program applies to all NSR pollutants, including greenhouse gases (GHG) and $PM_{2.5}$. The GHG rule (AQ315) was promulgated in the Louisiana Register on April 20, 2011 and submitted to EPA for approval on December 21, 2011. LDEQ revised LAC 33:III.509, Prevention of Significant Deterioration with substantive changes to rule AQ 328ft. The rule was finalized in the Louisiana Register on December 20, 2012 and submitted to EPA for SIP approval on February 7, 2013.

Federal CAA Citation	Summary of Federal Language	State Citation (if applicable)	Comments on State Language
§110(a)(2)(K)	provide for— (i) the performance of such air quality modeling as the Administrator may prescribe for the purpose of predicting the effect on ambient air quality of any emissions of any air pollutant for which the Administrator has established a national ambient air quality standard, and (ii) the submission, upon request, of data related to such air quality modeling to the Administrator;	La R.S. 30:2011, La. R.S. 30:2054	LDEQ contracts the attainment modeling requirement when necessary. Modeling was done for all nonattainment areas in the instance of Ozone as well as Regional Haze.
§110(a)(2)(L)	require the owner or operator of each major stationary source to pay to the permitting authority, as a condition of any permit required under this Act, a fee sufficient to cover— (i) the reasonable costs of reviewing and acting upon any application for such a permit, and (ii) if the owner or operator receives a permit for such source, the reasonable costs of implementing and enforcing the terms and conditions of any such permit (not including any court costs or other costs associated with any enforcement action), until such fee requirement is superseded with respect to such sources by the Administrator's approval of a fee program under title V; and	LAC 33:III Chapter 2	Louisiana has an approved permit fee structure.
§110(a)(2)(M)	provide for consultation and participation by local political subdivisions affected by the plan.	La RS 30: 2011(D)(21)(b)	Louisiana includes these entities as part of the stakeholder group before plan implementation begins.

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Department of Children and Family Services
Division of Programs

Temporary Assistance to Needy Families (TANF)
Caseload Reduction Report

The Department of Children and Family Services hereby gives notice that, in accordance with federal regulations at 45 CFR 261.40, the Temporary Assistance to Needy Families (TANF) Caseload Reduction Report for Louisiana is now available to the public for review and comment.

In order to receive a caseload reduction credit for minimum participation rates, the agency must submit a report based on data from the Family Independence Temporary Assistance Program (FITAP) and the Strategies to Empower People Program (STEP) containing the following information:

1. a listing of, and implementation dates for, all State and Federal eligibility changes, as defined at §261.42, made by the state after FY 2005;
2. a numerical estimate of the positive or negative impact on the applicable caseload of each eligibility change (based, as appropriate, on application denials, case closures, or other analyses);
3. an overall estimate of the total net positive or negative impact on the applicable caseload as a result of all such eligibility changes;
4. an estimate of the state's caseload reduction credit;
5. a description of the methodology and the supporting data that it used to calculate its caseload reduction estimates;
6. a certification that it has provided the public an appropriate opportunity to comment on the estimates and methodology, considered their comments, and incorporated all net reductions resulting from federal and state eligibility changes; and
7. a summary of all public comments.

Copies of the TANF Caseload Reduction Report may be obtained by writing Brandy Bonney, Department of Children and Family Services, P.O. Box 94065, Baton Rouge, LA 70804-9065, by telephone at (225) 342-4096, or via email at brandy.bonney@la.gov.

Written comments regarding the report should also be directed to Ms. Bonney. These must be received by close of business on February 19, 2013.

Suzy Sonnier
Secretary

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Department of Environmental Quality
Office of the Secretary
Legal Division

2008 Ozone (O_3) National Ambient Air Quality Standards (NAAQS)—State Implementation Plan (SIP) Revisions

Under the authority of the Louisiana Environmental Quality Act, R.S. 30:2051 et seq., the secretary of the Louisiana Department of Environmental Quality gives notice that the Office of Environmental Services, Air Permits Division, Manufacturing Section, will submit to the Environmental Protection Agency (EPA) a revision to the infrastructure, as required by Section 110(a)(1) and (2) of the Clean Air Act (CAA). (1301Pot1)

On March 27, 2008, EPA revised the primary and secondary Ozone NAAQS from a 1997 8-hour standard of 0.08 part per million (ppm) to a 8-hour standard of 0.075 ppm. Pursuant to Sections 110(a)(1) and (2) of the CAA, each State is required to submit a plan to provide for the implementation, maintenance and enforcement of a newly promulgated or revised NAAQS.

If any party requests a public hearing on this matter, one will be scheduled and the comments received will be submitted as an addendum to the original submittal. All interested persons are invited to submit written comments concerning the revisions no later than 4:30 p.m., February 19, 2013, to Sonya Eastern, Office of Environmental Services, P.O. Box 4313, Baton Rouge, LA 70821-4313, fax (225) 219-3474, or by email to sonya.eastern@la.gov.

A copy of the recommendation may be viewed online at the LDEQ Air Permits Engineering and Planning website or the LDEQ headquarters at 602 North Fifth Street, Baton Rouge, LA, Room 536-38.

Herman Robinson, CPM
Executive Counsel

1301#047

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Office of the Governor
Coastal Protection and Restoration Authority

Public Hearing—State Fiscal Year 2014 Draft Annual Plan

Pursuant to R.S. 49:213.6, the Coastal Protection and Restoration Authority of Louisiana (CPRA), will hold the following public hearings to receive comments and recommendations from the public and from elected officials

Comment Summary Response & Concise Statement
Louisiana SIP Infrastructure Checklist
2008 Ozone National Ambient Air Quality Standards Revision

Comment 1: Comment on Proposed Submittal for Infrastructure Elements (A-M)

The information provided in the proposed SIP revision is not detailed enough to substantiate that the State has adequate provisions to meet all the infrastructure requirements of Section 110(a)(2)(A-M). Infrastructure elements 110(a)(2)(C), (H) and (K) lack sufficient detail regarding citations under the Louisiana Statute and cross referencing to applicable rules.

Response 1: The department agrees with this comment. The specific citations have been added.

Comment 2: Comment Specific to Transport Elements

A SIP submission addressing CAA 110(a)(2)(D)(i)(I) is not required consistent with the court's decision. However, the information provided by LDEQ is based upon the 1997 8-hour Ozone NAAQS requirements and is not sufficient to conclude that the State's emissions do not contribute to nonattainment or interfere with maintenance of the 2008 ozone standards.

Response 2: The LDEQ agrees in part and disagrees in part. The Department disagrees and points out that the information based upon the 1997 8-hour Ozone NAAQS requirements is relevant [emphasis added] through the CAIR NO_x program in that it demonstrates the Department's most recent efforts in maintaining the 8-Hour Ozone NAAQS and to alleviate transport pollutants. The Department agrees with EPA's assessment that the circumstances surrounding the D.C. Circuit court decision in EME City Generation v. EPA, 696 F.3d7,31 (D.C. cir 2012) makes it obsolete to address 110(a)(2(D(i)(I) (requirements regarding significant contribution to nonattainment and interference with maintenance). Based on the court's decision 110(a)(2(D(i)(I) is not a "required" SIP submission until EPA has defined a state's obligation regarding transport pollutants.

Comment 3: Comment Specific to Louisiana's PSD Demonstration

For an approvable infrastructure SIP, States need to have in place a comprehensive PSD program that applies to all regulated NSR pollutants, including greenhouse gases (GHGs) and $PM_{2.5}$. Please ensure that your infrastructure submittal identifies the regulatory citations for LDEQ's authority to regulate GHG consistent with federal requirements in the GHG Tailoring Rule and your authority to regulate $PM_{2.5}$ and its precursors

consistent with EPA's May 16, 2008 NSR $PM_{2.5}$ Implementation Rule in the PSD program.

Response 3: The LDEQ has identified the rulemaking efforts for the adoption of the $PM_{2.5}$ PSD increment and the GHG requirements in sections 110(a)(2)(C), 110(a)(2)(D)(i)(II), and 110(a)(2)(J)(II) of the Clean Air Act. The PSD program applies to all NSR pollutants, including greenhouse gases (GHG) and $PM_{2.5}$. The GHG rule (AQ315) was promulgated in the Louisiana Register on April 20, 2011 and submitted to EPA for approval on December 21, 2011. LDEQ revised LAC 33:III.509, Prevention of Significant Deterioration with substantive changes to rule AQ 328ft. The $PM_{2.5}$ rule was finalized in the Louisiana Register on December 20, 2012 and submitted to EPA for SIP approval on February 7, 2013.

Comment Summary Key

Comment Nos. 1-3Guy Donaldson, Chief/EPA Air Planning Section

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

FEB 15 2013

Ms. Sonya Eastern
Office of Environmental Services
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313

Re: Proposed 2008 Ozone Infrastructure State Implementation Plan (SIP)

Dear Ms. Eastern:

Thank you for the opportunity to review and comment on the proposed State Implementation Plan (SIP) revision "2008 Ozone National Ambient Air Quality Standards Revision" in accordance with Section 110(a)(1) and (2) of the Clean Air Act (CAA). The Environmental Protection Agency (EPA) appreciates the efforts of the Louisiana Department of Environmental Quality (LDEQ) to meet this important CAA requirement. The EPA Region 6 offers the following comments on the proposed SIP revision:

Comment 1: Comment on Proposed Submittal for Infrastructure Elements (A-M)

The information provided in the proposed SIP revision is not detailed enough to substantiate that the State has adequate provisions to meet all the infrastructure requirements of Section 110(a)(2)(A-M) of the CAA. As a minimum, please provide state legal citations to support/document each infrastructure element you are submitting in the proposal. Infrastructure elements 110(a)(2)(C), (H) and (K) lack sufficient detail regarding citations under the Louisiana Statute and cross-referencing to applicable rules. For example, regarding section 110(a)(2)(H), LDEQ explains it revises the Louisiana SIP, as necessary, to comply with changes to the NAAQS or findings of inadequacies, yet lists "N/A" under State Citation in the proposal. As 110(a)(2)(H) requires that a state have the authority to revise the SIP as necessary, we recommend LDEQ additionally provide discussion of and reference to the State statutory authority that allows LDEQ to make the regular revisions as stated.

Regarding section 110(a)(2)(K), LDEQ states that LDEQ contracts the attainment modeling requirement when necessary and lists "N/A" under State Citation in the proposal. Section 110(a)(2)(K) requires that a state have the authority to cooperate with the Federal government and to make the submissions to the EPA. We recommend LDEQ additionally provide discussion of and reference to such authority that allows LDEQ to make the modeling submissions as stated (e.g., Revised Statutes, Title 30).

The same recommendation for additional detail applies to sections 110(a)(2)(C) in the proposal. Please include a discussion of and a more comprehensive listing of relevant rules (e.g., 33 LAC 1, 5-7,9,11,13-15 and 21-23 if appropriate) that address federal requirements in section 110(a)(2)(C).

Additionally, please refer to our "Guidance on Infrastructure State Implementation Plan (SIP) Elements Required Under Sections 110(a)(1) and 110(a)(2) for the 2008 Lead (Pb) National Ambient Air Quality

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Standards (NAAQS)." The Pb Guidance is applicable to most pollutants and addresses the infrastructure elements for SIPs to meet the requirements of CAA sections 110(a)(1) and (2).

Comment 2: Comment Specific to Transport Elements

We appreciate that your proposal attempts to address CAA 110(a)(2)(D)(i)(I) requirements regarding significant contribution to nonattainment and interference with maintenance for the 2008 ozone standards. However, in accordance with the August 21, 2012 United States Court of Appeals for the District of Columbia Circuit decision vacating the Cross-State Air Pollution Rule (CSAPR), a SIP submission addressing these requirements is not a "required" SIP submission until EPA has defined a state's obligations regarding transported pollutants. Consistent with the court decision, we did not make a finding of failure to submit SIPs addressing section 110(a)(2)(D)(i)(I) of the Clean Air Act for the 2008 ozone standards and we do not intend to make such a finding. (Please see the January 15, 2013 Federal Register notice, 78 FR 2882 and the November 19, 2012 EPA memorandum on the court decision at http://www.epa.gov/crossstaterule/pdfs/CSAPR_Memo_to_Regions.pdf).

However, if LDEQ still wishes to address the CAA 110(a)(2)(D)(i)(I) requirements, the information provided is based upon the 1997 8-hour Ozone NAAQS requirements and is not sufficient to conclude that the State's emissions do not contribute to nonattainment or interfere with maintenance of the 2008 ozone standards. Modeling and rulemaking conducted for both the Clean Air Interstate Rule (CAIR) and the CSAPR addressed the 1997 ozone standards. The modeling and rulemaking for CAIR and CSAPR did not address the 2008 ozone standards.

Comment 3: Comments Specific to Louisiana's PSD Demonstration

For an approvable infrastructure SIP, States need to have in place a comprehensive PSD program that applies to all regulated NSR pollutants, including greenhouse gases (GHGs) and $PM_{2.5}$. To assist in our review of the PSD program for infrastructure elements, please ensure that your infrastructure submittal identifies the regulatory citations for LDEQ's authority to regulate GHGs consistent with federal requirements in the GHG Tailoring Rule and your authority to regulate $PM_{2.5}$ and its precursors consistent with EPA's May 16, 2008 NSR $PM_{2.5}$ Implementation Rule in the PSD program.

The EPA finalized the $PM_{2.5}$ PSD Increment—SILs—SMC Rule (75 FR 64864, October 20, 2010) to provide additional regulatory requirements under the PSD SIP program regarding the implementation of the $PM_{2.5}$ NAAQS for NSR. As a result, the $PM_{2.5}$ PSD Increment— SILs—SMC Rule required states to submit SIP revisions to adopt the required PSD increments by July 20, 2012. This requirement applies to Louisiana. Specifically, the October 20, 2010 $PM_{2.5}$ Rule requires states to adopt and submit for EPA approval a PSD SIP revision that implements the $PM_{2.5}$ increments pursuant to section 166(a) of the CAA to prevent significant deterioration of air quality in areas meeting the NAAQS.

We recognize that on January 22, 2013 the U.S. Court of Appeals for the District of Columbia Circuit Court (Court) vacated and remanded to the EPA portions of the October 20, 2010 $PM_{2.5}$ Rule establishing PSD significant impact levels (SILs) and significant monitoring concentrations (SMCs) for $PM_{2.5}$. However, the $PM_{2.5}$ PSD increment requirements from our October 20, 2010 $PM_{2.5}$ Rule were not subject of the Court's decision and remain in place. We encourage the LDEQ to complete the rulemaking process for the adoption of the $PM_{2.5}$ increments and associated SIP submittal. Please address this rule making effort and the $PM_{2.5}$ PSD increment requirements in the proposal outlining the requirements of sections 110(a)(2)(C), 110(a)(2)(D)(i)(II), and 110(a)(2)(J))(II), of the CAA. The EPA will not be able propose a full approval of the Infrastructure SIP for the PSD related components of

sections 110(a)(2)(C), 110(a)(2)(D)(i)(II), and 110(a)(2)(J) until the LDEQ submits a SIP revision addressing the $PM_{2.5}$ PSD increment requirements and the EPA approves this SIP revision.

Thank you for your efforts to meet this important CAA requirement. We offer our assistance during the SIP revision process. If you have any questions or need additional clarification, please contact Mr. John Walser of my staff at 214-665-7128. Please let us know how we may be of further assistance.

Sincerely yours,

Guy Donaldson
Chief
Air Planning Section

cc: Ms. Vivian Aucoin
Air Permits Division
Louisiana Department of
Environmental Quality

APPENDIX D: CLEAN DATA DETERMINATION REQUEST, PROPOSAL, AND APPROVAL

D.1 CLEAN DATA DETERMINATION REQUEST

BOBBY JINDAL
GOVERNOR

PEGGY M. HATCH
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE SECRETARY

RECEIVED - 6PDL
AIR PLANNING SEC.
14 JAN 31 PM 6:08

Certified# 7004 1160 0001 9954 2315

Mr. Ron Curry, Regional Administrator
US EPA Region 6 6/RA
1445 Ross Ave, Suite 1200
Dallas TX 75202-2733

RE: Clean Data Determination for the Baton Rouge 5-Parish 2008 Ozone Nonattainment Area

Dear Mr. Curry;

I am pleased to inform you that the Baton Rouge Ozone Nonattainment Area has monitored attainment as of December 31, 2013. Based on this data, I would like to request a clean data determination ahead of the formal redesignation. The area was designated as nonattainment and classified as marginal in April 2012.

The Louisiana Department of Environmental Quality (LDEQ) submitted the ambient concentration data to your office on January 7, 2014 for certification. Once this data is certified by your office, the LDEQ will submit a request for redesignation along with all of the required elements. A copy of the data submitted is enclosed for your reference and review.

If you have any questions concerning this matter, please contact Tegan Blades Treadaway, Administrator, Air Permits Division at (225)-219-3408 or at tegan.treadaway@la.gov.

Sincerely,

Peggy M. Hatch

Peggy M. Hatch
Secretary

January 23, 2014
date

C: Thomas Diggs
Guy Donaldson

Enclosures

Post Office Box 4301 • Baton Rouge, Louisiana 70821-4301 • Phone 225-219-3953 • Fax 225-219-3971
www.deq.louisiana.gov

BOBBY JINDAL
GOVERNOR

PEGGY M. HATCH
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF ENVIRONMENTAL COMPLIANCE

January 7, 2014

Mr. Thomas Diggs
Associate Director for Air
USEPA Region 6-6PDQ
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Mr. Diggs:

This letter and the enclosed reports are submitted as certification that the ambient concentration data and the quality assurance data for ozone are completely submitted to AQS for the calendar year 2013.

This certifies that the data is complete and accurate to the best of our knowledge, taking into consideration the quality assurance findings. The report enclosed is the Data Certification Report AMP 600 for ozone including the P/A Quality Indicator Summary.

If you have any questions please do not hesitate to contact me at 225-219-3710.

Sincerely,

Cheryl Nolan, Assistant Secretary
Office of Environmental Compliance

Enclosures: 2013 AMP 600 (Ozone)

cc: Ms. Maria Martinez, EPA:6PD-Q;
Ms. Trisha Curran, EPA: 6PD-Q;
Ms. Kara Allen, EPA: 6PD-Q;

Post Office Box 4312 • Baton Rouge, Louisiana 70821-4312 • Phone 225-219-3550 • Fax 225-219-3708
www.deq.louisiana.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: TCG

CERTIFICATION EVALUATION AND CONCURRENCE

Report Request ID: 1162731

Report Code: AMP600

Jan. 7, 2014

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region	Method	Duration	Begin Date	End Date
	22														

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA	44201		

AGENCY SELECTIONS

State Of Louisiana

SELECTED OPTIONS

Option Type	Option Value
MERGE PDF FILES	YES

GLOBAL DATES

Start Date	End Date
2013	2013

Data Evaluation and Concurrence Report Summary

Certification Year: 2013
Certifying Agency (CA): State Of Louisiana (1001)

Pollutants in Report:

Parameter Name	Code	Monitors Evaluated	Monitors Recommended for Concurrence by AQS	Monitors NOT Recommended for Concurrence by AQS
Ozone	44201	24	24	0

PQAOs in Report:

PQAO Name	PQAO Code	TSA Date
State Of Louisiana	1001	09/13/11

Summary of 'N' flags for all pollutants:

PQAO	Parameter Code	AQS Site-ID	POC	AQS Recommended Flag	Cert. Agency Recommended Flag	Reason for AQS Recommendation

Signature of Monitoring Organization Representative: _____

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2013
Certifying Agency Code State Of Louisiana (1001)
Parameter Ozone (44201) (ppm)
PQAO Name State Of Louisiana (1001)
QAPP Approval Date 11/21/2012

NPAP Audit Summary:

Number of Valid Audits	NPAP Bias	Criteria Met
0		Y

AQS Site ID	POC	Monitor Type	Routine Data Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	One Point Quality Check Precision	Bias	Complete	Annual PE Bias	Complete	NPAP Bias	PQAO Level Criteria	QAPP Appr.	Concur. Flag Aqs Rec Flag	CA Rec Flag	Epa Eval.
22-005-0004	1	SLAMS	0.042	0.005	0.080	0	0	98	1.58	+/-1.28	100	0.31	100		Y	Y	Y		
22-015-0008	2	SLAMS	0.049	0.015	0.086	0	0	98	2.96	-2.93	100	- 1.36	100		Y	Y	Y		
22-017-0001	2	SLAMS	0.049	0.017	0.085	0	0	98	2.25	+/-1.70	94	1.13	100		Y	Y	Y		
22-019-0002	1	SLAMS	0.042	0.009	0.089	0	0	98	1.54	+/-1.30	100	10.20	100		Y	Y	Y		
22-019-0008	1	SLAMS	0.041	0.011	0.089	0	0	98	3.17	+/-2.63	100	2.52	100		Y	Y	Y		
22-019-0009	1	SPECIAL PURPOSE	0.044	0.011	0.088	0	0	98	1.16	+/-0.90	100	8.45	100		Y	Y	Y		
22-033-0003	1	SLAMS	0.043	0.002	0.103	0	0	98	2.17	+/-1.82	100	- 0.96	100		Y	Y	Y		
22-033-0009	1	SLAMS	0.041	0.005	0.088	0	0	99	0.95	+/-0.66	100	10.01	100		Y	Y	Y		
22-033-0013	1	SLAMS	0.044	0.008	0.096	0	0	98	3.10	+/-2.37	100	10.75	100		Y	Y	Y		
22-047-0009	1	SLAMS	0.041	0.002	0.104	0	0	99	1.59	-3.02	100	- 4.68	100		Y	Y	Y		
22-047-0012	1	SLAMS	0.045	0.006	0.095	0	0	97	2.84	+/-2.38	96	1.53	100		Y	Y	Y		
22-051-1001	2	SLAMS	0.044	0.006	0.091	0	0	97	1.59	+/-1.53	92	1.66	100		Y	Y	Y		
22-055-0007	1	SLAMS	0.044	0.008	0.083	0	0	98	1.76	+1.82	100	3.44	100		Y	Y	Y		
22-057-0004	1	SLAMS	0.042	0.002	0.084	0	0	98	0.97	+/-1.12	100	3.68	100		Y	Y	Y		
22-063-0002	1	SPECIAL PURPOSE	0.047	0.009	0.090	0	0	98	1.36	+1.82	100	1.99	100		Y	Y	Y		
22-071-0012	2	SLAMS	0.041	0.005	0.089	0	0	95	1.44	+/-1.34	100	0.49	100		Y	Y	Y		
22-073-0004	1	SLAMS	0.040	0.009	0.076	0	0	98	4.22	+/-3.09	100	- 10.43	100		Y	Y	Y		
22-077-0001	1	SLAMS	0.046	0.014	0.083	0	0	98	4.31	+/-3.76	100	1.18	100		Y	Y	Y		
22-087-0004	1	SPECIAL PURPOSE	0.044	0.016	0.079	0	0	95	2.24	+/-2.02	100	2.72	100		Y	Y	Y		
22-089-0003	1	SLAMS	0.040	0.002	0.081	0	0	99	1.28	+/-1.25	100	2.46	100		Y	Y	Y		
22-093-0002	1	SLAMS	0.041	0.009	0.081	0	0	97	2.58	+/-2.43	100	0.31	100		Y	Y	Y		
22-095-0002	1	SLAMS	0.045	0.011	0.081	0	0	98	1.67	+2.60	100	- 6.82	100		Y	Y	Y		
22-103-0002	1	SPECIAL PURPOSE	0.044	0.002	0.095	0	0	98	1.43	+/-1.33	100	2.41	100		Y	Y	Y		
22-121-0001	1	SLAMS	0.039	0.002	0.087	0	0	99	5.60	+/-4.81	100	2.62	100		Y	Y	Y		

TABLE 2—BREAKPOINTS FOR THE AQI

These breakpoints							Equal these AQI's	
O_3 (ppm) 8-hour	O_3 (ppm) 1-hour[1]	$PM_{2.5}$ ($\mu g/m^3$) 24-hour	PM_{10} ($\mu g/m^3$) 24-hour	CO (ppm) 8-hour	SO_2 (ppb) 1-hour	NO_2 (ppb) 1-hour	AQI	Category
0.000-0.059		0.0-12.0	0-54	0.0-4.4	0-35	0-53	0-50	Good.
0.060-0.075		12.1-35.4	55-154	4.5-9.4	36-75	54-100	51-100	Moderate.
0.076-0.095	0.125-0.164	35.5-55.4	155-254	9.5-12.4	76-185	101-360	101-150	Unhealthy for Sensitive Groups.
0.096-0.115	0.165-0.204	[3]55.5-150.4	255-354	12.5-15.4	[4]186-304	361-649	151-200	Unhealthy.
0.116-0.374	0.205-0.404	[3]150.5-250.4	355-424	15.5-30.4	[4]305-604	650-1249	201-300	Very Unhealthy.
([2])	0.405-0.504	[3]250.5-350.4	425-504	30.5-40.4	[4]605-804	1250-1649	301-400	Hazardous.
([2])	0.505-0.604	[3]350.5-500.4	505-604	40.5-50.4	[4]805-1004	1650-2049	401-500	

[1]Areas are generally required to report the AQI based on 8-hour ozone values. However, there are a small number of areas where an AQI based on 1-hour ozone values would be more precautionary. In these cases, in addition to calculating the 8-hour ozone index value, the 1-hour ozone index value may be calculated, and the maximum of the two values reported.

[2]8-hour O^3 values do not define higher AQI values (≥301). AQI values of 301 or greater are calculated with 1-hour O_3 concentrations.

[3]If a different SHL for $PM_{2.5}$ is promulgated, these numbers will change accordingly.

[4]1-hr SO_2 values do not define higher AQI values (≥200). AQI values of 200 or greater are calculated with 24-hour SO_2 concentrations.

D.2 PROPOSED: APPROVAL AND PROMULGATION OF AIR QUALITY IMPLEMENTATION PLANS; LOUISIANA; CLEAN DATA DETERMINATION FOR THE BATON ROUGE AREA FOR THE 2008 OZONE NATIONAL AMBIENT AIR QUALITY STANDARD (79 FR 21178)

Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA; and

• does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this proposed rule, which satisfies certain infrastructure requirements of section 110(a)(2) of the CAA for the 2010 NO_2 NAAQS for the State of Maryland, does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the state, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Nitrogen dioxide, Reporting and recordkeeping requirements.

Authority: 42 U.S.C. 7401 *et seq.*

Dated: April 4, 2014.

W.C. Early,

Acting Regional Administrator, Region III.

[FR Doc. 2014–08490 Filed 4–14–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R07–OAR–2013–0672; FRL–9909–42–Region 7]

Approval and Promulgation of Implementation Plans; State of Missouri

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing action to approve a revision to the State Implementation Plan (SIP) submitted by the State of Missouri for the purpose of incorporating administrative changes to the Missouri rule entitled, ''Municipal Solid Waste Landfills''. EPA is proposing to approve this SIP revision based on EPA's finding that the rule is as stringent as the rule it replaces and fulfills the requirements of the Clean Air Act (CAA or Act) for the protection of the ozone National Ambient Air Quality Standards (NAAQS) in St. Louis.

DATES: Comments on this proposed action must be received in writing by May 15, 2014.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–R07–OAR–2013–0672, by mail to Craig Bernstein, Environmental Protection Agency, Air Planning and Development Branch, 11201 Renner Boulevard, Lenexa, Kansas 66219. Comments may also be submitted electronically or through hand delivery/courier by following the detailed instructions in the **ADDRESSES** section of the direct final rule located in the rules section of this **Federal Register**.

FOR FURTHER INFORMATION CONTACT: Craig Bernstein, Environmental Protection Agency, Air Planning and Development Branch, 11201 Renner Boulevard, Lenexa, Kansas 66219; at 913–551–7688; or by email at *Bernstein.craig@epa.gov.*

SUPPLEMENTARY INFORMATION: In the final rules section of this **Federal Register**, EPA is approving the state's SIP revision as a direct final rule without prior proposal because the Agency views this as a noncontroversial action and anticipates no relevant adverse comments because the revisions are administrative and consistent with Federal regulations. A detailed rationale for the approval is set forth in the direct final rule. If no relevant adverse comments are received in response to this action, no further activity is contemplated in relation to this action. If EPA receives relevant adverse comments, the direct final rule will be withdrawn and all public comments received will be addressed in a subsequent final rule based on this proposed action. EPA will not institute a second comment period on this action. Any parties interested in commenting on this action should do so at this time. Please note that if EPA receives adverse comment on part of this rule and if that part can be severed from the remainder of the rule, EPA may adopt as final those parts of the rule that are not the subject of an adverse comment. For additional information, see the direct final rule which is located in the rules section of this **Federal Register**.

Dated: April 3, 2014.

Karl Brooks,

Regional Administrator, Region 7.

[FR Doc. 2014–08339 Filed 4–14–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R06–OAR–2014–0145; FRL–9909–52–Region 6]

Approval and Promulgation of Air Quality Implementation Plans; Louisiana; Clean Data Determination for the Baton Rouge Area for the 2008 Ozone National Ambient Air Quality Standard

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to find that the Baton Rouge, Louisiana marginal 2008 8-hour ozone nonattainment area is currently attaining the 2008 8-hour National Ambient Air Quality Standard (NAAQS) for ozone. This proposed clean data determination is based upon complete, quality assured, certified ambient air monitoring data that show the area has monitored attainment of the 2008 8-hour ozone NAAQS during the 2011–2013 monitoring period, and continues to monitor attainment of the NAAQS based on preliminary 2014 data.

DATES: Written comments should be received on or before May 15, 2014.

ADDRESSES: Comments may be mailed to Mr. Guy Donaldson, Chief, Air Planning Section (6PD–L), Environmental Protection Agency, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202–2733. Comments may also be submitted electronically or through hand delivery/courier by following the detailed instructions in the **ADDRESSES** section of the direct final rule located in the rules section of this **Federal Register**.

FOR FURTHER INFORMATION CONTACT: Ms. Ellen Belk, Air Planning Section (6PD–L); telephone (214) 665–2164; email address: *belk.ellen@epa.gov.*

SUPPLEMENTARY INFORMATION: In the final rules section of this **Federal Register**, EPA is approving the State's SIP submittal as a direct rule without prior proposal because the Agency views this as a noncontroversial submittal and anticipates no adverse comments. A detailed rationale for the approval is set forth in the direct final rule. If no relevant adverse comments are received in response to this action no further activity is contemplated. If EPA receives relevant adverse comments, the direct final rule will be withdrawn and all public comments received will be addressed in a subsequent final rule based on this

proposed rule. EPA will not institute a second comment period. Any parties interested in commenting on this action should do so at this time.

For additional information, see the direct final rule which is located in the rules section of this **Federal Register**.

Dated: April 1, 2014.

Samuel Coleman,

Acting Regional Administrator, Region 6.

[FR Doc. 2014–08373 Filed 4–14–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R10–OAR–2011–0715, FRL–9909–54–Region–10]

Approval and Promulgation of Implementation Plans; Idaho: Infrastructure Requirements for the 1997 and 2006 Fine Particulate Matter and 2008 Ozone National Ambient Air Quality Standards; Correction

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule; correction.

SUMMARY: On March 26, 2014, the EPA published a proposed rule finding that the Idaho State Implementation Plan (SIP) meets the infrastructure requirements of the Clean Air Act (CAA) for the National Ambient Air Quality Standards (NAAQS) promulgated for fine particulate matter ($PM_{2.5}$) on July 18, 1997 and October 17, 2006, and for ozone on March 12, 2008, in addition to the interstate transport requirements of the CAA related to prevention of significant deterioration and visibility for the 2006 $PM_{2.5}$ and 2008 ozone NAAQS. In that publication, we supplied an incorrect docket number for commenters to use when they send us comments. The correct docket number is EPA–R10–OAR–2011–0715. If commenters have already submitted comments, they need not resubmit them, because they will be routed to the correct docket.

DATES: Comments must be received on or before April 25, 2014.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–R10–OAR–2011–0715, by any of the following methods:

- *www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *Email: R10-Public_Comments@epa.gov.*
- *Mail:* Kristin Hall, EPA Region 10, Office of Air, Waste and Toxics (AWT–107), 1200 Sixth Avenue, Suite 900, Seattle WA, 98101.
- *Hand Delivery/Courier:*

List of Subjects

EPA Region 10 Mailroom, 9th floor, 1200 Sixth Avenue, Suite 900, Seattle WA, 98101. Attention: Kristin Hall, Office of Air, Waste and Toxics, AWT—107. Such deliveries are only accepted during normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–R10–OAR–2011–0715. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information the disclosure of which is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *www.regulations.gov* or email. The *www.regulations.gov* Web site is an ''anonymous access'' system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *www.regulations.gov* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in the *www.regulations.gov* index. Although listed in the index, some information is not publicly available, e.g., CBI or other information the disclosure of which is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy during normal business hours at the Office of Air, Waste and Toxics, EPA Region 10, 1200 Sixth Avenue, Seattle WA, 98101.

FOR FURTHER INFORMATION CONTACT: Kristin Hall at (206) 553–6357, *hall.kristin@epa.gov.*

SUPPLEMENTARY INFORMATION:

Correction

On March 26, 2014 (79 FR 16711), we, the EPA, published a proposed rule finding that the Idaho SIP meets the infrastructure requirements of the CAA for the 1997 $PM_{2.5}$, 2006 $PM_{2.5}$, and 2008 ozone NAAQS, in addition to the interstate transport requirements of the CAA related to prevention of significant deterioration and visibility for the 2006 $PM_{2.5}$ and 2008 ozone NAAQS. In that publication, we supplied an incorrect docket number for commenters to use when they submit comments. We are publishing this notice to clarify that the correct docket number is EPA–R10–OAR–2011–0715. However, if you already submitted a comment, you need not resubmit it, because it will be routed to the correct docket. For details on the proposed rule, please see our original **Federal Register** publication at 79 FR 16711.

Dated: March 28, 2014.

Michelle Pirzadeh,

Acting Regional Administrator, Region 10.

[FR Doc. 2014–08499 Filed 4–14–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R06–OAR–2010–0890; FRL–9909–39–Region 6]

Approval and Promulgation of Air Quality Implementation Plans; Texas; Control of Air Pollution From Motor Vehicles, Vehicle Inspection and Maintenance and Locally Enforced Motor Vehicle Idling Limitations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to approve revisions to the Texas State Implementation Plan (SIP). The revisions to the Texas Administrative Code (TAC) were submitted in 2002, 2005, 2006, 2008, 2010, 2011 and 2012. These revisions are related to the implementation of the state's motor vehicle emissions Inspection and Maintenance (I/M) program and the Locally Enforced Motor Vehicle Idling Limitations. The EPA is proposing to

D.3 DIRECT FINAL RULE: APPROVAL AND PROMULGATION OF AIR QUALITY IMPLEMENTATION PLANS; LOUISIANA; CLEAN DATA DETERMINATION FOR THE BATON ROUGE AREA FOR THE 2008 OZONE NATIONAL AMBIENT AIR QUALITY STANDARD (79 FR 21139)

methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this rule does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the state, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

The Congressional Review Act, 5 U.S.C. 801 *et seq.,* as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this action and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

Under section 307(b)(1) of the CAA, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by June 16, 2014. Filing a petition for reconsideration by the Administrator of this direct final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. Parties with objections to this direct final rule are encouraged to file a comment in response to the parallel notice of proposed rulemaking for this action published in the proposed rules section of today's **Federal Register**, rather than file an immediate petition for judicial review of this direct final rule, so that EPA can withdraw this direct final rule and address the comment in the proposed rulemaking. This action may not be challenged later in proceedings to enforce its requirements. (See section 307(b)(2).)

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Ozone, Particulate matter, Reporting and recordkeeping requirements, Volatile organic compounds.

Dated: April 3, 2014.

Karl Brooks,

Regional Administrator, Region 7.

Chapter I, title 40 of the Code of Federal Regulations is amended as follows:

PART 52—[AMENDED]

■ 1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401 et seq.

Subpart AA—Missouri

■ 2. In § 52.1320 the table in paragraph (c) is amended by revising the entry for 10–5.490 as follows:

§ 52.1320 Identification of plan.

* * * * *

(c) * * *

EPA-APPROVED MISSOURI REGULATIONS

Missouri citation	Title	State effective date	EPA Approval date	Explanation
Missouri Department of Natural Resources				
*	*	*	*	*
Chapter 5—Air Quality Standards and Air Pollution Control Regulations for the St. Louis Metropolitan Area				
*	*	*	*	*
10–5.490	Municipal Solid Waste Landfills.	5/30/12	4/15/14 *insert* FEDERAL REGISTER *page number where the document begins*].	
*	*	*	*	*

* * * * *

[FR Doc. 2014–08338 Filed 4–14–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R06–OAR–2014–0145; FRL–9909–53–Region 6]

Approval and Promulgation of Air Quality Implementation Plans; Louisiana; Clean Data Determination for the Baton Rouge Area for the 2008 Ozone National Ambient Air Quality Standard

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: The Environmental Protection Agency (EPA) has determined that the Baton Rouge, Louisiana marginal 2008 8-hour ozone nonattainment area is currently attaining the 2008 8-hour National Ambient Air Quality Standard (NAAQS) for ozone. This determination is based upon complete, quality assured, certified ambient air monitoring data that show the area has monitored attainment of the 2008 8-hour ozone NAAQS during the 2011–2013 monitoring period, and continues to

monitor attainment of the NAAQS based on preliminary 2014 data.

DATES: This rule is effective on June 16, 2014 without further notice, unless EPA receives relevant adverse comment by May 15, 2014. If EPA receives such comment, EPA will publish a timely withdrawal in the **Federal Register** informing the public that this rule will not take effect.

ADDRESSES: Submit your comments, identified by Docket No. EPA–R06–OAR–2014–0145, by one of the following methods:

- *www.regulations.gov.* Follow the on-line instructions.
- Email: Mr. Guy Donaldson at *donaldson.guy@epa.gov.* Please also send a copy by email to the person listed in the **FOR FURTHER INFORMATION CONTACT** section below.
- Mail or delivery: Mr. Guy Donaldson, Chief, Air Planning Section (6PD–L), Environmental Protection Agency, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202–2733.

Instructions: Direct your comments to Docket ID No. EPA–R06–OAR–2014–0145. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information the disclosure of which is restricted by statute. Do not submit information through *http://www.regulations.gov* or email, if you believe that it is CBI or otherwise protected from disclosure. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means that EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to EPA without going through *http://www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment along with any disk or CD–ROM submitted. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters and any form of encryption and should be free of any defects or viruses. For additional information about EPA's public docket, visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Docket: The index to the docket for this action is available electronically at *www.regulations.gov* and in hard copy at EPA Region 6, 1445 Ross Avenue, Suite 700, Dallas, Texas. While all documents in the docket are listed in the index, some information may be publicly available only at the hard copy location (e.g., copyrighted material), and some may not be publicly available at either location (e.g., CBI). To inspect the hard copy materials, please schedule an appointment with the person listed in the **FOR FURTHER INFORMATION CONTACT** paragraph below or Mr. Bill Deese at 214–665–7253.

FOR FURTHER INFORMATION CONTACT: Ms. Ellen Belk, Air Planning Section (6PD–L), Environmental Protection Agency, Region 6, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202–2733, telephone (214) 665–2164, fax (214) 665–6762, email address *belk.ellen@epa.gov.*

SUPPLEMENTARY INFORMATION: Throughout this document ''we,'' ''us,'' and ''our'' refer to EPA.

Table of Contents

I. Background
II. EPA's Evaluation
III. Final Action
IV. Statutory and Executive Order Reviews

I. Background

On May 21, 2012 (77 FR 30088), effective July 20, 2012, EPA designated as nonattainment any area that was violating the 2008 8-hour ozone NAAQS based on the three most recent years (2008–2010) of air quality data. The Baton Rouge area (specifically, Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge Parishes) was designated as a marginal ozone nonattainment area. Recent air quality data indicate that the Baton Rouge area is now attaining the 2008 8-hour ozone standard.

EPA is taking direct final action in determining that the Baton Rouge, Louisiana marginal 2008 8-hour ozone nonattainment area (hereafter the Baton Rouge area) has attained the 2008 8-hour NAAQS for ozone. This determination is based upon complete, quality assured and certified ambient air monitoring data that show the area has monitored attainment of the ozone NAAQS during the 2011–2013 monitoring period. Data entered into EPA's Air Quality System database (AQS) for 2014, but not yet certified also show that the area continues to attain the standard.

This clean data determination for the Baton Rouge area is being taken at the request of the State of Louisiana [1] and in accordance with our Clean Data Policy.[2] This Clean Data Determination serves as notice to the public that the nonattainment area's air quality meets the 2008 ozone NAAQS.[3]

To clarify, this action does not constitute a redesignation to attainment under CAA section 107(d)(3)(E)(i). This is because we do not yet have an approved maintenance plan for the area as required under section 175A of the CAA, nor have we found that the area has met the other applicable requirements for redesignation. The classification and designation status of the area will remain marginal nonattainment for the 2008 8-hour ozone NAAQS, and will be subject to marginal nonattainment applicable requirements including a nonattainment NSR SIP and an EI, until such time as EPA determines that the area meets all the CAA applicable requirements for redesignation to attainment. This finding means the area will have met one important requirement for redesignation, that is, having air quality that meets the standard. EPA expects that Louisiana will be providing the remaining elements necessary for redesignation in a SIP revision. Also, this action does not constitute a Determination of Attainment by an Area's Attainment Date under CAA section 179(c), 181(b)(2) and 188(b)(2).

II. EPA's Evaluation

For ozone, an area may be considered to be attaining the 2008 8-hour ozone NAAQS if there are no violations, as determined in accordance with 40 CFR 50, based on three complete, consecutive calendar years of quality-assured air quality monitoring data. Under EPA regulations at 40 CFR Part 50, the 2008 8-hour ozone standard is

[1] See Louisiana's letter from Secretary Peggy Hatch to Mr. Ron Curry, dated January 23, 2014 in the docket for this action.

[2] Our Clean Data Policy is set forth in a May 10, 1995, EPA memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards, entitled ''Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard.'' This policy is included in the docket for this action.

[3] See Memorandum from Janet McCabe, Deputy Assistant Administrator, Office of Air & Radiation, to Regional Administrators, Region I–X, dated April 6, 2011, entitled, ''Regional consistency for the Administrative Requirements of State Implementation Plan Submittals and the use of ''Letter Notices'', ''Attachment C—Determinations of Attainment by an Area's attainment Date v. Clean Data Determinations & Redesignation Requests and Maintenance Plans'' (p. 9) in the docket for this action.

attained when the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentrations at an ozone monitor is less than or equal to 0.075 parts per million (ppm) (i.e., 0.075 ppm, based on the truncating conventions in 40 CFR part 50, Appendix P). This 3-year average is referred to as the design value. When the design value is less than or equal to 0.075 ppm at each monitor within the area, then the area is meeting the NAAQS. Also, the data completeness requirement is met when the average percent of days with valid ambient monitoring data is greater than or equal to 90%, and no single year has less than 75% data completeness as determined in Appendix P of 40 CFR Part 50. The data must be collected and quality-assured in accordance with 40 CFR part 58, and recorded in the EPA Air Quality System (AQS). The monitors generally should have remained at the same location for the duration of the monitoring period required for demonstrating attainment. For ease of communication, many reports of ozone concentrations are given in parts per billion (ppb); ppb = ppm × 1,000. Thus, 0.075 ppm equals 75 ppb.

EPA reviewed the Baton Rouge area ozone monitoring data from ambient ozone monitoring stations for the ozone seasons 2011 through 2013, as well as data for the 2014 ozone in AQS but not yet certified. The 2011–2013 ozone season data for all the ozone monitors in the Baton Rouge area have been quality assured and certified by EPA. The design value for 2011–2013 is 0.075 ppm, and is not changed by the preliminary data for 2014 (at this time of this writing, March 7, 2014, preliminary data available in AQS included data for the month of January, 2014). The data for the three ozone seasons 2011–2013, and preliminary data for 2014, show that the Baton Rouge area is attaining the 2008 8-hour ozone NAAQS.

Table 1 shows the fourth-highest daily maximum 8-hour average ozone concentrations for the Baton Rouge, Louisiana nonattainment area monitors for the years 2011–2013. (To find the overall design value for the area for a given year, simply find the highest design value from any of the eight monitors for that year.) The location of each monitoring site in the Baton Rouge area is shown on the map entitled, ''Baton Rouge ozone and ozone precursor monitoring network'' included in the docket associated with this action.

TABLE 1—BATON ROUGE AREA FOURTH HIGH 8-HOUR OZONE AVERAGE CONCENTRATIONS AND DESIGN VALUES (PPM) [1] [2]

Site	4th Highest daily max			Design values three year averages
	2011	2012	2013	2011–2013
Plaquemine (22–047–0009)	0.079	0.074	0.061	0.071
Carville (22–047–0012)	0.084	0.073	0.068	0.075
Dutchtown (22–005–0004)	0.080	0.071	0.062	0.071
LSU (22–033–0003)	0.083	0.075	0.067	0.075
Port Allen (22–121–0001)	0.074	0.070	0.060	0.068
Pride (22–033–0013)	0.075	0.070	0.062	0.069
French Settlement (22–063–0002)	0.077	0.071	0.069	0.072
Capitol (22–033–0009)	0.080	0.072	0.066	0.072

[1] Unlike for the 1-hour ozone standard, design value calculations for the 2008 8-hour ozone standard are based on a rolling three-year average of the annual 4th highest values. This is the same as design value calculations for the 1997 8-hour ozone standard. (40 CFR Part 50, Appendix I).

[2] The Baker and Grosse Tete ozone monitoring sites were shut down after 2010; no data from these sites was used in the design values included in this table.

The 8-hour ozone design value for the Baton Rouge area based on monitoring data for 2011 through 2013 is provided in Table 2:

TABLE 2—BATON ROUGE AREA 8-HOUR OZONE DESIGN VALUE (PPM)

Baton Rouge area overall	Design value three year average
	2011–2013
	0.075

As shown in Table 2, the 8-hour ozone design value for 2011–2013, which is based on a three-year average of the fourth-highest daily maximum average ozone concentration at the monitor recording the highest concentrations, is 0.075 ppm, which meets the 2008 8-hour ozone NAAQS. Data through 2013 have been quality assured, as recorded in AQS. Data for 2014 not yet certified also indicate that the area continues to attain the 2008 8-hour NAAQS. In summary, monitoring data for Baton Rouge for the three years 2011 through 2013, as well as preliminary monitoring data for 2014, show continued attainment of the 2008 8-hour ozone standard. Preliminary data for Baton Rouge for 2014 are included in the docket.

EPA's review of these data confirms that the Baton Rouge ozone nonattainment area has met and continues to meet the 2008 8-hour ozone NAAQS. Data for 2011–2013, show the area continues to attain the 2008 8-hour ozone NAAQS. Preliminary data available to date for the 2014 ozone season are consistent with continued attainment.

III. Final Action

We are taking direct final action to find that the Baton Rouge, Louisiana marginal 2008 8-hour ozone nonattainment area has attained the 2008 8-hour NAAQS for ozone. This action is based on complete, quality assured data for 2011–2013 indicating attainment as well as on preliminary data for the 2014 ozone season available to date which are consistent with continued attainment. As provided in 40 CFR Section 51.918, this action provides formal acknowledgement that the Baton Rouge area air quality data for 2011–2013, including preliminary data for 2014, meet the applicable requirements of EPA's Clean Data Policy for the 2008 8-hour ozone standard.

EPA is publishing this rule without prior proposal because we view this as a non-controversial amendment and anticipate no adverse comments. However, in the proposed rules section of this **Federal Register** publication, we are publishing a separate document that will serve as the proposal to approve the SIP revision if relevant adverse comments are received. This rule will

be effective on June 16, 2014 without further notice unless we receive relevant adverse comments by May 15, 2014. If we receive relevant adverse comments, we will publish a timely withdrawal in the **Federal Register** informing the public that the rule will not take effect. We will address all public comments in a subsequent final rule based on the proposed rule. We will not institute a second comment period on this action. Any parties interested in commenting must do so now. Please note that if we receive a relevant adverse comment on an amendment, paragraph, or section of this rule and if that provision may be severed from the remainder of the rule, we may adopt as final those provisions of the rule that are not the subject of an adverse comment.

IV. Statutory and Executive Order Reviews

This action makes a determination based on air quality data. For that reason, this action:

- Is not a ''significant regulatory action'' subject to review by the Office of Management and Budget under Executive Order 12866 (58 FR 51735, October 4, 1993);
- does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*);
- does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4);
- does not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- is not subject to requirements of section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA; and
- does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this rule does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because it merely makes a determination based on air quality data.

The Congressional Review Act, 5 U.S.C. 801 *et seq.,* as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

Under section 307(b)(1) of the CAA, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by June 16, 2014. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. (See section 307(b)(2).)

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Ozone, Incorporation by reference.

Dated: April 1, 2014.

Samuel Coleman,

Acting Regional Administrator, Region 6.

40 CFR part 52 is amended as follows:

PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS

■ 1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart T—Louisiana

■ 2. Amend § 52.977 to add a new paragraph (e) to read as follows:

§ 52.977 Control strategy and regulations: Ozone.

* * * * *

(e) *Clean Data Determination.* Effective June 16, 2014 EPA has determined that the Baton Rouge, Louisiana, marginal 2008 8-hour ozone nonattainment area is currently attaining the 2008 8-hour NAAQS for ozone.

[FR Doc. 2014–08369 Filed 4–14–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R06–OAR–2011–0500; FRL–9909–57–Region–6]

Approval and Promulgation of Implementation Plans; Louisiana; Interstate Transport of Fine Particulate Matter

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is approving a portion of a State Implementation Plan (SIP) submittal, and technical supplement from the State of Louisiana to address Clean Air Act (CAA) requirements in section 110(a)(2)(D)(i)(I) that prohibit air emissions which will contribute significantly to nonattainment or interfere with maintenance in any other state for the 2006 fine particulate matter ($PM_{2.5}$) national ambient air quality standards (NAAQS). EPA has determined that the existing SIP for Louisiana contains adequate provisions to prohibit air pollutant emissions from significantly contributing to nonattainment or interfering with maintenance of the 2006 24-hour $PM_{2.5}$ NAAQS (2006 $PM_{2.5}$ NAAQS) in any other state as required by section 110(a)(2)(D)(i)(I) of the CAA.

DATES: This final rule is effective on May 15, 2014.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–R06–OAR–2011–0500. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, e.g., Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at the Air Planning Section (6PD–L),

APPENDIX E: TECHNICAL SUPPORT DOCUMENT - PHOTOCHEMICAL MODELING FOR THE LOUISIANA 8-HOUR OZONE STATE IMPLEMENTATION PLAN

Technical Support Document

Photochemical Modeling for the Louisiana 8-Hour Ozone State Implementation Plan

Prepared for:
Air Permits Division
Louisiana Department of Environmental Quality
602 North Fifth Street
Baton Rouge, Louisiana 70802

Prepared by:
ENVIRON International Corporation
773 San Marin Drive, Suite 2115
Novato, California, 94998

and

Eastern Research Group, Inc.
10860 Gold Center Drive, Suite 275
Rancho Cordova, CA 95670

August 2013
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EXECUTIVE SUMMARY

This Technical Support Document (TSD) describes the photochemical modeling conducted to support an attainment demonstration of the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS) in the Baton Rouge nonattainment area and other areas of Louisiana. The attainment demonstration is a central component of the Louisiana State Implementation Plan (SIP) that will specifically establish strategies to attain the 2008 ozone standard. The modeling program was directed by the Louisiana Department of Environmental Quality (LDEQ), Office of Environmental Services, Air Permits Division. The technical work was conducted by the contractor team of ENVIRON International Corporation (ENVIRON) and Eastern Research Group, Inc. (ERG). The US Environmental Protection Agency (EPA), Region 6, is responsible for reviewing and approving all SIPs submitted by the State of Louisiana.

The goal of this study was to develop the photochemical modeling tools and related databases needed to reliably simulate the complex interplay between meteorology, emissions, and ambient photochemistry during a recent 8-hour ozone exceedance period in the Baton Rouge area, to project those conditions to a future year, and to evaluate emissions reductions needed to reach attainment of the current ozone NAAQS. For nonattainment areas that are classified as “moderate”, the modeled attainment demonstration must show that 8-hour ozone design values at all monitoring sites in the nonattainment area are projected to be below the 2008 standard of 75 ppb by the end of 2018.

Several EPA-accepted modeling platforms and datasets were applied to address episodic-to-seasonal meteorology, emissions, and air quality during the selected modeling period of September-October 2010. Significant effort was directed towards the inclusion of the latest Louisiana state-wide emission inventories, and the leveraging of nationwide emission databases developed by the EPA, the National Center for Atmospheric Research (NCAR), and the Bureau of Ocean Energy and Management (BOEM). A modeling protocol document was developed previously (ENVIRON and ERG, 2012) following the latest modeling guidance published by the EPA related to 8-hour ozone attainment demonstrations (EPA, 2007).

Overview of Modeling Approach

This study has built from previous attainment demonstration modeling conducted for the same area that addressed the requirements of the 1997 ozone NAAQS, but included appropriate deviations to account for new episodes, updated datasets, new modeling tools, and other recently identified issues. For continuity, the modeling system employed many of the same emissions and photochemical model components as the previous modeling effort. However, some newer state-of-the-science components were used. The modeling system included:

- The Weather Research and Forecasting (WRF) meteorological model;
- The Emissions Processing System, version 3 (EPS3);
- The Sparse Matrix Operating Kernel Emissions (SMOKE) processor, version 3.1;

- The Consolidated Community Emissions Processing Tool (CONCEPT) combined with the EPA Motor Vehicle Emissions Simulator (MOVES) emission factor model for on-road sources;
- EPA's National Mobile Inventory Model (NMIM) for non-road sources;
- The Model of Emissions of Gases and Aerosols from Nature (MEGAN) for biogenic emissions;
- EPA's Biogenic Emissions Inventory System (BEIS);
- The Fire Inventory from NCAR (FINN) for wildfires, and agricultural/prescribed burning;
- The Comprehensive Air quality Model with extensions (CAMx).

This modeling system was employed for an extended period during September and October 2010 when elevated ozone was monitored throughout Louisiana. The modeling domain consists of a two-way interactive nested grid system employing three grids with 36, 12, and 4 km grid resolution, similarly to the previous modeling. However, the projection parameters were changed to align with the standard projection defined by the regional planning organizations (RPOs), and the 36 km grid was expanded to match the RPO continental US (CONUS) domain. This maximized portability of previously or concurrently developed emission inventories and other datasets into this project. The CAMx vertical grid structure was defined on a subset of the WRF meteorological grid structure, extending from the surface to about 11 km altitude.

Other agencies and groups contributed to the datasets employed in this study. The Louisiana Department of Transportation and Development (LDOTD) and the Capitol Region Planning Commission (CRPC) provided datasets necessary for the development of Baton Rouge and State-wide on-road emission estimates. All meteorological modeling, biogenic modeling with BEIS, and processing of EPA anthropogenic emission datasets outside of Louisiana and the Gulf of Mexico were externally performed by Alpine Geophysics, LLC (Alpine), who operated under contract to the local industry coalition.

The WRF meteorological model was supplied with several terrestrial and meteorological databases available from NCAR. Standard meteorological analyses were used to define initial/boundary conditions and to provide for analysis nudging as part of WRF's Four Dimensional Data Assimilation (FDDA) package. Meteorological modeling was conducted on the 36/12/4 km nested grid system for the duration of the modeling period. Details of the WRF configuration and application are provided in a separate report prepared by Alpine (2012). ENVIRON performed a focused evaluation of WRF's accuracy in replicating episodic weather conditions in the State of Louisiana.

Base year (2010) and projected future year (2017) model-ready emissions of ozone precursors were developed for all three modeling domains spanning the entire modeling period. The EPS3 and CONCEPT/MOVES emissions processors/models were used to translate raw stationary, non-road, and on-road emission inventories for the State of Louisiana to temporally allocated, speciated, spatially allocated input files in formats compatible with CAMx. The latest data for Louisiana stationary source emissions (from LDEQ) and on-road mobile source activity, fleet

activity, and fuel parameters (from LDOTD/CRPC) were accessed. Several datasets were used to generate CAMx-ready emissions outside of Louisiana: (1) anthropogenic inventories for the US, Canada, and Mexico developed by the EPA (processed by Alpine); (2) Gulf-wide oil and gas development and commercial shipping inventories developed by the BOEM; and (3) wildland, agricultural and prescribed fire emissions developed by NCAR. The MEGAN biogenic model was initially used to generate biogenic emissions on all three modeling grids using common North American vegetative distribution datasets. In response to model performance issues indicating over predictions of isoprene leading to over predictions of ozone, we ultimately switched to biogenic emissions generated by the EPA's BEIS model (processed by Alpine Geophysics) for final base and all future year modeling. Future year projections of US emissions considered growth, emission controls already on the books, and various other factors influencing emission rates to the extent possible. Natural emissions (biogenic and fires) were held constant between the base and future year scenarios.

Ancillary photochemical modeling inputs such as initial/boundary conditions, landuse, and photolysis rates were developed using appropriate contemporary data and techniques. Chemical boundary conditions were generated from archived 2010 global modeling products from NCAR, and used for both base and future year CAMx simulations. The latest version of CAMx was run for the entire modeling period using the Carbon Bond 6 (CB6) photochemical mechanism and several new state-of-the-science algorithms. Modifications to the initial configuration were made according to the model performance evaluation process and sensitivity testing. Final base and all future year modeling employed the Carbon Bond 2005 (CB05) photochemical mechanism.

An extensive model performance evaluation of the base year modeling was conducted for ozone and precursor predictions, to the extent possible given available ambient observational data. Graphical and statistical performance was gauged for ozone, NOx, and VOC using several techniques following EPA guidance. Diagnostic and sensitivity testing were conducted to understand model sensitivity and to obtain the best performance possible for the correct reasons. Eighteen different CAMx simulations were conducted with various emission inputs, vertical mixing characterization, chemistry mechanisms and inputs, and deposition rates. These tests culminated in improved model performance in replicating measurements throughout Louisiana, with the final CAMx base year run achieving statistical benchmarks for a well-performing model.

Future year modeling was conducted for the year 2017, to establish projections one year prior to the attainment year. The EPA model attainment test procedures were utilized to determine if the future year predictions attain the 2008 8-hour ozone standard. Future emission sensitivity tests were modeled and processed through the attainment test methodology to evaluate ozone response.

Modeled Attainment Test Results

CAMx was run for the September-October 2010 modeling period using the final base year model configuration, but exchanging the 2010 emissions with projected 2017 future year

emissions. Predicted daily maximum 8-hour ozone ($DM8O_3$) concentrations throughout the September-October modeling period were extracted from the CAMx results. These modeled concentrations were supplied to the EPA Modeled Attainment Test Software (MATS) tool, which tabulated the change in $DM8O_3$ at each site, determined site-specific relative response factors (RRF) averaged over all high ozone days during the modeling period, and applied the RRFs to current design values (DV) to estimate the 2017 DV at each site. MATS was also used to perform an "unmonitored area analysis" by extrapolating site-specific future year DVs to the entire modeling grid using modeled spatial gradients to help form the resulting DV surface. Following EPA (2007) guidance, we used MATS to calculate projections from the 2010-2012 average DV.

Table S-1 presents the base year 2010-2012 average DVs at each active monitoring site in Louisiana and the corresponding 2017 future year DVs projected by MATS. Missing values in the table indicate insufficient observation data from which to calculate a valid base year DV. All DVs are projected to be below the 75 ppb ozone NAAQS in 2017.

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Two emission sensitivity tests were run for the 2017 future year to quantify effects from simple across-the-board reductions in Louisiana anthropogenic NOx and VOC emissions. An arbitrary reduction of 30% was applied first to NOx (no change to VOC) and then to VOC (no change to NOx). All 2017 model-ready anthropogenic emissions in grid cells covering the State were scaled downward, including all low-level (gridded) sources and point sources. Emissions outside the State were not affected, nor were biogenic and fire sources throughout the 4 km grid.

These sensitivity tests indicated further ozone reductions by up to 10 ppb throughout the State. While both NOx and VOC reductions are shown to be effective in reducing ozone throughout the State, ozone tends to be somewhat more responsive to NOx reductions by typically 2-3 ppb. This effect could be more quantitatively analyzed through the use of CAMx probing tools, such as the Ozone Source Apportionment Tool (OSAT) or the Decoupled Direct Method (DDM) of sensitivity analysis.

Table S-1. Base year DM8O$_3$ design values at each active monitoring site in Louisiana for the 2010-2012 average and the 2017 projection. Values exceeding the current 75 ppb ozone NAAQS are highlighted in red. Blank entries indicate insufficient data from which to calculate the base year DV.

		Base Year	Future Year
AIRS Site ID	Parish	2010-12 DV	2017 DV
220050004	Ascension	76	70
220110002	Beauregard		
220150008	Bossier	77	68
220170001	Caddo	74	70
220190002	Calcasieu	74	68
220190008	Calcasieu	66	61
220190009	Calcasieu	73	67
220330003	E Baton Rouge	79	73
220330009	E Baton Rouge	75	69
220330013	E Baton Rouge	72	66
220331001	E Baton Rouge	72	66
220430001	Grant		
220470007	Iberville	71	64
220470009	Iberville	74	67
220470012	Iberville	75	68
220511001	Jefferson	75	68
220550005	Lafayette		
220550007	Lafayette	72	64
220570004	Lafourche	72	66
220630002	Livingston	75	69
220710012	Orleans	70	63
220730004	Ouachita	64	58
220770001	Pointe Coupee	75	70
220870002	St. Bernard		
220870009	St. Bernard	69	63
220890003	St. Charles	71	65
220930002	St. James	68	64
220950002	St. J. Baptist	74	69
221010003	St. Mary		
221030002	St. Tammany	74	65
221210001	W Baton Rouge	71	65

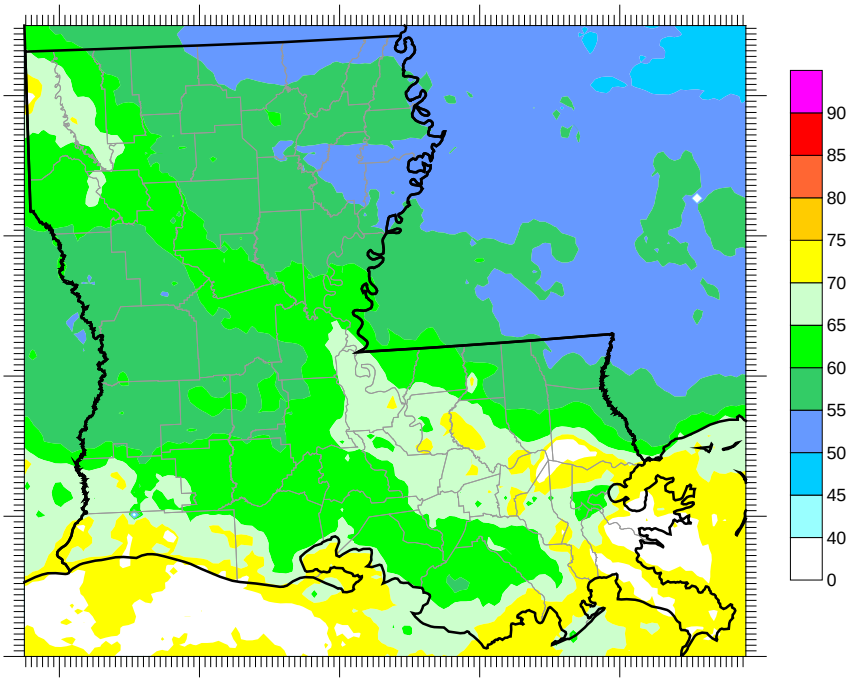


Figure S-1. MATS-derived 2017 DM8O$_3$ design value projection from the 2010-2012 average design value for un-monitored areas in Louisiana.

1.0 INTRODUCTION

This Technical Support Document (TSD) describes the photochemical modeling conducted to support an attainment demonstration of the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS) in the Baton Rouge nonattainment area and other areas of Louisiana. The attainment demonstration is a central component of the Louisiana State Implementation Plan (SIP) that will specifically establish strategies to attain the 2008 ozone standard. The modeling program was directed by the Louisiana Department of Environmental Quality (LDEQ), Office of Environmental Services, Air Permits Division. The technical work was conducted by the contractor team of ENVIRON International Corporation (ENVIRON) and Eastern Research Group, Inc. (ERG). The US Environmental Protection Agency (EPA), Region 6, is responsible for reviewing and approving all SIPs submitted by the State of Louisiana.

The goal of this study was to develop the photochemical modeling tools and related databases needed to reliably simulate the complex interplay between meteorology, emissions, and ambient photochemistry during a recent 8-hour ozone exceedance period in the Baton Rouge area, to project those conditions to a future year, and to evaluate emissions reductions needed to reach attainment of the current ozone NAAQS. For nonattainment areas that are classified as “moderate”, the modeled attainment demonstration must show that 8-hour ozone design values at all monitoring sites in the nonattainment area are projected to be below the 2008 standard of 75 ppb by the end of 2018.

Several EPA-accepted modeling platforms and datasets were applied to address episodic-to-seasonal meteorology, emissions, and air quality during the selected modeling period of September-October 2010. Significant effort was directed towards the inclusion of the latest Louisiana state-wide emission inventories, and the leveraging of nationwide emission databases developed by the EPA, the National Center for Atmospheric Research (NCAR), and the Bureau of Ocean Energy and Management (BOEM). A modeling protocol document was developed previously (ENVIRON and ERG, 2012) following the latest modeling guidance published by the EPA related to 8-hour ozone attainment demonstrations (EPA, 2007).

1.1 Study Background

1.1.1 The Ozone NAAQS

The EPA is required to consider revisions to the NAAQS every five years. The standard for each criteria pollutant comprises a primary value designed to protect public health, and a secondary value designed to protect public welfare. EPA promulgated the first 8-hour ozone NAAQS in 1997. The form of the standard is the three year running average of the annual fourth highest daily maximum 8-hour ozone concentration. This form establishes the yearly ozone “design value” (DV) for each individual monitor in the State. Design values exceeding the standard at any monitor result in a nonattainment designation for the area; the degree to which a monitor exceeds the standard determines the area’s classification (e.g., Marginal, Moderate, Serious, Severe, or Extreme). The 1997 primary and secondary 8-hour ozone standards were set at 0.08 ppm.

In March 2008, EPA lowered the 8-hour primary and secondary ozone NAAQS to 0.075 ppm. In January 2010, EPA announced that they were reconsidering a further reduction of the 2008 primary standard to within 0.060 – 0.070 ppm, while instituting a new secondary standard in the form of a seasonal (3 month) accumulation of ozone during daylight hours (8 AM – 8 PM) within 7-15 ppm-hrs. In September 2011, the Obama Administration directed EPA to withdraw the reconsideration and so the 2008 8-hour primary and secondary ozone NAAQS remains at 0.075 ppm.

The implementation schedule for the 2008 NAAQS calls for nonattainment area designations by mid-2012 based on monitoring data recorded in 2008-2010. The attainment year for marginal areas (Louisiana's highest nonattainment classification) is 2015. Marginal areas are not required to conduct modeling to demonstrate attainment, since EPA expects these areas to be able to attain the ozone NAAQS within three years of designation. During this time EPA is continuing to develop and implement federal rules that will reduce emissions from utilities, mobile sources, oil and gas source, and boilers/incinerators throughout the US. However, if nonattainment areas do not attain the ozone NAAQS by 2015 they will be bumped up to the moderate classification. In that case, modeling must be performed to demonstrate attainment by 2018.

In 2010 EPA initiated their next round of ozone NAAQS review. This is expected to result in a proposed new set of ozone NAAQS in 2014: a primary 8-hour ozone standard in the range of 0.060 – 0.070 ppm; and a secondary seasonal accumulated ozone standard of 7-15 ppm-hrs.

1.1.2 Recent Ozone History in Louisiana

Based on measured ozone data from 2001-2003, the EPA designated the five parishes comprising greater Baton Rouge (East Baton Rouge, West Baton Rouge, Livingston, Ascension, and Iberville) as a Marginal nonattainment area according to the 1997 8-hour ozone NAAQS. However, Baton Rouge experienced high ozone conditions as late as 2006 and therefore did not attain the 1997 standard by the Marginal attainment date of June 15, 2007. In response, EPA reclassified Baton Rouge as a Moderate nonattainment area with an attainment date of June 15, 2010.

Between 2007-2009, the LDEQ and its contractors developed a photochemical modeling system to support the attainment demonstration for the Baton Rouge Moderate-area ozone SIP. This modeling and related corroborative analyses showed that the area would reach attainment of the 1997 standard by the 2010 attainment date. Monitoring in Baton Rouge since 2006 has exhibited no exceedances of the 1997 standard, and thus in 2010 the LDEQ submitted an attainment reclassification request and maintenance plan to EPA Region 6 that included a TSD detailing the modeling demonstration (ENVIRON and ERG, 2009). On November 30, 2011, EPA took final action to redesignate Baton Rouge to attainment of the 1997 standard (Federal Register, 2011).

Based on a recent three year period of measured ozone data from 2008-2010, which constitutes the official period from which EPA has designated final nonattainment areas, only

one parish (East Baton Rouge) exceeded the 2008 standard of 75 ppb at the Marginal level (out of 18 monitored parishes in Louisiana). Figure 1-1 shows ranked design values from the most recent official three year data period (2010-2012).

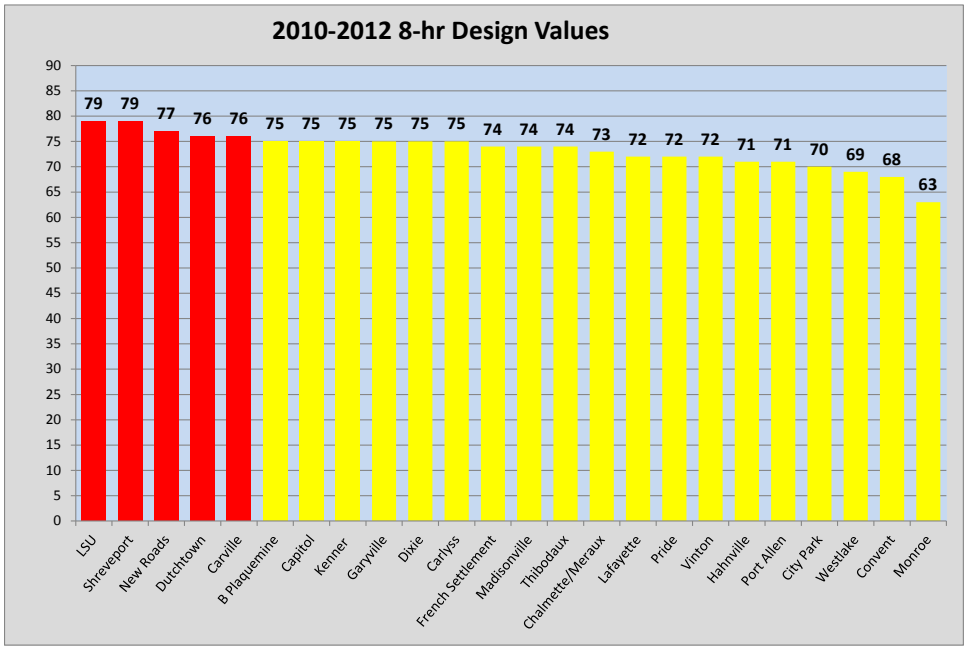


Figure 1-1. Ranked monitor design values in Louisiana based on 2010-2012 measurement data.

1.2 Overview of Modeling Approach

The goal of this study was to develop the photochemical modeling data bases and associated analysis tools needed to reliably simulate the processes responsible for ozone exceedances in the Baton Rouge nonattainment area and other areas throughout the State. It will culminate in the ozone attainment demonstration for the next 8-hour ozone SIP due in 2015. This study has built from previous attainment demonstration modeling conducted for the same area that addressed the requirements of the 1997 standard, but with appropriate deviations to account for new episodes, updated datasets, new modeling tools, and other recently identified issues.

The ENVIRON/ERG modeling team developed a Modeling Protocol document detailing the data, models, configurations, and analysis techniques to be employed in this project (ENVIRON and ERG, 2012). In particular, the Protocol outlined the rationale for model selection and grid configuration, and established the procedures for episode selection; such information is not repeated in this TSD. This section summarizes the technical approach and later chapters of this TSD provide further details.

For continuity, the modeling system employed many of the same emissions and photochemical model components documented in the 2009 TSD. However, some newer state-of-the-science components were used. The modeling system included:

- The Weather Research and Forecasting (WRF) meteorological model;
- The Emissions Processing System, version 3 (EPS3);
- The Sparse Matrix Operating Kernel Emissions (SMOKE) processor, version 3.1;
- The Consolidated Community Emissions Processing Tool (CONCEPT) combined with the EPA Motor Vehicle Emissions Simulator (MOVES) emission factor model for on-road sources;
- EPA's National Mobile Inventory Model (NMIM) for non-road sources;
- The Model of Emissions of Gases and Aerosols from Nature (MEGAN) for biogenic emissions;
- EPA's Biogenic Emissions Inventory System (BEIS);
- The Fire Inventory from NCAR (FINN) for wildfires, and agricultural/prescribed burning;
- The Comprehensive Air quality Model with extensions (CAMx).

This modeling system was employed for an extended period during September and October 2010 when elevated ozone was monitored throughout Louisiana. The modeling domain consists of a two-way interactive nested grid system employing three grids with 36, 12, and 4 km grid resolution, similarly to the previous modeling. However, the projection parameters were changed to align with the standard projection defined by the regional planning organizations (RPOs), and the 36 km grid was expanded to match the RPO continental US (CONUS) domain. This maximized portability of previously or concurrently developed emission inventories and other datasets into this project. The CAMx vertical grid structure was defined on a subset of the WRF meteorological grid structure, extending from the surface to about 11 km altitude.

Other agencies and groups contributed to the datasets employed in this study. The Louisiana Department of Transportation and Development (LDOTD) and the Capitol Region Planning Commission (CRPC) provided datasets necessary for the development of Baton Rouge and State-wide on-road emission estimates. All meteorological modeling, biogenic modeling with BEIS, and processing of EPA anthropogenic emission datasets outside of Louisiana and the Gulf of Mexico were externally performed by Alpine Geophysics, LLC (Alpine), who operated under contract to the local industry coalition.

The WRF meteorological model was supplied with several terrestrial and meteorological databases available from NCAR. Standard meteorological analyses were used to define initial/boundary conditions and to provide for analysis nudging as part of WRF's Four Dimensional Data Assimilation (FDDA) package. Meteorological modeling was conducted on the 36/12/4 km nested grid system for the duration of the modeling period. Details of the WRF configuration and application are provided in a separate report prepared by Alpine (2012).

ENVIRON performed a focused evaluation of WRF's accuracy in replicating episodic weather conditions in the State of Louisiana.

Base year (2010) and projected future year (2017) model-ready emissions of ozone precursors were developed for all three modeling domains spanning the entire modeling period. The EPS3 and CONCEPT/MOVES emissions processors/models were used to translate raw stationary, non-road, and on-road emission inventories for the State of Louisiana to temporally allocated, speciated, spatially allocated input files in formats compatible with CAMx. The latest data for Louisiana stationary source emissions (from LDEQ) and on-road mobile source activity, fleet activity, and fuel parameters (from LDOTD/CRPC) were accessed. Several datasets were used to generate CAMx-ready emissions outside of Louisiana: (1) anthropogenic inventories for the US, Canada, and Mexico developed by the EPA (processed by Alpine); (2) Gulf-wide oil and gas development and commercial shipping inventories developed by the BOEM; and (3) wildland, agricultural and prescribed fire emissions developed by NCAR. The MEGAN biogenic model was initially used to generate biogenic emissions on all three modeling grids using common North American vegetative distribution datasets. In response to model performance issues indicating over predictions of isoprene, we ultimately switched to biogenic emissions generated by the EPA's BEIS model (processed by Alpine Geophysics) for final base and all future year modeling. Future year projections of US emissions considered growth, emission controls already on the books, and various other factors influencing emission rates to the extent possible. Natural emissions were held constant between the base and future year scenarios.

Ancillary photochemical modeling inputs such as initial/boundary conditions, landuse, and photolysis rates were developed using appropriate contemporary data and techniques. Chemical boundary conditions were generated from archived 2010 global modeling products from NCAR, and used for both base and future year CAMx simulations.. The latest version of CAMx was run for the entire modeling period using the Carbon Bond 6 (CB6) photochemical mechanism and several new state-of-the-science algorithms. Modifications to the initial configuration were made according to the model performance evaluation process and sensitivity testing. Final base and all future year modeling employed the Carbon Bond 2005 (CB05) photochemical mechanism.

An extensive model performance evaluation of the base year modeling was conducted for ozone and precursor predictions, to the extent possible given available ambient observational data. Graphical and statistical performance was gauged using several techniques following EPA guidance. Diagnostic and sensitivity testing were conducted to understand model sensitivity and to obtain the best performance possible for the correct reasons.

Future year modeling was conducted for the year 2017, to establish projections one year prior to the attainment year. The EPA model attainment test procedures were utilized to determine if the future year predictions attain the 2008 8-hour ozone standard. Future emission sensitivity tests were modeled and processed through the attainment test methodology to evaluate ozone response.

2.0 EPISODE SELECTION

This section presents an evaluation of statewide ozone data between 2008 and 2010 from which to select a representative episode for photochemical modeling. Figure 2-1 shows the locations of the 26 observation sites in Louisiana, color-coded by region.

EPA (2007) has identified four primary episode selection criteria when choosing an episode for ozone SIP modeling:

- A variety of meteorological conditions should be covered, especially the types of meteorological conditions that produce 8-hour ozone exceedances in the area of interest;
- Choose episodes having days with monitored 8-hour daily maximum ozone concentrations close to the monitors' design values (DV);
- To the extent possible, the modeling database should include days for which extensive measurement data (i.e. beyond routine aerometric and emissions monitoring) are available; and
- Sufficient days should be available such that relative response factors (RRF) can be based on several (i.e., > 10) days, with at least 5 days being the absolute minimum.

Four secondary criteria should also be considered:

- Choose periods that have already been modeled;
- Choose periods that are drawn from the years upon which the current design values are based;
- Include weekend days among those chosen; and
- Choose modeling periods that meet as many episode selection criteria as possible in the maximum number of nonattainment areas as possible.

Ozone data were examined for three ozone seasons (April to October) between 2008 and 2010, from which new ozone attainment designations were established by EPA. If an entire ozone season were modeled, all of the criteria should be fulfilled as long as the season contained several 8-hour ozone exceedance events. The following conditions were considered to select the best period to model:

- The period from which the nonattainment designations are defined;
- A large number of exceedance days at all (or most) monitoring locations;
- A representative (non-extreme) spectrum of meteorological conditions that represent a range of transport patterns, high ozone periods, and clean out days;
- A representative (usual) pattern of anthropogenic activities not impacted by major planned or accidental events that effect population, traffic, or industrial/commercial activity.

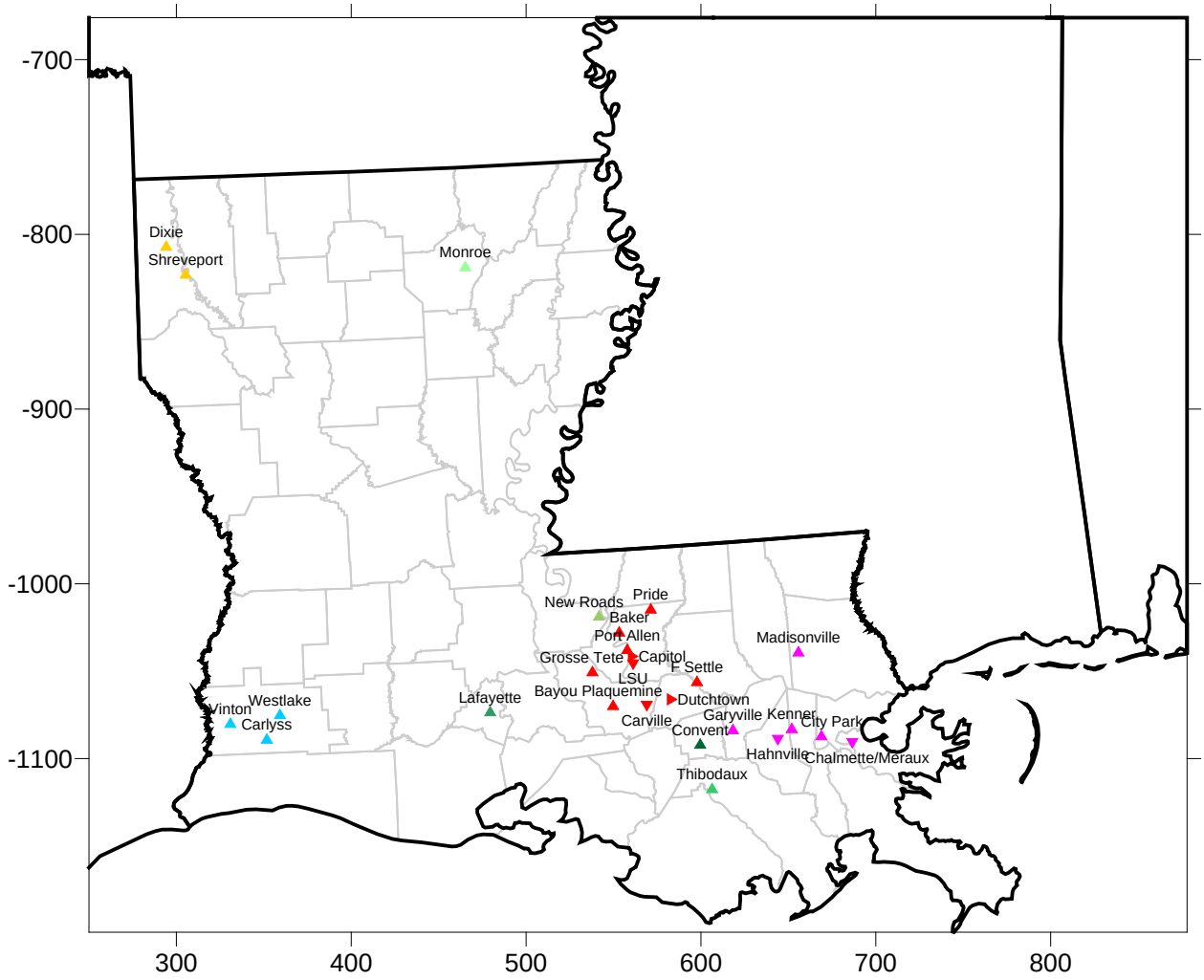


Figure 2-1. Location of ozone monitoring sites in Louisiana, color coded by region.

2.1 Decadal Trends Analysis

Figure 2-2 presents the 2000-2011 trends in annual 4th highest 8-hour ozone in the four regions of Louisiana with multiple monitoring sites (Baton Rouge, New Orleans, Shreveport, and Lake Charles). The figures present the trends for the peak site and for an average over all sites; a simple linear regression fit is also shown for both. In all four regions, the 4th highest ozone is trending downward at rates between -0.5 ppb/year (Shreveport) and -1.3 ppb/year (Baton Rouge). However, the most recent years show an uptick in peak ozone concentrations that reduce the gains seen between 2000 and 2008, especially in Shreveport.

Similar plots are shown in Figure 2-3, but for regions with just a single monitoring site. Four of five of these sites show similar and generally stronger downward trends, ranging from -0.8 ppb/year (Convent) to -1.7 ppb/year (Monroe). The site "New Roads" suggests a positive trend in peak ozone. Given that this site is just north of Baton Rouge (usually a downwind direction

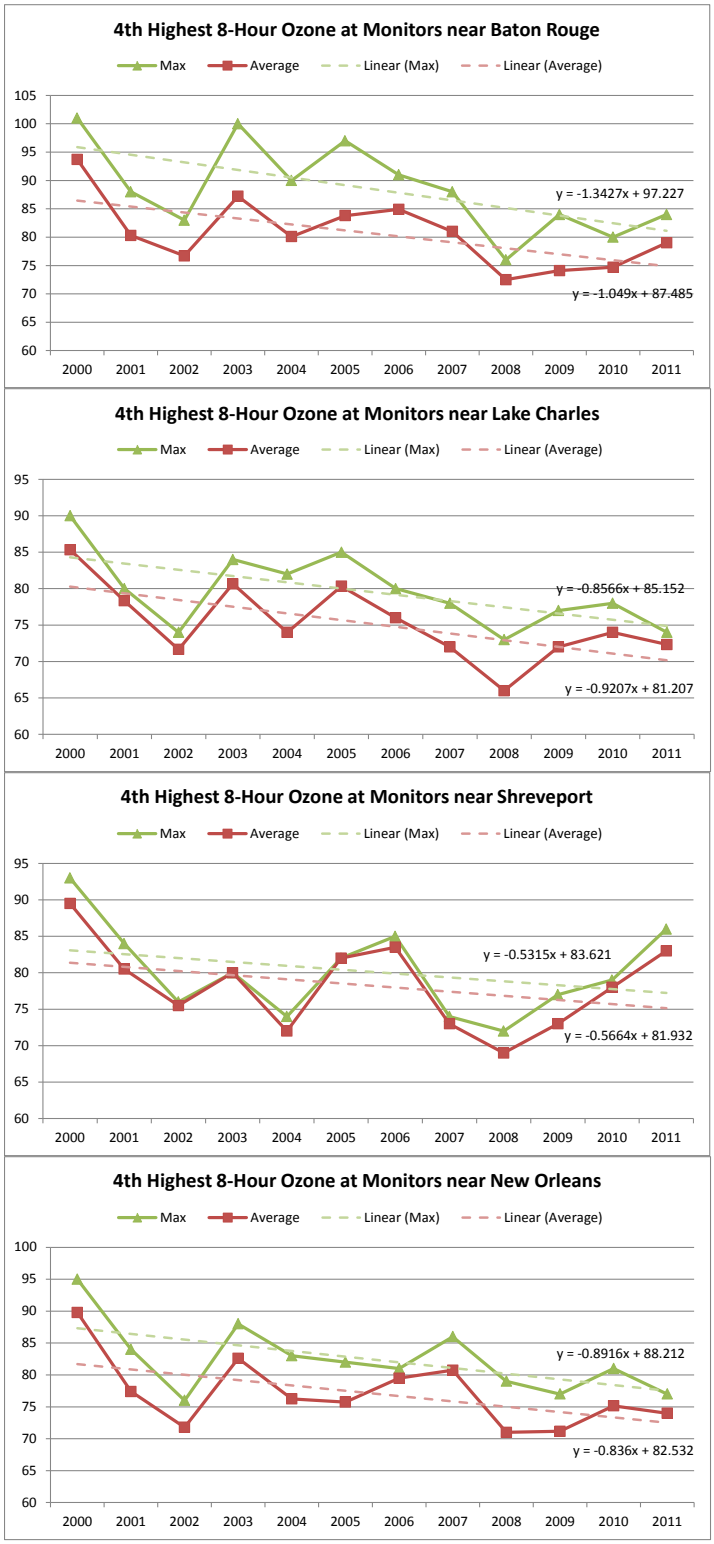


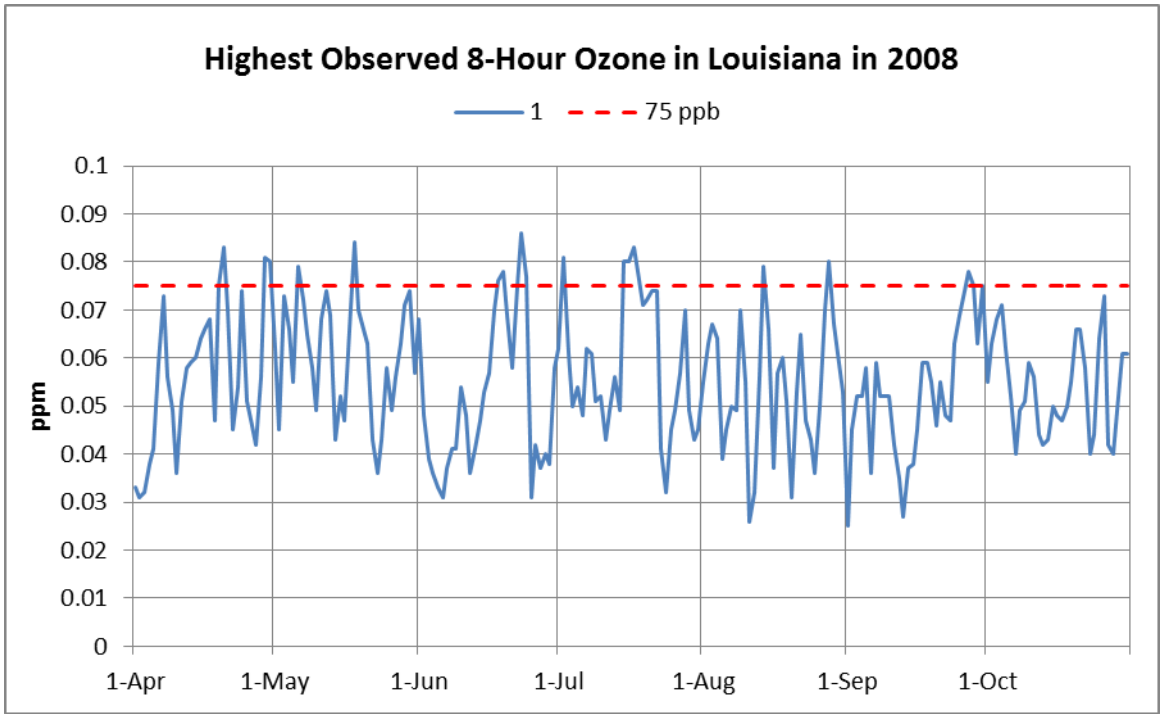
Figure 2-2. Decadal trends (2000-2011) in site-peak and site-average annual 4th highest 8-hour ozone concentration in Baton Rouge, Lake Charles, Shreveport, and New Orleans.

Figure 2-3. Decadal trends (2000-2011) in annual 4th highest 8-hour ozone concentration at five individual sites throughout Louisiana.

according to ozone episode climatology), it is possible that this site is measuring an increase in downwind ozone production from precursors originating in Baton Rouge. Larger reductions of industrial VOC emissions relative to urban NOx emissions would serve to slow urban ozone production, reduce peak ozone concentrations near Baton Rouge, and raise peak concentrations downwind.

2.2 2008 Ozone Season

In 2008 there were 24 active ozone monitors across Louisiana. Two time series are shown in Figure 2-4. The top displays the highest daily observed 8-hour ozone at any monitor in Louisiana for each date from April to October 2008. The dashed red line at 75 ppb denotes the current 8-hour ozone standard. The bottom plot shows the number of monitoring sites measuring at least 75, 70, 65, and 60 ppb on each date. Figure 2-5 shows similar time series for just the monitors in Baton Rouge. Table 2-1 summarizes the number of days and site-days when 8-hour ozone was above the same four thresholds throughout Louisiana and specifically



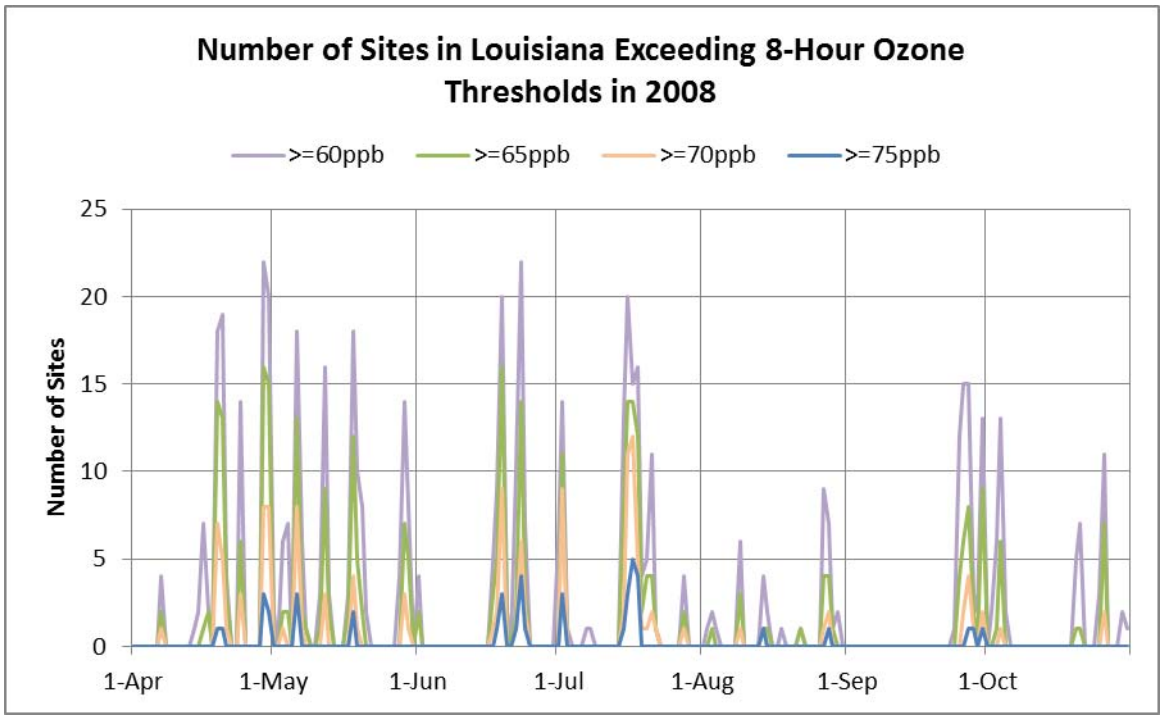
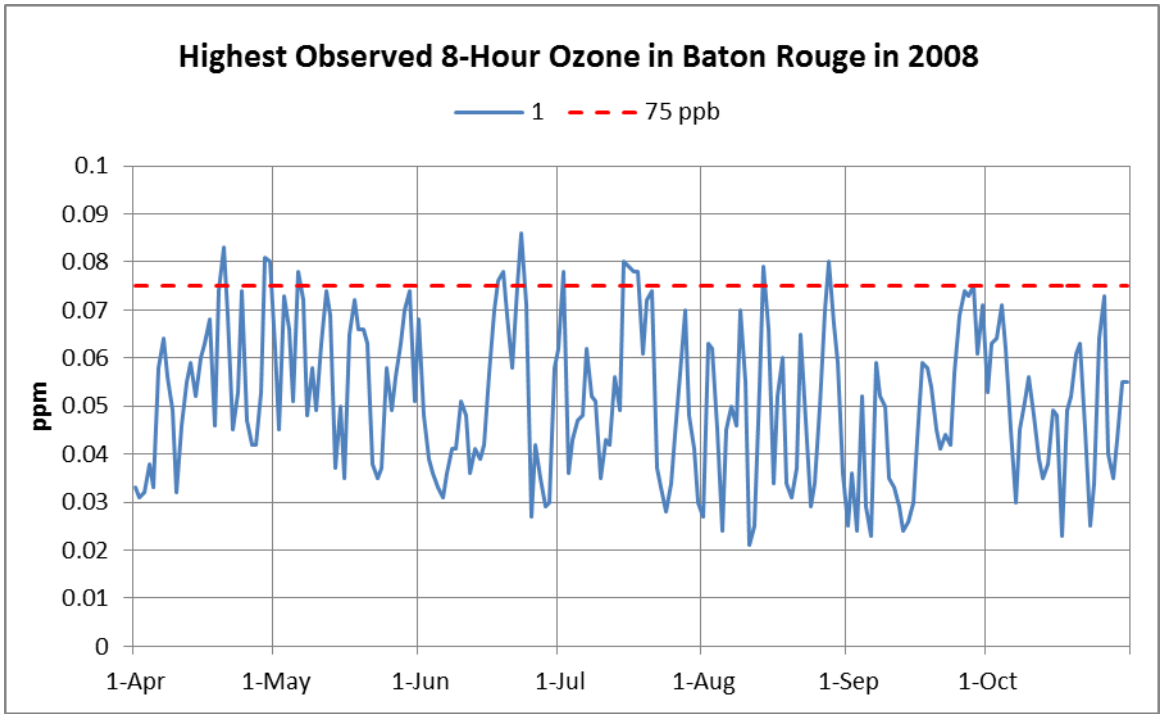


Figure 2-4. Time series of the highest observed 8-hour ozone (top) and number of ozone sites above selected thresholds (bottom) in Louisiana in 2008.



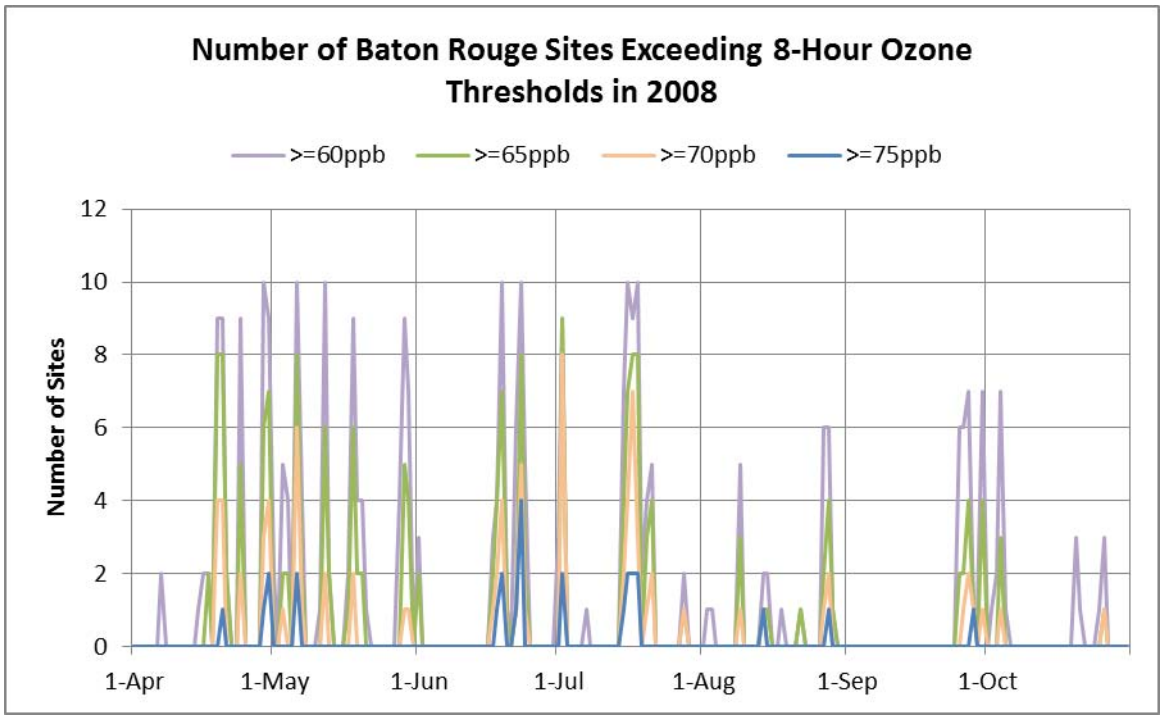


Figure 2-5. Time series of the highest observed 8-hour ozone (top) and number of ozone sites above selected thresholds (bottom) in Baton Rouge in 2008.

Table 2-1. 2008 ozone observation statistics.

	All Louisiana monitors		Baton Rouge monitors	
Ozone threshold (ppb)	Number of days	Number of site-days	Number of days	Number of site-days
≥ 75 ppb	21	43	16	26
≥ 70 ppb	41	138	36	85
≥ 65 ppb	59	316	49	181
≥ 60 ppb	79	583	69	310

in Baton Rouge; the number of site-days represents the total number of exceedances from all sites and all dates.

Ozone exceeded 75 ppb on 43 occasions during 21 dates across Louisiana. Most were 1 or 2 day episodes with peaks only slightly above the 75 ppb standard. There were never more than 5 sites exceeding 75 ppb ozone on the same date in 2008. Six of the 24 monitors never exceeded 75 ppb on any date in 2008. Baton Rouge accounted for more than half (26 out of 43) of all exceedances in the state, where 9 of the 10 monitors exceeded 75 ppb on at least one date in 2008. Ozone was greater than or equal to 75 ppb from at least one site in Baton Rouge on 16 days in 2008.

Table 2-2 lists the number of days and number of exceedances greater than or equal to 75 ppb in four areas of Louisiana (Baton Rouge, New Orleans, Lake Charles, and Shreveport), based on the monitor groupings shown in Figure 2-1. In New Orleans, Lake Charles, and Shreveport, each region had no more than 2 days and no more than 3 site-days of 8-hour ozone exceeding 75 ppb. These would not qualify as a sufficient number of exceedance days for ozone SIP modeling.

Table 2-2. Total number of 75 ppb exceedances in 2008 by region.

Region	Number of days	Number of site-days
Baton Rouge	16	26
New Orleans	1	1
Shreveport	2	3
Lake Charles	2	2

Ozone patterns in 2008 were characterized by occasional, localized, low to moderate exceedance episodes during the spring and summer. It was an active year for tropical weather in Louisiana. The state was impacted by Hurricane Gustav on September 1 and by Hurricane Ike from September 10-13, both of which most likely disrupted typical activities across the state. In addition, Tropical Storm Edouard and Tropical Depression Fay were in the vicinity on August 5 and August 24-25, respectively, helping mix out the air pollutants on those dates. No atypical anthropogenic activity patterns were apparent in 2008. The low number of exceedance days, low number of exceeding sites, low peak concentrations, and the active tropical season made this year atypically clean, and thus it is not an ideal year for ozone SIP modeling.

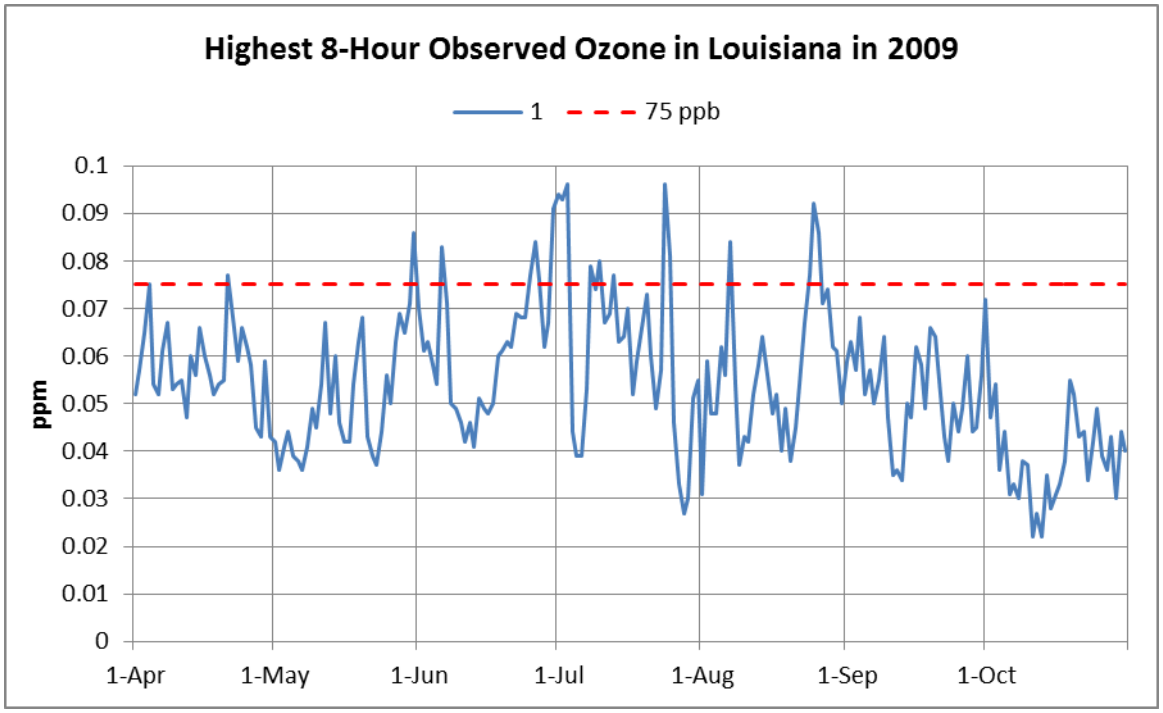
2.3 2009 Ozone Season

Figures 2-6 and 2-7 are parallel to Figures 2-4 and 2-5, showing time series of the highest observed 8-hour ozone at any monitor, and the frequency of sites exceeding various thresholds on each date in 2009 throughout Louisiana and in Baton Rouge, respectively. Data were available for 25 ozone monitors in 2009, but the statistics for the number of days and site-days exceeding thresholds in Tables 2-3 and 2-4 only consider the exceedances from the 24 monitors common to all three years.

Most ozone exceedances took place between June and August, with some of the highest 8-hour ozone levels in the 3-year period. Peaks reached 94, 96, and 96 ppb in Baton Rouge, Shreveport, and Lake Charles, respectively. But while the number of days when at least one monitor in Louisiana exceeded the 75, 70, 65, or 60 ppb thresholds was the lowest among the three ozone seasons, there were more ozone monitors that measured at least 75 ppb on at least one date in 2009 than in 2008 (21 sites vs. 18 sites); 2009 also had more site exceedances than in 2008 (68 site-days vs. 43 site-days). Baton Rouge showed similar trends, with the fewest number of days (14 days) at or over 75 ppb of all three years, but with more sites (10 out of 10) and more site-days (35) over 75 ppb than in 2008.

Table 2-4 separates the total number of observed 2009 exceedances into 4 regions of Louisiana. There were more exceedances in 2009 than in 2008 in all four regions. Shreveport, with only 2 ozone monitors, had 6 exceedance site-days; the other regions all had at least 10. All regions had at least 5 exceedance days in 2009.

Ozone patterns in 2009 were characterized by a few intense, widespread exceedance events during the summer. Tropical storm activity was relatively quiet near Louisiana. June was hot and dry as Baton Rouge recorded the third warmest June and fourth driest June on record. Conversely, October was very wet; Baton Rouge reported 21 rain days and the second wettest October on record, which was reflected by the fact that 8-hour ozone never exceeded 60 ppb at any monitor in Louisiana after October 1. The near-record heat in June could be considered an extreme meteorological condition, but ozone was only high at the beginning and end of the month, and was swept clean during the middle of the month. No atypical anthropogenic activity patterns were apparent in 2009, except that the year marked the low point in the US economic recession. However, the LDEQ believes that Louisiana was not impacted by the recession to the extent experienced in other regions of the US. The inactive tropical season and higher number of site exceedances in all four regions of Louisiana makes 2009 a better ozone season to model than 2008.



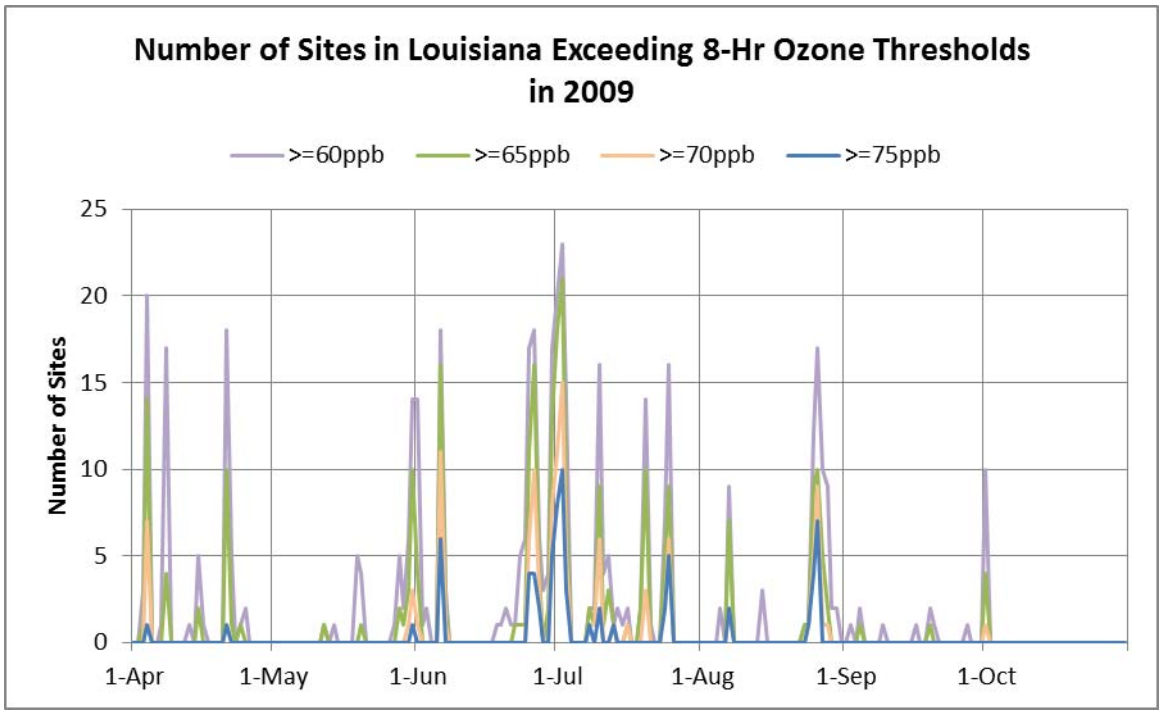
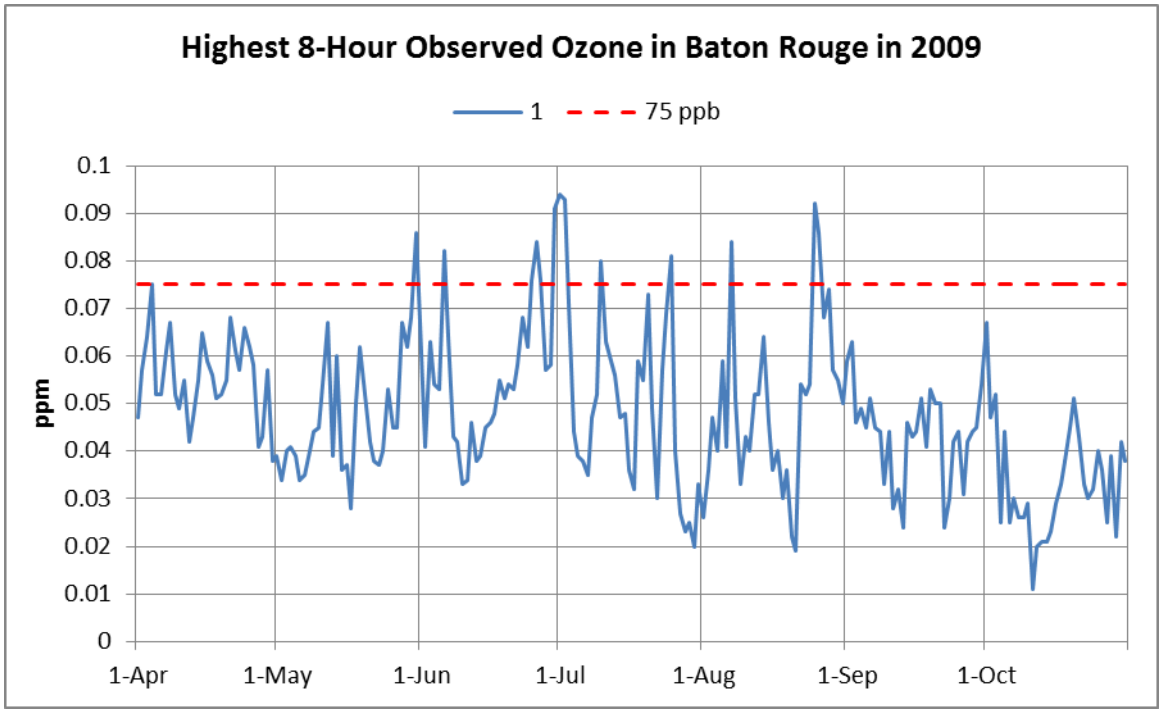


Figure 2-6. Time series of the highest observed 8-hour ozone (top) and number of ozone sites above selected thresholds (bottom) in Louisiana in 2009.



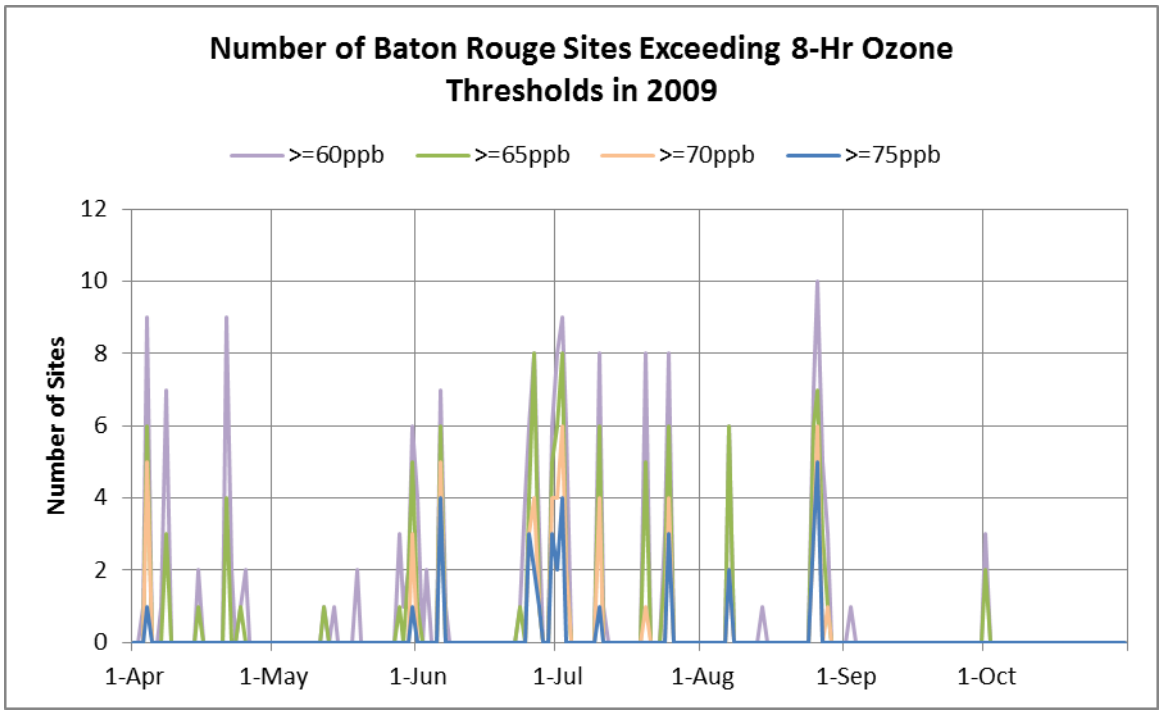


Figure 2-7. Time series of the highest observed 8-hour ozone (top) and number of ozone sites above selected thresholds (bottom) in Baton Rouge in 2009.

Table 2-3. 2009 ozone observation statistics.

	All Louisiana monitors		Baton Rouge monitors	
Ozone threshold (ppb)	Number of days	Number of site-days	Number of days	Number of site-days
≥ 75 ppb	20	68	14	35
≥ 70 ppb	27	119	17	58
≥ 65 ppb	46	241	29	110
≥ 60 ppb	71	428	42	179

Table 2-4. Total number of 75 ppb exceedances in 2009 by region.

Region	Number of days	Number of site-days
Baton Rouge	14	35
New Orleans	5 (5)[1]	10 (12)[1]
Shreveport	5	6
Lake Charles	8	11

[1]when including 1 additional site not available in 2008

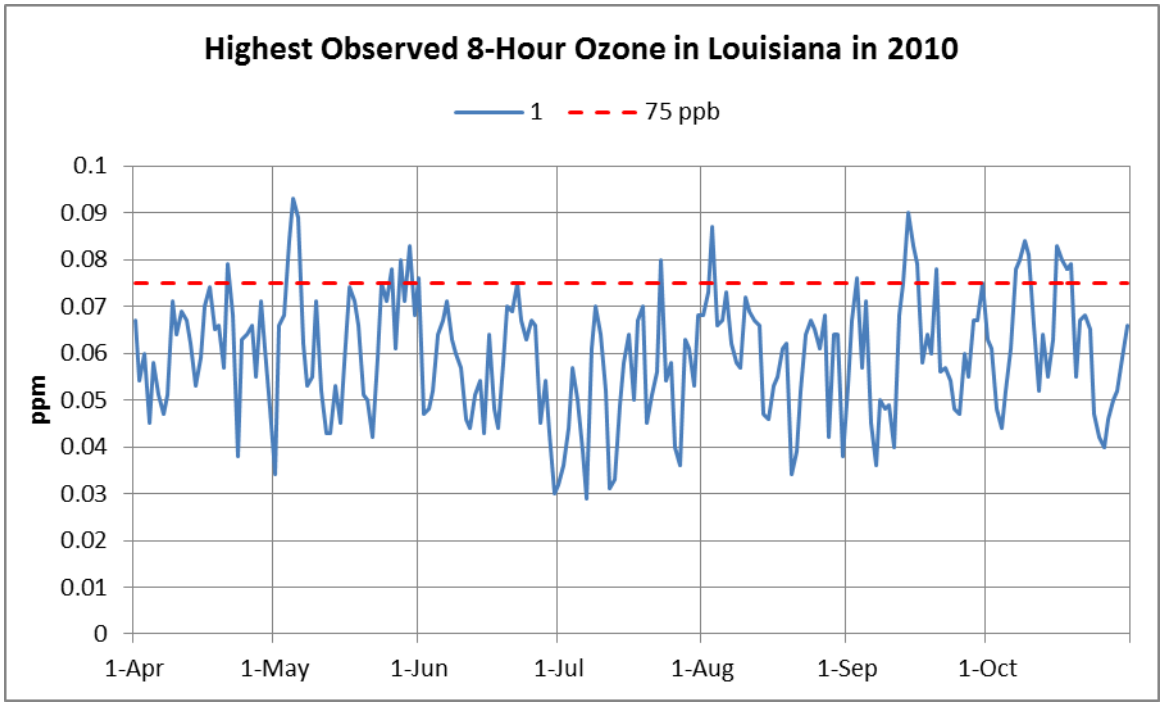
2.4 2010 Ozone Season

Figures 2-8 and 2-9 show similar sets of time series based on 2010 ozone data from the Louisiana and Baton Rouge monitors, respectively. Table 2-5 summarizes the number of days and site-days in 2010 that exceed the four thresholds in Louisiana and Baton Rouge. Table 2-6 breaks down the statistics at the 75 ppb cutoff for four regions in Louisiana.

The 2010 ozone season had the most number of days (27) during which at least one monitor recorded an exceedance, the most number of exceeding sites (22 out of the 24 sites common to all 3 years), and the most number of site-day exceedances (88 – twice as many as in 2008). This was true both statewide and in the Baton Rouge non-attainment area. Lake Charles was the only area that did not experience more exceedances than 2009.

Ozone patterns in 2010 were characterized by a variety of low to intense, localized and widespread exceedance events during the spring and late summer/fall. Tropical storms were minimal in 2010 except for tropical depression 5, which produced copious amounts of precipitation in Louisiana, resulting in the third wettest August on record in Baton Rouge. This was followed by a very dry September.

Overall, the higher number and variety of exceedance events would make the April to October, 2010 episode the ideal modeling period. However, the BP Deepwater Horizon oil production platform exploded on April 20, 2010, resulting in a massive oil spill in the outer Louisiana coastal waters. Cleanup efforts lasted for months as oil threatened to wash up onto the beaches, and fishing in the Gulf was suspended. This obviously represents an atypical activity and emissions pattern for the Gulf coast region. The EPA installed additional air quality sensors on the Louisiana coast to monitor for emissions from the spill, but no significant impacts to air quality were detected. According to the LDEQ, the oil spill also did not impact Louisiana's



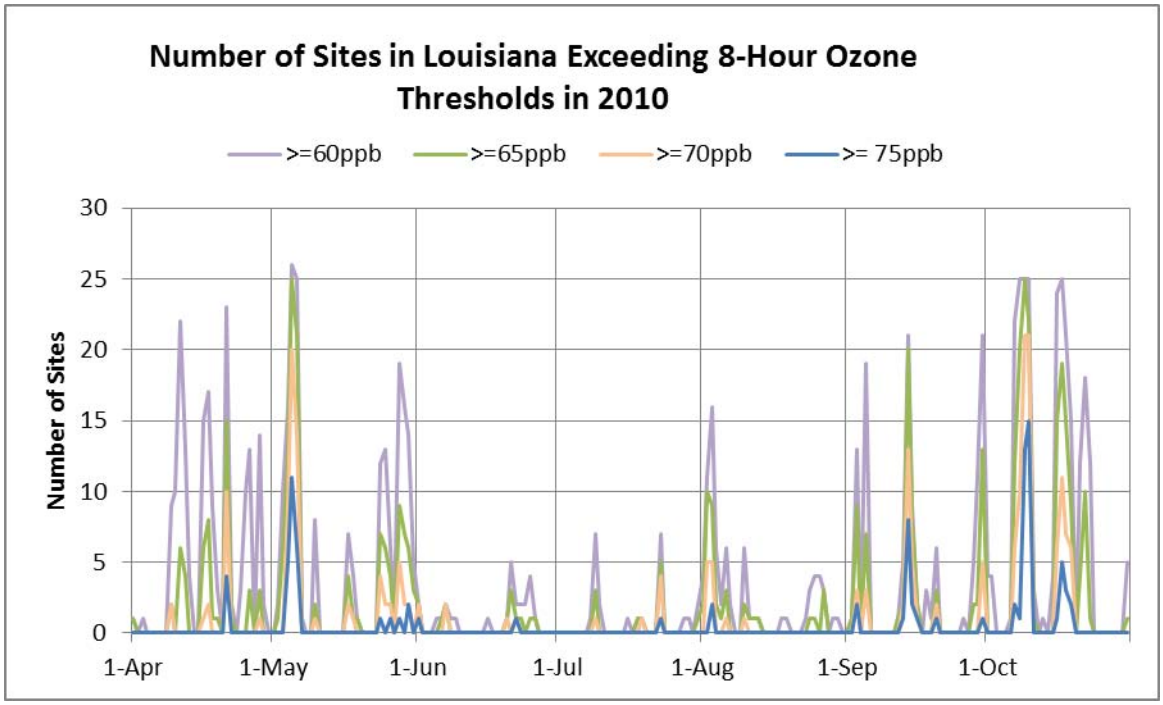
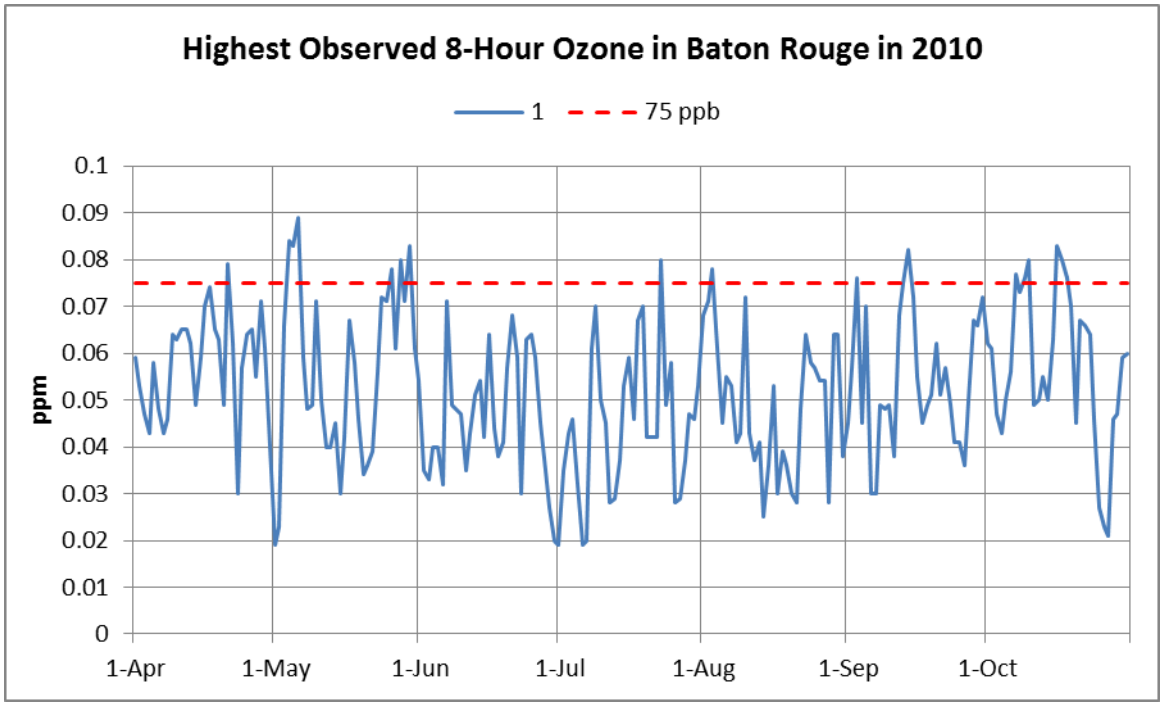


Figure 2-8. Time series of the highest observed 8-hour ozone (top) and number of ozone sites above selected thresholds (bottom) in Louisiana in 2010.



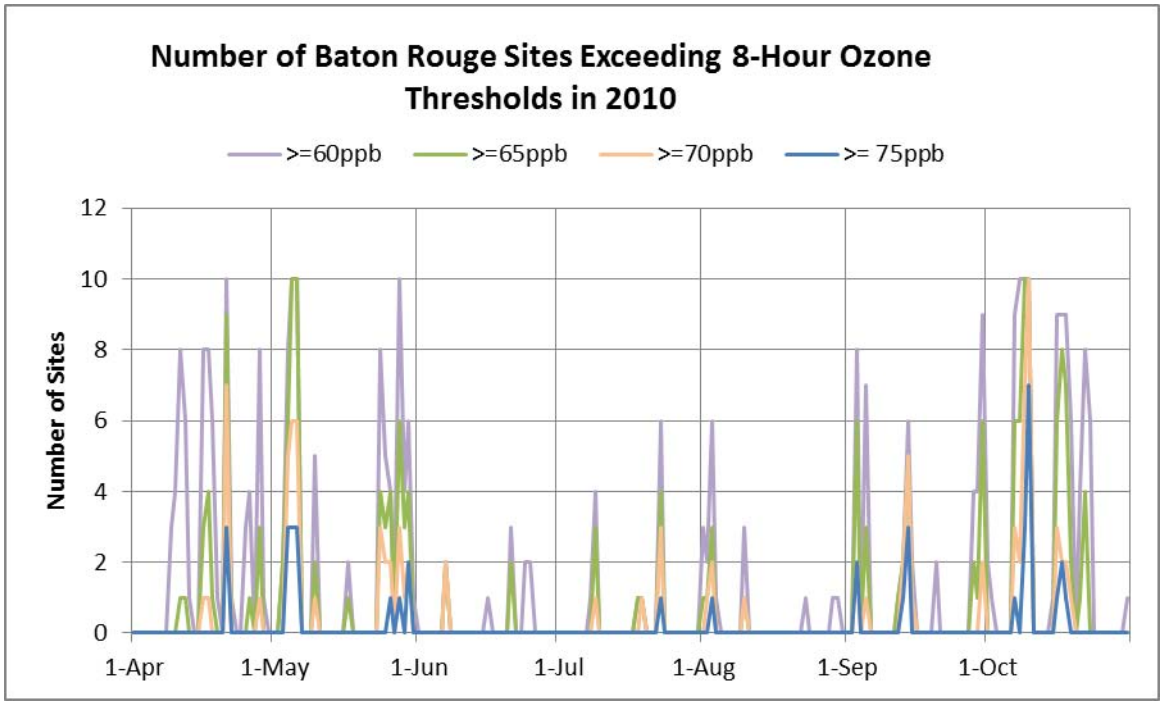


Figure 2-9. Time series of the highest observed 8-hour ozone (top) and number of ozone sites above selected thresholds (bottom) in Baton Rouge in 2010.

Table 2-5. 2010 ozone observation statistics.

	All Louisiana monitors		Baton Rouge monitors	
Ozone threshold (ppb)	Number of days	Number of site-days	Number of days	Number of site-days
≥ 75 ppb	27	88	18	39
≥ 70 ppb	44	217	35	95
≥ 65 ppb	77	427	49	184
≥ 60 ppb	107	791	72	329

Table 2-6. Total number of 75 ppb exceedances in 2010 by region.

Region	Number of days	Number of site-days
Baton Rouge	18	39
New Orleans	8 (8)[1]	15 (21)[1]
Shreveport	11	14
Lake Charles	5	9

[1]when including 1 additional site not available in 2008

economy as much as it hurt other Gulf States because the idled fishermen were hired to help clean up the oil spill and because Louisiana's beaches are not typically a tourist destination.

Nevertheless, especially during the first few months of the oil spill, emissions patterns in the Gulf were significantly altered from normal oil and gas production activities, commercial marine shipping, and fishing operations, not to mention fire-related and evaporative emissions from the ocean surface. As a precaution, we have elected to disregard the spring of 2010 to avoid potential impacts from the oil spill. Ozone monitoring statistics for the August-October, 2010 period are summarized in Tables 2-7 and 2-8. Modeling late 2010 would include the widespread ozone event on October 10, when 15 of the 26 ozone monitors across the state exceeded 75 ppb. However, this would reduce the number of 75 ppb exceedances in all regions; Lake Charles would only have 4 days and 6 exceedances over 75 ppb if the modeling period was confined to August through October. Except for Baton Rouge, the total number of exceedance site-days in late 2010 is consistent with the total in 2009 in other regions of the State, and certainly higher than in 2008.

Table 2-7. August-October 2010 ozone observation statistics.

	All Louisiana monitors		Baton Rouge monitors	
Ozone threshold (ppb)	Number of days	Number of site-days	Number of days	Number of site-days
≥ 75 ppb	16	57	10	22
≥ 70 ppb	20	129	17	47
≥ 65 ppb	38	247	23	93
≥ 60 ppb	53	412	33	158

Table 2-8. Total number of 75 ppb exceedances in August-October 2010 by region.

Region	Number of days	Number of site-days
Baton Rouge	10	22
New Orleans	6	12 (15)[1]
Shreveport	8	11
Lake Charles	4	6

[1]when including 1 additional site not available in 2008

2.5 Final Consideration and Selection

Table 2-9 summarizes the number of 75 ppb exceedances for each potential modeling period, broken down for the entire State and for each region. We ruled out 2008 because of the low number of exceedances, particularly in New Orleans, Shreveport, and Lake Charles, and the unusually active tropical season. We believe 2009 would have been adequate, but it had the fewest number of exceedance days in Baton Rouge and across the state. Sites like Westlake and Monroe only exceeded 60 ppb on 5 days during the entire season. If 60 ppb is the lowest observed 8-hour ozone in which dates can be used for design value scaling, then these sites would barely apply the minimum allowed.

Table 2-9. Summary of the number of 75 ppb exceedances during four potential modeling periods, by region (extracted from Tables 1 through 8).

Region	2008	2009	2010	2010 (Aug-Oct)
Louisiana	43	68	88	57
Baton Rouge	26	35	39	22
New Orleans	1	10	15	12
Shreveport	3	6	14	11
Lake Charles	2	11	9	6

Table 2-10 displays the total number of days in which each site in Baton Rouge exceeded 60, 65, 70, and 75 ppb for five potential modeling periods (adding a combination of June-August 2009 and August-October 2010). These data are useful to compare how many days above each concentration threshold are available in each period for the design value scaling approach as outlined in the EPA's current ozone modeling guidance.

The full 2010 ozone season had the most number of exceedance days, sites, and site-days in most regions, and was the ideal period to model, but complications from the Gulf oil spill could be an issue especially in the first few months following the oil rig explosion. If only the last three months of the 2010 ozone season were modeled, some sites like Pride and French Settlement, where the 4th highest 8-hour daily maximum ozone in 2010 was in exceedance (76 ppb), would also be close to the minimum number of days available for design value scaling (French Settlement had only 8 days above 60 ppb in the August to October, 2010 period).

Ultimately we selected September-October 2010 as the primary modeling period for the ozone modeling attainment demonstration. Only two Louisiana exceedances occurred in August

during the first few days of the month, and the remainder of August was characterized by low state-wide peak 8-hour ozone ranging between 30-60 ppb. This decision also included a special consideration for Shreveport, which had the highest number of exceedance days during the fall of 2010.

Table 2-10. Summary of number of days during five potential modeling periods when daily 8-hour ozone exceeded 60, 65, 70, and 75 ppb at each monitoring site in the Baton Rouge nonattainment area.

Site	Threshold	2008	2009	2010	Aug - Oct, 2010	Jun -Aug, 2009 + Aug-Oct, 2010
Baton Rouge/Capitol	75 ppb	0	4	5	2	6
	70 ppb	1	7	10	4	11
	65 ppb	8	10	19	9	19
	60 ppb	22	15	34	16	29
Baker	75 ppb	2	2	5	2	4
	70 ppb	6	5	7	3	7
	65 ppb	13	7	16	9	15
	60 ppb	26	14	30	14	24
Bayou Plaquemine	75 ppb	7	2	3	2	4
	70 ppb	15	4	10	6	9
	65 ppb	27	11	23	12	19
	60 ppb	42	16	42	22	30
Baton Rouge/LSU	75 ppb	1	11	7	3	14
	70 ppb	9	13	14	4	16
	65 ppb	20	15	26	11	25
	60 ppb	33	25	42	21	42
Carville	75 ppb	3	4	2	1	5
	70 ppb	11	5	10	7	12
	65 ppb	25	14	24	12	22
	60 ppb	30	28	38	19	37
Dutchtown	75 ppb	2	3	6	6	9
	70 ppb	11	4	13	9	13
	65 ppb	19	10	19	13	23
	60 ppb	31	19	34	17	31
French Settlement	75 ppb	4	4	4	2	5
	70 ppb	12	6	6	3	8
	65 ppb	24	14	12	4	13
	60 ppb	43	20	22	8	22
Grosse Tete	75 ppb	3	1	3	2	3
	70 ppb	4	4	14	6	10
	65 ppb	8	9	23	12	20
	60 ppb	26	14	41	17	29
Port Allen	75 ppb	1	1	1	1	2
	70 ppb	5	4	5	3	7
	65 ppb	14	7	14	8	15
	60 ppb	21	12	24	14	25
Pride	75 ppb	3	3	3	1	4
	70 ppb	11	6	6	2	7
	65 ppb	23	13	8	3	11
	60 ppb	36	16	22	10	20

3.0 METEOROLOGICAL MODELING EVALUATION

The WRF model, version 3.3.1, was run by Alpine Geophysics from August through October 2010 to cover the LDEQ 36, 12, and 4 km photochemical modeling domains. WRF output was used to prepare meteorological inputs for the CAMx photochemical model. Since CAMx model performance depends on the accuracy of meteorology, predicted wind, temperature, and precipitation patterns on the 4 km grid were evaluated against available measurement data across Louisiana. Emphasis was placed on the 16 dates when 8-hour ozone exceeded 75 ppb from at least one ozone monitor in the State – August 3; September 3, 13-16, 20, and 30; and October 7-10 and 16-19. This section details the WRF model performance over the State of Louisiana and serves as a supplementary evaluation report to the original documentation developed by Alpine (2012).

Meteorological data sites were grouped into two regions – northern Louisiana, which includes Shreveport, and southern Louisiana, which includes Baton Rouge, New Orleans, and Lake Charles. This breakout allows us to separately analyze WRF performance for a coastal-influenced zone, and an inland zone. Figure 3-1 shows the locations of all monitoring stations used in this analysis.

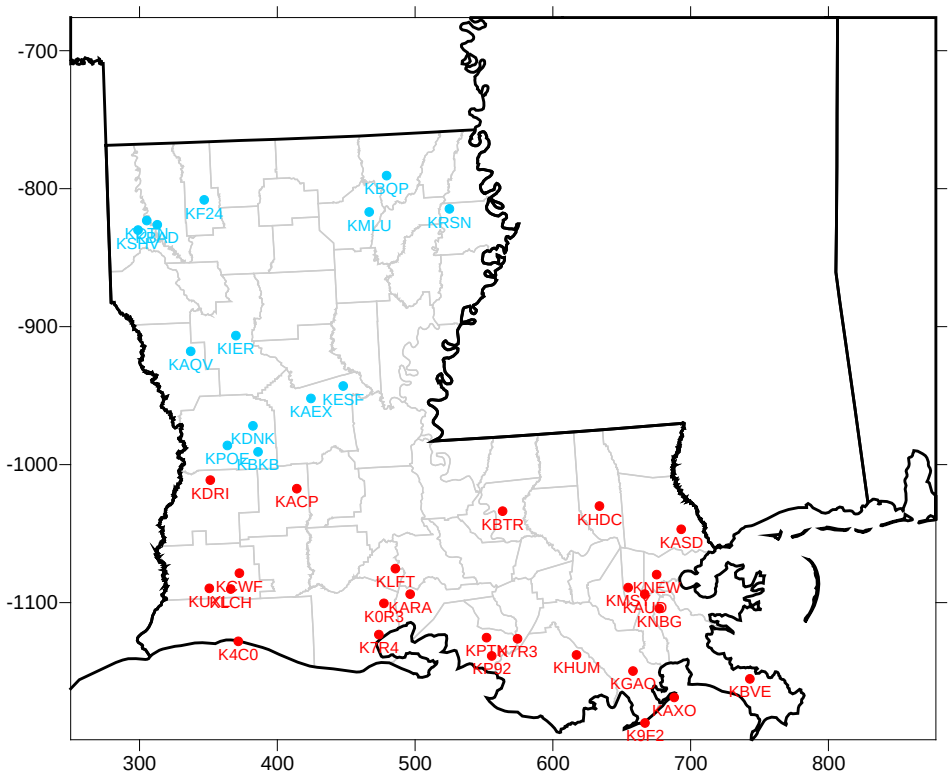


Figure 3-1. Meteorology stations in Louisiana with the north and south sites colored in blue and red, respectively.

3.1 Wind speed

Figure 3-2 compares hourly time series of predicted and observed wind speed from August to October, 2010 averaged over all sites in northern Louisiana. Blue lines represent the WRF-predicted wind speeds; black lines show the observed. Vertical lines representing midnight CST for each date are plotted to differential the days. Figure 3-3 shows the hourly time series of wind speed bias in northern Louisiana.

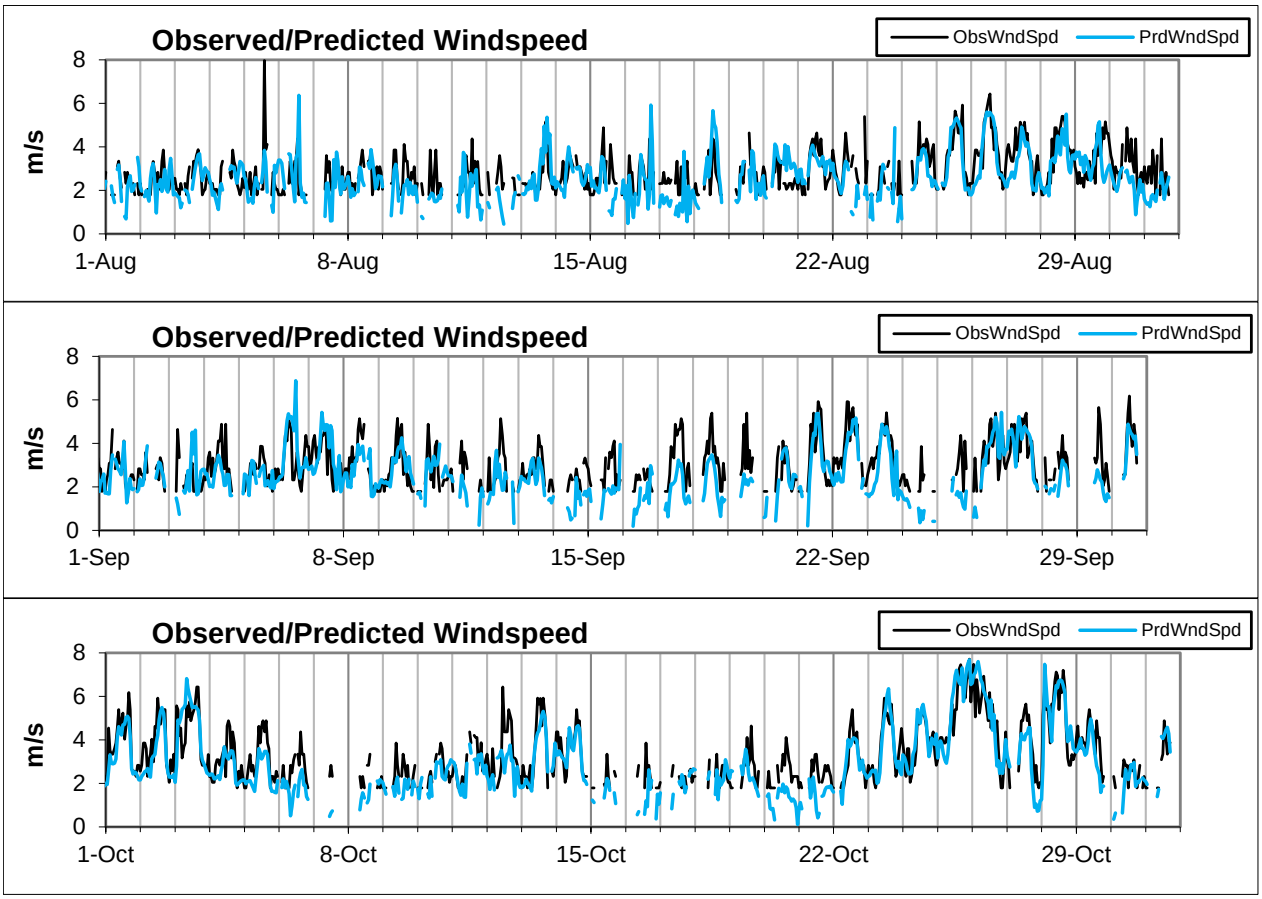


Figure 3-2. Hourly predicted (blue) and observed (black) wind speed averaged over all sites in northern Louisiana for August (top), September (middle) and October (bottom).

WRF tended to under predict winds in northern Louisiana, especially from mid-September to mid-October, when the bulk of the high ozone dates occurred. The under predicted wind speeds could result in more stagnation and higher ozone concentrations in CAMx.

Similar sets of time series are shown in Figures 3-4 and 3-5, respectively, for southern Louisiana. WRF is shown in red; the observed is in black. The bias was within ±2 m/s for most hours, but

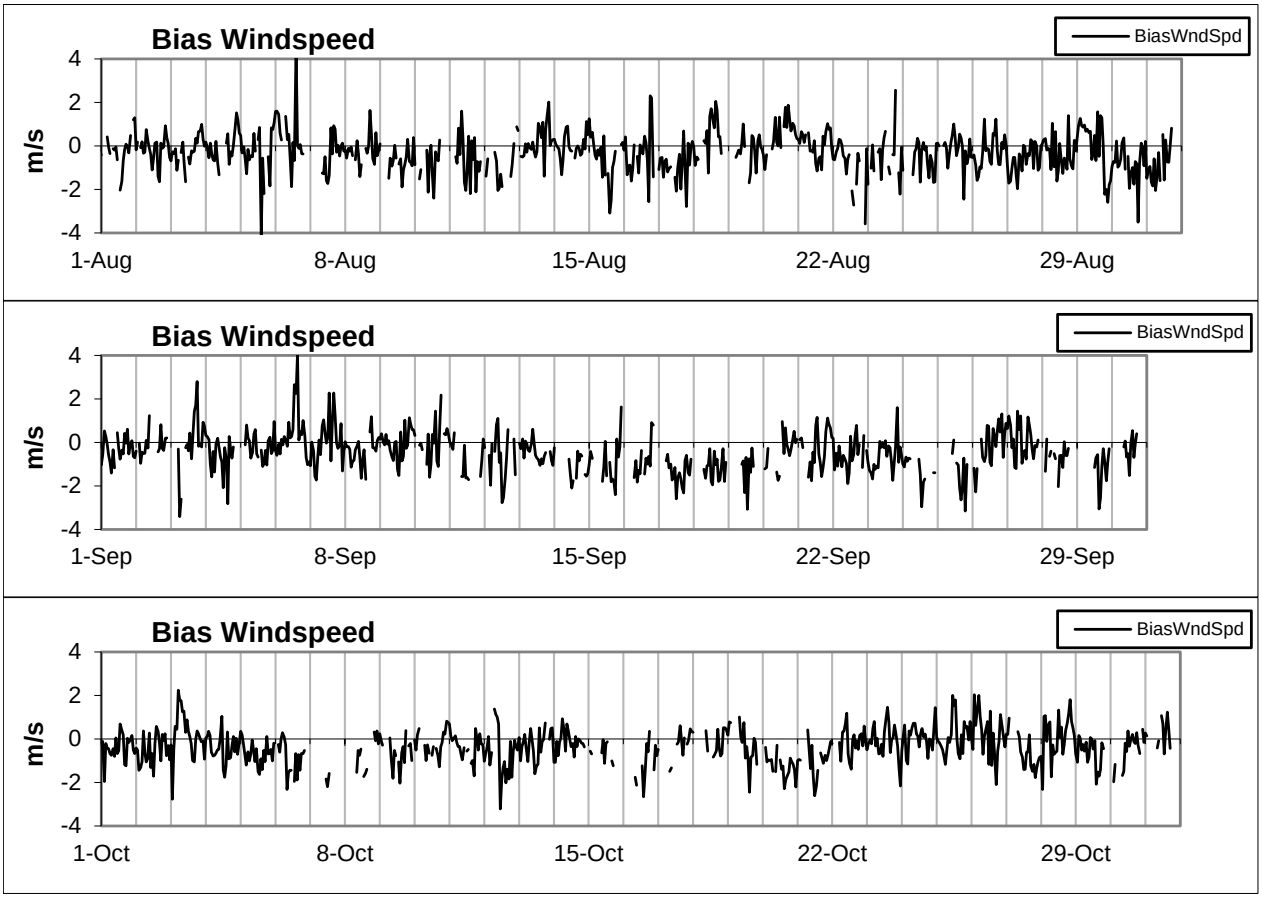


Figure 3-3. Hourly wind speed bias over all sites in northern Louisiana for August (top), September (middle) and October (bottom).

there tended to be an under prediction of wind speeds during most hours on the episode dates in October. Agreement tended to be slightly better than in northern Louisiana.

Figure 3-6 contains four scatter plots comparing hourly predicted and observed wind speeds, but the pairings were limited to the dates when 8-hour ozone exceeded 75 ppb anywhere in the state. Northern Louisiana pairings are shown on the top and southern Louisiana are shown on the bottom. Hours with episode dates in September are shown on the left, hours with episodes dates in October are shown on the right. August was excluded because it is only used for model spin-up. Red circles represent daytime hours (8 AM – 6 PM CST) and blue represents nighttime hours (7 PM to 7 AM). Ideally, all of the pairings should line up on the solid black diagonal line, but any pairings between the two black dashed lines, which represent wind speeds within ±2 m/s of the observed, are considered to perform well. Statistics are also included to show the regression line and the fraction of hours when the bias is between ±0.5, 1, and 2 m/s.

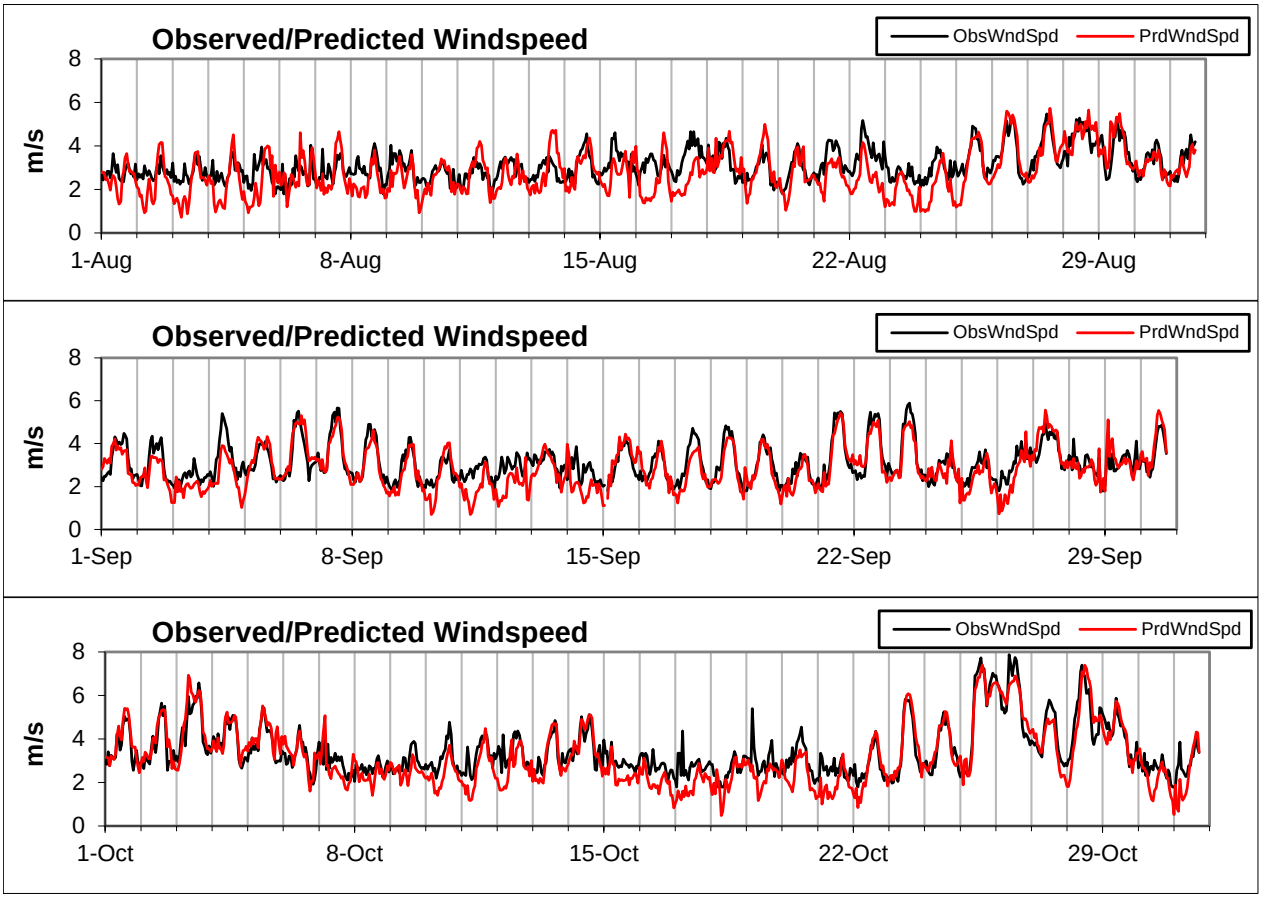


Figure 3-4. Time series of hourly predicted (red) and observed (black) wind speeds averaged over all sites in southern Louisiana for August (top), September (middle) and October (bottom).

WRF predicted wind speeds within 2 m/s of the observed during most hours of the episode dates in both northern and southern Louisiana. The hours that exceeded the ±2 m/s bias were all under predicted. WRF performed the best in September in southern Louisiana, when 99% and 89% of the episode hours were within 2 and 1 m/s of the observed, respectively. In October, the daytime wind speeds, which were generally faster than at night, were mostly under predicted throughout Louisiana.

Figure 3-7 shows "soccer goal" plots displaying daily wind speed performance statistics. The plots are ordered similarly to Figure 3-6. Statistics for all dates of the month are plotted, but the high ozone dates are highlighted in red. The "goals" (outlined in blue) represent benchmarks for exceptionally good performance; daily wind speed bias no greater than ±0.5 m/s and wind speed root mean squared error (RMSE) no greater than 2 m/s.

In northern Louisiana, all dates in both September and October met the daily RMSE performance benchmark while the daily bias benchmark was met on about 60% of all dates

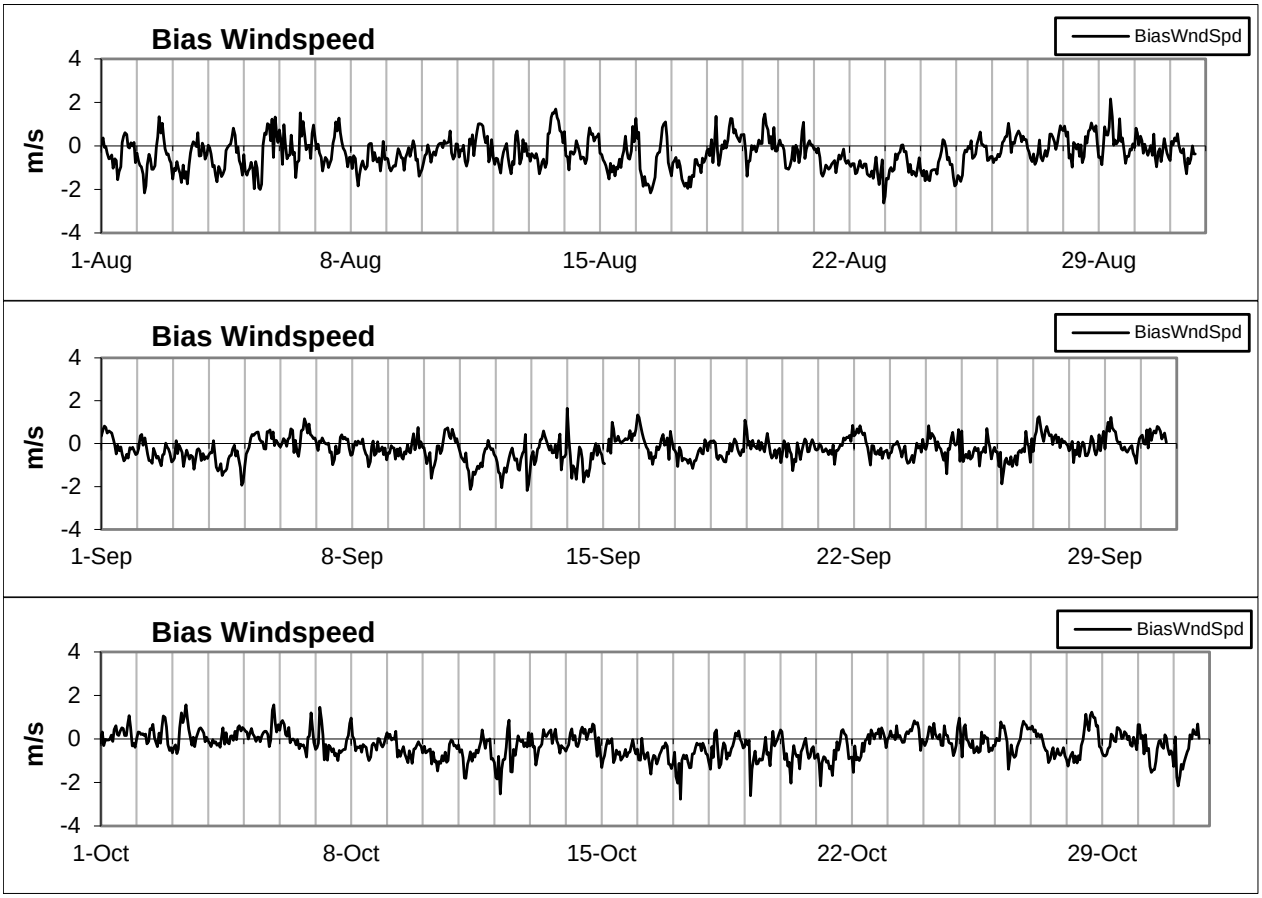


Figure 3-5. Time series of hourly wind speed bias over all sites in southern Louisiana for August (top), September (middle) and October (bottom).

during the 2 month period. Among the episode dates, all had a negative wind speed bias with 7 of the 15 dates in the 2 month period inside the soccer goal line. However, most dates were within -1 m/s bias, which is also quite good.

In southern Louisiana, the daily wind speed bias statistics were better, especially in September when over 70% of all dates and episode dates met the performance goals. In October, the high ozone dates all had negative biases, with half of these within the bias benchmark and all within -1 m/s bias.

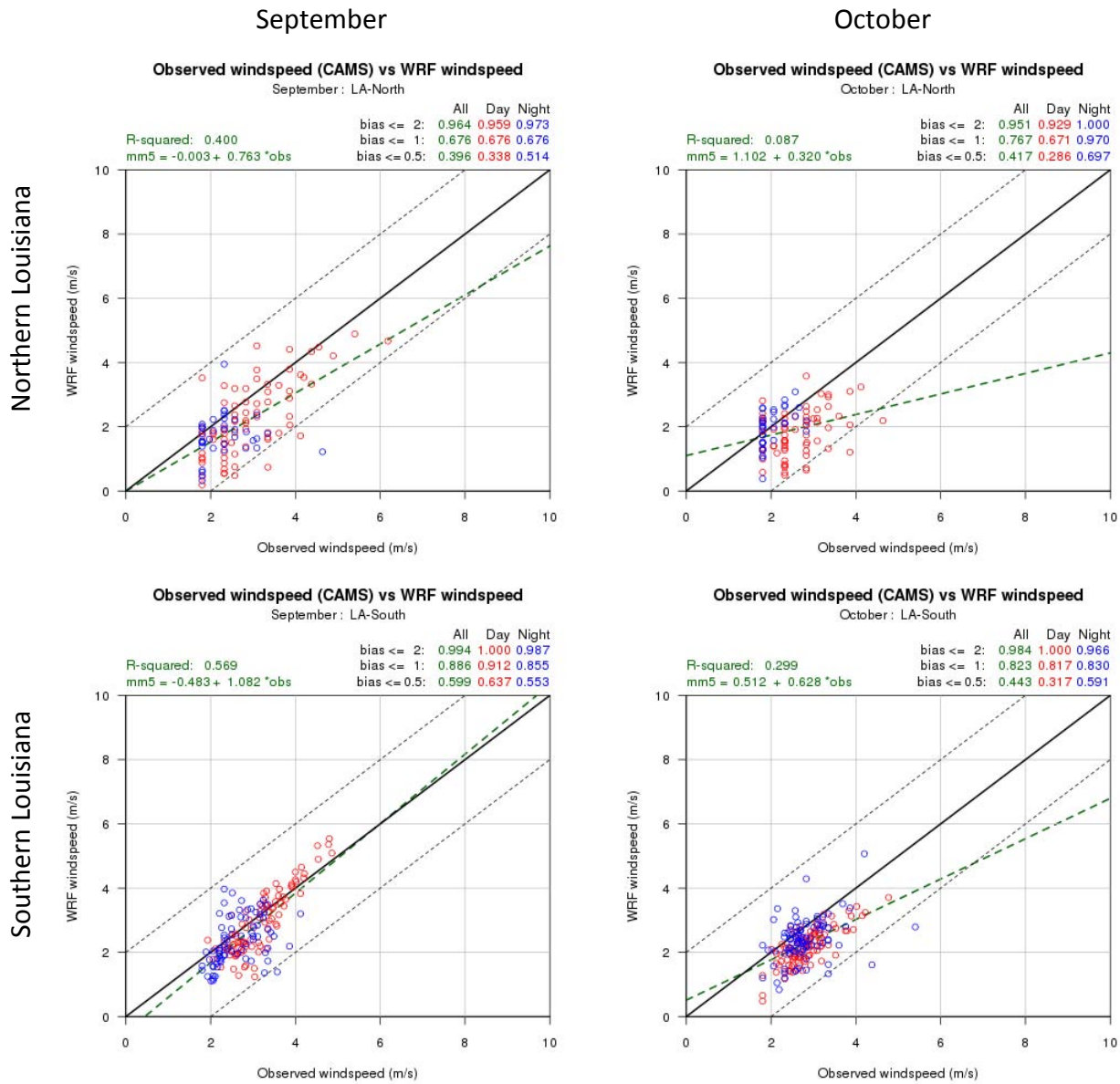


Figure 3-6. Scatter plots of hourly predicted and observed wind speeds on high ozone dates during September (left) and October (right) for northern Louisiana (top) and southern Louisiana (bottom). Red circles represent daytime hours (8 AM – 6 PM CST), blue represents nighttime hours (7 PM to 7 AM). The solid black diagonal line is the 1:1 perfect correlation line; the two black dashed lines represent the ±2 m/s bias envelope. Statistics show the regression line and the fraction of hours when the bias is between ±0.5, 1, and 2 m/s.

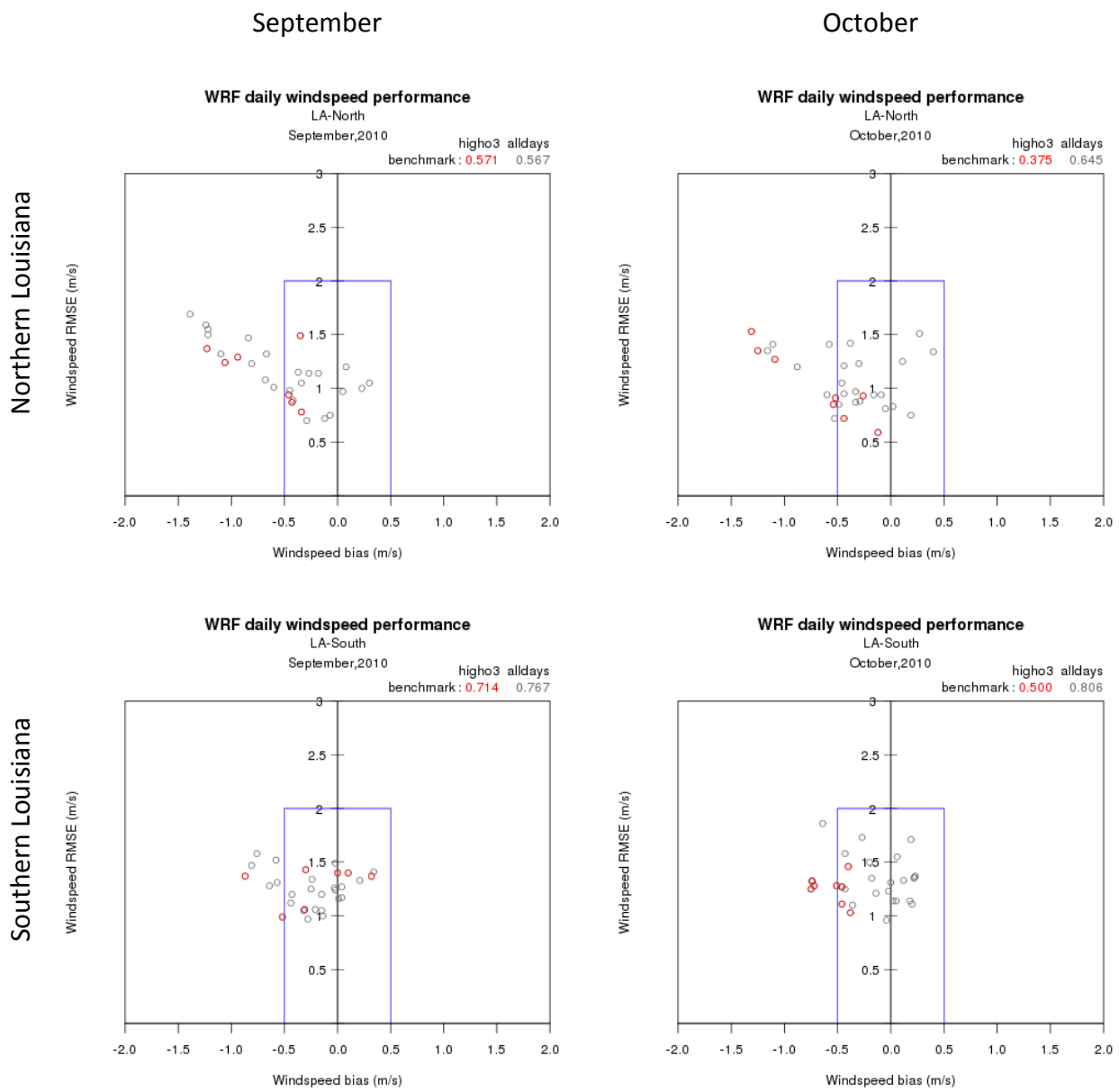


Figure 3-7. Soccer goal plot of daily wind speed statistics. Red circles highlight the high ozone dates.

3.2 Wind Direction

Figures 3-8 and 3-9 show hourly time series of predicted and observed wind direction averaged among all the meteorology stations in northern and southern Louisiana, respectively. The scatter plots shown in Figure 3-10 limit the hourly predicted and observed wind direction pairings to the high ozone dates, with red circles representing daytime hours and blue representing nighttime hours. The two dotted diagonal lines highlight daily-averaged bias within 30 degrees of the observed.

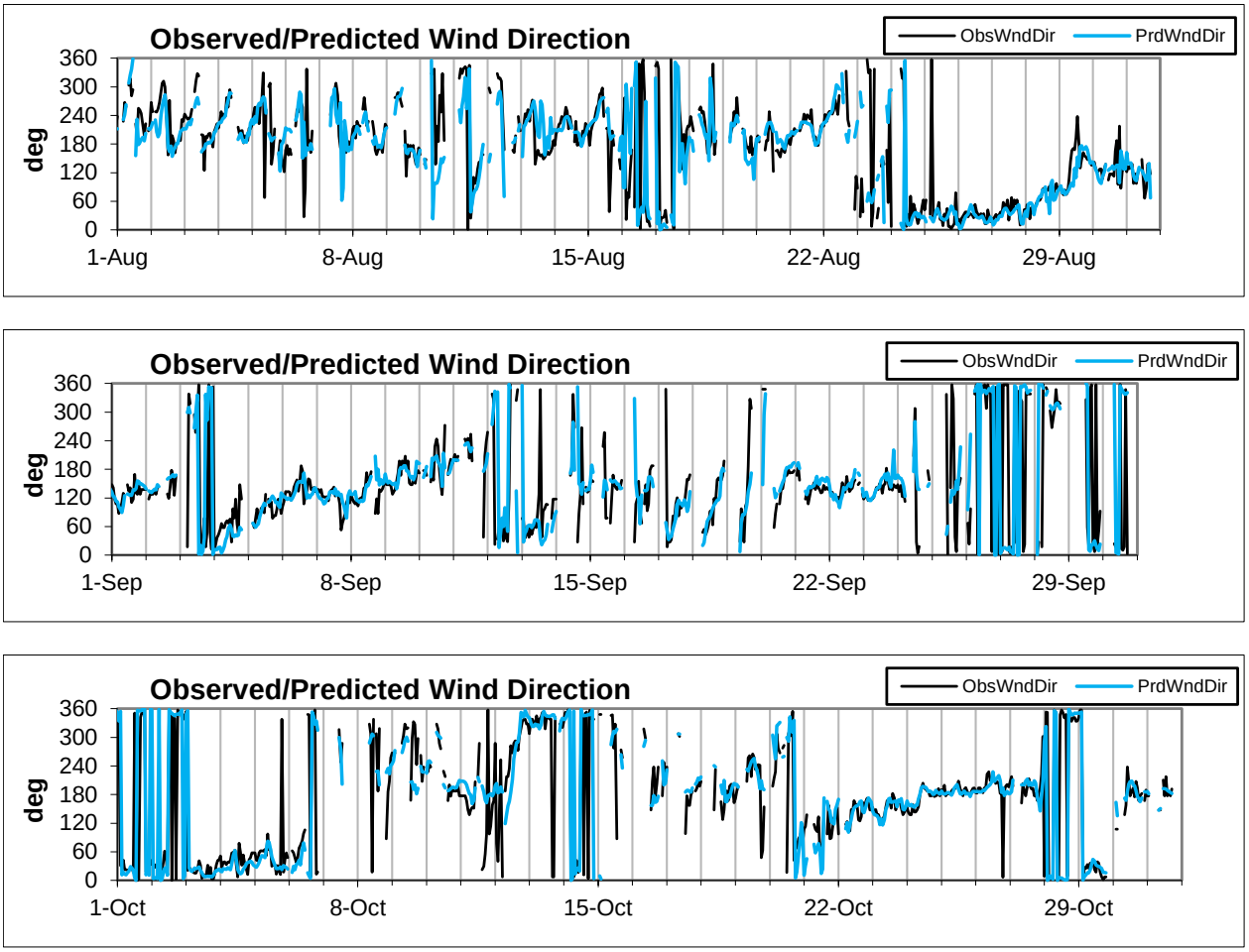


Figure 3-8. Hourly predicted (blue) and observed (black) wind direction averaged over all sites in northern Louisiana for August (top), September (middle) and October (bottom).

In northern Louisiana, the hourly wind direction bias was within ±30 degrees for about 60% of all hours on the episode dates. September wind direction performance was somewhat scattered, likely due to the very light wind speeds predicted, which can result in more variability

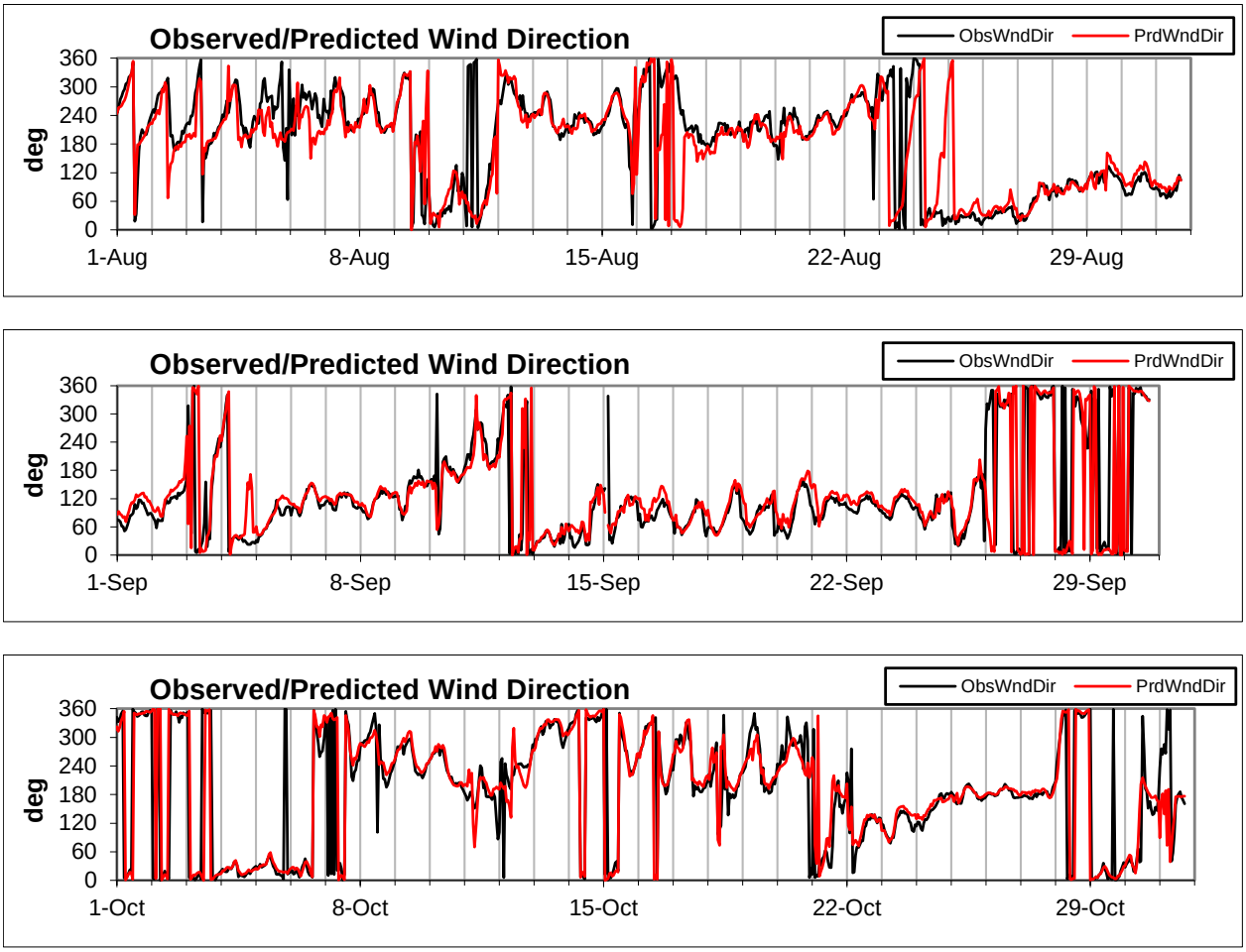


Figure 3-9. Hourly predicted (red) and observed (black) wind direction averaged over all sites in southern Louisiana for August (top), September (middle) and October (bottom).

in direction. October had numerous hours in which WRF predicted southwest winds when the observed were west to northwesterly.

WRF performed better in southern Louisiana than northern Louisiana. Over 85% of all hours on the episode dates had a bias within ±30 degrees in southern Louisiana. The best performance took place in September during the daylight hours, when 90% of the hours had a bias between ±30 degrees. WRF correctly predicted that the wind direction during most high ozone dates would be between north and southeast direction (going clockwise) in September, and between the southwest and north in October.

Soccer goal plots comparing daily wind direction error with wind speed RMSE are shown in Figure 3-11. The benchmark for exceptional performance is for RMSE below 2 m/s and wind direction error less than 30 degrees. All dates in the month are shown; high ozone dates are highlighted in red. In all four plots, the fraction of dates meeting the performance goals were

September October

Northern Louisiana

Southern Louisiana

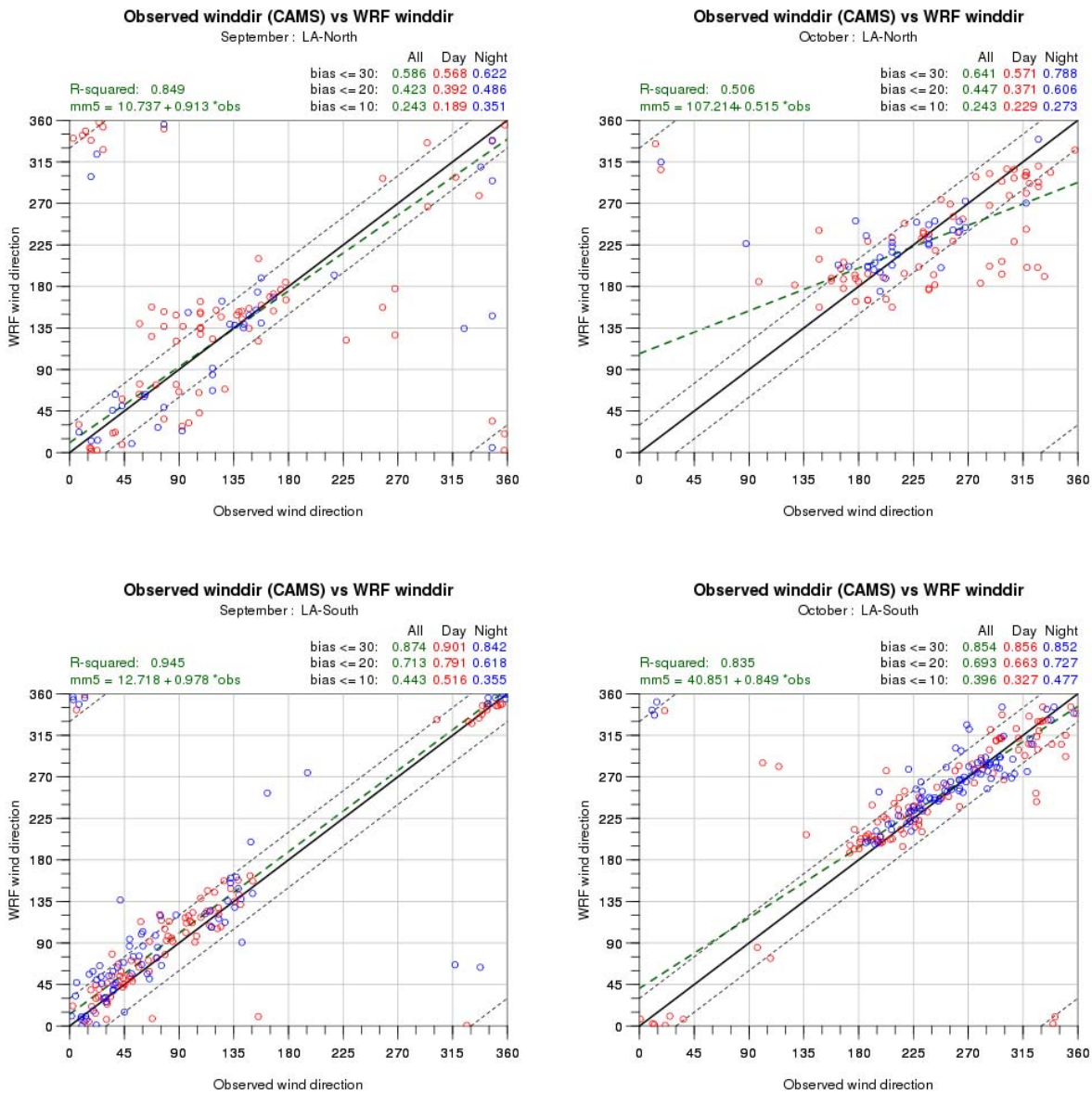


Figure 3-10. Scatter plots of hourly predicted and observed wind direction on high ozone dates during September (left) and October (right) for northern Louisiana (top) and southern Louisiana (bottom). Red circles represent daytime hours (8 AM – 6 PM CST), blue represents nighttime hours (7 PM to 7 AM). The solid black diagonal line is the 1:1 perfect correlation line; the two black dashed lines represent the ±30 degree bias envelope. Statistics show the regression line and the fraction of hours when the bias is between ±10, 20, and 30 degrees.

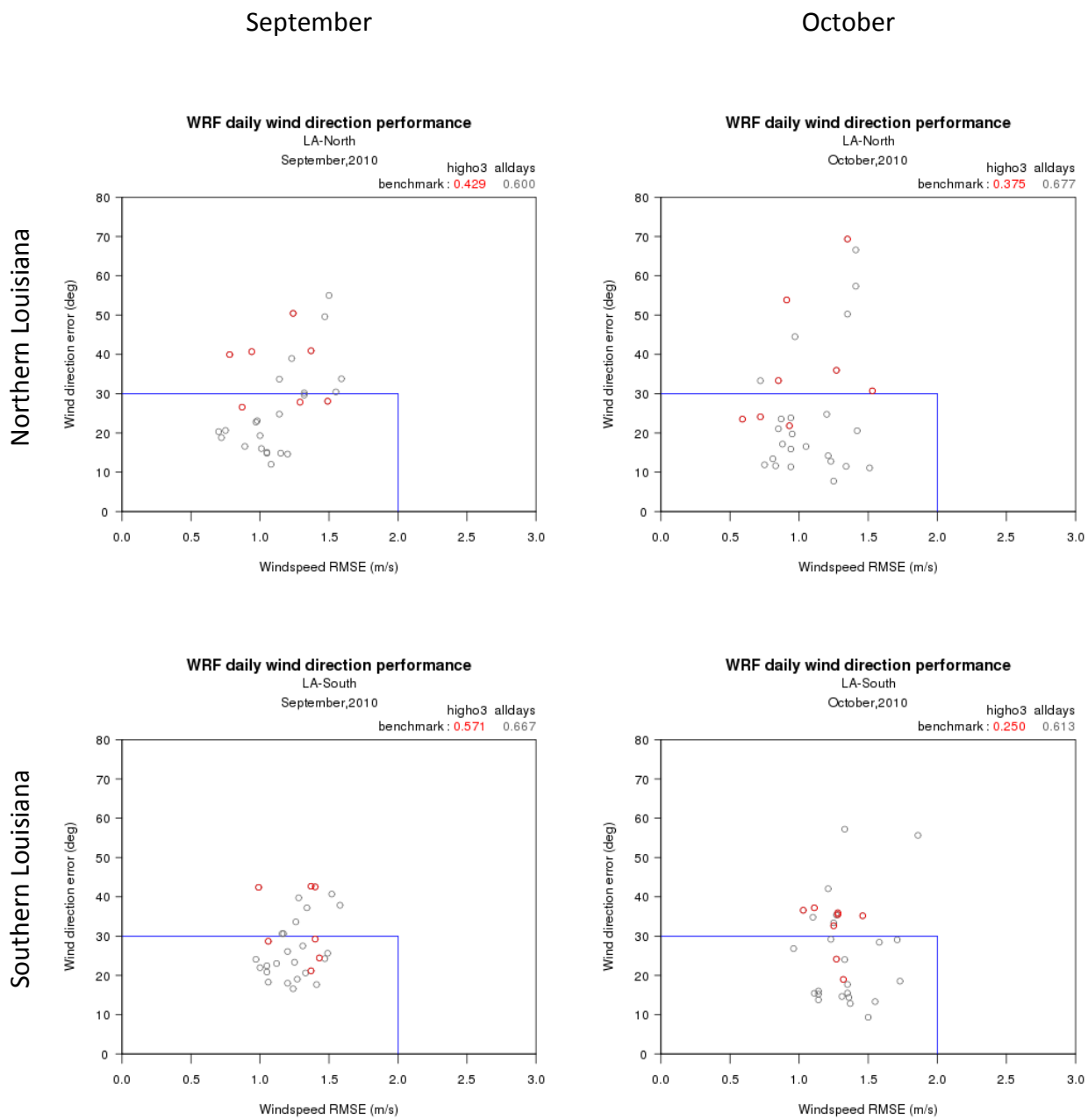


Figure 3-11. Soccer goal plots of daily wind direction statistics. Red circles highlight the high ozone dates.

lower when considering only high ozone dates than when using all dates in the month. On high ozone dates, stagnant air and low wind speeds are common, which may have resulted in more light and variable wind conditions on these dates, making it more difficult to achieve a directional error of less than 30 degrees. September in southern Louisiana had the highest fraction of high ozone dates inside the goal (57%); October in southern Louisiana had the

lowest fraction (25%). Overall, wind direction performance in this application is better than most WRF applications we have analyzed in other areas of the US.

3.3 Temperature

Figures 3-12 and 3-13 display hourly time series of predicted and observed temperatures from August to October, 2010 averaged over all sites in northern and southern Louisiana, respectively. The scatterplots in Figure 3-14 show hourly predicted and observed pairings on the high ozone dates, separated for daytime and nighttime hours. Points within the two dotted lines represent predicted temperatures within 2 K of the observed. Soccer goal plots in Figure 3-15 display daily temperature bias and error statistics, where the performance benchmarks are defined for a bias within ±0.5 K and an error of less than 2 K. High ozone dates are highlighted in red.

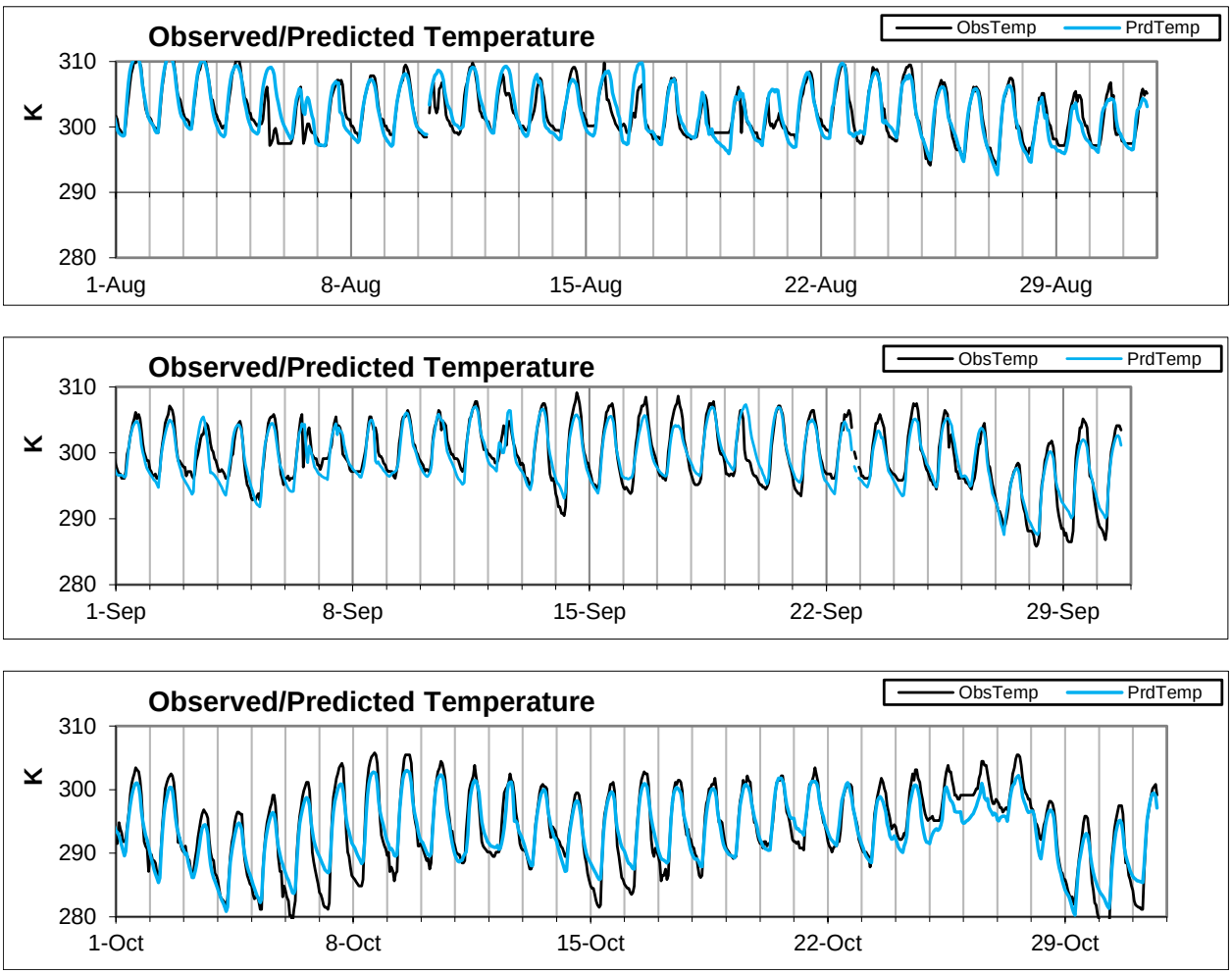


Figure 3-12. Hourly predicted (blue) and observed (black) temperature averaged over all sites in northern Louisiana for August (top), September (middle) and October (bottom).

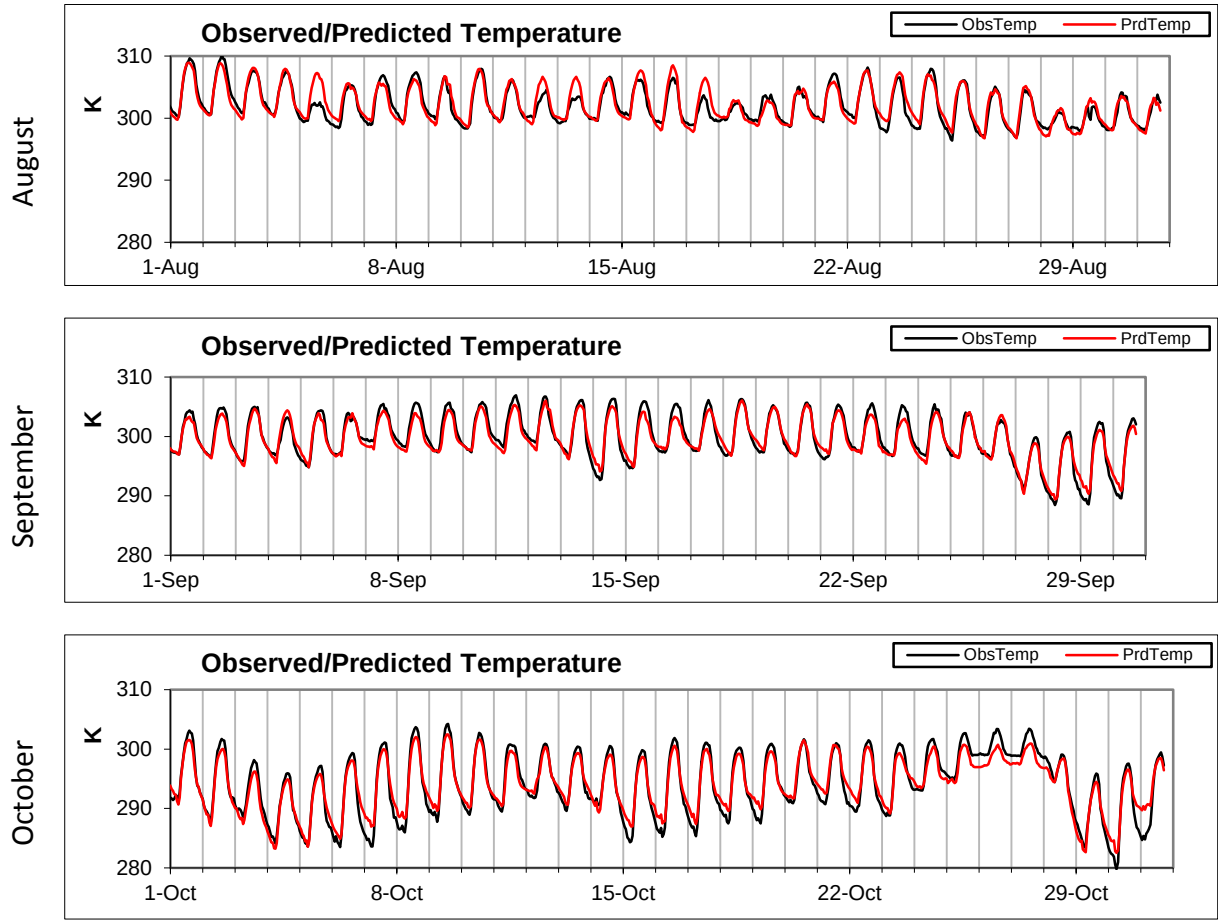


Figure 3-13. Hourly predicted (red) and observed (black) temperature averaged over all sites in southern Louisiana for August (top), September (middle) and October (bottom).

In both areas of Louisiana, WRF simulated larger diurnal variations in temperature in October than in August in accordance with observations. However, the predicted diurnal range in October was not as great as the observed as daytime highs were under predicted and nighttime lows were over predicted, as can be seen in both the time series and scatter plots. September daytime peaks also tended to be under predicted. WRF correctly predicted strong drops in temperature on September 27 and October 28, and smaller diurnal ranges on October 25-27, but those temperatures were under predicted.

WRF performed better in southern Louisiana, where over 90% of the predicted temperatures during the daytime hours on high ozone dates were within 2 K of the observed. In northern Louisiana, around 70 % of the hours on the episode dates were within 2 K of the observed.

Daily temperature statistics revealed somewhat scattered performance in both months in northern Louisiana. Southern Louisiana temperatures fared much better, especially in September when the daily temperature error never exceeded 2 K and the daily bias on the high

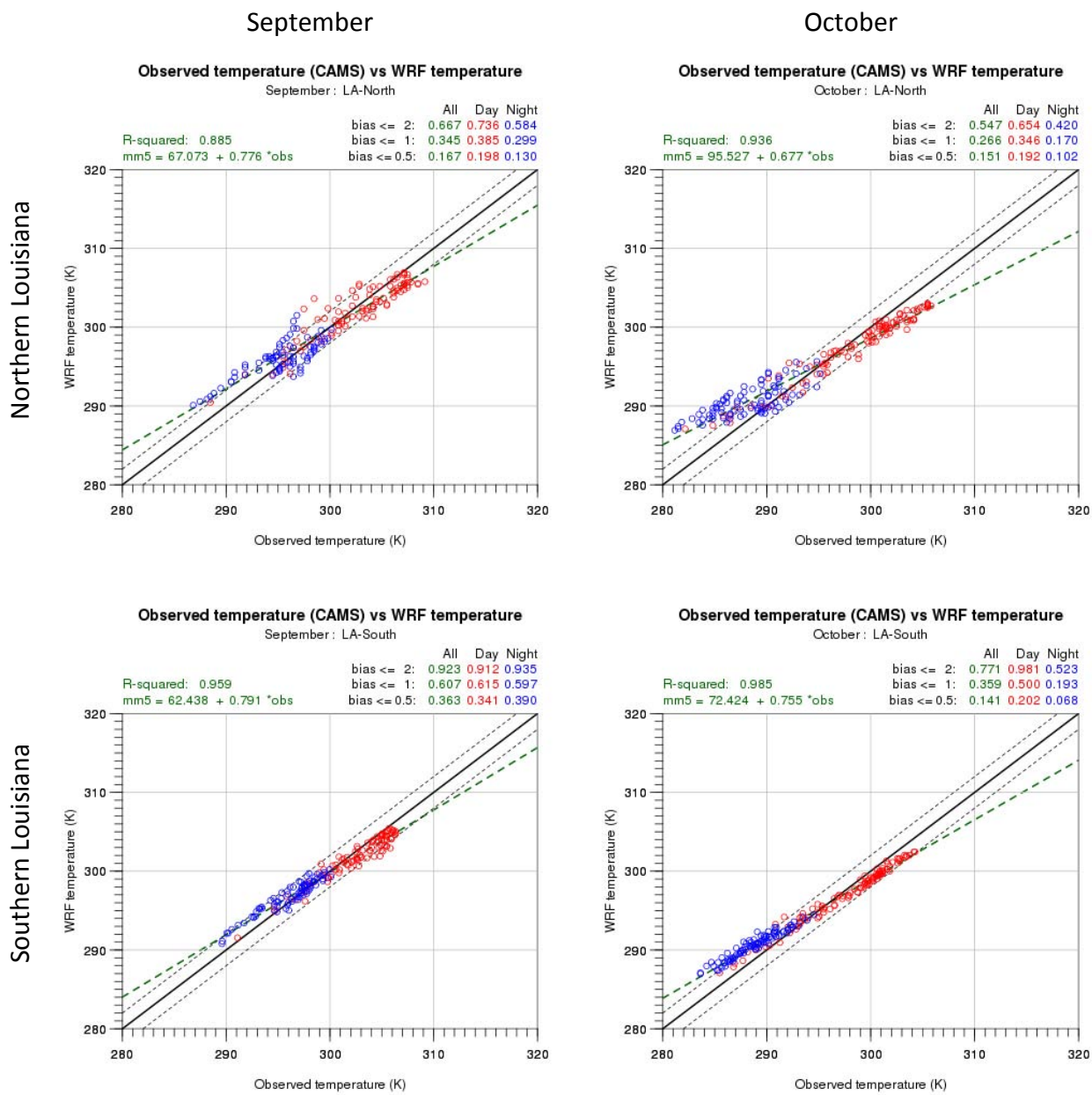


Figure 3-14. Scatter plots of hourly predicted and observed temperature on high ozone dates during September (left) and October (right) for northern Louisiana (top) and southern Louisiana (bottom). Red circles represent daytime hours (8 AM – 6 PM CST), blue represents nighttime hours (7 PM to 7 AM). The solid black diagonal line is the 1:1 perfect correlation line; the two black dashed lines represent the ±2 K bias envelope. Statistics show the regression line and the fraction of hours when the bias is between ±.5, 1, and 2 K.

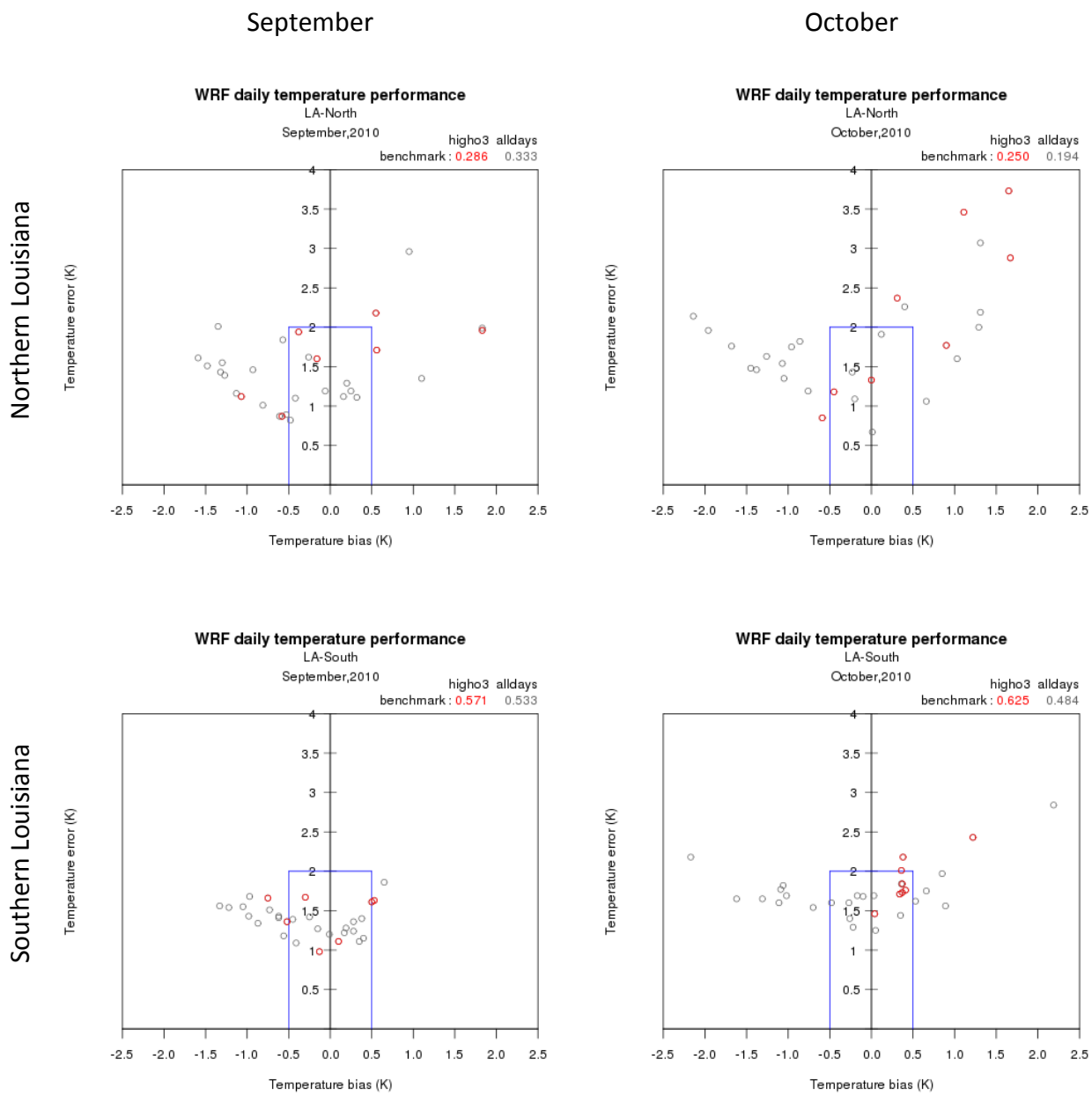


Figure 3-15. Soccer goal plots of daily temperature bias and error. Red circles highlight the high ozone dates.

ozone dates were inside or very close to the ±0.5 K benchmark. October daily temperature statistics met the performance goals on 5 of the 8 high ozone dates. The daily biases on these 8 dates were all positive. Overall, this temperature performance is on par with our experience using WRF in other areas of the US.

3.4 Precipitation

Predicted 24-hour precipitation totals were compared to precipitation analysis fields from the Advanced Hydrologic Prediction Service (AHPS), which were downloaded from http://water.weather.gov/precip/p_download_new/2010/ and reformatted to match the LDEQ 4 km modeling domain. All totals were for the 24-hour period ending at 12 UTC (6 AM CST).

Ozone production rates are greater on sunny and warm days so little or no precipitation would be expected on the high ozone dates. For the most part, little cloudiness and precipitation was predicted over Louisiana on high observed ozone days. Instead of showing multiple precipitation plots on the high ozone dates when WRF correctly predicted dry conditions across Louisiana, we focused on two high ozone dates when there was precipitation – September 13 and 16. Figure 3-16 shows spatial plots of the observed and predicted 24-hour precipitation totals for two consecutive dates to include all hours of September 13. Figure 3-17 is similar, but for September 16.

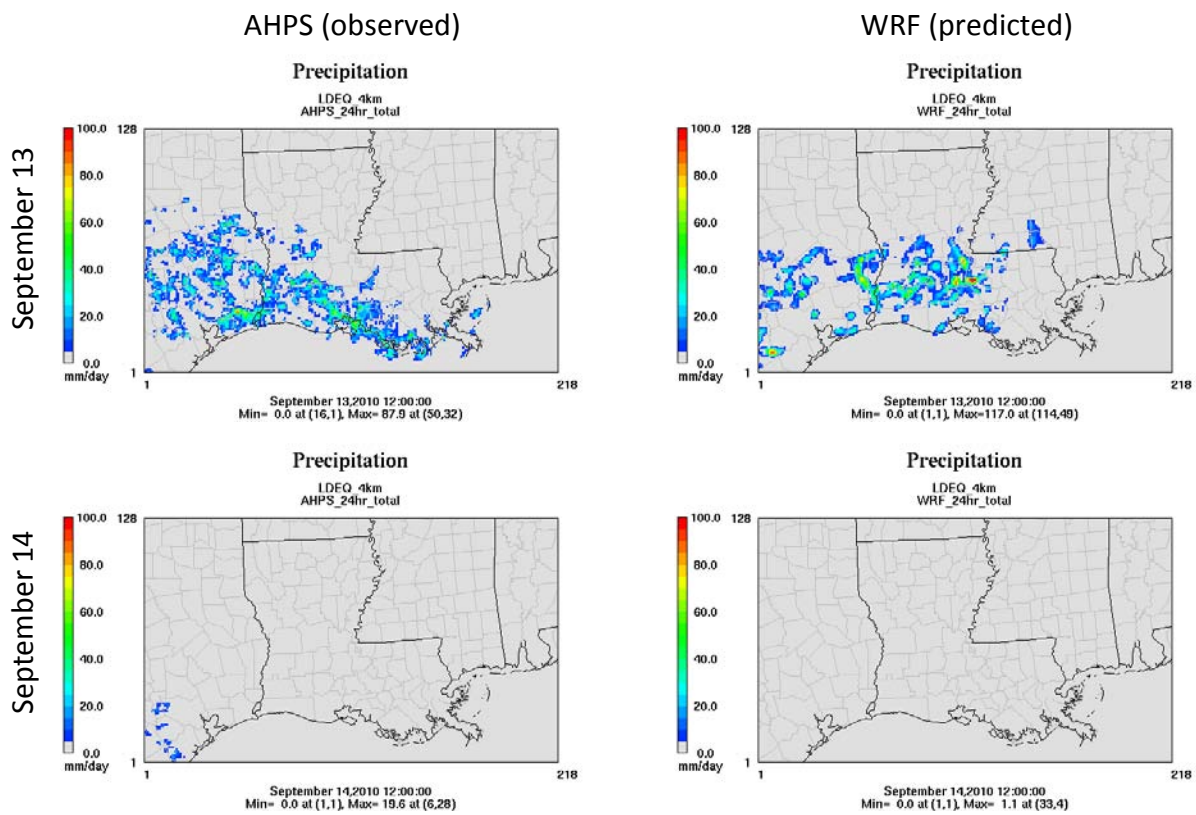


Figure 3-16. Observed (left) and predicted (right) 24-hour precipitation ending at 6 AM CST on September 13 (top) and 14 (bottom).

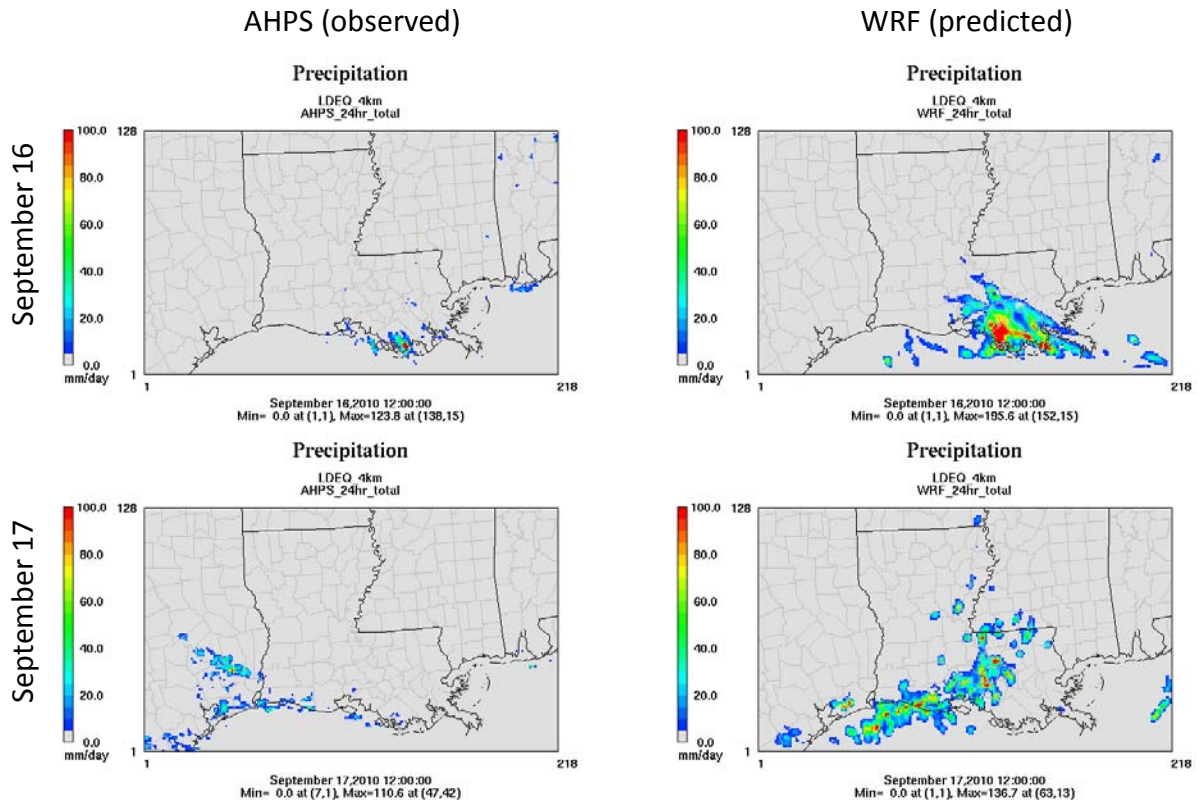


Figure 3-17. Observed (left) and predicted (right) 24-hour precipitation ending at 6 AM CST on September 16 (top) and 17 (bottom).

On September 13, WRF correctly predicted convective activity over southern Louisiana during the 24 hours ending at 6 AM on September 13, and dry conditions during the next 24 hours, which included all of the daytime hours of the high ozone date.

September 16 was one of the dates when WRF did not predict precipitation well over southern Louisiana. Precipitation in southeast Louisiana was over predicted during both the 24-hour periods ending at 6 AM on September 16 and 17. Fortunately, Shreveport was the only ozone monitor in Louisiana that observed 8-hour ozone greater than 75 ppb on September 16; WRF maintained dry conditions over northern Louisiana, as were observed.

Figure 3-18 compares the observed and predicted 24-hour precipitation fields on three other dates in which WRF corresponded well with the observed pattern.

AHPS (observed) WRF (predicted)

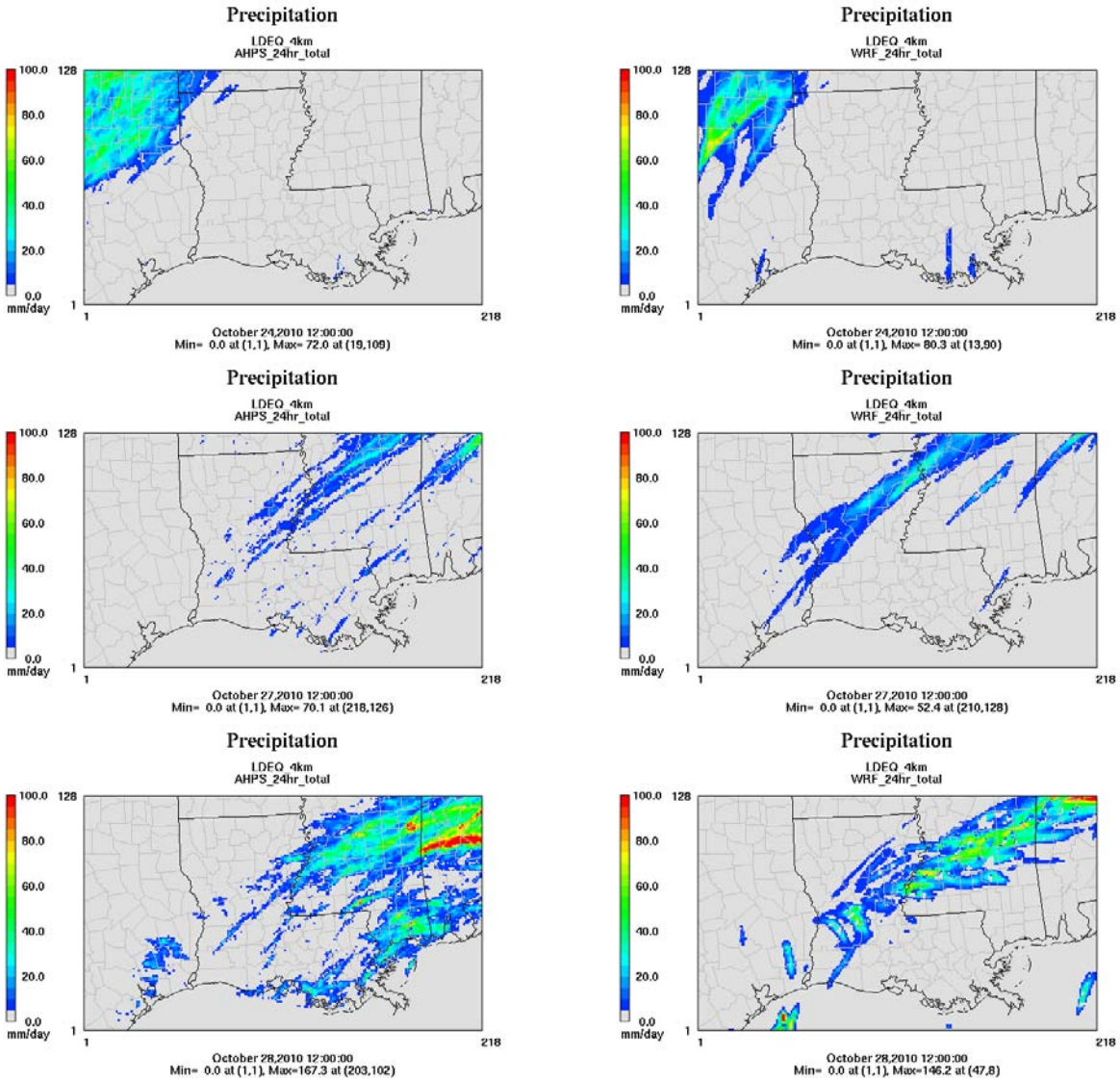


Figure 3-18. Daily observed (left) and predicted (right) precipitation on selected episode dates (October 24, 27, and 28).

3.5 Summary

A model performance evaluation was performed on the 4 km WRF meteorology, which was used to develop meteorology inputs for CAMx. Performance for wind speed, wind direction, and temperature was examined by computing hourly and daily statistics from all meteorology stations in northern and southern Louisiana. WRF performance in southern Louisiana in September was very good for all three variables. In October, the daytime wind speed and temperatures in southern Louisiana were both slightly under predicted. The former could lead to more stagnation and higher ozone, which may be compensated by slower ozone production rates due to the cooler predicted temperatures. Performance was consistently better in southern Louisiana than northern Louisiana, where daytime wind speeds and temperatures were also under estimated.

Overall, performance for wind speed and direction were markedly better than usually achieved in other WRF applications across the country. Temperature performance was on par with other applications. Precipitation performance on high ozone days was quite good, and did not exhibit the usually high degree of over prediction so often identified in past applications.

4.0 PHOTOCHEMICAL MODEL INPUTS

Inputs for the CAMx photochemical model were prepared for the Louisiana September-October 2010 modeling period. Inputs include emissions, meteorology, landuse, albedo-haze-ozone, photolysis rates, and initial/boundary conditions. This section describes details on the creation of all input files except the emissions, which are documented separately in Section 5.

4.1 Meteorology

WRF version 3.3.1 was run from August through October 2010 to cover the LDEQ 36, 12, and 4 km photochemical modeling domains (Alpine, 2012). The WRF output was then used to generate CAMx meteorological input files using the WRFCAMx version 3.3 converter. The CAMx and WRF domains are shown in Figure 4-1, where the CAMx domain was at least 5 grid cells inside any of the WRF boundaries. The Lambert Conformal Projection (LCP) in WRF was the same as CAMx, where the projection center was at 40°N/97°W with true latitudes of 33°N and 45°N.

Six binary CAMx meteorological files are generated by WRFCAMx for each simulation date, which include the following hourly-varying three-dimensional fields:

- Height (m)/pressure (mb)
- Wind (as separate east-west and north-south components, m/s)
- Temperature (K)
- Vertical diffusivity (m^2/s)
- Humidity (ppm)
- Cloud and rain water (g/m^3)

A 26-category landuse file is also output, but is not used because it is derived from WRF's dominant landuse category in each grid cell. A better alternative is to create landuse files based on high-resolution land cover datasets, processed with Geographic Information System (GIS) software, from which to develop the fraction of each land cover category in each grid cell. Details on the GIS-based landuse files are provided below.

WRFCAMx was configured to time-shift the meteorology from its native Coordinated Universal Time (UTC) to Central Standard Time (CST) and extract 27 vertical layers of meteorological data up to 11 km, near the top of the troposphere, using the layer structure shown in Table 4-1. A layer averaging scheme that combined multiple WRF layers into single CAMx layers was applied to layers above 3 km to focus on the photochemical simulation in the lower to mid troposphere and to reduce computational time.

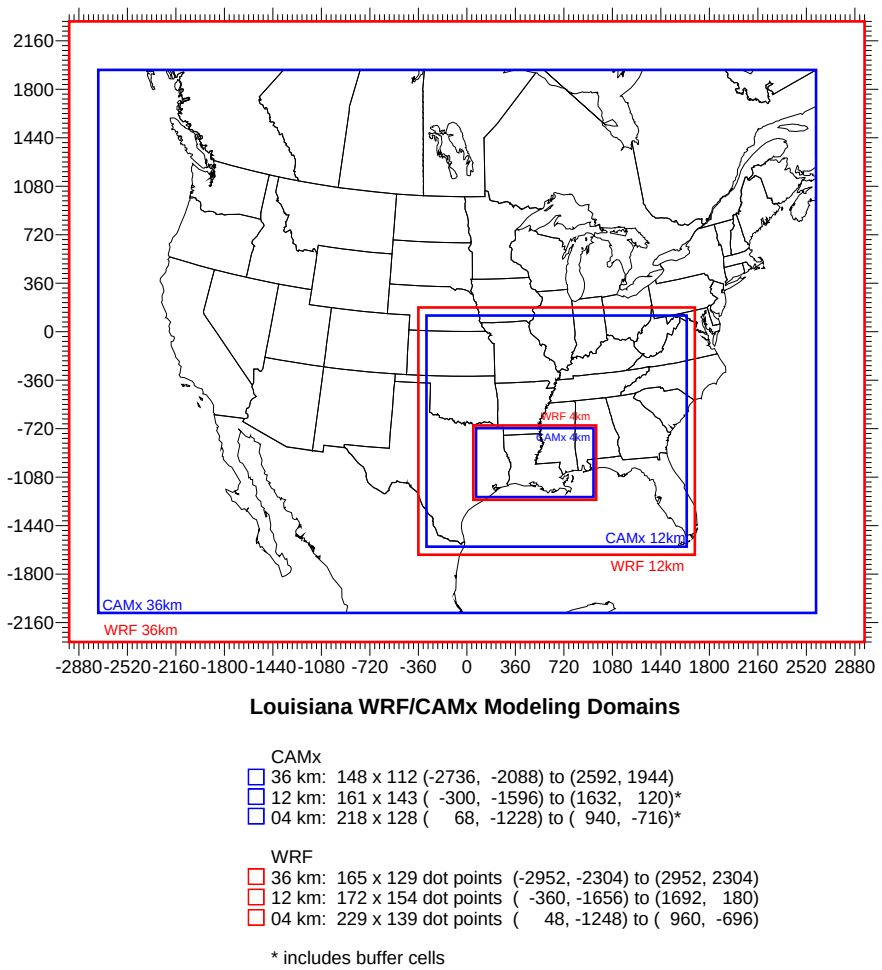


Figure 4-1. Map of CAMx and WRF modeling domains.

WRFCAMx was set to diagnose sub-grid clouds in the 36 km and 12 km domains, but not in the 4 km domain, where grid-scale convection was explicitly treated by WRF's resolved cloud microphysics algorithm.

WRFCAMx includes several methods for computing the vertical turbulent exchange coefficients (or "diffusivities", Kv). Since WRF was configured with the Mellor-Yamada-Janjic (MYJ) turbulent kinetic energy (TKE) boundary layer scheme, the MYJ TKE option was selected to compute the vertical diffusivities from the TKE fields output by WRF. The minimum Kv was set to 0.1 m^2/s.

An additional program (KVPATCH) is often applied to the vertical diffusivity files to enhance mixing in specific environments. Two patches within the program were applied. The first enhances the minimum Kv floor in urban areas according to the profile methodology of O'Brien (1970). This maintains low-level urban mixing in the stable nighttime hours with the lowest 200 m to account for urban heating and turbulence induced by the urban canopy. The second patch

Table 4-1. CAMx and WRF vertical layer structures.

WRF Meteorological Model				CAMx Air Quality Model		
Layer Index	Sigma	Height (m)	Depth (m)	Layer Index	Height (m)	Depth (m)
43	0.000	18872	736			
42	0.010	18135	970			
41	0.025	17165	1110			
40	0.045	16055	959			
39	0.065	15096	1045			
38	0.090	14050	918			
37	0.115	13132	975			
36	0.145	12157	869			
35	0.175	11288	909	27	11288	2678
34	0.210	10379	931			
33	0.250	9449	839			
32	0.290	8610	765	26	8610	2044
31	0.330	7845	704			
30	0.370	7140	574			
29	0.405	6566	540	25	6566	1050
28	0.440	6026	510			
27	0.475	5516	484	24	5516	879
26	0.510	5033	396			
25	0.540	4637	380	23	4637	745
24	0.570	4258	365			
23	0.600	3893	352	22	3893	691
22	0.630	3541	339			
21	0.660	3202	328	21	3202	328
20	0.690	2874	317	20	2874	317
19	0.720	2556	307	19	2556	307
18	0.750	2249	249	18	2249	249
17	0.775	2000	243	17	2000	243
16	0.800	1757	237	16	1757	237
15	0.825	1520	232	15	1520	232
14	0.850	1288	136	14	1288	136
13	0.865	1152	135	13	1152	135
12	0.880	1017	133	12	1017	133
11	0.895	884	131	11	884	131
10	0.910	753	86	10	753	86
9	0.920	667	86	9	667	86
8	0.930	581	85	8	581	85
7	0.940	496	84	7	496	84
6	0.950	412	84	6	412	84
5	0.960	328	83	5	328	83
4	0.970	245	82	4	245	82
3	0.980	163	82	3	163	82
2	0.990	81	49	2	81	49
1	0.996	32	32	1	32	32

enhances vertical diffusivities through the depth of convective clouds capping the daytime boundary layer, which is often suppressed within models such as WRF.

4.2 Landuse

Landuse within CAMx is specified through a binary input file (SURFACE) that contains a time-invariant two-dimensional gridded field of landuse distribution. For the Zhang dry deposition scheme, the fractional distributions of 26 landuse categories and two-dimensional fields of leaf area index (LAI) are specified for each grid cell. These are used to define surface resistances for dry deposition calculations and to set default surface roughness lengths. These landuse categories are described in Table 4-2 for the Zhang dry deposition scheme.

The landuse/landcover (LULC) data were extracted from the North America Land Cover (NALC) database for the year 2000 (Latifovic, et al. 2002). NALC was developed jointly by the Natural Resources Canada - Canada Centre for Remote Sensing, and the USGS EROS Data Center as part of the larger Global Land Cover 2000 project implemented by the Global Vegetation Monitoring Unit, Joint Research Center (JRC) of the European Commission. The North American database was compiled using satellite data during the 2000 growing season at a spatial resolution of 1-km. The data are available as GIS raster datasets for each continent, in a geodetic coordinate system and can be obtained from the project website at http://edc2.usgs.gov/glcc/nadoc2_0.php. The NALC land use classification scheme includes 29 separate categories as presented in Table 4-3. The landuse classes available in the source GIS database were cross referenced to those required for the Zhang dry deposition schemes used by CAMx. Table 4-4 shows the cross references used for the Zhang scheme.

Gridded LAI data are an optional input for use with the Zhang dry deposition scheme in CAMx. We derived gridded LAI inputs from the Model of Emissions of Gases and Aerosols from Nature (MEGAN) biogenic emissions model. The data are provided as un-projected global 30 arc second (~1-km horizontal resolution) GIS raster datasets. LAI is defined as the ratio of total upper leaf surface area divided by the surface area of the land on which the vegetation grows. The LAI data available with the MEGAN databases represent average values over each raster, in units of m^2/m^2 and are available as monthly averaged datasets for calendar year 2001. The LAI data can be obtained as ArcGIS raster GRID files from http://acd.ucar.edu/~guenther/MEGAN/MEGAN.htm.

A suite of GIS and Perl-based processors were used to prepare landcover and LAI input datasets for CAMx. Arc Macro Language (AML) scripts were used to process the raster-based and vector-based GIS data and export text datasets for subsequent processing with Perl scripts and FORTRAN programs. User-defined options are used to specify various parameters including the definition of output modeling domains, map projection parameters, and the input LULC and MEGAN LAI databases. The CAMx landuse file was prepared for the LDEQ 36/12/4km grids. Figure 4-2 shows a spatial map displaying the dominant land cover category for each grid cell in the 4 km domain.

Table 4-2. CAMx landuse categories for the Zhang dry deposition scheme.

Category Number	Land Cover Category
1	Water
2	Ice
3	Inland Lake
4	Evergreen Needleleaf Trees
5	Evergreen Broadleaf Trees
6	Deciduous Needleleaf Trees
7	Deciduous Broadleaf Trees
8	Tropical Broadleaf Trees
9	Drought Deciduous Trees
10	Evergreen Broadleaf Shrubs
11	Deciduous Shrubs
12	Thorn Shrubs
13	Short Grass and Forbs
14	Long Grass
15	Crops
16	Rice
17	Sugar
18	Maize
19	Cotton
20	Irrigated Crops
21	Urban
22	Tundra
23	Swamp
24	Desert
25	Mixed Wood Forests
26	Transitional Forest

Table 4-3. NALC LULC classification.

Code	Description
1	Tropical or Sub-tropical Broadleaved Evergreen Forest - Closed Canopy
2	Tropical or Sub-tropical Broadleaved Deciduous Forest - Closed Canopy
3	Temperate or Sub-polar Broadleaved Deciduous Forest - Closed Canopy
4	Temperate or Sub-polar Needleleaved Evergreen Forest - Closed Canopy
5	Temperate or Sub-polar Needleleaved Evergreen Forest - Open Canopy
6	Temperate or Sub-polar Needleleaved Mixed Forest - Closed Canopy
7	Temperate or Sub-polar Mixed Broadleaved or Needleleaved Forest - Closed Canopy
8	Temperate or Sub-polar Mixed Broadleaved or Needleleaved Forest - Open Canopy
9	Temperate or Subpolar Broadleaved Evergreen Shrubland - Closed Canopy
10	Temperate or Subpolar Broadleaved Deciduous Shrubland - Open Canopy
11	Temperate or Subpolar Needleleaved Evergreen Shrubland - Open Canopy
12	Temperate or Sub-polar Mixed Broadleaved and Needleleaved Dwarf-Shrubland - Open Canopy
13	Temperate or Subpolar Grassland
14	Temperate or Subpolar Grassland with a Sparse Tree Layer
15	Temperate or Subpolar Grassland with a Sparse Shrub Layer
16	Polar Grassland with a Sparse Shrub Layer
17	Polar Grassland with a Dwarf-Sparse Shrub Layer
18	Cropland
19	Cropland and Shrubland/woodland
20	Subpolar Needleleaved Evergreen Forest Open Canopy - lichen understory
21	Unconsolidated Material Sparse Vegetation (old burnt or other disturbance)
22	Urban and Built-up
23	Consolidated Rock Sparse Vegetation
24	Water bodies
25	Burnt area (resent burnt area)
26	Snow and Ice
27	Wetlands
28	Herbaceous Wetlands
29	Tropical or Sub-tropical Broadleaved Evergreen Forest - Open Canopy

Table 4-4. LULC mapping between the 29 NALC categories and the 26 CAMx categories.

GRID-CODE	CAMx-CODE	Description
1	8	Tropical or Sub-tropical Broadleaved Evergreen Forest - Closed Canopy
2	8	Tropical or Sub-tropical Broadleaved Deciduous Forest - Closed Canopy
3	7	Temperate or Sub-polar Broadleaved Deciduous Forest - Closed Canopy
4	4	Temperate or Sub-polar Needleleaved Evergreen Forest - Closed Canopy
5	4	Temperate or Sub-polar Needleleaved Evergreen Forest - Open Canopy
6	25	Temperate or Sub-polar Needleleaved Mixed Forest - Closed Canopy
7	25	Temperate or Sub-polar Mixed Broadleaved or Needleleaved Forest - Closed Canopy
8	25	Temperate or Sub-polar Mixed Broadleaved or Needleleaved Forest - Open Canopy
9	10	Temperate or Subpolar Broadleaved Evergreen Shrubland - Closed Canopy
10	11	Temperate or Subpolar Broadleaved Deciduous Shrubland - Open Canopy
11	10	Temperate or Subpolar Needleleaved Evergreen Shrubland - Open Canopy
12	10	Temperate or Sub-polar Mixed Broadleaved and Needleleaved Dwarf-Shrubland - Open Canopy
13	14	Temperate or Subpolar Grassland
14	14	Temperate or Subpolar Grassland with a Sparse Tree Layer
15	13	Temperate or Subpolar Grassland with a Sparse Shrub Layer
16	22	Polar Grassland with a Sparse Shrub Layer
17	22	Polar Grassland with a Dwarf-Sparse Shrub Layer
18	15	Cropland
19	15	Cropland and Shrubland/woodland
20	4	Subpolar Needleleaved Evergreen Forest Open Canopy - lichen understory
21	13	Unconsolidated Material Sparse Vegetation (old burnt or other disturbance)
22	21	Urban and Built-up
23	24	Consolidated Rock Sparse Vegetation
24	1	Water bodies
25	24	Burnt area (resent burnt area)
26	2	Snow and Ice
27	23	Wetlands
28	23	Herbaceous Wetlands
29	10	Tropical or Sub-tropical Broadleaved Evergreen Forest - Open Canopy

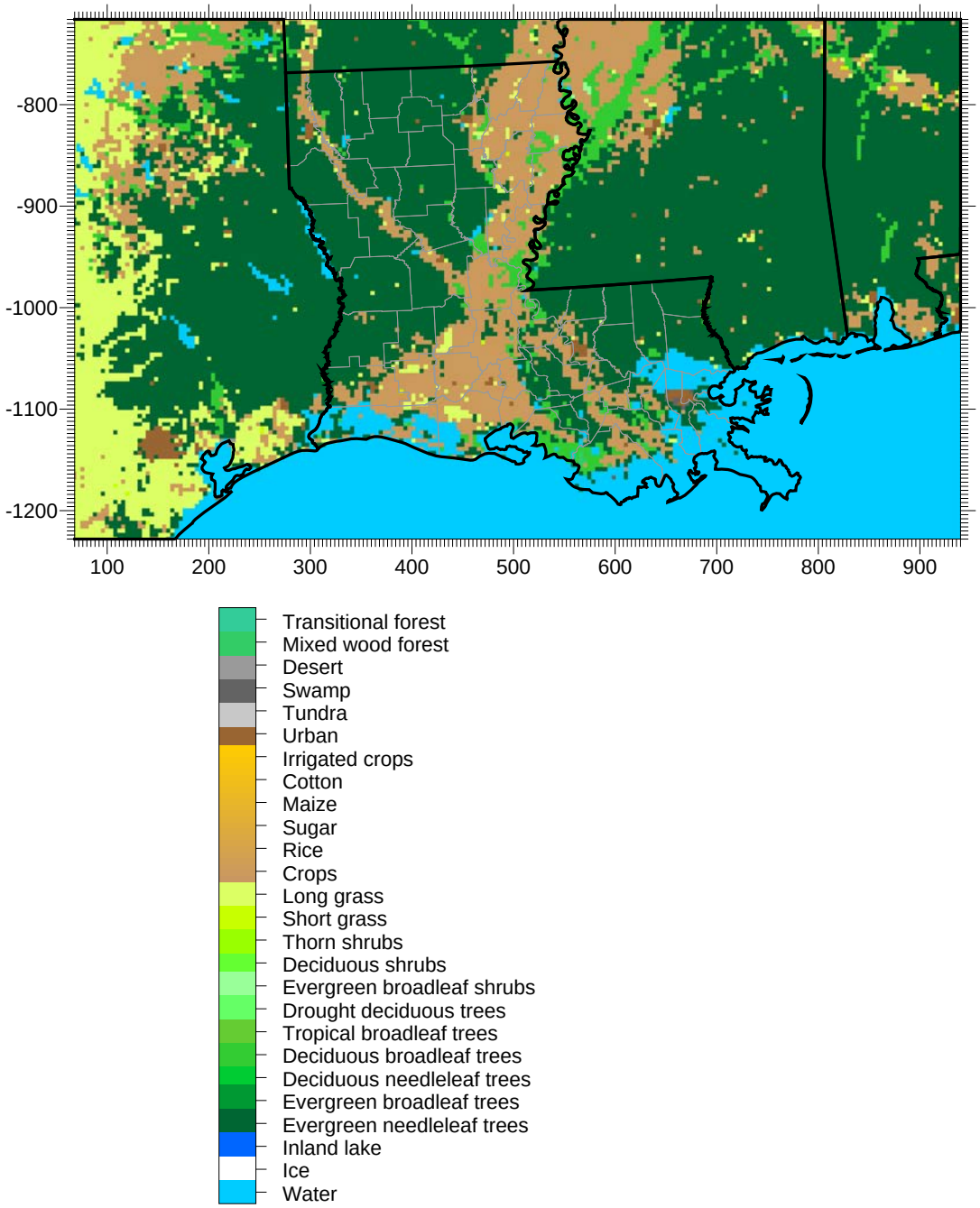


Figure 4-2. Dominant landuse type in each grid cell of the 4 km CAMx domain.

4.3 Albedo-Haze-Ozone

The CAMx preprocessor, AHOMAP version 4, was used to create a CAMx text input file containing gridded surface albedo, total atmospheric column haze opacity, and total atmospheric ozone column data. The program reads in CAMx landuse files for all domains to be modeled and daily Ozone Monitoring Instrument (OMI) data in 1 degree resolution, which can be downloaded for each episode date from http://ozoneaq.gsfc.nasa.gov/OMIOzone.md. All daily ozone column datasets for each month of the episode were run together to yield one albedo-haze-ozone file per month. For haze opacity, a default uniform field was specified representing a typical continental aerosol loading. Optional fields such as snow cover, surface roughness, and drought stress were not added.

4.4 Clear-Sky Photolysis Rates

Version 4.8 of the TUV radiative transfer model, developed by the National Center for Atmospheric Research (NCAR), reads the ranges of albedo, haze opacity and ozone column and creates a lookup table of clear-sky photolysis rates for a range of heights above the ground and solar zenith angles. The TUV program was run for each month in the modeling period to develop rates for the specific photolysis reactions defined by the Carbon Bond version 6 (CB6) and Carbon Bond 2005 (CB05) chemical mechanism. The photolysis rates are internally adjusted within CAMx for hourly cloud conditions within each grid column.

4.5 Initial and Boundary Conditions

Initial conditions are used to represent an initial three-dimensional concentration distribution throughout the master grid from which the simulation starts. Boundary conditions are used to represent concentration patterns outside of the outer CAMx modeling domain that are subsequently transported into the grid system. Data for initial and boundary conditions were derived from the output of the global Model for Ozone and Related chemical Tracers, version 4 (MOZART-4). MOZART outputs are available from http://www.acd.ucar.edu/wrf-chem/mozart.shtml and were downloaded for the 2010 episode.

MOZART was run with 1.9 by 2.5 degree horizontal resolution and 56 vertical layers, and output data in 6-hour intervals. By comparison, MOZART data used for the 2006 Baton Rouge ozone simulation had 2.8 by 2.8 degree resolution with 28 vertical layers.

Native MOZART-4 output data in netCDF format were first converted to IOAPI format using the NCF2IOAPI program. Then, the MOZART2CAMx program horizontally and vertically interpolated the data onto the CAMx domain and remapped the chemical species to CB6 and CB05 speciation. Daily boundary condition files were generated for each date to be simulated by CAMx with the assumption that each MOZART 6-hourly time period was representative of the next six hours in CAMx. Boundary conditions were then time shifted from UTC to CST; initial conditions, based on MOZART fields at 6 AM UTC (midnight CST) on August 17, did not need to be time shifted.

5.0 DEVELOPMENT OF 2010 BASE YEAR EMISSIONS

Emission estimates were prepared for the September-October 2010 Base Year modeling period. Details on the creation of certain emission input files for the CAMx photochemical model are described in this section, specifically including Louisiana and Gulf of Mexico anthropogenic sources, and biogenic and fire sources throughout the North American modeling domain. Alpine Geophysics developed anthropogenic emission estimates for the remainder of the North American modeling domain.

5.1 Introduction

A key component of an ozone modeling study is the underlying emissions inventory. Spatially, temporally and chemically resolved estimates of volatile organic compounds (VOC), nitrogen oxides (NOx), and carbon monoxide (CO) from sources such as industries, electric generating units (EGUs), on-road motor vehicles, and vegetation are critical inputs to an air quality model. This section documents the development of certain components of the 2010 Base Year emission inventories, and the preparation of CAMx-ready emission inputs for the 4, 12, and 36 km modeling domains (Figure 4-1).

Emphasis was placed on developing emissions estimates within the State of Louisiana (LA). EPS3 was used to convert the LA emission inventory into the hourly, chemically speciated, and gridded formats needed by CAMx. Other emission modeling tools were used to estimate emissions from specific categories; MEGAN and BEIS for biogenics, MOVES/CONCEPT for on-road, NMIM for non-road sources, and FINN for wildfires, and agricultural/prescribed burning.

EPS3 requires emission inventory files and support data (cross-reference files, spatial surrogates, temporal and speciation profiles) as input. Area and point source emissions in Louisiana were prepared by ERG, working closely with the LDEQ. Day- and hour-specific 2010 NOx emissions for sources throughout the modeling domain that are subject to continuous emissions monitoring (CEM) under the Title V Acid Rain Program (ARP) were extracted from the EPA's database and were reconciled against, and supplemented with, data provided by LDEQ. Gulf-wide offshore emissions were developed by ERG from the BOEM 2008 Gulf-wide Emission Inventory Study. Biogenic and fire emissions were estimated for all three modeling grids for each hour of each day of the September and October 2010 modeling period.

5.2 Emissions in Louisiana

EPS3 was set up to process criteria pollutant emissions into the CAMx configuration using the Carbon Bond version 6 (CB6) chemical mechanism. Emissions for the following model species were generated:

Nitrogen oxides:	NO, NO2, HONO
Volatile organic compounds:	ACET, ALD2, ALDX, BENZ, ETH, ETHA, ETHY, ETOH, FORM, IOLE, ISOP, KET, MEOH, OLE, PAR, PROP,TERP, TOL, XYL
Carbon monoxide:	CO

Speciation to CB6 compounds was performed by applying standard source-specific profiles derived from the EPA SPECIATE 4.3 database. These profiles were assigned to each of the source categories contained in the raw emissions inventory files using default EPA cross-references. Because of its backward-compatibility, CB6 speciation can be subsequently reverted back to CB05 by combining certain CB6-specific VOCs to the generic alkane "PAR" as follows:

BENZ → 1 PAR (+ 5 "non-reactive" moles in compounds that are ignored);
PROP → 1.5 PAR (+ 1.5 "non-reactive")
ACET → 3 PAR
ETHY → 1 PAR
KET → 1 PAR,

where emissions for the five CB6 species listed above are set to zero after the conversion.

Temporal allocation for most source categories was performed by applying default EPA seasonal, monthly, day-of-week, and hourly profiles and cross-references for the inventory components.

Gridding surrogates were developed for the 4 km modeling domain using the EPA Spatial Allocator tool that is available from http://www.cmascenter.org/index.cfm. Typical surrogate types were created including: population, various road types and other transportation networks, agriculture, residential, commercial and industrial land, retail, and water bodies. The EPA Spatial Allocator tool creates surrogates formatted for the SMOKE emissions model, which were reformatted to the EPS3 requirements. The surrogate list used for spatial allocation of LA emissions is listed in Table 5-1.

EPS3 generated model-ready hourly point, area, non-road mobile, and on-road mobile emissions of CB6 compounds on the 36/12/4 km grid system. Annual and ozone season emission estimates were used to develop a representative weekday, Saturday and Sunday. Day specific estimates were developed for on-road mobile, acid rain point, and fire sources. The remainder of this sub-section details the emissions processing by source category.

1.1.1 Point Sources

The 2010 point source emissions were based upon a point source inventory provided by LDEQ (2012a). In consultation with LDEQ staff, the modeling team partitioned the inventory into two groups: those electricity generating units that are subject to the EPA's Clean Air Markets Division (CAMD) Acid Rain Program (ARP), and all other point sources.

As required by law, units subject to ARP must submit their hourly nitrogen oxide (NOx) and sulfur oxide (SOx) emissions data to the EPA. Because these data were reported on an hourly basis, these data are considered to provide a more accurate representation of the temporal distribution of emissions compared to annual emission estimates. In order to avoid double-counting, all ARP units and their associated emissions were removed from LDEQ's point source

Table 5-1. Spatial surrogate codes developed for Louisiana emissions processing.

SURROGATE	SURROGATE CODE	SURROGATE	SURROGATE CODE
Population	100	Commercial, Industrial and Institutional	520
Housing	110	Golf Courses, Institutional, Industrial and Commercial	525
Urban Population	120	Single Family Residential	527
Rural Population	130	Residential - High Density	530
Housing Change	137	Residential + Commercial + Industrial + Institutional + Government	535
Housing Change and Population	140	Retail Trade	540
Residential Heating - Natural Gas	150	Personal Repair	545
Residential Heating - Wood	160	Retail Trade plus Personal Repair	550
0.5 Residential Heating - Wood plus 0.5 Low Intensity Residential	165	Professional/Technical plus General Government	555
Residential Heating - Distillate Oil	170	Hospital	560
Residential Heating - Coal	180	Medical Office/Clinic	565
Residential Heating - LP Gas	190	Heavy and High Tech Industrial	570
Urban Primary Road Miles	200	Light and High Tech Industrial	575
Rural Primary Road Miles	210	Food, Drug, Chemical Industrial	580
Urban Secondary Road Miles	220	Metals and Minerals Industrial	585
Rural Secondary Road Miles	230	Heavy Industrial	590
Total Road Miles	240	Light Industrial	595
Urban Primary plus Rural Primary	250	Industrial plus Institutional plus Hospitals	596
0.75 l Roadway Miles plus 0.25 Population	255	Gas Stations	600
Total Railroad Miles	260	Refineries and Tank Farms	650
Class 1 Railroad Miles	270	Refineries ,Tank Farms, and Gas Stations	675
Class 2 and 3 Railroad Miles	280	Airport Points	710
Low Intensity Residential	300	Airport Areas	700
Total Agriculture	310	Military Airports	720
Orchards/Vineyards	312	Navigable Waterway Miles	807
Forest Land	320	Marine Ports	800
Strip Mines/Quarries	330	Navigable Waterway Activity	810
Land	340	Golf Courses	850
Water	350	Mines	860
Rural Land Area	400	Wastewater Treatment Facilities	870
Commercial Land	500	Drycleaners	880
Industrial Land	505	Commercial Timber	890
Commercial plus Industrial	510	Gulf of Mexico non-platform	990
Commercial plus Institutional Land	515		

database. However, only ARP units were removed at any given facility; any non-ARP units were left in the database unchanged.

The 2010 hourly emissions data for all units subject to ARP were downloaded from U.S. EPA's Air Markets Program Data website (EPA, 2012). Because only NOx and SOx emissions data were reported to ARP, VOC and CO ratios were used to estimate hourly VOC and CO emissions. Annual unit-specific VOC-to-NOx ratios were calculated using data from LDEQ's point source database and then applied to the hourly NOx emissions for ARP units to estimate hourly VOC emissions; a similar CO-to-NOx ratio was developed to estimate hourly CO emissions for ARP units.

Emissions from the LDEQ point source database for all other non-ARP point sources were incorporated into the inventory without any adjustments. However, some basic quality assurance checks were performed on the point source data, including review of the largest emitters, review of important sectors such as electricity generation and refineries, and visual review of plotted stack coordinate data to ensure that all coordinates were located within the State of Louisiana. The 2010 ARP hourly emissions data was compared with the annual emission estimates contained in the LDEQ point source inventory database. In general, the summation of the 2010 hourly emissions data for the units subject to ARP equaled the annual estimates. However, in a few instances the summation of the 2010 hourly emissions data slightly exceeded the annual estimates. In these cases, it was assumed that the hourly emissions reported to EPA were correct.

Non-ARP point sources report annual emissions as tons per year (TPY). These sources were temporally allocated to month, day of week, and hours, according to source category code using default EPA profiles and cross-reference files. All point source emissions were speciated to CB6 compounds using default EPA profiles and cross-reference files. All acid rain point sources were treated as elevated sources. The non-ARP points were processed as elevated sources when stack information indicated a sufficient plume rise to warrant elevated treatment. All point source emissions were located in the CAMx grid system according to their reported coordinates.

5.2.1 Area Sources

Area sources comprise stationary sources that are not identified as individual points and are distributed over a large spatial extent (i.e. parish). Annual parish-level area source emissions inventory data were provided by the LDEQ (2012b). The inventory data were taken from the 2009 attainment demonstration for nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOC). Because of the proximity of the year for which data were obtained, it was decided that 2009 area source estimates would be used for 2010 without any projection. All data were checked for completeness (e.g., combustion categories had NOx, CO, and VOC emissions; solvent evaporation categories had VOC; all parishes had solvent evaporation and fuel combustion categories; etc.).

The VOC emissions were speciated to CB6 compounds. All sources were temporally allocated to month of year, day of week and hour of day using the EPA defaults by source category. The emissions were spatially allocated to the CAMx grid system by mapping source category code to a spatial surrogate code using the default EPA cross-reference file.

5.2.2 On-Road Mobile Sources

On-road mobile emissions are pollutants emitted from highway motor vehicles during both driving operation and while parked. However, emissions from the refueling of motor vehicles at service stations (Stage 2 Refueling) are included under area sources. Two models were used to develop the on-road mobile inventory for the full state of Louisiana:

- MOtor Vehicle Emission Simulator (MOVES);
- CONsolidated Community Emissions Processor Tool, Motor Vehicle (CONCEPT MV).

5.2.2.1 MOVES

This EPA regulatory model was run in the mode referred to as Emission Rate Calculation Type for individual Louisiana parishes using the County Scale/Domain with local data inputs provided by the LDEQ. Under this particular MOVES configuration, the model outputs emission factor tables in units of grams/mile or grams/vehicle/hour, depending on emission process (e.g. start or running). MOVES was run under a wide range of conditions to produce lookup tables so that relatively few MOVES runs produced emission factors applicable to many hours and grid cells. The model and database version used for this work were MOVES2010a and movesdb20100830, respectively.

The important MOVES inputs for emission factor calculations include temperature, humidity, fuels, inspection and maintenance (I/M) programs, vehicle fleet age distribution, and the ratio of vehicle-miles traveled (VMT) to vehicle population. The full range of meteorological conditions input to MOVES was determined by an analysis of WRF meteorological data using ENVIRON's MET2MOVES tool. LDEQ provided the other MOVES input data, including:

- Age Distribution, Fuels and I/M programs, by parish
- Annual average day VMT by road type and parish
- Vehicle population by parish for four source types:
    1. Motorcycle
    2. Passenger Car
    3. Passenger Truck
    4. Light Commercial Truck

After analysis of the MOVES input data, three distinct groups of parishes were selected due to their unique combinations of age distribution, fuel properties, and I/M programs. Table 5-2 shows the assignment of parish to the three representative parishes.

Table 5-2. Representative Louisiana parish groups for MOVES model runs.

East Baton Rouge Parish	Jefferson Parish	St. Tammany Parish			
I/M and RVP controls	*RVP controls only*	*Neither I/M nor RVP controls*			
Ascension	Beauregard	Acadia	De Soto	Natchitoches	Tangipahoa
East Baton Rouge	Calcasieu	Allen	East Carroll	Ouachita	Tensas
Iberville	Grant	Assumption	East Feliciana	Plaquemines	Terrebonne
Livingston	Jefferson	Avoyelles	Evangeline	Rapides	Union
West Baton Rouge	Lafayette	Bienville	Franklin	Red River	Vermilion
	Lafourche	Bossier	Iberia	Richland	Vernon
	Orleans	Caddo	Jackson	Sabine	Washington
	Pointe Coupee	Caldwell	Jefferson Davis	St. Helena	Webster
	St. Bernard	Cameron	La Salle	St. John the Baptist	West Carroll
	St. Charles	Catahoula	Lincoln	St. Landry	West Feliciana
	St. James	Claiborne	Madison	St. Martin	Winn
	St. Mary	Concordia	Morehouse	St. Tammany	

LDEQ specified fuel formulations and I/M properties by parish. For September 1-15, the Reid Vapor Pressure (RVP) of gasoline used was 7.8 psi in the 17 parishes represented by East Baton Rouge and Jefferson, with 9.0 psi in the remaining 47 parishes represented by St. Tammany in Table 5-2. For September 16 through Oct 31, LDEQ specified 11.5 psi RVP in all parishes. MOVES defaults were used for all other non-RVP gasoline parameters and for diesel fuel.

LDEQ specified using 2005 I/M programs in the 5-parish nonattainment area represented by East Baton Rouge in Table 5-2. The I/M program parameters shown below in MOBILE6-format were converted to MOVES-equivalent test standard identifications according to Table 3.10.4 of the technical guidance (EPA, 2010). Also per guidance (Appendix A-3 in EPA, 2010), the MOBILE6 vehicle classes were mapped to MOVES source types through the use of the MOVES I/M compliance factor percent.

```
* 2005 I/M and ATP for Baton Rouge Non-attainment Area

* I/M program On Board Diagnostics (exhaust)
*
I/M PROGRAM        : 1 2002 2050 1 TRC OBD I/M
I/M MODEL YEARS    : 1 1996 2050
I/M VEHICLES       : 1 22222 21111111 1
I/M STRINGENCY     : 1 20.0
I/M EFFECTIVENESS  : 0.75 0.75 0.75
I/M COMPLIANCE     : 1 96.0
I/M WAIVER RATES   : 1 0.0 0.0
I/M GRACE PERIOD   : 1 2

*
* Baton Rouge I/M programs (evaporative)
*
I/M PROGRAM        : 2 2000 2001 1 TRC GC
I/M MODEL YEARS    : 2 1980 2001
```

```
I/M VEHICLES       : 2 22222 21111111 1
I/M COMPLIANCE     : 2 96.0
*
I/M PROGRAM        : 3 2002 2006 1 TRC GC
I/M MODEL YEARS    : 3 1980 2006
I/M VEHICLES       : 3 11111 21111111 1
I/M COMPLIANCE     : 3 96.0
*
I/M PROGRAM        : 4 2002 2050 1 TRC EVAP OBD & GC
I/M MODEL YEARS    : 4 1996 2050
I/M VEHICLES       : 4 22222 11111111 1
I/M STRINGENCY     : 4 20.0
I/M COMPLIANCE     : 4 96.0
I/M GRACE PERIOD   : 1 2
*
I/M PROGRAM        : 5 2007 2050 1 TRC EVAP OBD & GC
I/M MODEL YEARS    : 5 2007 2050
I/M VEHICLES       : 5 11111 21111111 1
I/M STRINGENCY     : 5 20.0
I/M COMPLIANCE     : 5 96.0
I/M GRACE PERIOD   : 1
```

The parish-level age distributions provided by LDEQ were averaged for each representative parish using a weighted average of vehicle populations in constituent parishes. In the data provided by LDEQ, just four of the 13 source types had unique age distributions by parish: motorcycle, passenger car, passenger truck, and light commercial truck. The other nine source types each had a single age distribution identical to the rest of the state.

Lastly, the input ratio of VMT to population is important in MOVES because it directly affects the magnitude of evaporative hydrocarbon emission factors from parked vehicles. LDOTD provided annual average day VMT by parish, which needed to be further broken out to vehicle type. The disaggregation was performed using Louisiana's temporal profiles (discussed later). Population provided by LDEQ covered only four source types of 13. For the nine source types not included in the LDEQ dataset, we used MOVES2010a default annual mileage accumulation rates (miles/vehicle/year) and the disaggregated VMT dataset (VMT/year) to estimate the population for the nine source types. LDEQ provided 2011 data for both VMT and Population, which was used directly for the 2010 base year without adjustment.

After preparing all MOVES inputs, ENVIRON's RUNSPEC generator tool was run to automatically create the input files to run MOVES for all conditions in the episode and domain. Once MOVES runs had completed, a post-processing tool was used to reformat the emission factors for input to CONCEPT MV.

5.2.2.2 CONCEPT MV

The CONCEPT MV tool completely replaces EPS3 for the on-road mobile sector; the tool outputs air quality model-ready emissions files that are gridded, hourly, and speciated using the Carbon Bond version 6 (CB6) chemical mechanism. CONCEPT MV combines emission factors from MOVES2010a with VMT, vehicle population, and speed activity from transportation planning sources.

Louisiana on-road emissions were processed at the parish-level (as opposed to link level) with VMT input at the level of detail of parish and road type. Each episode day was processed one day at a time using hourly, gridded meteorological data (61 episode days).

Activity input to CONCEPT MV includes both VMT and vehicle population. CONCEPT MV gridded each activity type to the modeling domain using spatial surrogates according to road type or specific emissions type as shown in Table 5-3. The spatial surrogate assignments were based on EPA's cross-reference included in the SMOKE model.

Table 5-3. Spatial surrogates used in CONCEPT MV processing.

Surrogate	Surrogate Code	Applicability in CONCEPT
Urban Population	120	Grids all VMT from road type U19
Rural Population	130	Grids all VMT from road type R09
Urban Primary Roads	200	Grids all VMT from road types U11, U12, U14, U16
Rural Primary Roads	210	Grids all VMT from road types R01, R02, R06
Urban Secondary Roads	220	Grids all VMT from road type U17
Rural Secondary Roads	230	Grids all VMT from road types R07, R08
Urban and Rural Primary Roads	250	Grids Combination Long-haul Truck population for calculation of extended idling emissions only.
0.75 Total Roadway Miles + 0.25 Population	255	Grids all population for calculation of parked vehicle emissions (except from extended idling).

CONCEPT MV estimates hourly VMT from an annual average day by applying a series of temporal profiles for month of year, day of week, and hour of day. The monthly temporal profiles were provided by LDEQ and are shown by road type in Figure 5-1. These monthly temporal profiles tend to show higher VMT in summer months.

Figure 5-2 shows the day of week temporal profiles from Louisiana's previous SIP modeling, which we used again in the current work. The day of week profiles show generally lower VMT on Saturday and Sunday (exception for urban local roads, U19) and the profiles feature a single weekday day type with no variation Monday through Friday.

The hourly temporal profile patterns differ according to weekday or weekend. Figure 5-3 shows each relative distribution of daily VMT to hours. The hourly profiles came from two sources. Weekday hourly profiles were prepared by LDEQ in the previous SIP. A weekend hourly profile was provided by LDOTD, applicable to all road types. The weekday profile has more pronounced VMT peaks during commuter periods in the morning and afternoon rush hours.

A fourth and final type of temporal profile CONCEPT uses are hourly fleet mix temporal profiles. The weekday fleet mix was derived from the previous Louisiana SIP, and the weekend fleet mix was a daily average of weekday and specified as the same mix at all hours.

All of the VMT was temporally allocated from average day total to hour specific by vehicle class and allocated to the grid. Population was directly allocated to the grid.

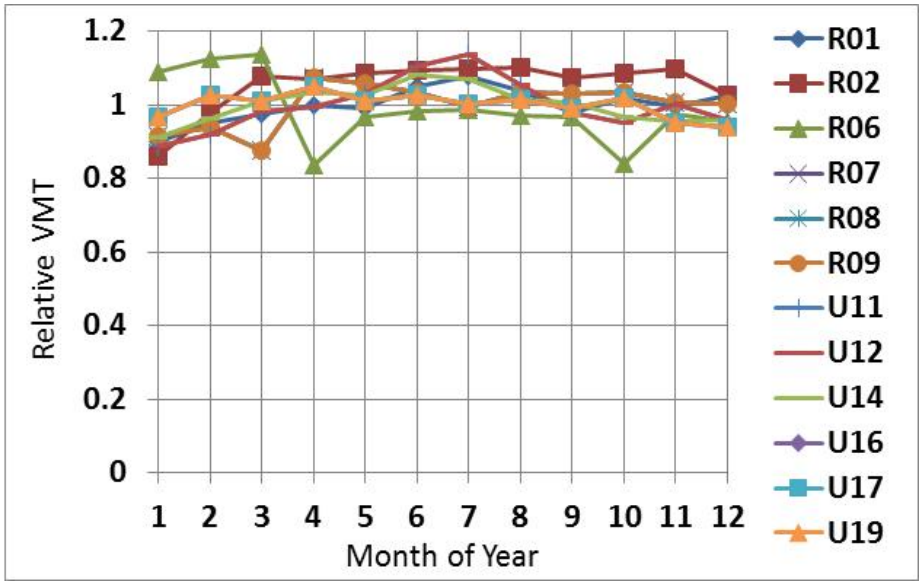


Figure 5-1. Monthly temporal profiles by roadway type.

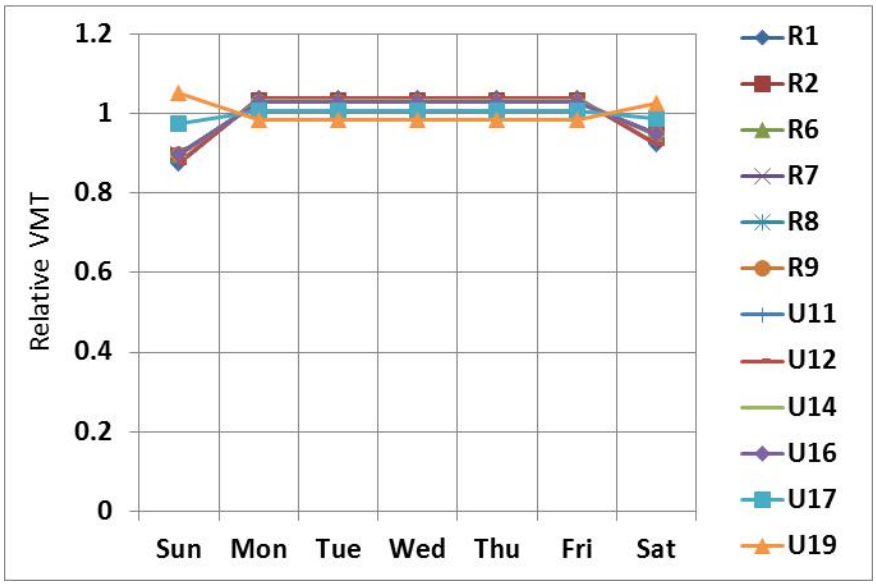


Figure 5-2. Day of week temporal profiles by roadway type.

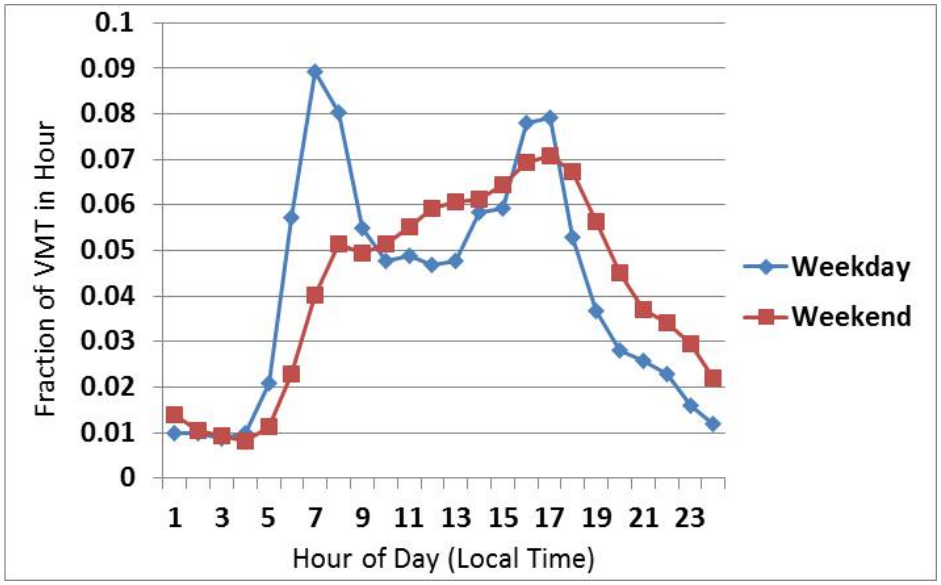


Figure 5-3. Hourly temporal profiles for all roadways on weekdays and weekends.

Daily average vehicle speeds by road type were provided by the DOTD. Provided speeds shown in Table 5-4 were 90% of the design speed for their conformity plan.

Table 5-4. Louisiana average vehicle speeds.

Road Type	Average Speed (mph)
Rural Interstate	63.0
Rural Principal Arterial	58.5
Rural Minor Arterial	49.5
Rural Major Collector	45.0
Rural Minor Collector	36.0
Rural Local	27.0
Urban Interstate	58.5
Urban Other Expressway	58.5
Urban Principal Arterial	49.5
Urban Minor Arterial	45.0
Urban Collector	36.0
Urban Local	27.0

In summary, CONCEPT MV temporally allocated average day VMT to hourly by vehicle type using temporal profiles. The model then gridded the VMT using spatial surrogates according to roadway type and vehicle population using a combination of spatial surrogate. CONCEPT MV looked up the MOVES emission factors closest to the road type speed and grid cell temperature and humidity and interpolated the emission factor. After this interpolation, CONCEPT MV multiplied emission factors in grams/mile with the hourly gridded VMT and emission factors in grams/vehicle/hour with the gridded vehicle populations to calculate the full inventory. Figures 5-4 and 5-5 show a snapshot of the modeling episode at 8-9 AM on September 1, 2010. Figure 5-4 shows the species nitrous oxide (NO) and Figure 5-5 shows alkane ("PAR") emissions in units of moles/hour.

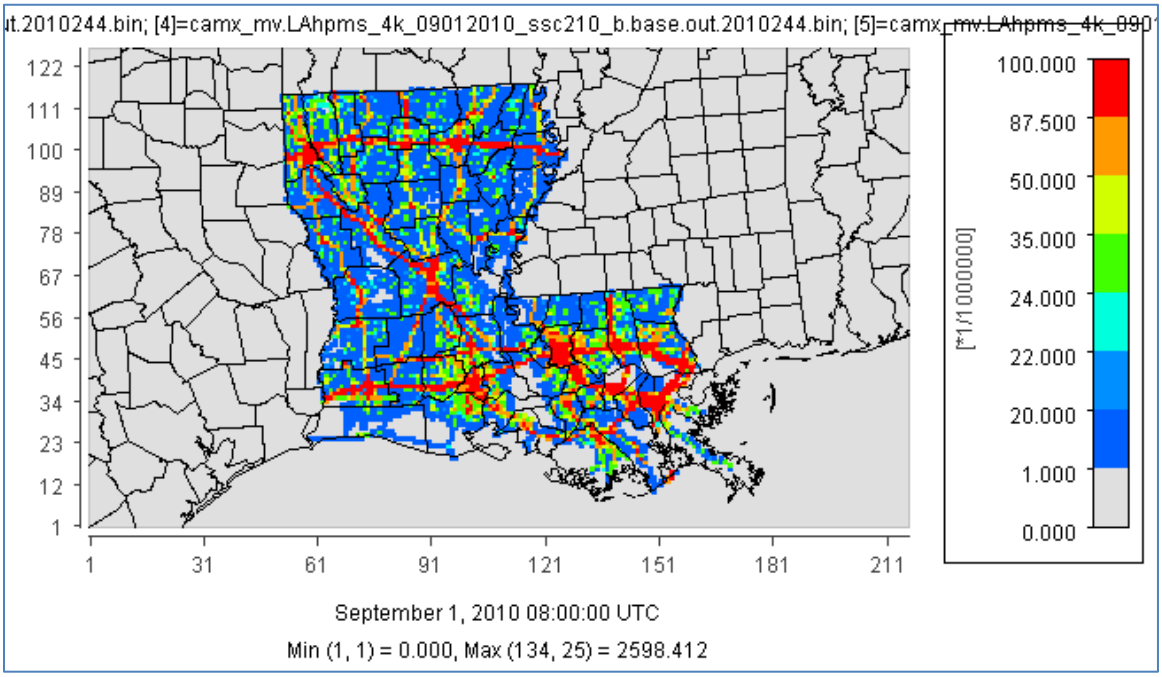


Figure 5-4. Louisiana on-road NO emissions (mol/h) during 8-9 AM LST September 1, 2010.

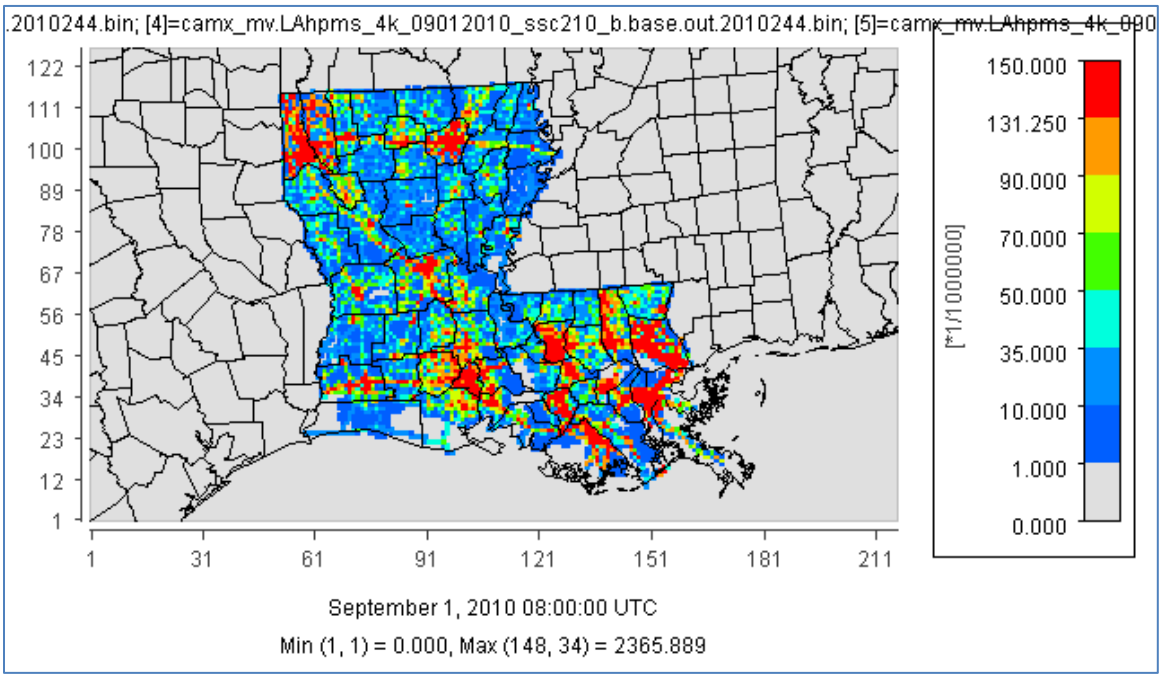


Figure 5-5. Louisiana on-road alkane (PAR) emissions (mol/h) during 8-9 AM LST September 1, 2010.

5.2.3 Off-Road Sources

The EPA's NMIM was used to generate Louisiana statewide parish-level off-road equipment emissions estimates for September and October 2010. NMIM is a tool for estimating on-road and non-road emissions by county for the entire US to support updates to the EPA National Emissions Inventory (NEI). For this modeling effort NMIM version NMIM20090504 was run with county database NCD20090531 and NONROAD2008a. Emissions were estimated from off-road equipment in the following categories:

- Agricultural equipment, such as tractors, combines, and balers;
- Airport ground support, such as terminal tractors and supply vehicles;
- Construction equipment, such as graders and back hoes;
- Industrial and commercial equipment, such as fork lifts and sweepers;
- Residential and commercial lawn and garden equipment, such as leaf blowers;
- Logging equipment, such as shredders and large chain saws;
- Recreational equipment, such as off-road motorbikes and ATVs; and
- Recreational marine vessels, such as power boats.

Local data were used for gasoline fuel parameters with guidance from LDEQ and to be consistent with the on-road mobile inventory. All non-gasoline equipment used default parameters. Gasoline sources used non-default gasoline fuel RVP values. For September 1 through September 15, inclusive, the set of parishes listed in Table 5-5 had an RVP of 7.8 psi. Outside these parishes gasoline was assigned an RVP of 9 psi. After September 15 all parishes used 11.5 psi RVP gasoline.

Table 5-5. Parishes assigned 7.8 RVP for episode days September 1- 15, 2010.

Parish	
Ascension	Livingston
Beauregard	Orleans
Calcasieu	Pointe Coupee
East Baton Rouge	St. Bernard
Grant	St. Charles
Iberville	St. James
Jefferson	St. Mary
Lafayette	West Baton Rouge
Lafourche	

In order to support the different gas RVP values NMIM was run with:

1. Non-gasoline equipment run for September and October (default fuel parameters)
2. Gasoline-only equipment run for September and October with 11.5 psi, all parishes
3. Gasoline-only equipment run for September with 7.8 psi to represent Table 5 parishes

4. Gasoline-only equipment run for September with 9 psi, to represent parishes outside the Table 5-5 list.

Run types 3 and 4 representing September 1-15 were averaged with run 2 representing September 16-31 to determine average September day emissions.

For quality assurance, the Louisiana (compiled) inventory was compared with a simple state-wide Louisiana NMIM/NONROAD run for September and October. The expectation was that non-gasoline emissions would match exactly for both September and October. Gasoline emissions would be similar between runs, with differences in magnitude attributable to RVP. Differences were primarily in evaporative total organic gasses (TOG).

Using EPS3, the off-road emissions were speciated to CB6 compounds, temporally allocated to day of week and hour of day, and spatially allocated using EPA default source category cross-reference files.

NONROAD and NMIM do not include emission estimates for railroad locomotives, aircraft, and marine vessels (excluding maintenance equipment). Louisiana emissions for locomotives and aircraft were extracted from the EPA 2008 NEI (version 2) and processed as area sources. The development of emissions from commercial marine vessels is described next.

5.2.4 Commercial Marine Vessels: Shipping Channels and Ports

Emissions from commercial marine vessels servicing the ports along the Mississippi River and the Port of Lake Charles were processed separately from other area sources.

ENVIRON (2010) updated the commercial marine shipping emissions inventory for the State of Louisiana for the year 2006. This emissions inventory was further modified for the 2010 Base Year. The inventory is based on the latest estimates from the EPA for “Category 3” ocean-going vessels. The EPA estimates are provided by port and by transit mode in a spatially precise and accurate link-based format that is suitable for emissions processing. These data were reformatted for input to the EPS3 PRESHP module. PRESHP is a link-based module specifically designed to handle shipping lane emissions. Five Louisiana ports were processed:

- Baton Rouge
- Lake Charles
- New Orleans
- Port of Plaquemines
- Port of South Louisiana

These data include the following transit modes:

- Hoteling (at port, auxiliary engines only, no propulsion engines used)
- Maneuvering (at or near port)

- Reduced Speed Zone (RSZ; navigating away from a port towards the open ocean, often through a river system)
- Cruise Mode (CM; the vessel is away from constrained waterways and traveling at cruise speed)

The hoteling and maneuvering emissions were modeled as points located at the port center. The RSZ emissions were modeled as line emission sources, which are defined as multiple straight line segments with known endpoint coordinates. The CM emissions were not used for the current project to avoid double counting emissions with the existing ocean traffic emissions inventory developed from the BOEM database (see Gulf Sources below).

EPA shipping emissions were estimated as total annual emissions for 2002. Previous LDEQ emissions were prepared for 2006 (ENVIRON, 2010). To obtain 2010 emissions, the 2006 emissions were scaled based on growth and control factors. Growth factors were based on the annual total commodity tonnage summary from the US Army Corp of Engineers (USACE) Waterborne Commerce Statistics, principal ports database (http://www.ndc.iwr.usace.army.mil/data/datappor.htm). Table 5-6 provides a summary of commodities processed using the total tonnage for the 5 Louisiana ports. The growth factor from 2006 to 2010 was estimated as 1.0035.

Table 5-6. Principal Ports Commodity Tonnage by year.

Year	Louisiana Combined Principal Ports Commodity Tonnage	Growth Factor
2002	468,612,466	1.0000
2003	453,217,009	0.9671
2004	468,528,396	0.9998
2005	438,011,524	0.9347
2006	473,034,017	1.0094
2007	482,759,763	1.0302
2008	466,330,458	0.9951
2009	435,745,874	0.9299
2010	474,661,368	1.0129
2010/2006	-	1.0035

EPA estimated NOx control factors for the year 2020 for different engine/ship types. These values were interpolated from 2006 values to estimate a 2010 control factor for NOx as 0.9781.

The growth and control factors were applied to adjust the 2006 emissions to estimated 2010 emissions. The emissions were projected to the 4 km modeling grid shown in Figure 4-1. Ocean going vessels typically emit from stacks that are between 40–60 m in height. This corresponds to the second vertical layer in the CAMx model, which spans from 32 m to 81 m. For this application plume heights for all transit modes were set to 56 m, ensuring that emissions were injected into the second model layer. No temporal variation was assigned, i.e.

the emissions were assumed to be constant in time. Figure 5-6 is an example of the spatial distribution of 24 hr average NOx emissions.

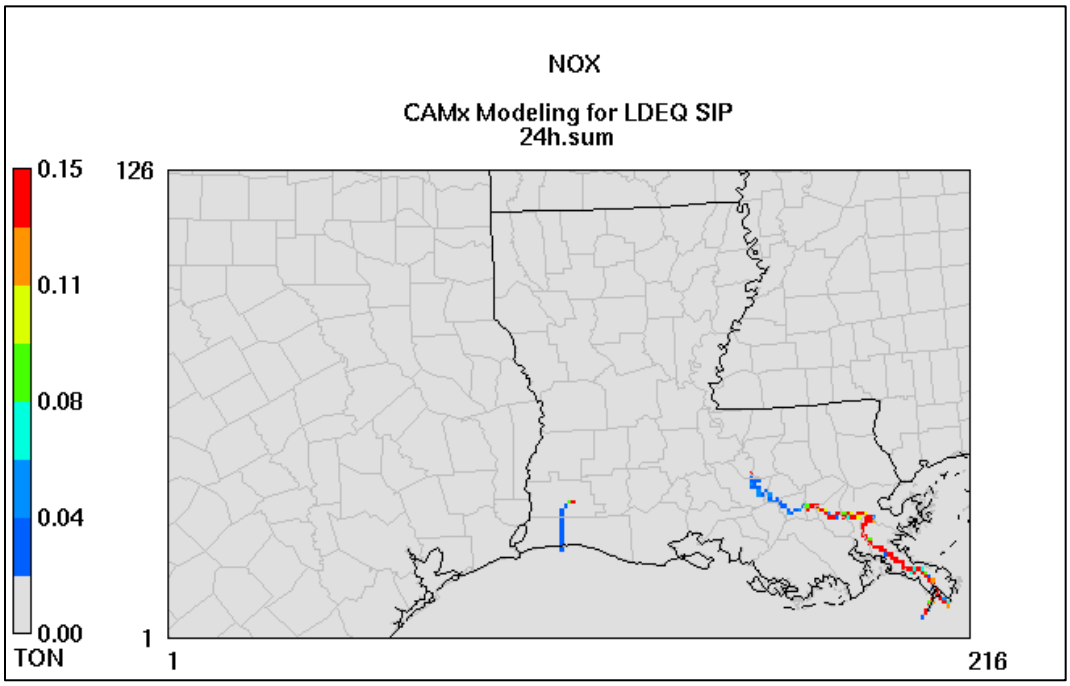


Figure 5-6. 24-hour commercial marine shipping NOx emissions at Louisiana deep draft ports and along RSV shipping lanes.

5.2.5 Port Fourchon

According to LDEQ, emission estimates may have been historically underestimated for Port Fourchon, which is a harbor located on the Gulf coast in southeastern Louisiana that specifically supports offshore oil and gas development activities. Emission estimates were updated based on a report by Starcrest Consulting Group, LLC and Louisiana State University (2010). Figure 5-7 is an image of the emissions summary (Table 2.1) from that report. The off-shore source estimates from this table were not included as they are already represented in the Gulf platform and non-platform inventories from the BOEM data (discussed below).

The Port Fourchon emission estimates were spatially allocated to two grid cells that the port spans. The coordinates of the port were acquired from Wikipedia and plotted in GIS overlaying a street map and imagery layer with the 4 km grid. Based on a visual inspection of the plot (Figure 5-8) the Port Fourchon emission estimates were distributed equally between two grid cells.

Table 2.1: Summary of Estimated Emissions

Source Category	NO_x	VOC	CO
Marine Vessels	**10.0**	0.36	1.15
Cargo Handling Equipment	**0.30**	0.03	0.07
Heavy-Duty Vehicles	**0.14**	0.01	0.03
Aircraft	**0.22**		0.63
Off-Shore Non-Platform Sources	**12.1**	2.3	2.8
Off-Shore Platform Sources	**7.6**	4.3	9.1
Total	**30.4**	**7.0**	**13.8**

Figure 5-7. Table 2.1 from the Port Fourchon Ozone Day Port-Related Emissions Inventory Study (Starcrest and LSU, 2010).

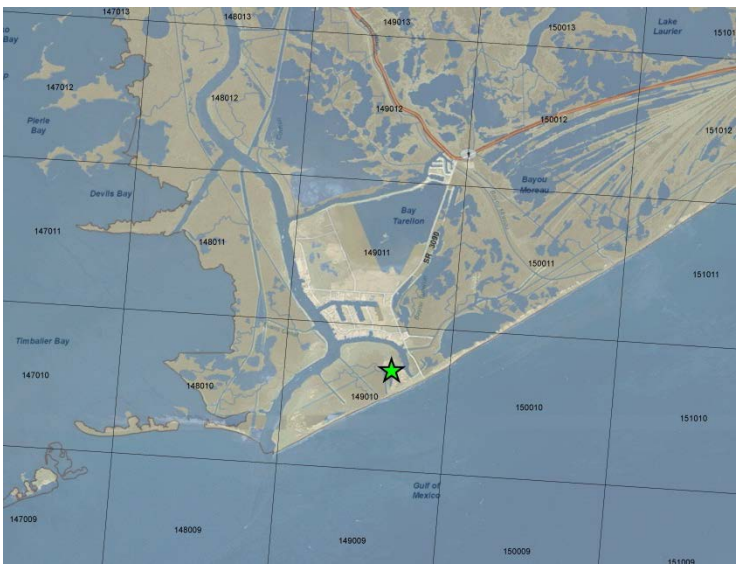


Figure 5-8. Port Fourchon with 4 km grid overlay.

5.2.6 Haynesville Shale

The Haynesville Shale is a rock formation that lies at depths of 10,000 to 13,000 feet below the surface and straddles the border between Northeast Texas and Northwest Louisiana near Shreveport. This formation is estimated to contain very large recoverable reserves of natural gas, and during the first two years since the drilling of the first highly productive wells in 2007-2008, it was the focus of aggressive exploration and leasing activity.

In 2009, Northeast Texas Air Care (NETAC; www.netac.org), a local stakeholder group comprised of representatives of local government, business and industry, the general public, and environmental interest groups, undertook a study to investigate how development in the Haynesville Shale may impact future ozone air quality in Northeast Texas. Well production data, the historical record of activity in the nearby Barnett Shale, and other available literature were used to project future activity in the Haynesville Shale. Annual natural gas production for the years 2009-2020 was estimated for three scenarios corresponding to aggressive, moderate, and limited development of the Haynesville Shale (Grant et al., 2009).

The 2009 study generated model-ready emission inventories of Haynesville Shale sources for the year 2012. These emissions data included low, moderate, and high scenarios for each of three general sources categories (exploration, production, and "midstream" processing), resulting in a total of nine separate inventories. Specific 2012 model-ready inventories for the exploration category (drill rigs and other non-road sources) and the production category (wells) were incorporated into the 2010 Louisiana emissions inventory. Based on a review of the actual 2010 reported well counts, the limited development (low) scenario for 2012 production sources most accurately reflected 2010, while the number of drill rigs in 2010 was comparable to the aggressive (high) scenario for 2012 exploration sources. The midstream sources (e.g., permitted compressor stations and gas processing plants) were assumed to be included in the Louisiana 2010 point source permitting inventory and no adjustment was made to reflect any different emissions in 2010 from these specific Haynesville sources.

Spatial allocation of the Haynesville Shale emissions was based on Louisiana Department of Natural Resources, Haynesville Shale wells data in GIS shape files. These were obtained from http://sonris-www.dnr.state.la.us/gis/agsweb/arcgisserver/arcgisoutput/extData/shp/Haynesville_wells.zip. Active well location data for 2010 were used as weight factors in developing the spatial surrogates.

5.3 Gulf Sources

There are a number of emission sources located in the Gulf of Mexico (GoM). Emissions from the GoM were obtained from the Year 2008 Gulfwide Emission Inventory Study (BOEM, 2010). Emissions were obtained for both platform sources and non-platform sources.

The platform source emissions included a wide number of emission sources, including: amine units, boilers/heaters/burners, diesel and gasoline engines, drilling rigs, combustion flares, fugitives, glycol dehydrators, flashing losses, mud degassing, natural gas engines and turbines, pneumatic pumps, pressure/level controllers, storage tanks, and cold vents.

The non-platform sources consisted of oil and gas production-related and non-production related sources. The production-related sources included drilling rigs, pipelaying operations, support helicopters, support vessels, and survey vessels. The non-production-related sources included: biogenic and geogenic emissions, commercial fishing vessels, commercial marine vessels, the Louisiana Offshore Oil Port (LOOP), military vessels, and vessel lightering.

The 2008 platform source emissions were projected to 2010 using lease-specific projection factors based upon 2008 and 2010 total oil and gas production quantities converted to a BTU-basis (BOEM, 2012). If lease-specific production quantities were unavailable for either 2008 or 2010, then a GoM average projection factor of 0.901, based upon GoM-wide production, was used to project 2008 emissions to 2010.

The 2008 non-platform source emissions associated with production were projected to 2010 using a GoM average projection factor of 0.901 based upon GoM-wide production quantities for 2008 and 2010. It was assumed that the 2008 non-platform source emissions not associated with production were representative of 2010, so the 2008 emissions were carried forward to 2010 without any projection.

5.4 Anthropogenic Emissions Outside of Louisiana

Anthropogenic emission estimates for states outside of Louisiana, as well as for Canada, Mexico, and commercial marine shipping outside the Gulf of Mexico, were developed by Alpine Geophysics. Alpine developed a 2008 inventory on the Regional Planning Organization (RPO) continental US (CONUS) domain for several concurrent regional modeling programs, and provided these data for use in this project. The inventory was based on the most complete and consistent inventory available at the time modeling commenced; namely, version 2 of the 2008 National Emission Inventory (2008 NEIv2, publicly released on the NEI website on April 10, 2012). A draft Technical Support Document (TSD) for the 2008 NEIv2 has been developed by EPA and is available at http://www.epa.gov/ttn/chief/net/2008neiv2/ 2008_neiv2_tsd_draft.pdf.

The EPA maintains and updates the NEI every three years, which consists of a comprehensive and detailed estimate of air emissions of both criteria and hazardous air pollutants from all air emissions sources in the US by county as well as for Canada and Mexico. The NEI is based primarily upon emission estimates and emission model inputs provided by State, Local, and Tribal air agencies for sources in their jurisdictions, and supplemented by data developed by the EPA. The 2008 NEIv2 contained the most recent updates to the point, nonpoint (other area), non-road, and on-road motor vehicle emissions categories. All source categories except county-level on-road and commercial marine shipping outside the Gulf of Mexico were processed.

On-Road Mobile sources were separately developed using the MOVES2010a model in “inventory mode”, run for each US county outside of Louisiana, using a representative weekday/weekend day activity per month. Marine shipping emissions outside of the Gulf of Mexico were developed for 2008 using an inventory derived from the EPA 2005v4.1 modeling platform (ftp.epa.gov/EmisInventory/2005v4.1, April 2011).

The 2008 inventories were processed by Alpine using the EPA Sparse Matrix Operator Kernel Emissions (SMOKE, v3.1) processor using the ancillary data for spatial, temporal, and speciation distribution supplied with the emissions input files. SMOKE was used to generate gridded,

speciated, temporally allocated emissions for the 36, 12, and 4 km modeling domains. The 2008 data were used for the 2010 base year modeling without year-to-year adjustment.

5.5 Biogenic Emissions

Biogenic sources are important contributors to air emissions in North America and must be combined with anthropogenic emissions for photochemical model simulations. The Model of Emissions of Gases and Aerosols from Nature (MEGAN) version 2.10 (ENVIRON, 2012) was initially used to develop the biogenic emissions inventory. Subsequently, BEIS was run by Alpine Geophysics as an alternative source of biogenic emissions, which was successful in reducing over predicted isoprene emissions that were shown in CAMx simulations to contribute to ozone over predictions throughout the domain. The biogenic emissions from MEGAN and BEIS are gridded, hourly files formatted for input to the CAMx model using the CB6 chemical mechanism.

5.5.1 MEGAN Processing

MEGAN estimates net emissions of gases and aerosols from terrestrial ecosystems to the atmosphere (Sakulyanontvittaya, 2008; Guenther et al., 2006). Emission calculations are driven by land cover, weather, and atmospheric chemical composition. MEGAN has global land cover data with a base resolution of approximately 1 km^2. The latest version of MEGAN includes an explicit canopy environment, updated emission algorithms, and a soil NOx emission model that accounts for fertilizer application and precipitation. Land cover and emission factor inputs were updated with: 1) Leaf Area Index (LAI) based on improved 2008 satellite data products with 8-day temporal resolution, 2) improved Plant Functional Type fractional (PFTf) coverage data based on 30-meter 2008 LANDSAT TM data; and 3) emission factors based on recent emission measurements and improved U.S. species composition data.

The LAI dataset provided with MEGAN contains a set of 46 eight-day 1-km spatial resolution LAIv files for North America which were developed from 2008 NASA MODIS LAI product version 5 (ENVIRON, 2012). The dataset has been reviewed using ARCGIS and eco-region average, minimum, and maximum values were examined for quality assurance. The default LAI data in ESRI 1-km GRID format were interpolated using a zonal average method and reformatted to text format for the modeling grid.

The PFTf dataset provided with MEGAN contains a set of 9 PFTf data files with 56-m or 1-km resolution for the contiguous US, which were developed from 2008 National Land Cover Dataset (NLCD) with 30-meter resolution and 2008 Cropland Data Layer (CLD) with 56-meter resolution (ENVIRON, 2012). MEGAN includes a total of 17 PFTs but 8 types (e.g., tropical and boreal PFTs) do not occur within the CAMx modeling domain. The 9 PFTf files that do occur are for needle leaf evergreen tree, needle leaf deciduous tree, broadleaf evergreen tree, broadleaf deciduous tree, broadleaf deciduous shrub, cold grass, warm grass, other crops, and corn categories. Each file was reviewed in ARCGIS and ecoregion average and minimum and maximum values were examined for quality assurance. The dataset was processed in the same manner as LAI.

MEGAN calculates emissions for 20 categories of biogenic compounds. Some are individual compounds while others represent groups of compounds that are then allocated to individual compounds using built-in speciation profiles. Geo-gridded emission factor maps were calculated based on plant species composition and plant species specific emission factors for 10 biogenic compounds; isoprene, methyl butenol, nitric oxide (NO), and 7 monoterpenes. PFT-average emission factors are combined with the geo-gridded PFTs for an additional 10 categories. The emission factor map data was processed using a zonal average method and reformatted from ESRI GRID format to text format for the modeling domain.

MEGAN requires meteorological data near the surface, such as temperature, solar radiation, and wind speed to drive emission algorithms. For this project, we processed the WRF data using MCIP version 4 for August - November, 2010. This provides all parameters needed for the emission estimates.

Photosynthetically Active Radiation (PAR) is an important driving variable for MEGAN. MEGAN provides two options for PAR input data; solar radiation from a meteorological model (in MCIP output format) or PAR data from satellite observation. MCIP data are usually available and have no problems with missing data, but are subject to uncertainties in simulated cloud cover (a parameter for which PAR is very sensitive). MEGAN internally estimates PAR from MCIP solar radiation data by assuming 45% of the solar radiation is in the 400-700 nm spectral region. Usually satellite data provide a better approximation of PAR but are subject to missing data periods. The development of 2010 biogenic emission for this project used the predicted solar radiation from WRF/MCIP because satellite PAR data were not available for this period.

MEGAN estimates emissions for 150 chemical species, which were converted into CB6 model compounds for CAMx modeling. Biogenic emissions were processed for each hour of each day on all three of the 36/12/4 km modeling grids. The time zone of the data was set to CST. The inventories were visually checked for quality assurance.

5.5.2 BEIS Processing

Alternative biogenic emissions were processed using BEIS3.14 contained in the SMOKE3.1 emissions processing system (http://www.cmascenter.org/). Reference emission files for BEIS3.14 rely on the BELD3 (Biogenic Emissions Landuse Database, version 3) available at http://www.epa.gov/ttn/chief/emch/biogenic/. This North American database contains fractional area information on 230 individual forest, grass, and crop types at 1-km horizontal resolution. Tools for spatial allocation of BELD3 data into common user defined grids are also available at this website. As part of the reference emission preprocessing, BEIS3.14 contains season-specific and vegetation-specific information for emissions of 33 individual VOC species (including isoprene and 14 monoterpenes), biogenic/agricultural NO, and LAI (Leaf Area Index) information needed in the canopy light dependence calculations of isoprene, methanol and methyl-butenol.

The BELD3 files were used to develop the required input data for the 36, 12 and 4 kilometer grids. The project specific gridded hourly meteorological data generated by WRF for 2010 were used to produce hourly, temperature adjusted biogenic emissions.

5.6 Wildland, Agricultural, and Prescribed Fires

Fire emissions were based on the FINN version 1 dataset, which were downloaded from http://bai.acd.ucar.edu/Data/fire/. The global dataset contained daily emissions for each satellite pixel, which represented an area of approximately 1 km^2. Emission species included NO, NO_2, $PM_{2.5}$, CO, and non-methane organic compounds (NMOC) speciated into MOZART-4 species for six fire types – tropical, temperate, and boreal forests, cropland, shrublands, and grasslands. The data were windowed to the 36/12/4 km modeling grids and mapped to CAMx CB6 speciation. Fire points within 5 km of one another were assumed to be part of the same fire and assigned properties of a larger fire.

The daily fire emissions were then processed from August to October, 2010 using an updated version of EPS3 (version 3.20). EPS3 incorporated the WRAP methodology to temporally and vertically (by altitude) allocate the fire emissions. Temporally, the same diurnal profile was applied to all fires such that emissions were highest in the early afternoon and lowest at night. Vertically, a fraction of each hour's emissions was assigned to the lowest layer; the rest was distributed into multiple point sources directly above with one point assigned to each CAMx layer between the plume bottom and plume top, weighted by the thickness of each layer. The fraction in layer 1 and the plume bottom and top were all dependent on the hour of the day and size of the fire. All emissions were output into a point source file and flagged with no additional plume rise.

Figure 5-9 shows monthly total NOx emissions for September and October, 2010. Near Louisiana, fire emissions were highest in eastern Arkansas, especially in September and October due to crop burning.

5.7 Summary of 2010 Louisiana Emissions

Parish level emissions for 2010 are reported in Table 5-6. As biogenic and fire emissions are not reported at the county level they are not included in this comparison. Figures 5-10 through 5-12 show examples of the spatial distribution of total model-ready 2010 weekday low-level (gridded – not including point sources) emission of NOx, CO, and VOC over the 4 km modeling domain.

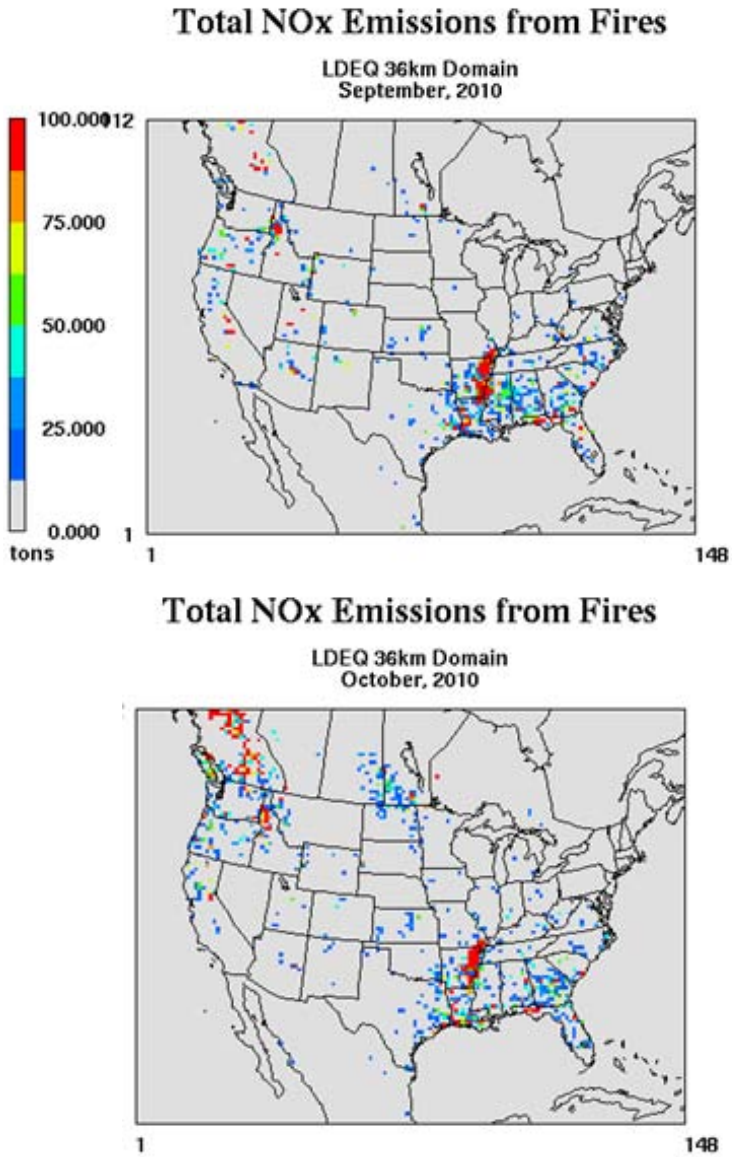


Figure 5-9. FINN-based fire NOx emissions for September and October 2010.

Table 5-7. Summary of 2010 Louisiana emissions (tons/day) for typical September weekday.

Parish	NOx Area	NOx Off-road	NOx On-road	NOx Points	CO Area	CO Off-road	CO On-road	CO Points	VOC Area	TOG Off-road	TOG On-road	VOC Points
Acadia	1.08	1.56	5.35	8.08	2.12	6.28	35.04	3.16	4.26	0.96	4.51	1.33
Allen	0.31	0.83	2.16	1.65	1.33	1.77	13.04	2.95	1.70	0.18	1.68	0.19
Ascension	3.01	1.63	5.48	20.01	15.75	9.99	36.98	10.75	22.05	0.83	4.74	8.44
Assumption	0.87	0.44	2.85	3.33	13.32	2.12	25.98	2.52	2.15	0.31	5.42	1.42
Avoyelles	0.82	1.47	2.96	0.38	8.95	4.75	19.21	0.17	3.30	0.60	2.69	0.07
Beauregard	0.51	1.49	3.42	7.51	1.42	6.31	21.55	6.50	2.40	1.41	2.56	2.88
Bienville	2.52	0.66	3.11	5.58	2.40	1.97	16.11	2.92	1.75	0.26	1.54	1.51
Bossier	4.25	2.90	7.94	1.87	10.42	12.99	56.67	1.38	4.07	1.68	7.36	1.41
Caddo	11.68	6.69	15.03	4.06	10.43	53.59	105.24	2.39	14.91	4.86	13.23	3.19
Calcasieu	4.67	5.14	11.11	56.06	10.86	31.62	78.18	39.58	31.45	5.56	8.27	19.07
Caldwell	0.07	0.72	1.58	0.15	0.44	1.44	9.54	0.01	0.93	0.20	1.33	0.01
Cameron	0.31	0.56	1.01	4.01	1.77	8.00	6.01	2.03	1.25	2.97	0.73	2.13
Catahoula	0.22	0.85	1.51	0.00	2.29	2.71	8.46	0.00	1.03	0.42	1.00	0.00
Claiborne	0.25	0.32	2.23	0.70	0.76	3.20	11.97	1.01	1.68	0.76	1.49	0.22
Concordia	0.08	1.04	1.99	0.00	0.39	4.62	11.92	0.00	1.66	1.08	1.41	0.00
De Soto	24.65	1.25	4.87	19.24	16.67	4.94	26.35	8.58	7.88	0.95	2.43	7.44
E Baton Rouge	5.73	5.42	15.95	30.25	5.34	51.87	112.75	30.82	32.99	4.13	15.38	17.85
East Carroll	0.18	1.20	1.28	0.33	2.22	1.89	6.73	0.08	0.62	0.30	0.61	0.04
East Feliciana	0.15	0.31	1.53	0.79	0.60	2.42	9.14	0.25	0.91	0.64	1.28	1.31
Evangeline	0.54	0.88	2.76	2.81	3.41	4.03	16.63	9.32	5.81	0.87	2.12	0.52
Franklin	0.20	1.03	1.46	0.28	0.60	2.84	9.95	0.15	1.24	0.32	1.51	0.04
Grant	0.26	0.93	2.42	0.54	1.04	3.07	13.14	2.43	1.22	0.79	1.42	0.39
Iberia	2.63	1.82	2.19	4.63	21.39	12.16	15.57	4.49	6.34	1.30	1.92	1.96
Iberville	2.30	1.38	2.08	21.80	17.82	4.22	11.92	14.65	18.10	0.55	1.41	6.53
Jackson	0.65	0.26	1.68	4.81	1.08	1.92	9.64	4.66	1.16	0.24	1.27	2.04
Jefferson	7.51	8.25	12.53	37.62	6.19	67.48	104.01	4.14	27.99	7.20	15.47	1.93
Jeff Davis	0.38	1.70	3.72	2.48	3.63	5.51	21.46	0.62	4.30	0.89	2.13	0.24
Lafayette	3.23	3.84	9.70	5.85	7.79	36.66	72.92	0.48	9.70	4.39	8.52	0.35
Lafourche	12.65	1.52	4.70	5.22	15.01	11.09	34.99	4.47	8.79	2.03	4.02	2.40
La Salle	0.21	0.47	1.91	0.42	0.42	2.53	10.49	0.11	1.18	0.40	1.20	0.04
Lincoln	0.83	1.20	4.86	4.10	2.38	6.28	29.37	1.47	3.07	0.47	2.88	0.87
Livingston	0.95	1.05	6.08	0.18	10.51	7.81	41.26	0.79	4.59	1.38	5.75	0.76
Madison	0.14	2.05	3.31	0.20	1.70	3.01	17.10	0.06	1.16	0.43	1.11	0.12
Morehouse	0.65	1.75	2.88	1.95	4.09	3.51	17.96	0.30	1.73	0.40	2.42	0.06
Natchitoches	1.28	1.19	5.97	6.53	3.46	4.42	32.50	3.81	4.62	0.63	3.09	3.39
Orleans	4.67	4.74	10.57	14.35	3.83	48.30	77.37	5.32	10.50	6.63	8.02	1.10
Ouachita	3.53	3.08	9.10	11.66	9.72	20.79	64.76	9.13	13.97	3.10	8.12	7.27
Plaquemines	0.83	1.34	1.06	36.05	1.36	16.04	8.02	10.27	3.39	4.62	1.36	6.01
Pointe Coup	1.25	1.60	1.88	44.98	21.39	4.50	11.10	105.06	2.71	0.54	1.19	2.09

Parish	NOx Area	NOx Off-road	NOx On-road	NOx Points	CO Area	CO Off-road	CO On-road	CO Points	VOC Area	TOG Off-road	TOG On-road	VOC Points
Rapides	1.75	2.96	11.46	14.99	7.46	15.91	73.36	9.27	9.26	1.93	8.08	1.60
Red River	13.22	0.65	1.70	0.56	8.61	2.57	11.30	0.42	2.52	0.72	1.83	0.34
Richland	0.50	1.44	3.42	2.00	6.49	2.56	17.59	0.94	1.89	0.27	1.56	0.31
Sabine	0.42	1.38	2.82	0.53	1.08	4.77	16.01	1.28	2.17	1.21	1.97	0.49
St. Bernard	0.73	0.79	0.73	11.19	0.61	9.50	6.87	4.92	0.94	2.47	1.14	3.47
St. Charles	2.11	1.58	3.51	37.62	2.31	8.42	23.71	22.56	14.96	1.32	2.48	12.74
St. Helena	0.11	0.12	0.90	1.11	0.52	0.72	5.82	0.33	1.49	0.08	0.87	0.25
St. James	0.90	0.88	1.44	14.91	1.17	2.72	8.72	6.52	6.20	0.30	0.98	3.92
St. J Baptist	1.07	1.05	3.64	14.28	2.88	5.89	23.98	5.17	5.57	1.15	2.63	4.51
St. Landry	1.21	2.64	6.64	3.81	8.65	8.79	42.24	1.51	5.45	1.27	5.16	2.11
St. Martin	1.49	0.80	3.71	2.72	14.84	6.72	24.62	1.80	4.48	1.79	3.02	1.34
St. Mary	2.46	1.73	2.60	21.26	13.83	10.33	18.63	19.40	9.56	1.35	2.14	3.66
St. Tammany	1.82	3.85	13.27	0.07	15.81	36.33	98.25	0.00	9.64	7.12	13.49	0.05
Tangipahoa	1.37	1.68	9.41	0.02	5.79	14.14	61.21	0.19	5.95	2.55	6.91	0.34
Tensas	0.18	1.03	1.25	0.00	3.65	2.15	6.07	0.00	1.37	0.41	0.52	0.00
Terrebonne	1.92	2.30	5.00	2.89	3.55	25.98	39.91	3.70	4.41	5.13	6.06	1.82
Union	0.73	0.43	2.57	0.55	3.26	3.87	14.15	0.32	2.50	0.47	1.78	0.45
Vermilion	1.31	1.47	3.25	9.40	11.64	11.63	21.92	3.52	3.85	2.57	3.15	1.46
Vernon	0.19	1.21	3.91	0.14	1.13	4.74	24.50	0.08	1.90	0.94	3.27	0.12
Washington	0.82	0.45	1.98	11.11	2.88	3.20	14.24	21.17	3.47	0.30	2.28	4.78
Webster	1.69	0.85	4.02	3.16	2.69	4.35	24.89	2.67	4.40	0.47	2.74	1.79
W Baton Rouge	1.26	0.84	2.23	3.21	6.26	7.61	12.59	6.36	4.08	1.06	1.22	1.68
West Carroll	0.37	0.55	0.87	2.38	7.21	1.42	5.46	0.23	1.18	0.14	0.78	0.06
West Feliciana	0.32	0.29	0.95	1.34	1.16	1.51	5.47	1.29	0.87	0.24	0.69	0.33
Winn	0.41	0.27	2.81	0.88	0.75	1.91	14.53	3.60	2.42	0.20	1.32	2.25
Total	144.39	105.79	276.31	530.61	378.48	676.38	1847.05	414.08	379.09	100.75	228.67	156.51

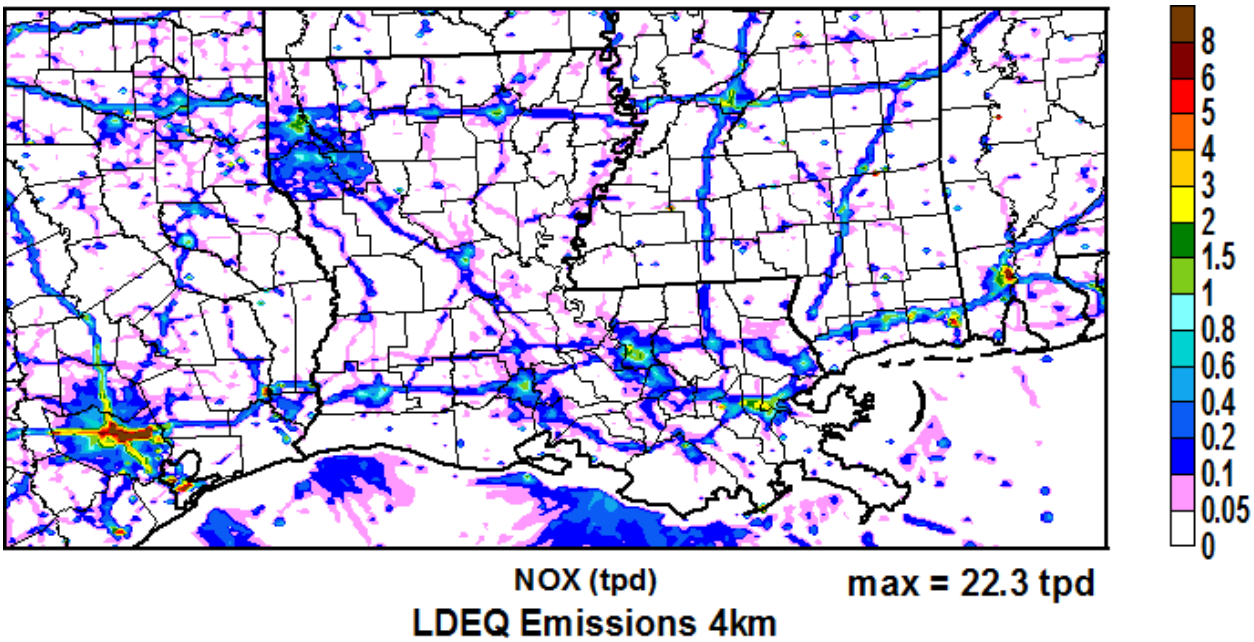


Figure 5-10. Spatial distribution of total (anthropogenic and biogenic) weekday surface NOx emissions (tons/day) in 2010.

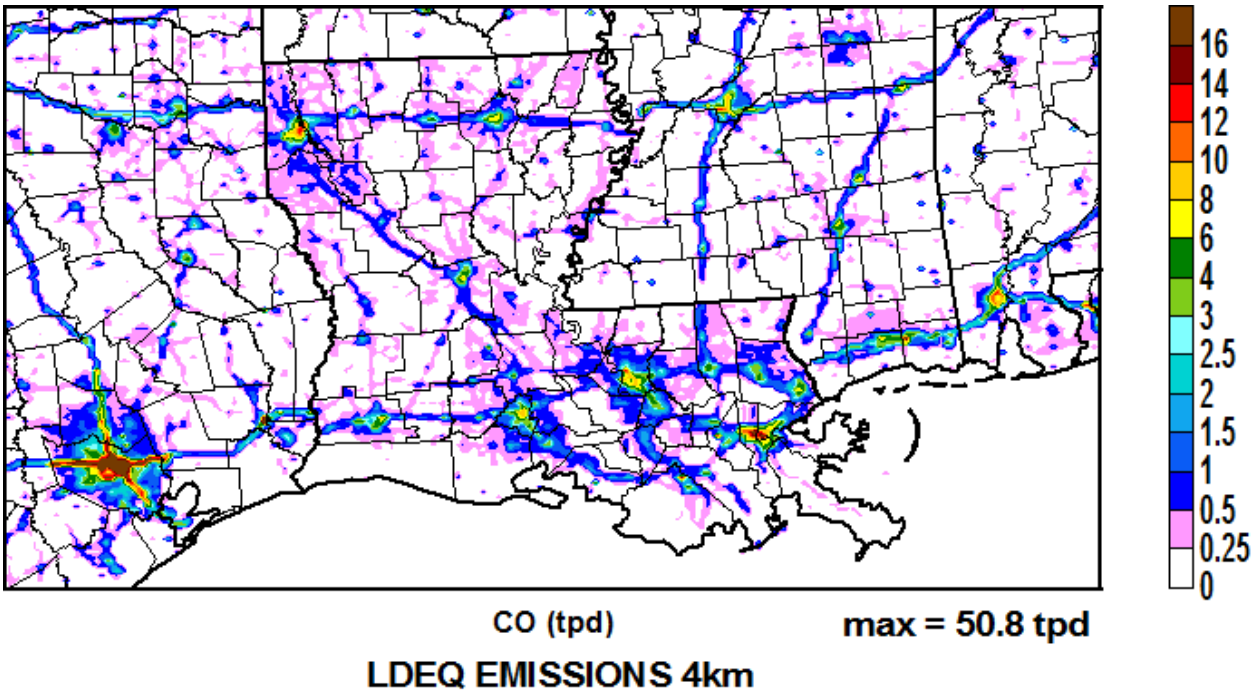


Figure 5-11. Spatial distribution of total weekday surface CO emissions (tons/day) in 2010.

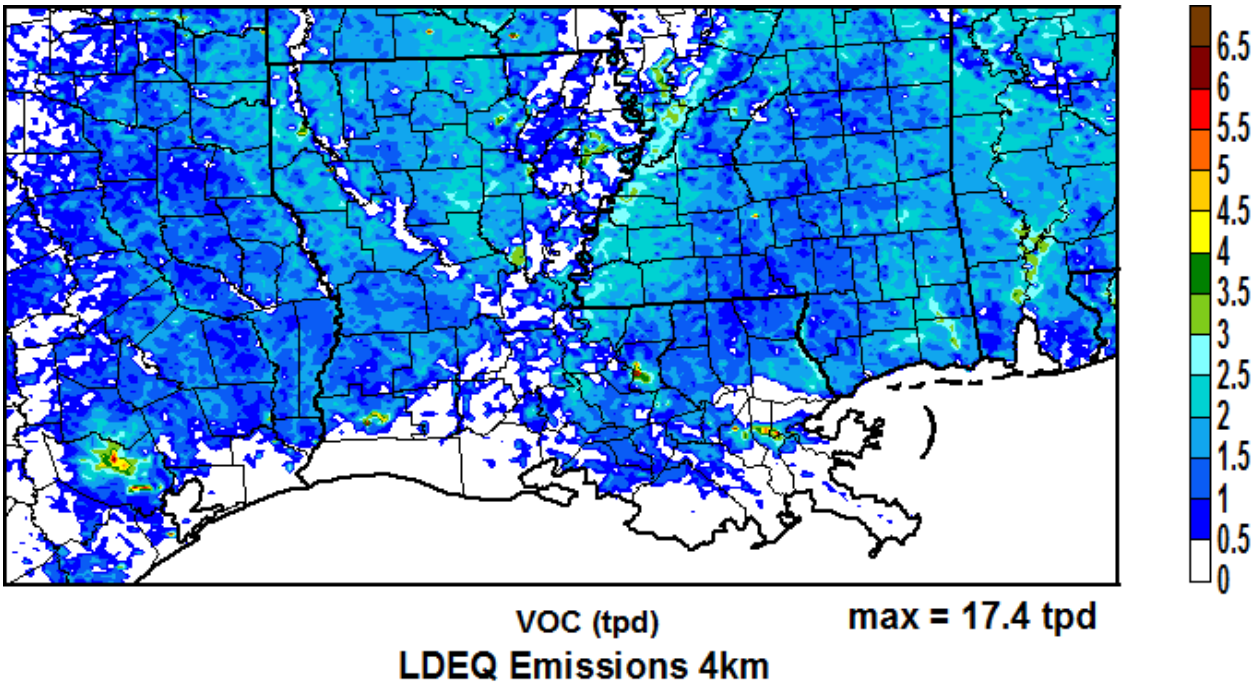


Figure 5-12. Spatial distribution of total (anthropogenic and biogenic) weekday surface VOC emissions (tons/day) in 2010.

6.0 BASE YEAR MODEL PERFORMANCE EVALUATION

The Comprehensive Air quality Model with extensions (CAMx) was used to simulate ozone levels throughout Louisiana during the period of September 1 to October 31, 2010. The methodology described in this section comprised the base year component of the wider modeling program designed to provide the technical underpinnings of the attainment demonstration for the 2008 8-hour ozone NAAQS. The base year modeling was conducted according to the approach described in the Modeling Protocol (ENVIRON and ERG, 2012) and follows the photochemical modeling guidance established by the EPA (2007).

All ozone simulations were run on the nested grid domains shown in Figures 4-1 using CAMx v5.4 (ENVIRON, 2011). Predictions of ozone were compared to measurements recorded at monitoring sites throughout Louisiana (Figure 2-1), while predictions of NOx and VOC precursors were evaluated against monitoring measurements in the Baton Rouge area (Figure 5-1). A multitude of CAMx diagnostic runs were conducted and evaluated in an effort to improve model performance and to characterize ozone sensitivity to changes in various model inputs.

6.1 Overview and Context

A model performance evaluation (MPE) is the process of testing a model's ability to accurately estimate observed atmospheric properties over a range of spatial, temporal, and geophysical conditions. In general terms, the process to establish reliable photochemical modeling consists of the following cycle:

- Exercise the modeling system for the base year, attempting to replicate the time and space behavior of observed ozone concentrations as well as concentrations of precursor and product species;
- Identify sources of error and/or compensating biases, through evaluation of pre-processor models (e.g., WRF, EPS3), air quality model inputs, mass budgets and conservation, process analysis, etc.;
- Through a documented process of diagnostic and sensitivity investigation, pinpoint and correct the performance problems via model refinement, additional data collection and/or analysis, or theoretical considerations;
- Re-run the model for the base year and re-evaluate performance until adequate, justifiable performance is achieved, or time and/or resources are expended, or the episode is declared unsuited for further use based on documented performance problems.

To the extent possible, these steps were undertaken by the modeling team, culminating in a modeling application exhibiting sufficiently minimal bias and error that it can be used reliably to perform the 8-hour ozone attainment demonstration. The modeling team selected the final model configuration for the CAMx base year simulation based on the following factors:

- Model performance obtained using the initial model configuration and input data;

- Model performance impacts from diagnostic sensitivity tests;
- The modeling team's knowledge and experience with model options and their associated performance attributes;
- Experience performing sensitivity tests and model performance evaluation for a multitude of other local and regional applications;
- Comments from EPA and other participants.

The objective in identifying the optimum model configuration is to obtain the best performance for the right reasons consistent with sound science and EPA guidance. Sometimes, decisions must be made that trade off better/poorer model performance for one pollutant against another. These factors were considered and potential issues discussed among the LDEQ modeling team, EPA and others.

6.1.1 Evaluation Datasets

A variety of chemical concentration measurements were available for the MPE phase of the project. Available air quality monitoring data were extracted from the following network databases:

Air Quality System (AQS): Hourly ozone and NOx concentration measurements were extracted for sites shown in Figure 4-1. Typical surface measurements include ground-level (i.e., 2 to 10 m) ozone, NO_2, NOx and CO.

Photochemical Assessment Monitoring Sites (PAMS): Four PAMS sites operated in Baton Rouge in 2010. These PAMS sites are co-located with the Capitol, LSU, Pride and Bayou Plaquemine AQS sites (Figure 5-1). PAMS sites collect ground-level ozone, NOx, hydrocarbons, and other parameters. Multi-hour concentrations for 55 individual hydrocarbons are determined from canister samples.

Clean Air Status and Trends Network (CASTNET): these sites monitor rural ground-level gas and PM pollutant concentrations. Hourly ozone concentrations from CASTNET sites in the south-central US were used to evaluate model performance at the regional scale.

6.1.2 Model Configuration

The initial CAMx base year simulation ("Run 1") used the meteorological, emissions, and ancillary input datasets described in Sections 4 and 5. The model simulated the evolution of ozone and precursor concentrations over the entirety of September and October 2010. A spinup period between August 15-31 was run to ensure a chemically balanced simulation and to remove the effects of initial conditions at coarse resolution.

CAMx provides some run-time options that need to be set for each specific simulation. Most options and capabilities are defined or provided to the model through the various input files. The CAMx configuration for the initial base year simulation is listed below (see ENVIRON [2011] for specific details):

- Time zone: Central Standard Time (CST)
- I/O frequency: 1 hour
- Map projection: Lambert conformal (see Section 4.1)
- Nesting: 2-way fully interactive 36/12/4-km computational grids (Figure 4-1)
- Chemistry mechanism: CB6 gas-phase only (without PM)
- Chemistry solver: Euler-Backwards Iterative (EBI)
- Advection solver: Piecewise Parabolic Method (PPM)
- Plume-in-Grid sub-model: Off
- Probing Tools: Off
- Asymmetric Convective Model: On
- Photolysis Adjustments for Clouds: in-line TUV
- Photolysis Adjustment for Aerosols: input AHOMAP
- Dry deposition: Zhang03
- Wet deposition: On

6.2 Initial CAMx Run

Figure 6-1 presents spatial plots of maximum daily 8-hour (MDA8) ozone over the 4-km nested grid on days when ozone exceeded the 2008 ozone NAAQS at any location in Louisiana. Simulated ozone was over predicted substantially on a vast majority of these days. Relative to observed MDA8 concentrations in Baton Rouge, over predictions in excess of 15-20 ppb covered large portions of the area, especially in mid-September. In particular, the highest simulated ozone occurred on September 14, reaching 190 ppb to the northeast of Baton Rouge and exceeding certain measurements by up to 30 ppb. The 190 ppb simulated peak occurred near a large prescribed fire complex according to the FINN fire inventory and State fire reports, but nearby monitoring indicated ozone reaching less than 60 ppb.

Statistical model performance was calculated for 1-hour ozone for four areas of the state that exceed (Baton Rouge) or nearly exceed (Shreveport, New Orleans, Lake Charles) the 2008 ozone NAAQS. Daily average normalized bias and gross error were calculated for all prediction-observation pairs at all sites when observed ozone exceeded 40 ppb following EPA's modeling guidance (EPA, 2007). This guidance de-emphasizes the use of statistical "goals" for 8-hour ozone as a means of defining acceptable model performance, and instead stresses performing corroborative and confirmatory analysis to assure that the model is working correctly. Older 1-hour ozone modeling guidance (EPA, 1991) established performance goals for certain statistical parameters, including mean normalized bias (< ±15%) and mean normalized gross error (< 35%), respectively. While now considered obsolete, these 1-hour statistical metrics nevertheless provide established benchmarks that modern photochemical models should be expected to achieve.

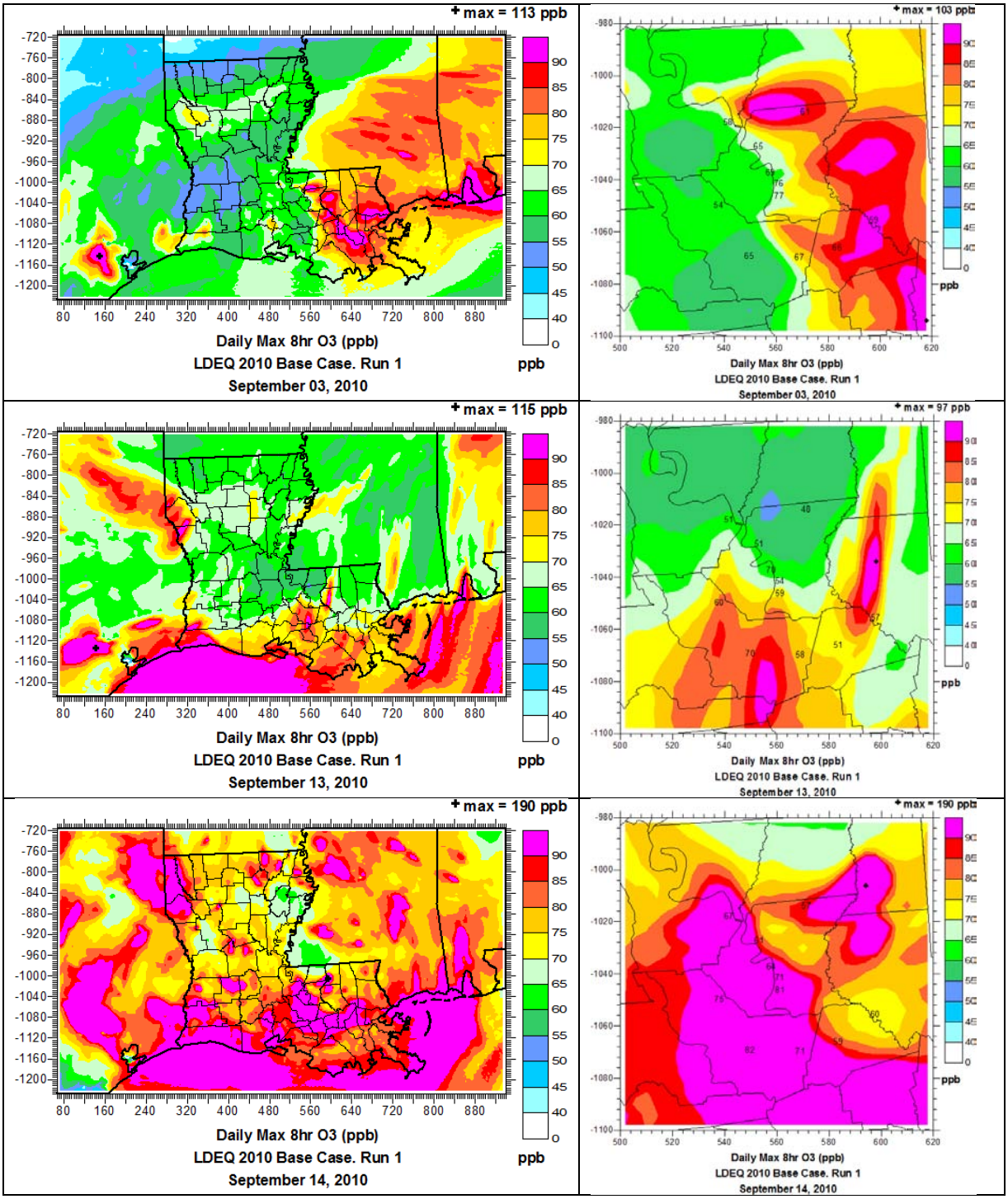


Figure 6-1. Spatial distribution of predicted MDA8 ozone (ppb) from the initial base year run on days exceeding the 2008 ozone NAAQS in Louisiana. Plots are shown for the entire 4 km modeling grid (left) and for south-central Louisiana focusing on Baton Rouge, with observed MDA8 ozone overlaid at monitor locations (right).

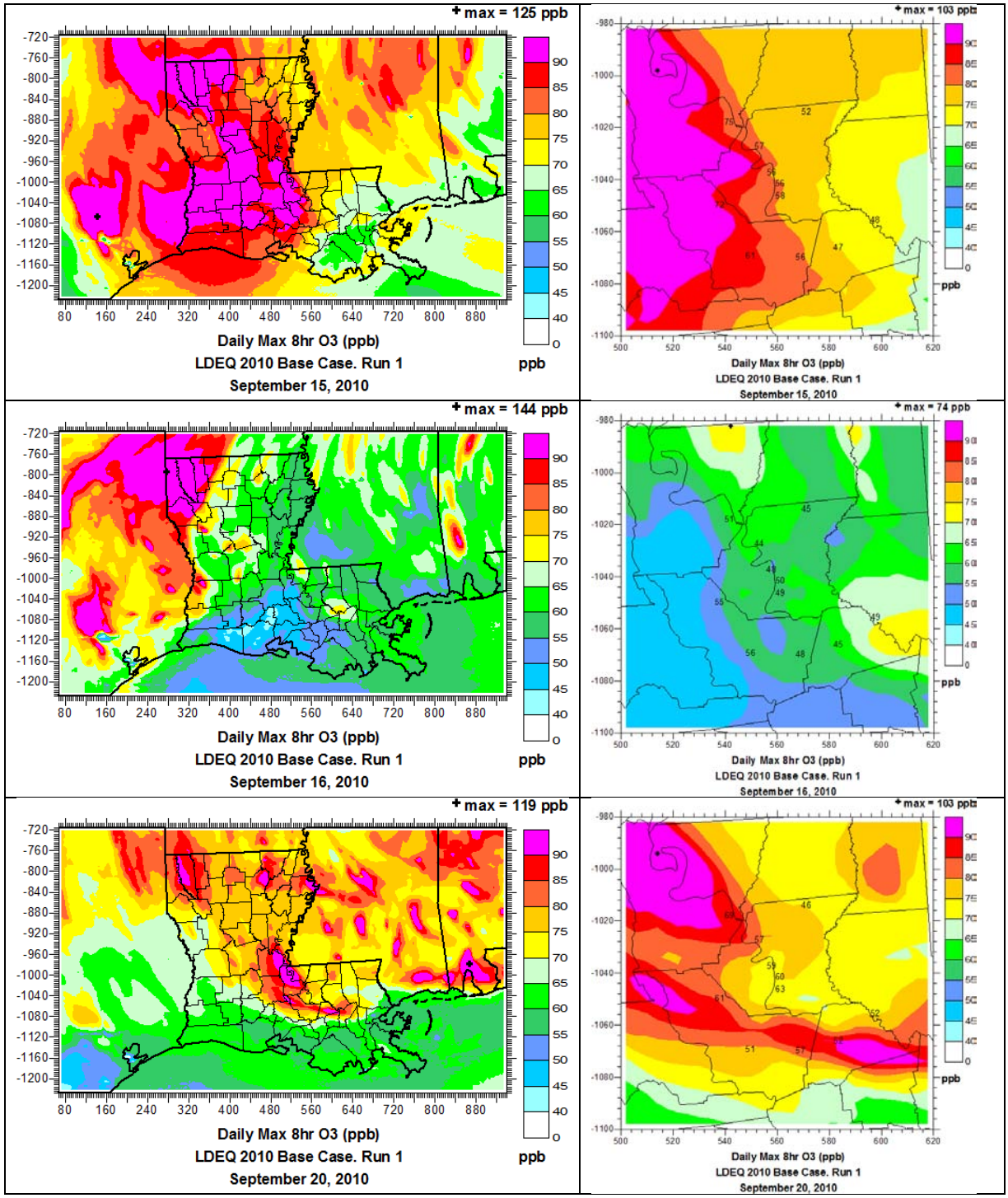


Figure 6-1 (continued).

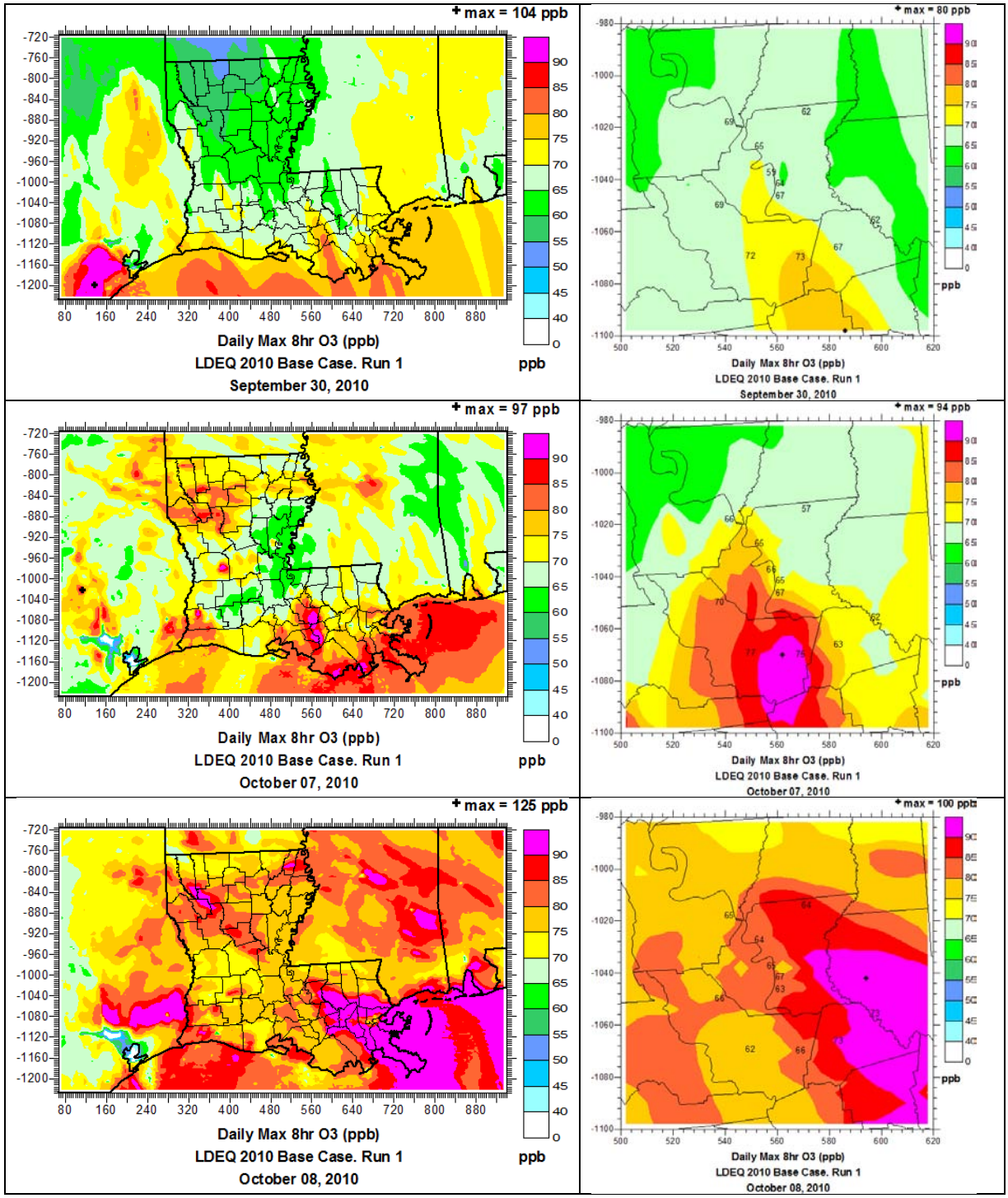


Figure 6-1 (continued).

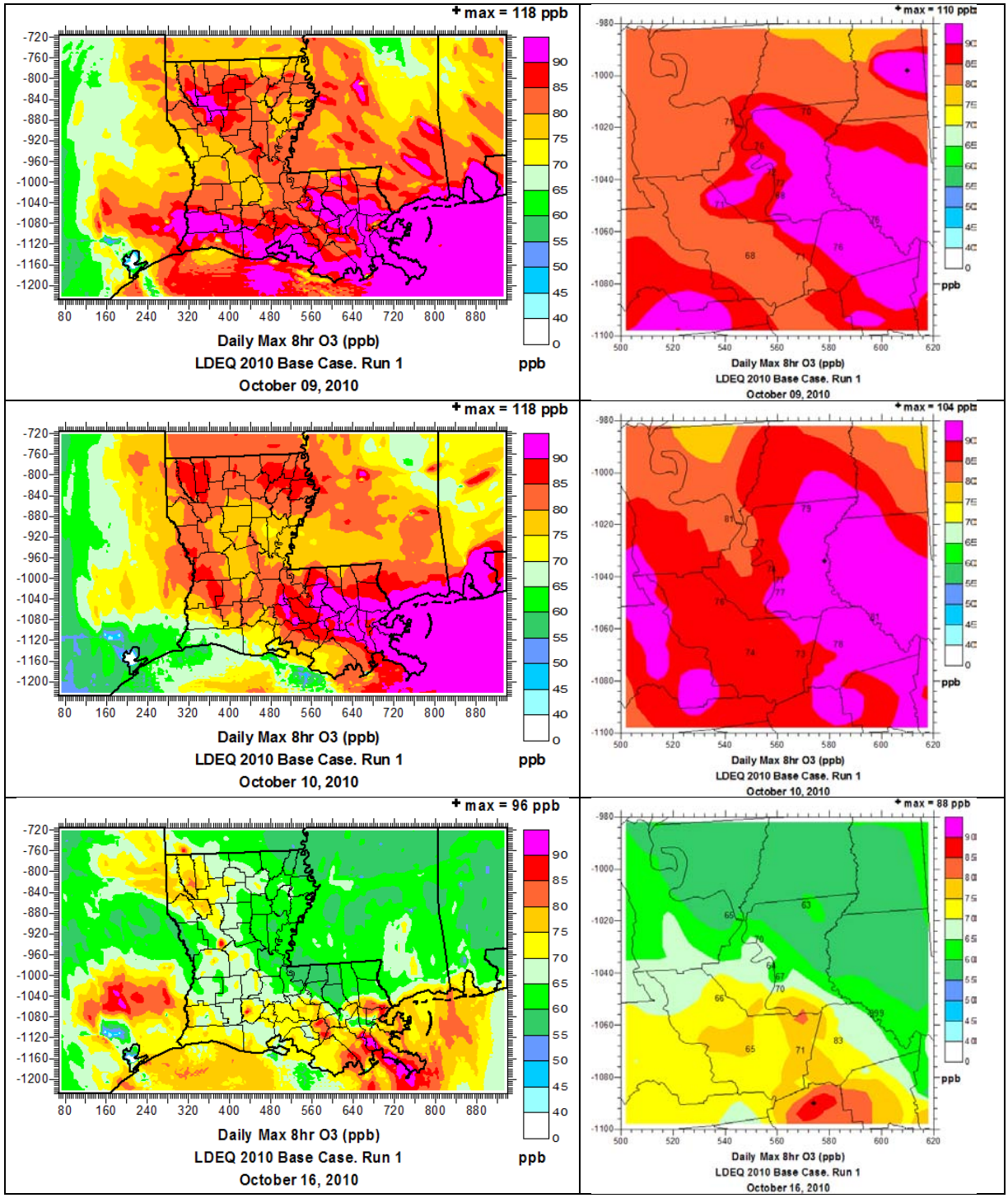


Figure 6-1 (continued).

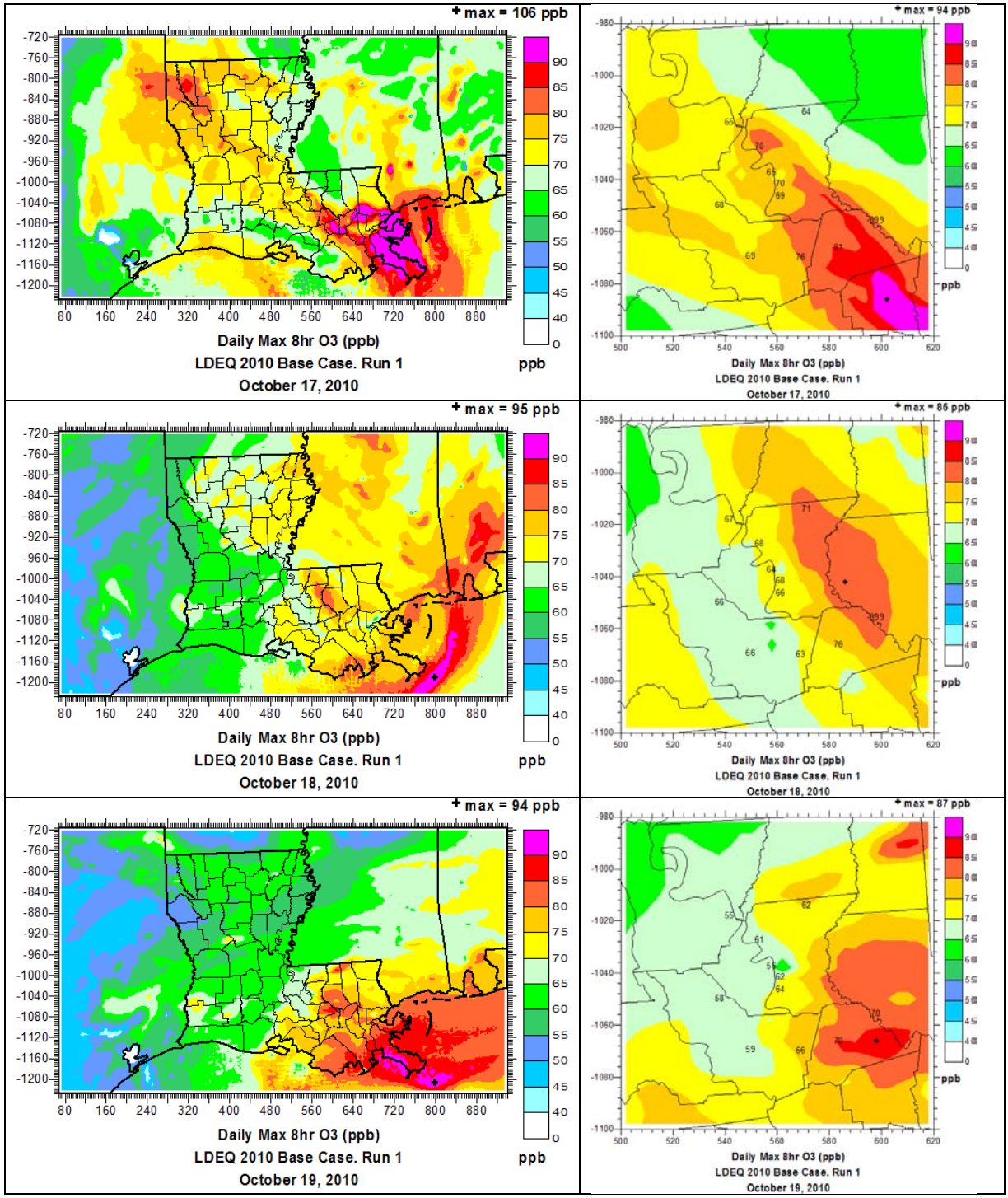


Figure 6-1 (concluded).

Time series of daily statistics for Baton Rouge are shown in Figure 6-2; the old 1-hour goals for normalized bias and gross error are also shown for reference. Performance in September was clearly worse than in October. The pattern for over prediction bias in September was consistently 30-50% and not particularly related to observed levels, whereas over prediction patterns in October tended to be associated with high ozone episodes.

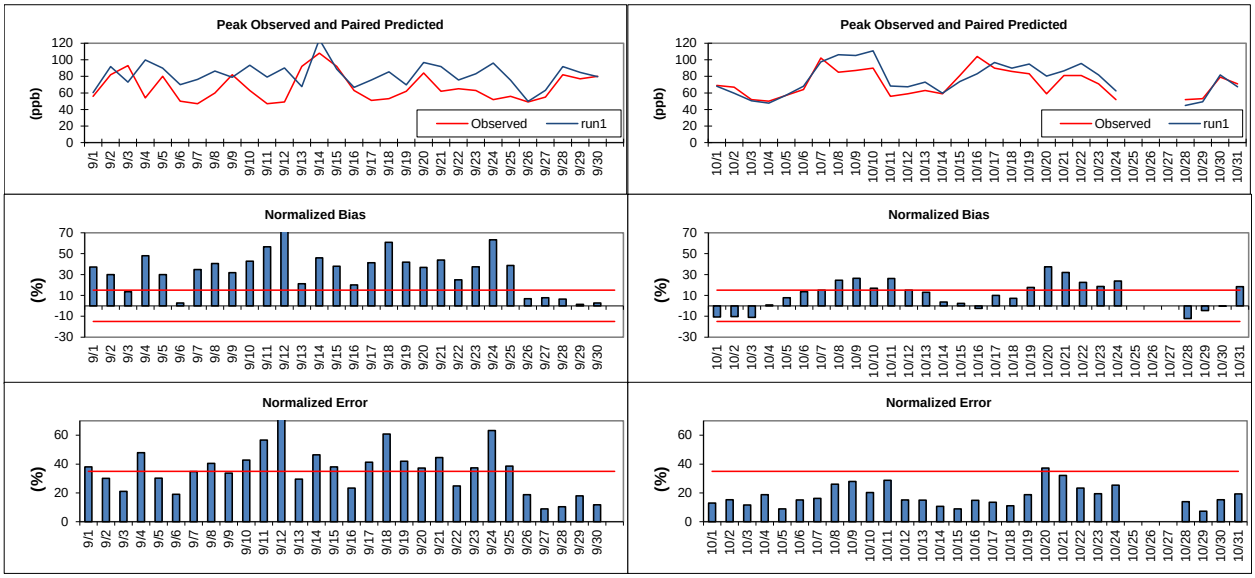


Figure 6-2. Daily statistical performance for the initial base year run at all Baton Rouge monitoring sites and for all hours when observed ozone was greater than 40 ppb, for September (left) and October (right), 2010. Top row: maximum daily peak 1-hour observed ozone (red) and paired simulated peak at the same site (blue). Middle row: daily mean normalized bias (bars) with ±15% bias highlighted (red lines). Bottom row: daily mean normalized gross error (bars) with 35% error highlighted (red lines).

Figure 6-3 presents the same data shown for the daily bias and error statistics in Figure 6-2, but in terms of a two-dimensional error space, with bias on the horizontal axis and gross error on the vertical axis. The 1-hour benchmarks have been plotted to represent a "goal" within which the bulk of paired daily bias and gross error points should fall to indicate a well-performing model. We have plotted the error points in different colors; those in red signify the ozone exceedance days in Louisiana as shown in Figure 6-1. Each figure notes the fraction of days within the goal. In Baton Rouge, the September over prediction bias is clearly evident for most days, regardless of observed ozone level. Performance in October was better but also exhibited an over prediction tendency.

Similar plots are shown for New Orleans, Shreveport, and Lake Charles in Figures 6-4 through 6-6, respectively. Large over predictions are evident in all cases, although Shreveport performance in September was not as extreme as in the southern cities.

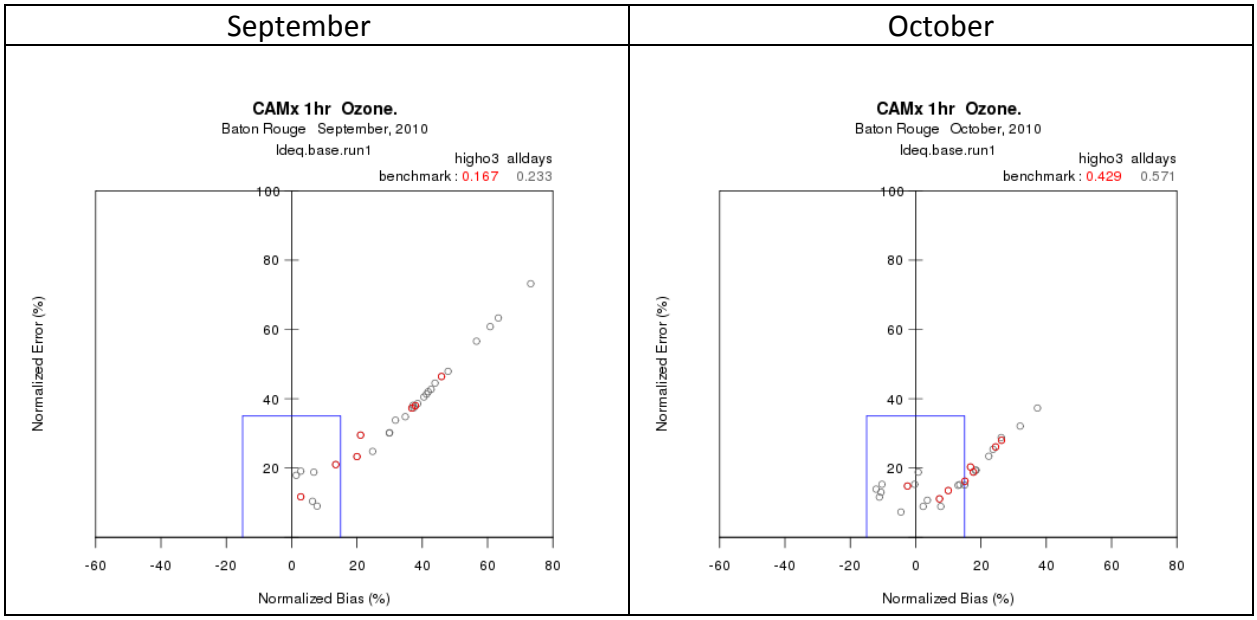


Figure 6-3. "Goal" plots of daily normalized bias and error from the initial base year run in Baton Rouge for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days shown in Figure 6-1.

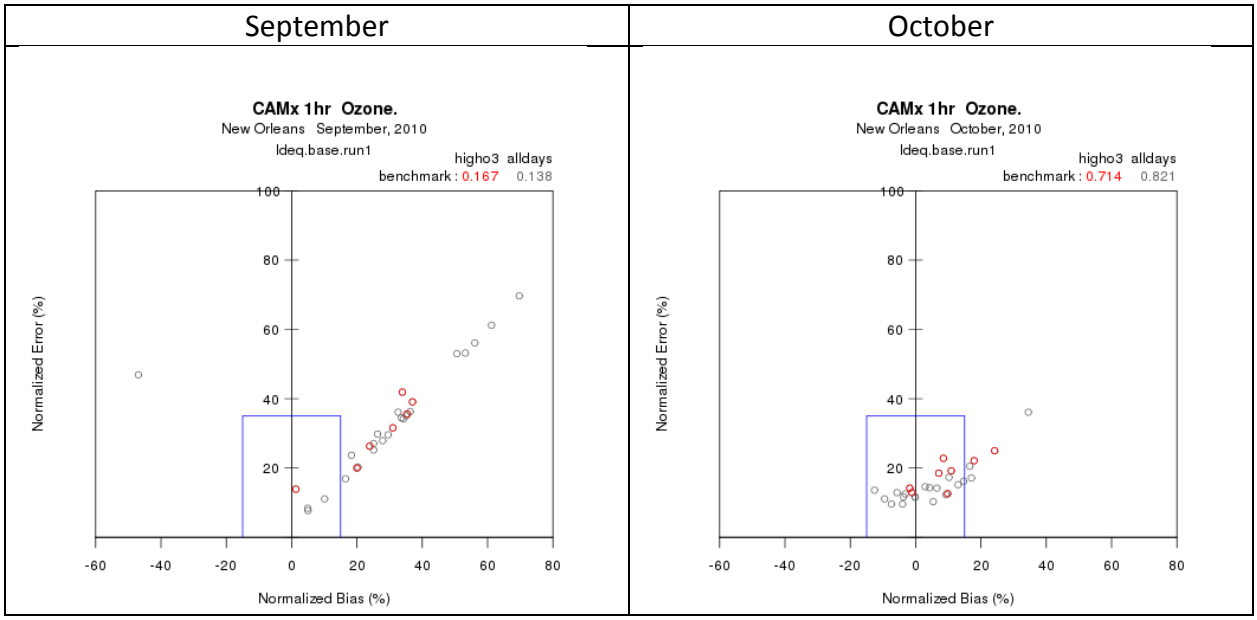


Figure 6-4. "Goal" plots of daily normalized bias and error from the initial base year run in New Orleans for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days.

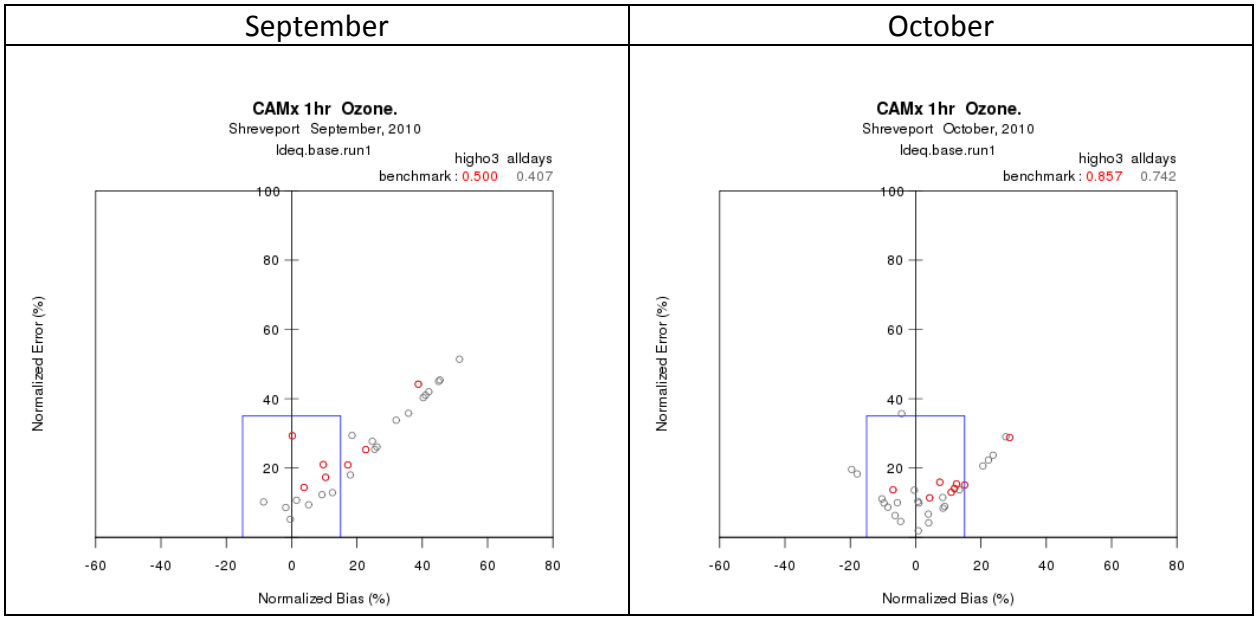


Figure 6-5. "Goal" plots of daily normalized bias and error from the initial base year run in Shreveport for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days.

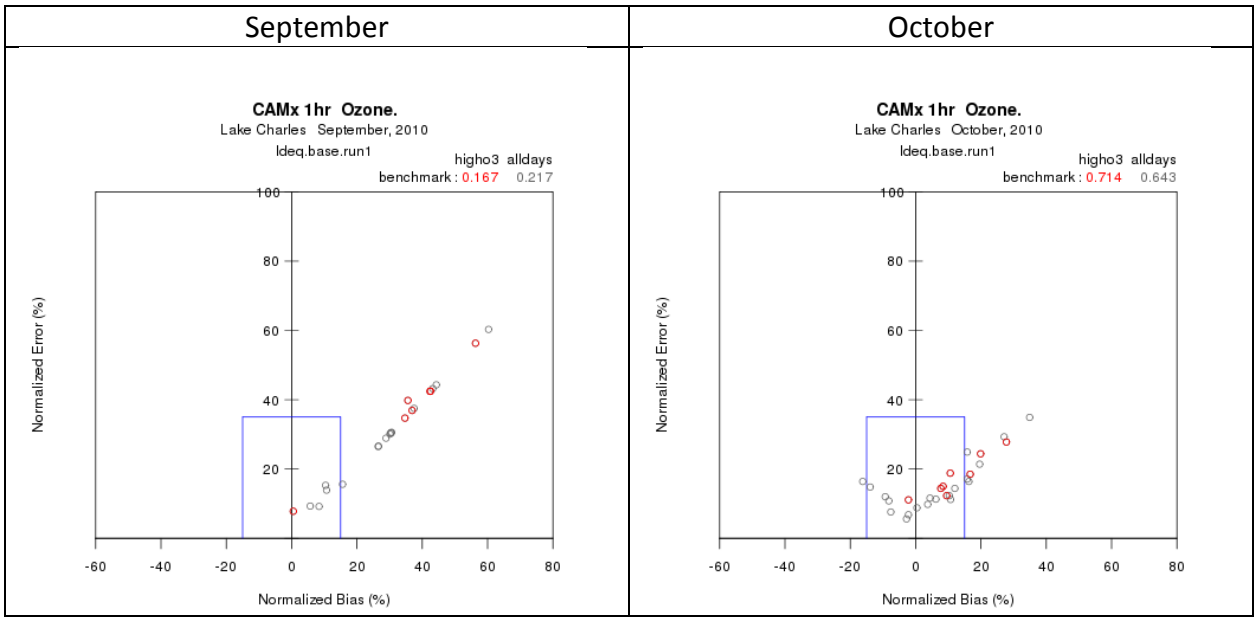


Figure 6-6. "Goal" plots of daily normalized bias and error from the initial base year run in Lake Charles for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days.

Time series of simulated and observed hourly ozone and NOx at the urban LSU monitor throughout September and October are shown in Figures 6-7 and 6-8, respectively. Among all Baton Rouge sites, the LSU monitor recorded the highest ozone of the modeling period. In September, daily ozone over predictions occurred for most hours, although they were more extreme during the daytime. Performance was much better in October, when only a few of the highest ozone days exhibited similarly large over predictions. Hourly NOx concentrations were simulated well at LSU, especially during the daytime. The only exceptions were for occasional peak nighttime values when the model under predicted NOx by factors of up to 2 or 3. The under prediction of nighttime NOx is not likely related to improper characterization of nighttime emissions, but rather to an inability to resolve local emission at 4 km grid scale (i.e., over-dilution to grid volume) and meteorological influences such as excessive nocturnal vertical mixing.

Similar time series for ozone and NOx are shown at the Dutchtown monitor in Figures 6-9 and 6-10; this site represents a high NOx emissions site as it is located very near the I-10 freeway south of Baton Rouge. Similar large daytime ozone over prediction patterns occurred at this site in September, and perhaps better performance occurred in October at Dutchtown than at LSU. Predicted and observed NOx agreed rather well, with generally higher NOx and much more diurnal variability (as expected). It is possible that higher levels of fresh NOx emissions predicted at Dutchtown may have controlled ozone over predictions to some extent through chemical scavenging.

A final set of time series is shown for the rural Pride site in Figures 6-11 and 6-12, which is located northwest of Baton Rouge. From the standpoint of daily peak hourly ozone, over predictions were not as extreme as at LSU, but the entire time series exhibited over predictions for very nearly every hour of both months. In particular, nighttime ozone was far too high, taking on the characteristics typical of rural background ozone with small diurnal amplitude that is not influenced by scavenging from local NOx. However, the observations clearly show nightly ozone scavenging to zero each night. Indeed, NOx observations were surprisingly high for a rural site, and likely indicated a local source that contributed to nightly ozone reductions around the monitor. NOx tended to be under predicted, but even during the few nights with over predictions, simulated ozone was not greatly affected.

The consistent dichotomy in ozone performance between September and October across all regions of Louisiana suggests a fundamental and systematic difference in the characterization of the photochemical environment. The two most obvious inputs that define this environment are meteorology and emissions, and their impacts may not be mutually independent. For example, temperature is very influential for various important emissions categories (e.g., biogenic and on-road sources), while wind patterns affect the source mix contributing to high ozone levels. Figures 6-13 and 6-14 reiterate the wind direction and temperature patterns, respectively, that were prevalent in southern Louisiana during September and October of 2010. Note that September was warm with winds from the east, while October was much cooler with winds from the west. At least meteorologically, these two months were indeed very different.

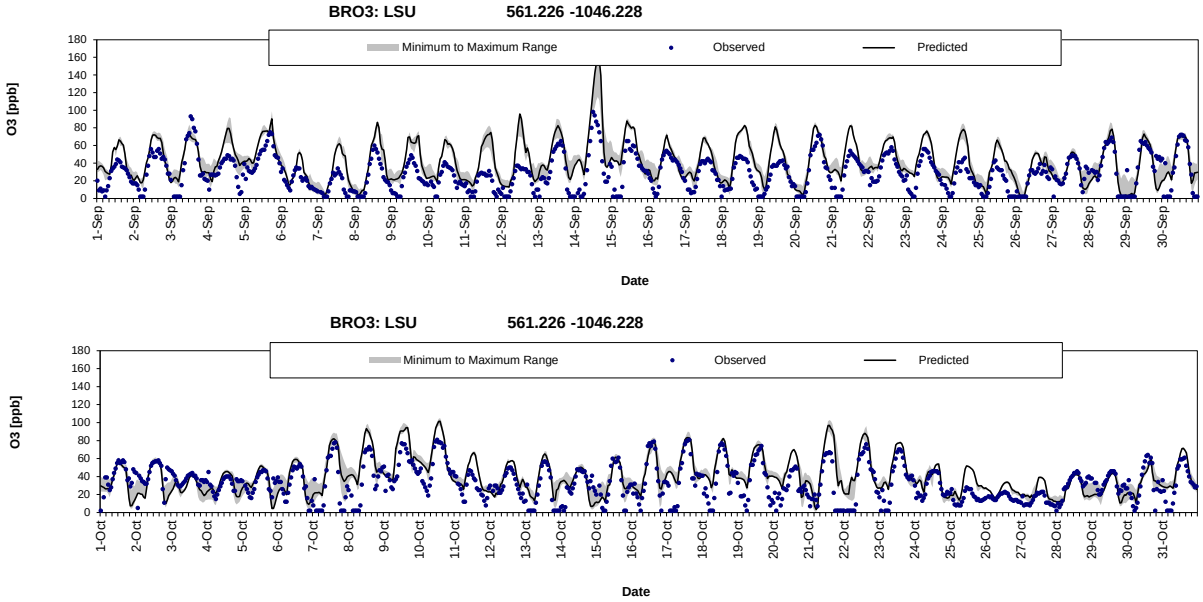


Figure 6-7. Hourly time series of observed (blue dots) and predicted (solid line) ozone at the LSU monitoring site during September (top) and October (bottom). Grey shading indicates the range of predicted ozone among the nine grid cells surrounding the monitor.

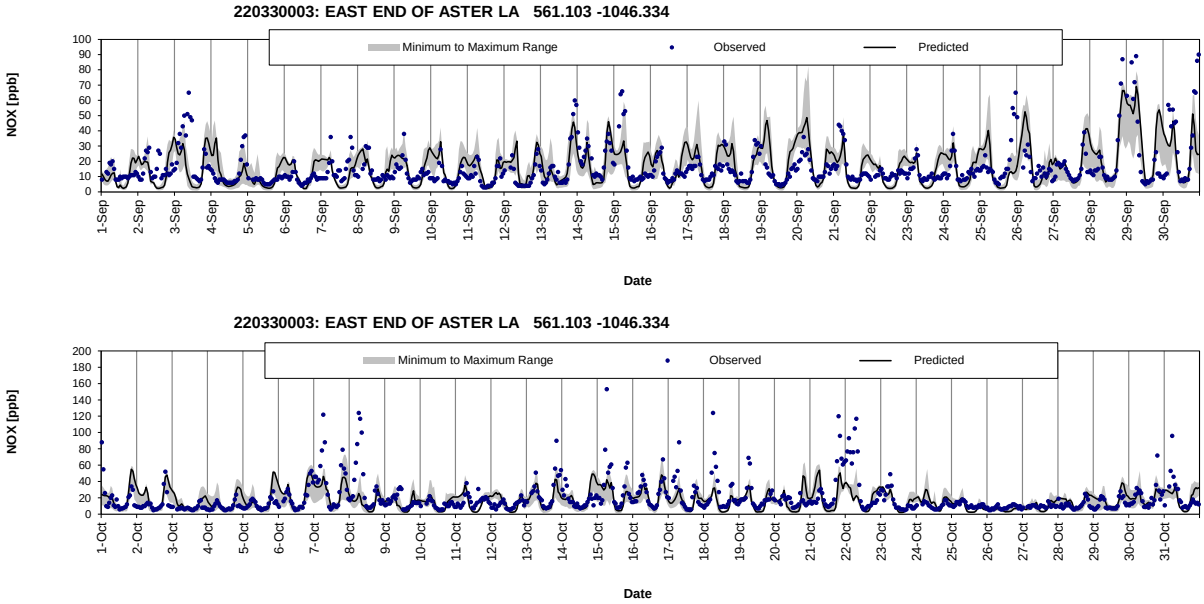


Figure 6-8. Hourly time series of observed (blue dots) and predicted (solid line) NOx at the LSU monitoring site during September (top) and October (bottom). Grey shading indicates the range of predicted NOx among the nine grid cells surrounding the monitor.

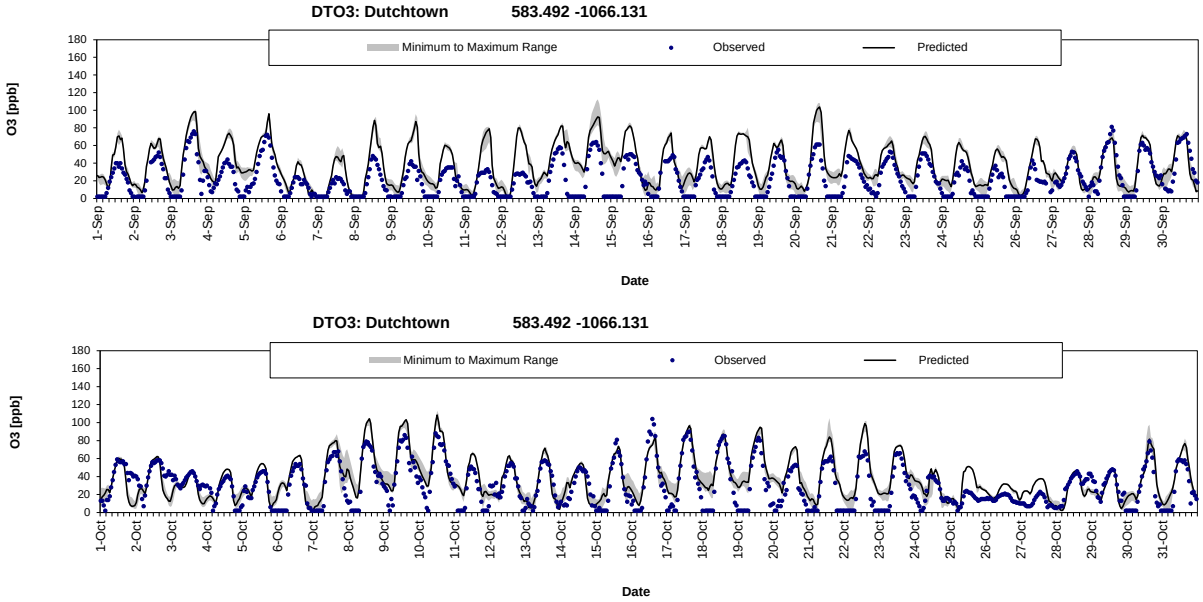


Figure 6-9. Hourly time series of observed (blue dots) and predicted (solid line) ozone at the Dutchtown monitoring site during September (top) and October (bottom). Grey shading indicates the range of predicted ozone among the nine grid cells surrounding the monitor.

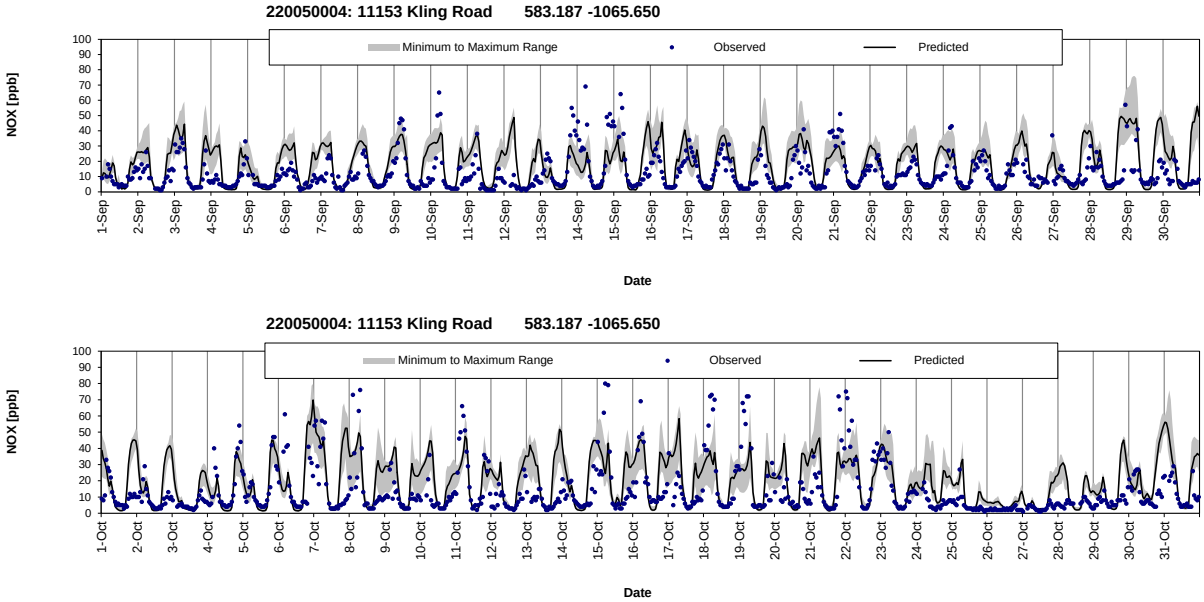


Figure 6-10. Hourly time series of observed (blue dots) and predicted (solid line) NOx at the Dutchtown monitoring site during September (top) and October (bottom). Grey shading indicates the range of predicted NOx among the nine grid cells surrounding the monitor.

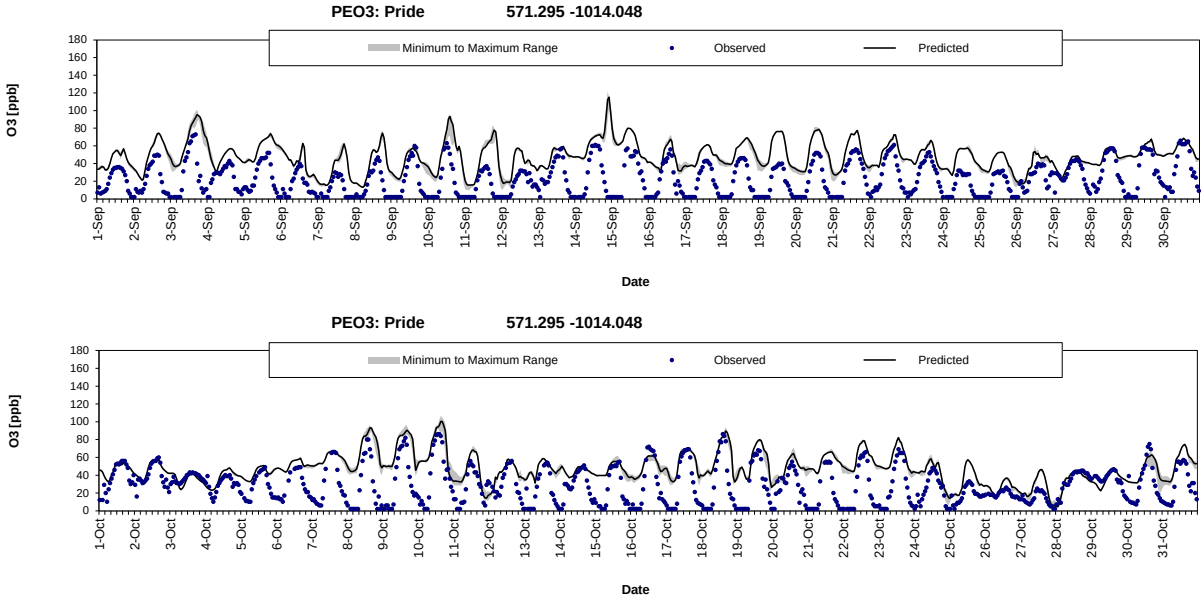


Figure 6-11. Hourly time series of observed (blue dots) and predicted (solid line) ozone at the Pride monitoring site during September (top) and October (bottom). Grey shading indicates the range of predicted ozone among the nine grid cells surrounding the monitor.

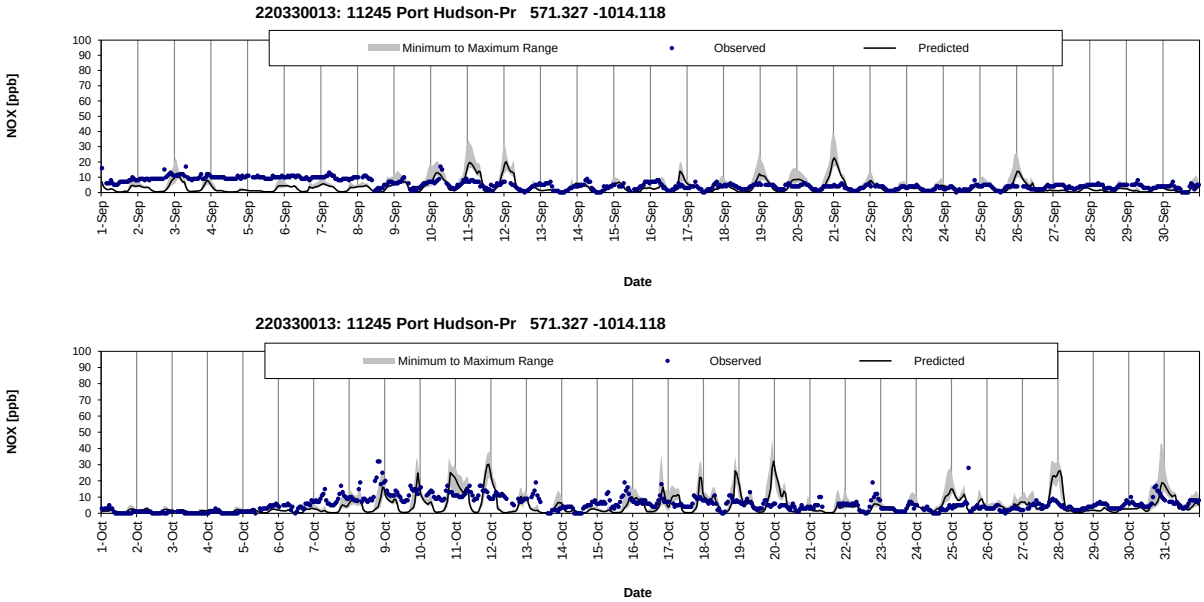


Figure 6-12. Hourly time series of observed (blue dots) and predicted (solid line) NOx at the Pride monitoring site during September (top) and October (bottom). Grey shading indicates the range of predicted NOx among the nine grid cells surrounding the monitor.

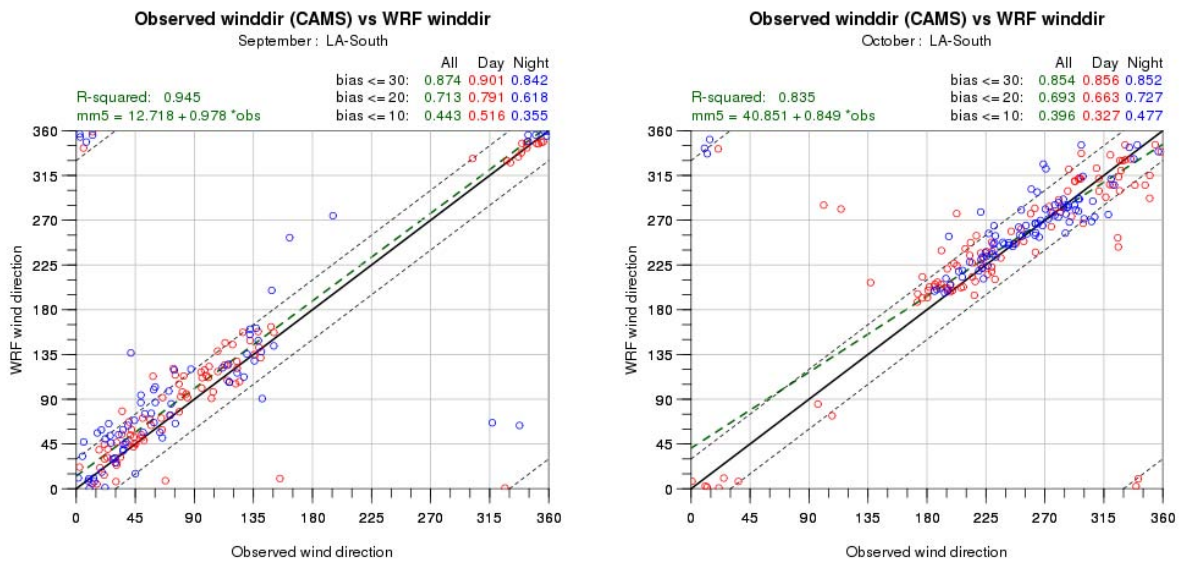


Figure 6-13. WRF performance for wind direction against observations in southern Louisiana in September (left) and October (right). Figure is duplicated from Figure 3-10.

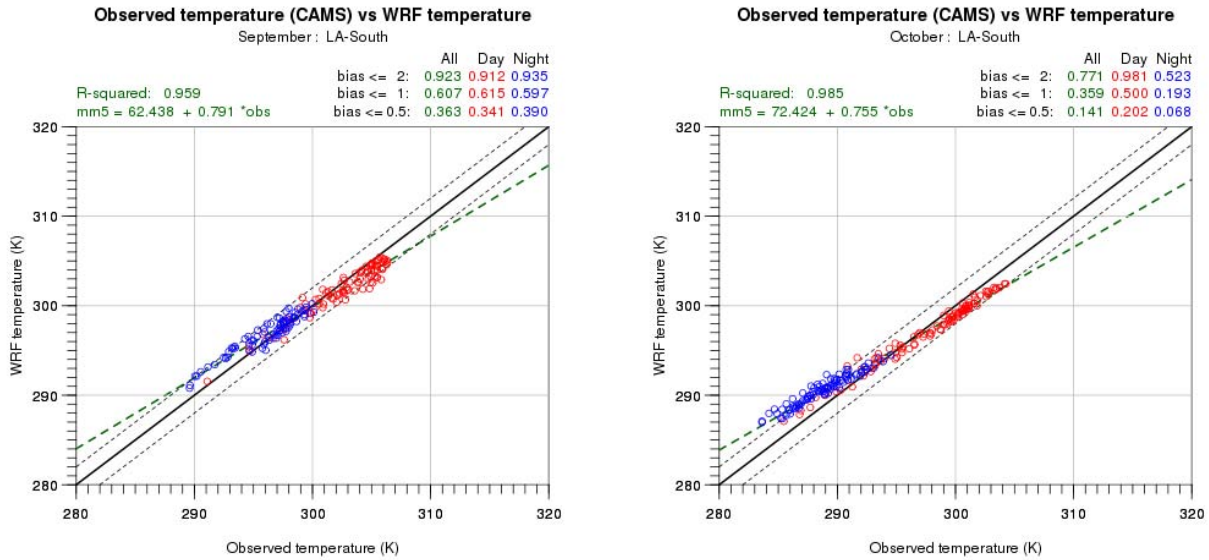


Figure 6-14. WRF performance for temperature against observations in southern Louisiana in September (left) and October (right). Figure is duplicated from Figure 3-14.

6.3 Diagnostic Sensitivity Testing (Phase 1)

A series of diagnostic sensitivity tests were conducted for the month of September to identify and potentially rectify the ubiquitous ozone over predictions evident from the initial base year run. Table 6-1 summarizes each of the Phase 1 sensitivity tests, including their purpose and their results.

Table 6-1. Phase 1 diagnostic sensitivity tests performed on the CAMx 2010 base year simulation.

Run ID	Purpose	Results
2	Remove all wildfire emissions to isolate their impact	Large local ozone reductions in fire plumes; Minor regional ozone reductions; Negligible impact on statistical performance
3	Remove Kv "patching" to quantify its impact	Negligible impact on daytime NOx and ozone; Increased nighttime NOx, lower nighttime ozone; Better nighttime ozone performance
5	Remove wildfire NOx emissions to verify it as the driver for locally high ozone	Nearly identical results to Run 2; Confirms NOx-sensitive rural conditions
6	Calculate Kv from WRF/YSU technique to test sensitivity to Kv approach	Minor mixed impacts on MDA8 patterns; Mostly higher ozone
7	Replace CB6 chemistry with Carbon Bond 2005 (CB05) to test sensitivity to choice of mechanism	Large widespread reductions in MDA8 ozone; Improved statistical performance
8	Scale MOVES on-road emissions in 4 km domain to emulate MOBILE6; derived from 2008 EPA NEI for LA parishes (30% NOx reduction, 34% VOC increase)	Minor impacts to statistical performance; Minor mixed impacts on MDA8 patterns; Confirms VOC-sensitive urban conditions; LDEQ elected to stay with MOVES
9	Scale wildfire NOx down by 80%, add emissions of PAN and HNO_3 to represent aged NOy	Moderate local ozone reductions in fire plumes; Minor regional ozone reductions; Negligible impact on statistical performance

We also analyzed other issues beyond additional CAMx simulations, including:

- *Does the gasoline RVP switch in late September impact on-road emissions?* We evaluated daily total on-road emissions for each day throughout September and October. No obvious RVP signal was seen, and the largest day-to-day variation was caused by temperature fluctuations.
- *Were any emissions double-counted during processing into model-ready inputs?* Further quality assurance checks revealed no double-counting.
- *Are biogenic isoprene emissions too high?* Other concurrent regional modeling efforts have observed that MEGAN isoprene estimates in the eastern US are much higher than other models, such as EPA's Biogenic Emission Inventory System (BEIS), thereby contributing to ozone over predictions. September isoprene emissions in the 4 km grid were about two times higher than in October. A review of 8-day satellite vegetative fields exhibited only slight reductions from September to October. There were negligible changes in sunlight. A sudden shift to cooler temperatures on September 25 tracked well with the downward shift

in isoprene and ozone bias. Therefore, excessive biogenic emissions were considered a possible cause for the September over predictions.

- *Is the depth of daytime vertical diffusion too shallow in September?* We compared modeled mixing depths against 6 PM Shreveport rawinsonde temperature profiles. Relatively large day-to-day variations in mixing depth occurred in both the observations and the model, but the model tended to grossly track observed variability with no consistent high or low bias. Therefore, results were inconclusive. However, since this was a single point comparison per day, we could not extend results to entire State.

An intermediate simulation (Run 10) was performed over the entire September-October modeling period by combining several of the most significant changes listed in Table 6-1. Specifically, the run included:

- CB05 chemical mechanism: emissions for a certain few VOC compounds specific to CB6 were aggregated into CB05 compounds and the TUV preprocessor was run to calculate photolysis rates specific to CB05;
- No nocturnal Kv "patch": enhanced urban vertical mixing at night was removed, but the daytime patch was retained to maximize vertical diffusion;
- Revised wildfire NOy emissions per Run 9, following the approach of Alvarado et al. (2010): Reduced NOx by 80% to align NOx:CO ratios, and added new emissions of PAN (94% of final NOx) and HNO_3 (50% of final NOx) to align NOx:NOy ratios and to emulate rapid oxidation of NOx during plume rise and prior to release into the grid.

Figure 6-15 presents spatial plots of MDA8 ozone from Run 10 on September 14, along with the difference in MDA8 from Run 1. This particular day was chosen because it possessed the highest observed ozone of the period in Baton Rouge and exhibited the largest over predictions in Run 1. Dramatic reductions of MDA8 ozone by 10-20+ ppb are evident throughout the domain, but concentrations in Baton Rouge continued to be over predicted by 10-20 ppb on this day. The peak MDA8 continued to be predicted in the fire plume northwest of Baton Rouge, but that peak was reduced by 44 ppb (from 190 ppb).

Figures 6-16 through 6-19 show September and October bias and gross error goal plots for Baton Rouge, New Orleans, Shreveport, and Lake Charles, respectively. Daily bias and gross error were reduced substantially in all four regions and on all days of September, and October daily performance met performance goals on nearly every day. However, the majority of exceedance days in September continued to exhibit high ozone bias in all regions except Shreveport.

6.4 Evaluation of Ozone Precursors

Despite rather good October performance achieved in Run 10, the continued large over prediction tendencies in most areas of Louisiana during September indicated that a fundamental systematic problem remained that influenced September more than October. This further gave rise to concerns as to whether good October performance was achieved for

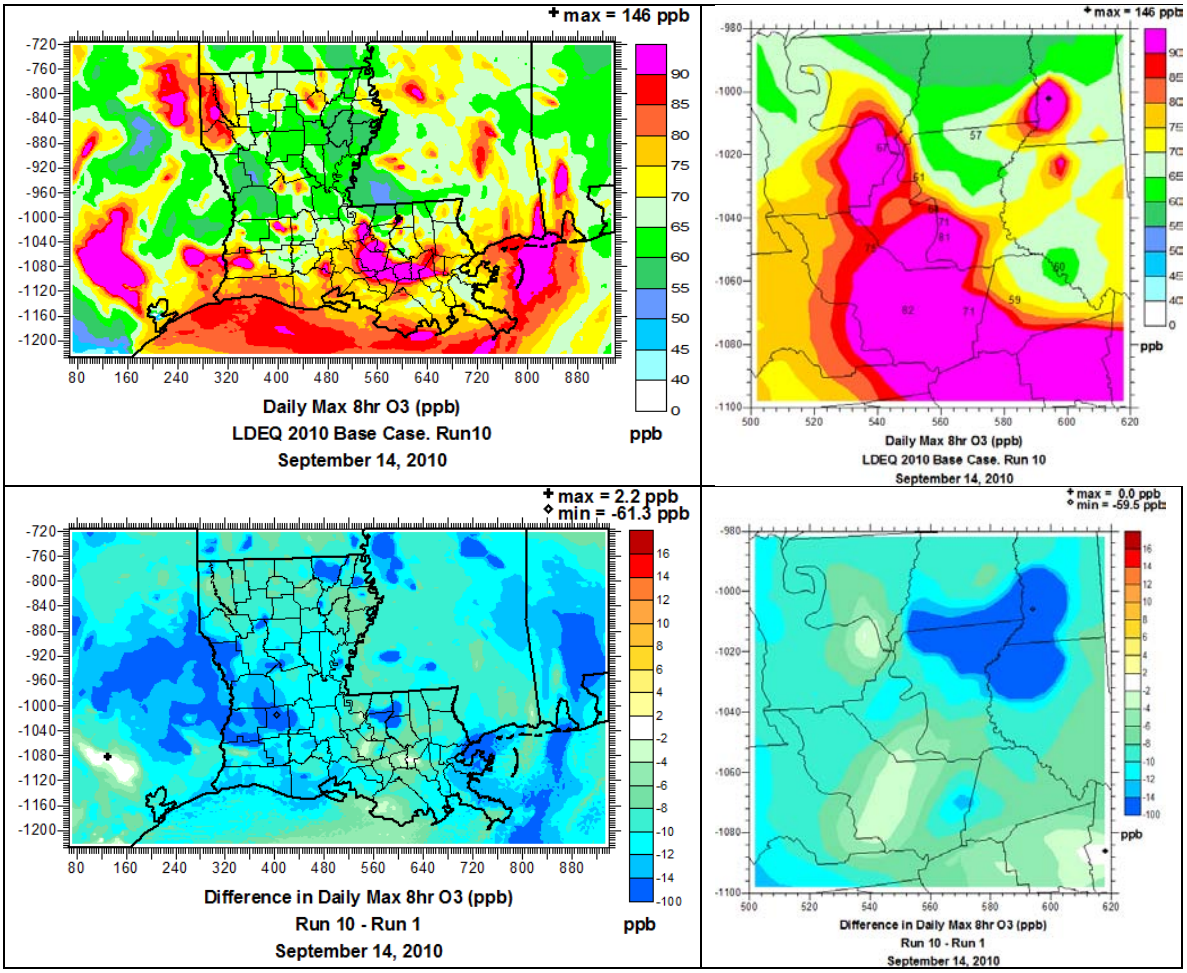


Figure 6-15. Top row: Spatial distribution of predicted MDA8 ozone (ppb) from Run 10 on September 14. Plots are shown for the entire 4 km modeling grid (left) and for south-central Louisiana focusing on Baton Rouge, with observed MDA8 ozone overlaid at monitor locations (right). Bottom row: Spatial distribution of differences (Run 10 – Run 1) in MDA8 on the 4 km modeling grid (left) and over south-central Louisiana (right).

the correct reason(s).

We hypothesized that higher NOx estimated by MOVES could be driving the over predictions. However, results from the MOBILE6 emulation test (Run 8) resulted in minor impacts on simulated urban ozone, despite 30% reductions in NOx. Such insensitivity to NOx is common in NOx-rich urban areas where on-road emissions dominate. But the question remained: should Baton Rouge be more NOx-sensitive?

Analyses comparing simulated and observed NOx, VOC, and VOC:NOx ratios were undertaken to evaluate the emissions inventory for Baton Rouge and to better understand the chemical conditions leading to high ozone in the region. Four PAMS sites are located in Baton Rouge, co-

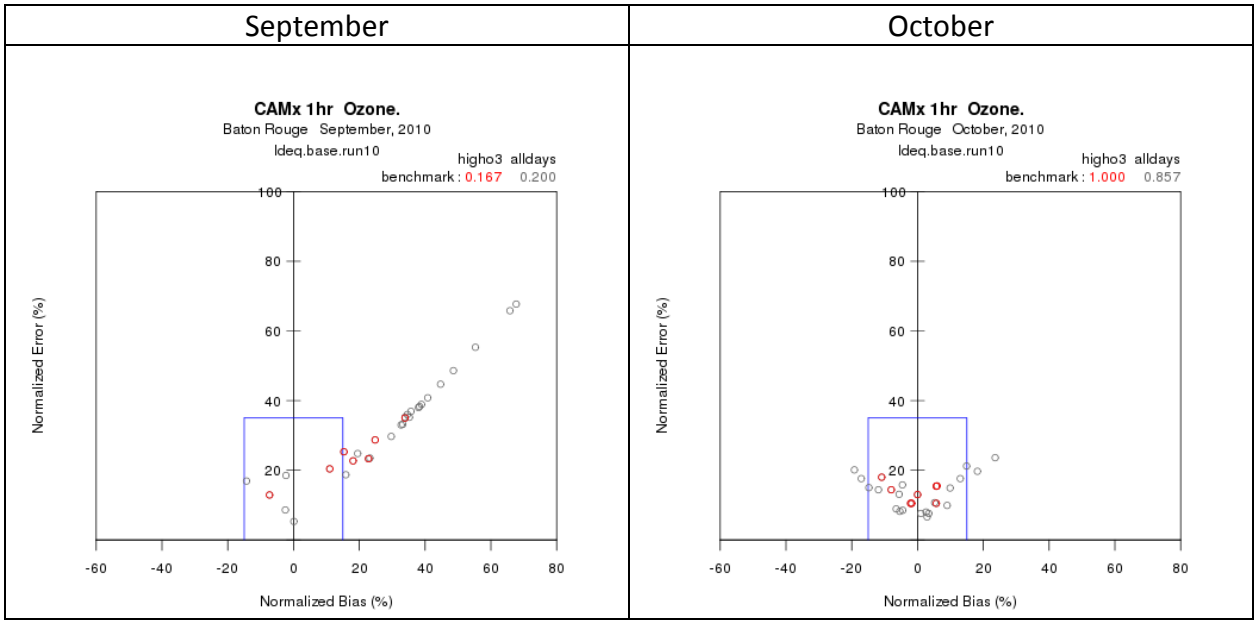


Figure 6-16. "Goal" plots of daily normalized bias and error from Run 10 in Baton Rouge for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days shown in Figure 6-1.

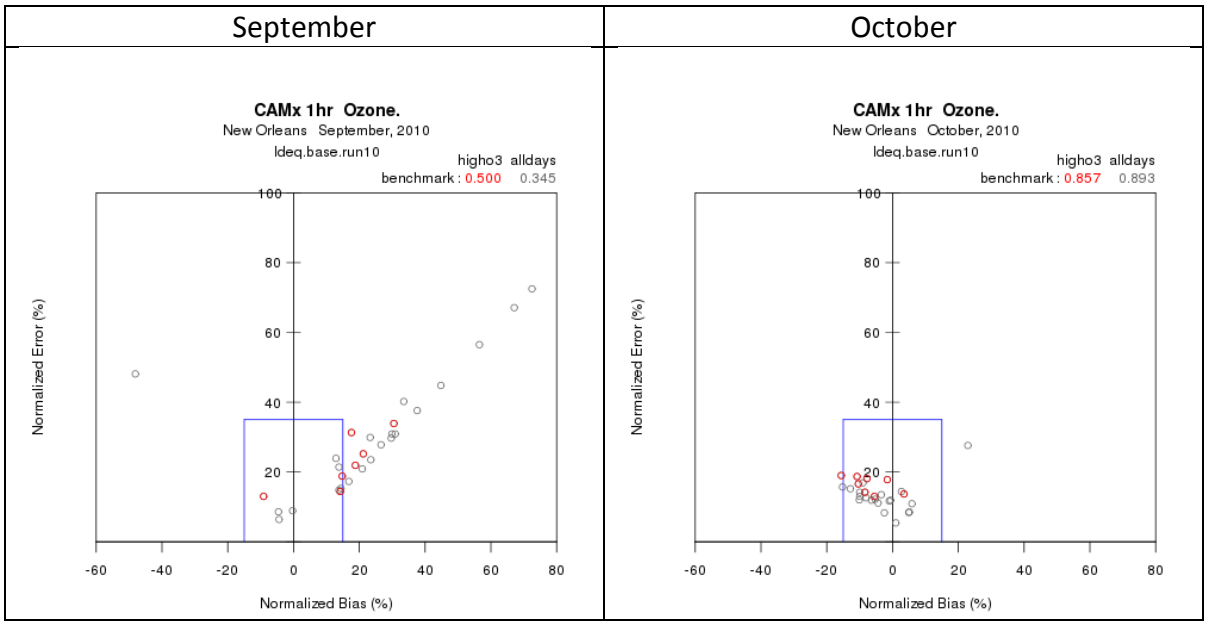


Figure 6-17. "Goal" plots of daily normalized bias and error from Run 10 in New Orleans for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days shown in Figure 6-1.

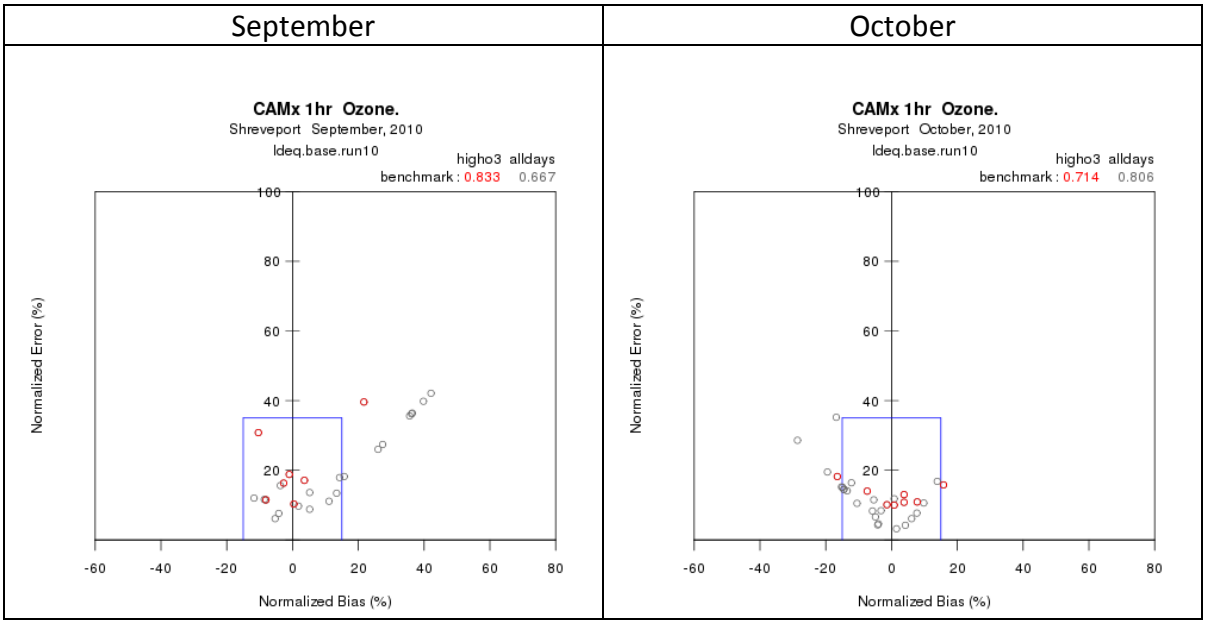


Figure 6-18. "Goal" plots of daily normalized bias and error from Run 10 in Shreveport for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days shown in Figure 6-1.

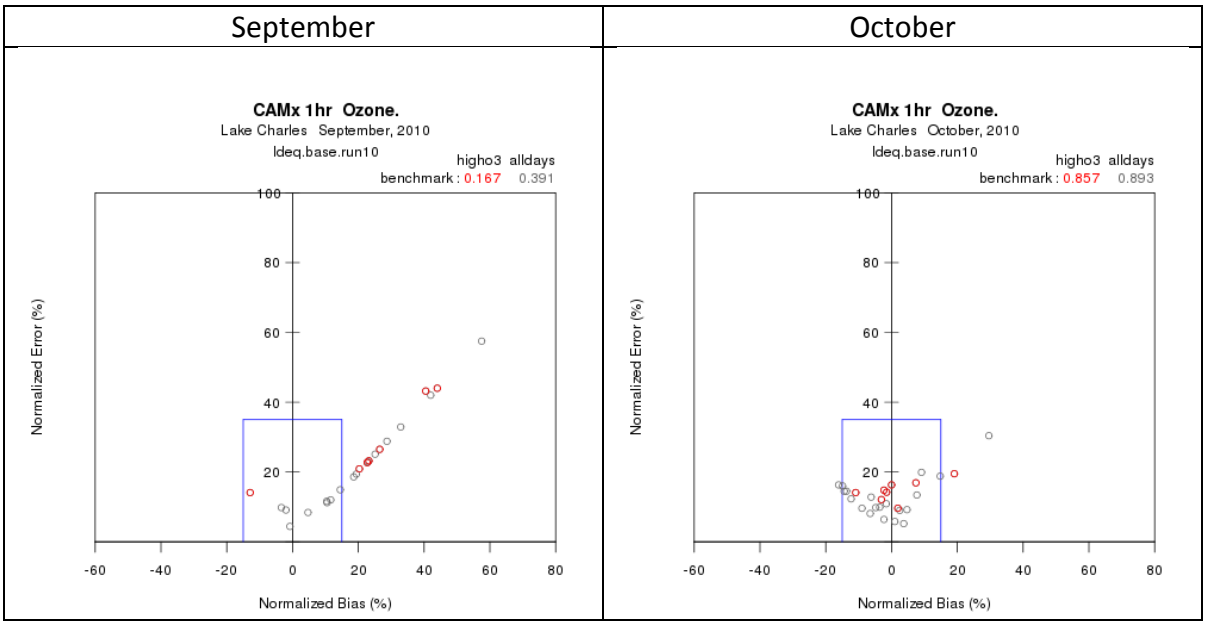


Figure 6-19. "Goal" plots of daily normalized bias and error from Run 10 in Lake Charles for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days shown in Figure 6-1.

located with AQS sites measuring hourly ozone and NOx (Figure 6-20). The PAMS sites take 3-hour canister samples of ambient air every few days, which are then analyzed for 55 individual hydrocarbon species.

Morning average (6-9 AM) CB05 VOC predictions from Run 10 were compared to PAMS measurement data (aggregated to CB05 compounds) for all available days of the September-October 2010 modeling period. This was done to evaluate fresh VOC emissions associated with the morning commute hours before significant chemistry and mixing impacted the measurements and simulation. Both the absolute concentrations on a species-by-species basis, and the relative distribution among all CB05 species were evaluated as a check of the emissions inventory speciation profiles. VOC:NOx ratios were generated for the same periods to evaluate daily ozone-forming potential and to assess precursor performance and potential issues with the local emissions inventory.

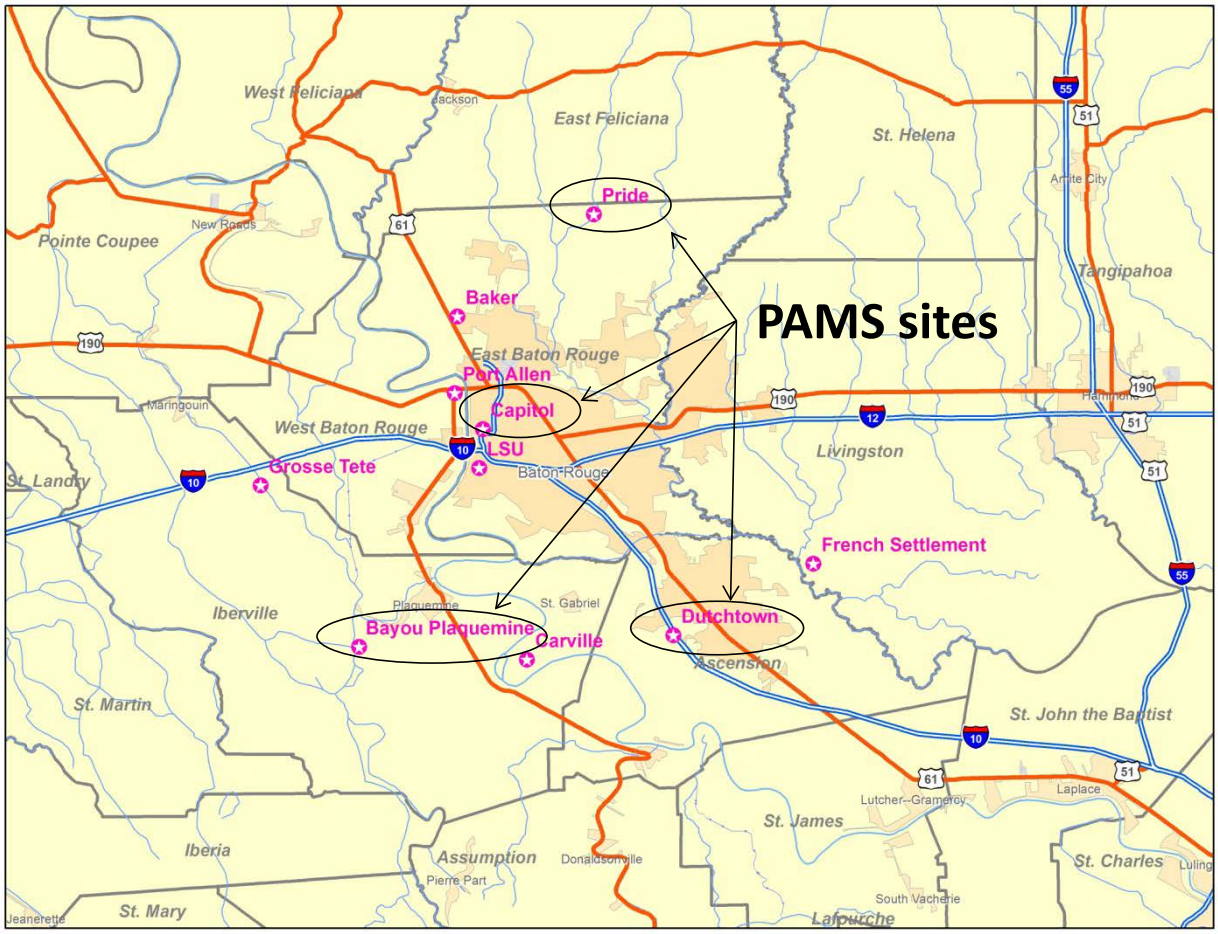


Figure 6-20. Location of AQS monitoring sites in the Baton Rouge area (stars). Highlighted are four co-located PAMS sites measuring 3-hour VOC samples every few days.

General precursor comparisons at all four PAMS sites are summarized in Table 6-2, expressed as 6-9 AM averages over September and October. At the urban sites (Capitol and Dutchtown), both NOx and VOC tend to be over predicted, but VOC:NOx ratios are adequately predicted and indicate NOx-rich, VOC-limited conditions. Precursor over predictions may be associated with inadequate morning ventilation in the growing mixed layer, and/or too much emission allocated to the 6-9 AM period. At the rural sites (Pride and Bayou Plaquemine), NOx is well-predicted, but VOC is over predicted and that leads to higher simulated VOC:NOx ratios than observed, particularly at Pride (NOx-sensitive conditions).

Table 6-2. September and October averages of 6-9 AM observed and simulated NOx, VOC, and VOC:NOx ratio at four PAMS sites in Baton Rouge. VOC:NOx ratios are colored according to VOC-limited (blue), NOx-limited (red), and transition (purple) conditions.

	Capitol		Dutchtown		Pride		B. Plaquemine	
	Sep	Oct	Sep	Oct	Sep	Oct	Sep	Oct
Obs NOx (ppb)	21	36	14	23	6	7	13	14
Prd NOx (ppb)	29	37	21	26	3	4	16	12
Obs VOC (ppbC)	104	214	59	72	24	30	70	72
Prd VOC (ppbC)	188	184	150	172	66	66	104	88
Obs VOC:NOx	5	6	4	3	4	5	5	5
Prd VOC:NOx	6	5	7	7	23	15	6	8

Figure 6-21 shows absolute comparisons of 6-9 AM CB05 VOC concentrations at all four sites as an example of a poor performing high ozone day (September 14); relative distributions are shown in Figure 6-22. Figure 6-21 also includes annotations indicating 6-9 AM NOx comparisons and VOC:NOx ratios on that day. All sites exhibit over predictions of VOC, especially isoprene at rural sites. At all sites except Pride, simulated NOx is close to measurements, and this leads to VOC:NOx ratios that are too high into the transitioning from VOC-sensitive to NOx-sensitive. At Pride, the excessive isoprene is driving VOC:NOx ratios far too high. Whereas NOx should be inhibiting ozone formation at these sites, both NOx and VOC are likely contributing to ozone formation and that could explain ozone over predictions on this day.

Plotting these distributions as relative contributions to total VOC indicates the extent to which emissions are speciated correctly (Figure 6-22). On September 14, the relative distributions of CB05 species are well-replicated except for the consistent under prediction of ethane. Ethane is not well characterized in emission inventories, and its presence at measured values shown in Figure 6-21 suggest regional contributions from natural gas sources (production, distribution, processing). While this suggests a missing component in the emission inventory, ethane reacts very slowly and thus has little impact on local ozone generation.

Figures 6-23 and 6-24 show the absolute and relative VOC concentrations as an example of a good performing high ozone day (October 23), but are otherwise identical to the plots for September 14. Again VOCs tend to be over predicted but so is NOx at all sites except Pride, leading to excellent agreement in VOC:NOx ratios at three of the four sites. Note the

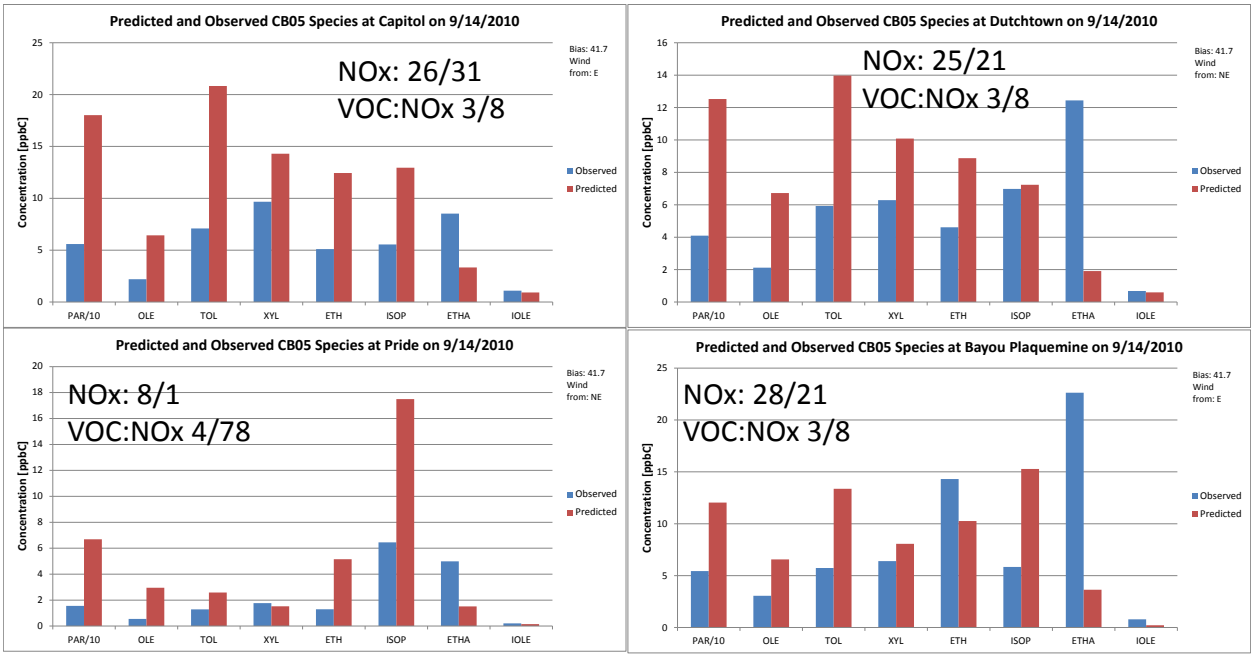


Figure 6-21. Comparison of 6-9 AM observed (blue) and simulated (red) CB05 VOCs at four PAMS sites in Baton Rouge on September 14, 2010. Plots are annotated with 6-9 AM observed/predicted NOx and VOC:NOx ratio.

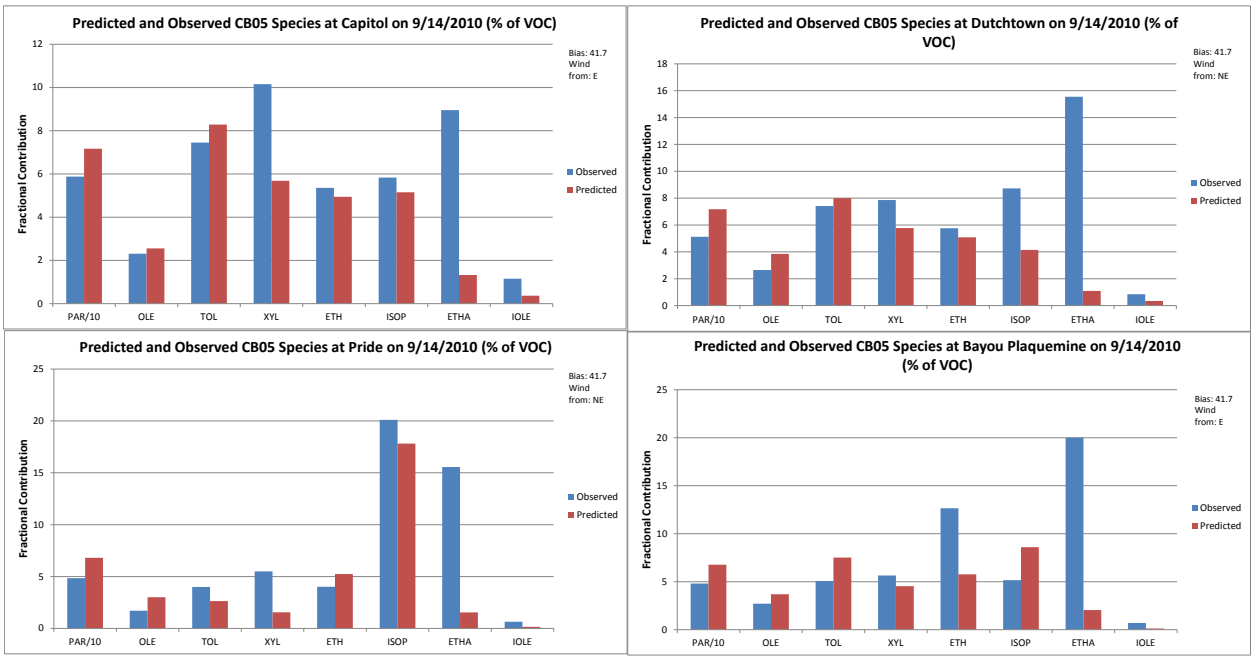


Figure 6-22. Comparison of 6-9 AM observed (blue) and simulated (red) relative contributions of CB05 VOCs to total VOC at four PAMS sites in Baton Rouge on September 14, 2010.

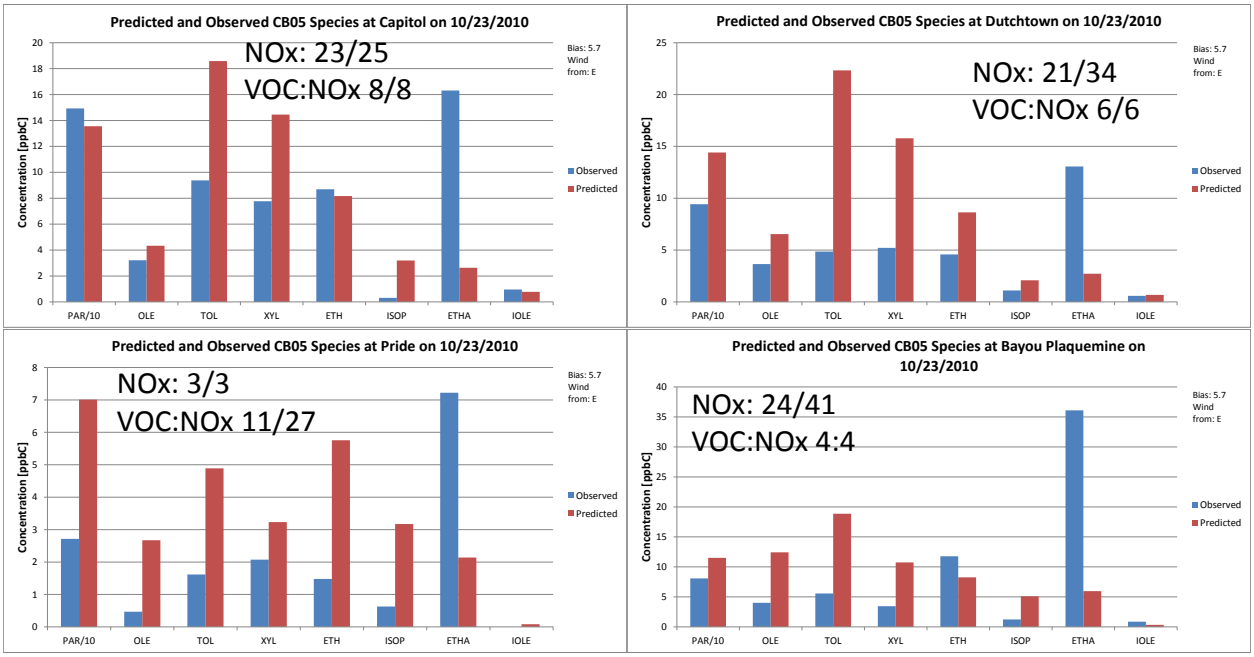


Figure 6-23. Comparison of 6-9 AM observed (blue) and simulated (red) CB05 VOCs at four PAMS sites in Baton Rouge on October 23, 2010. Plots are annotated with 6-9 AM observed/predicted NOx and VOC:NOx ratio.

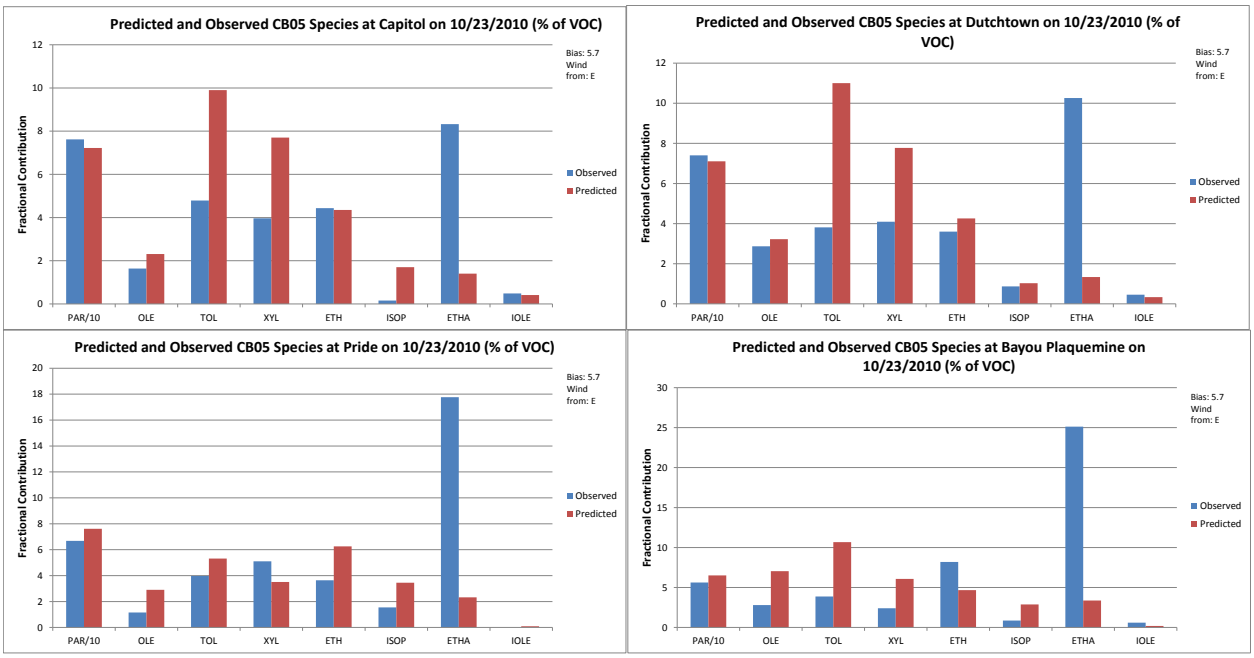


Figure 6-24. Comparison of 6-9 AM observed (blue) and simulated (red) relative contributions of CB05 VOCs to total VOC at four PAMS sites in Baton Rouge on October 23, 2010.

dramatically lower isoprene contributions at all sites. The relative plots show good agreement in the VOC distributions, except the urban sites exhibit larger proportions of aromatics (toluene and xylene), which suggest contributions from gasoline sources. Again, the ethane contribution is dominant at all four sites.

In summary, VOC:NOx ratios were replicated well at 3 of the 4 Baton Rouge PAMS sites over the entire modeling period. Both NOx and VOC tended to be equivalently too high. Generally, primary precursor emissions should be under predicted in grid models because of instantaneous dilution into large grid volumes. Over predictions in both NOx and VOC may be caused by too little vertical mixing during the morning hours, or an incorrect proportion of emissions allocated to that period of the day.

Based on VOC:NOx ratios, morning NOx and VOC emissions appear to be in the correct proportion. Furthermore, speciated (CB05) VOC emissions are correctly proportioned relative to total VOC except for isoprene and ethane. Simulated VOC:NOx ratios were too high on September days when ozone was grossly over predicted, and over estimates of isoprene were found to be a significant contributor to this. VOC:NOx ratios were in excellent agreement on good performing October days, when isoprene was much lower. Ethane appears to be largely missing in the emissions inventory, but this should be a negligible contributor to local ozone formation. PAMS measurements also showed occasionally large spikes in two additional compounds: light alkanes (PAR), which are usually associated with fugitive or evaporative sources; and ethylene, which is a highly reactive VOC released from petrochemical facilities.

With respect to the issue of higher NOx generated by MOVES, these analyses do not support the hypothesis that the on-road NOx inventory is driving ozone over predictions. The simple MOBILE6 test that reduced NOx and increased VOC should have raised VOC:NOx ratios, thereby misaligning from observed conditions and pushing the urban photochemical environment toward a more NOx-sensitive regime.

6.5 Additional Sensitivity Testing (Phase 2)

Based on new information gleaned from the precursor assessment described above, an additional series of diagnostic sensitivity tests were conducted for the high ozone period of September 10-25. Table 6-3 summarizes each of the Phase 2 sensitivity tests, including their purpose and their results. All tests were performed based on the Run 10 configuration.

A biogenic reduction test (Run 11) investigated the ozone impact from a 50% isoprene emission reduction. The choice of this factor was based on analyses of predicted and measured midday isoprene concentrations at PAMS sites during the September-October modeling period. Figure 6-25 shows and example at the Capitol site, where isoprene measurements were over predicted by an average factor of 2.5 throughout the period. Subsequent comparisons between MEGAN-derived isoprene emissions over the entire 4-km grid and estimates from the EPA's BEIS model also show differences by similar factors for August and September, and much smaller differences in October (Figure 6-26).

Table 6-3. Phase 2 diagnostic sensitivity tests performed on the CAMx 2010 base year simulation.

Run ID	Purpose	Results
11	Reduce biogenic isoprene by 50% according to PAMS measurements	Large widespread reductions in MDA8 ozone; Improved statistical performance
12	Increase haze turbidity by a factor of 5 to investigate impact to photolysis rates from heavy fire-derived aerosol burdens	Negligible impacts to statistical performance; Negligible impacts on MDA8 patterns;
13	Calculate Kv from ACM2 technique to test sensitivity to increased mixing (no changes to mixing depth)	Minor mixed impacts to statistical performance; Minor mixed impacts on MDA8 patterns
15	Replace Zhang03 dry deposition with Wesely89 to test sensitivity to choice of algorithm; gridded landuse derived from WRF	Large widespread reductions in MDA8 ozone; Improved statistical performance
16	Scale mixing depth upward by 25%, consistent with remaining average September over prediction bias, to test sensitivity to deeper mixing (no changes to Kv methodology)	Mixed impacts to statistical performance; Moderate mixed impacts on MDA8 patterns

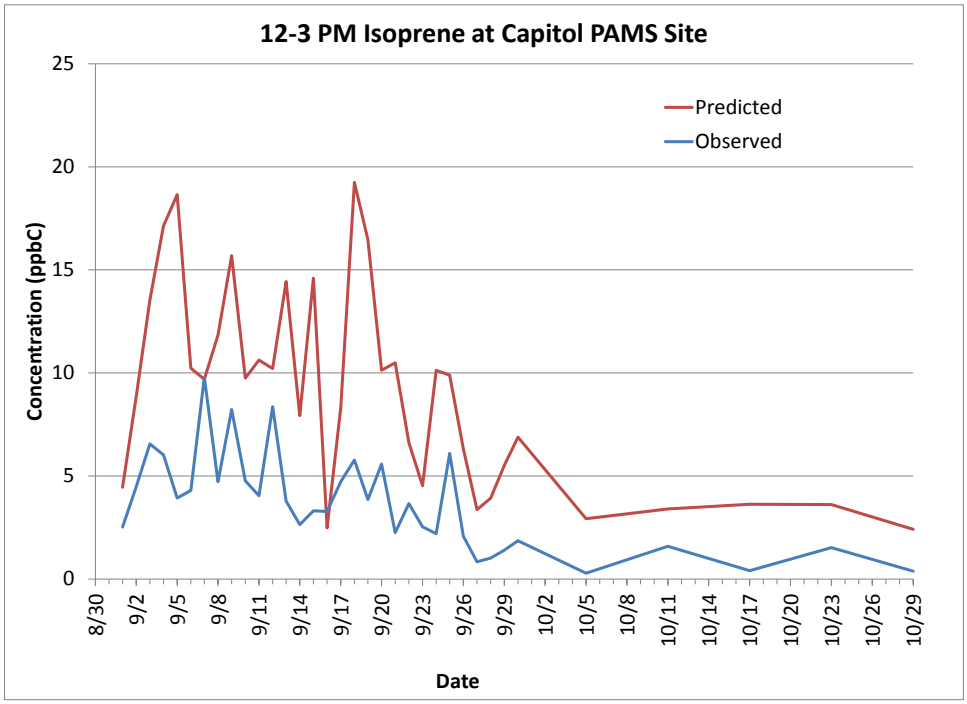


Figure 6-25. Midday (12-3 PM) observed and predicted (Run 10) isoprene concentrations at the Capitol PAMS site on sampling days throughout September and October 2010.

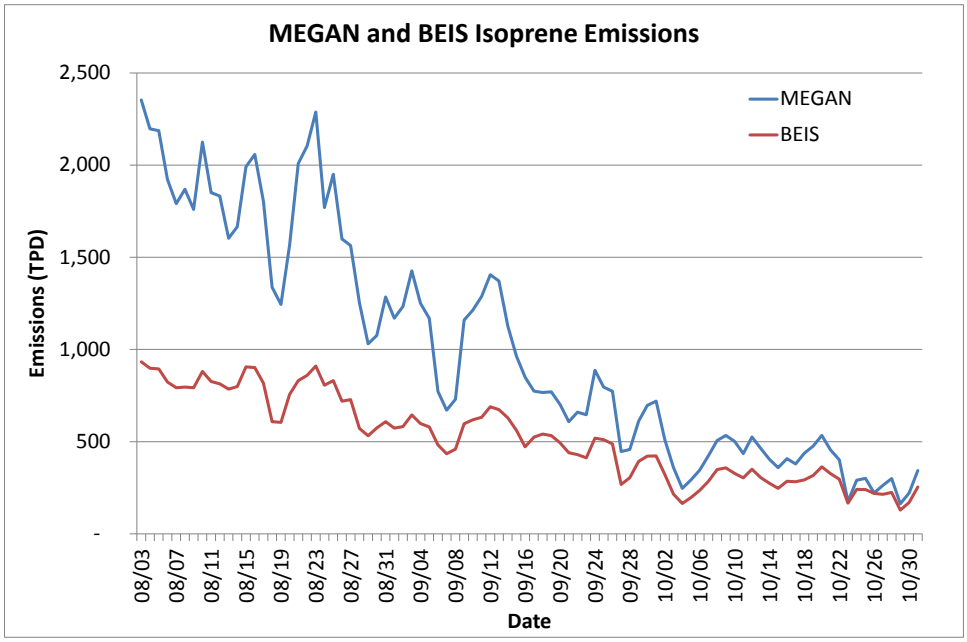


Figure 6-26. Daily total isoprene emissions across the entire 4 km modeling grid estimated by MEGAN and BEIS for each day of August through October 2010.

Figure 6-27 presents spatial plots of MDA8 ozone from Run 11 on September 14, along with the difference in MDA8 from Run 10. Results show much lower ozone in NOx-heavy, VOC-sensitive areas (i.e., urban). Widespread ozone reductions of 5-10 ppb were common throughout southern and northwestern where NOx emissions were highest. This strengthens evidence that over estimated biogenic emissions drive ozone over predictions, especially in September.

Two additional vertical mixing tests were conducted: the first employed an alternative Kv calculation methodology (ACM2) that consistently leads to much higher mixing rates than any other option available in the WRFCAMx pre-processor (Run 13); the second increased the depth of mixing by 25% (Run 16). The first test was designed to test if insufficient mixing rates within the same mixing depth were leading to ozone over predictions. Minor positive and negative ozone changes occurred (< ±5 ppb), scattered throughout the domain. The second test attempted to apply an ad-hoc increase to daily mixing volumes by a factor consistent with the September over prediction bias, thereby reducing the bias toward zero. Larger mixed signals were generated in this test, but impacts to statistical performance were not significant. These two tests show that ozone patterns did not respond linearly to modified vertical mixing rates or depths. Together with the original Phase 1 test using mixing rates calculated using the YSU option (Run 6), it is clear that the September over predictions were not driven by uncertainties in boundary layer mixing.

An alternative dry deposition algorithm, referred to as WESELY89, was employed in Run 15 to test sensitivity to pollutant removal to the surface. The WESELY89 option is the original scheme in CAMx, and it requires a different landuse classification scheme based on 11 types (as

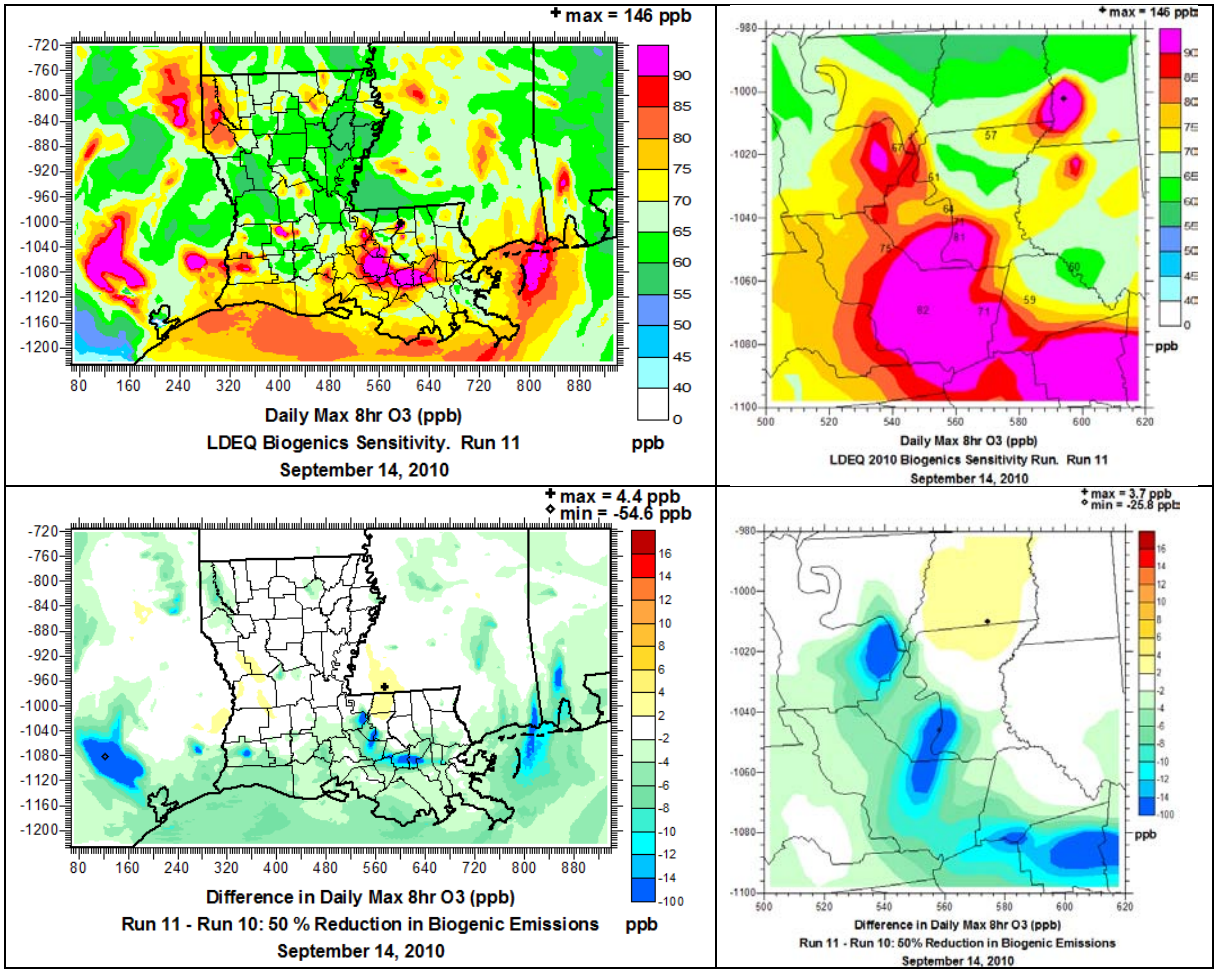


Figure 6-27. Top row: Spatial distribution of predicted MDA8 ozone (ppb) from Run 11 on September 14. Plots are shown for the entire 4 km modeling grid (left) and for south-central Louisiana focusing on Baton Rouge, with observed MDA8 ozone overlaid at monitor locations (right). Bottom row: Spatial distribution of differences (Run 11 – Run 10) in MDA8 on the 4 km modeling grid (left) and over south-central Louisiana (right).

opposed to 26 types in ZHANG03). Alternative gridded landuse input fields were derived from WRF output, which reports the dominant landuse type in each grid cell using a 26-category USGS classification scheme. The WRF landuse types were mapped to the 11 WESELY89 types using the WRFCAMx pre-processor. Run 15 included the 50% biogenic isoprene reduction from Run 11 to carry on that important modification. Relative to Run 11, the alternative deposition option resulted in additional large reductions in MDA8 ozone throughout the September 10-25 test period and significant improvements in statistical model performance in the Baton Rouge area. Figure 6-28 presents spatial plots of MDA8 ozone from Run 15 on September 14, along with the difference in MDA8 from Run 11 (the 50% biogenic test) to isolate the deposition signal. Reductions of MDA8 consistently reached 5-15+ ppb over much of the 4 km modeling

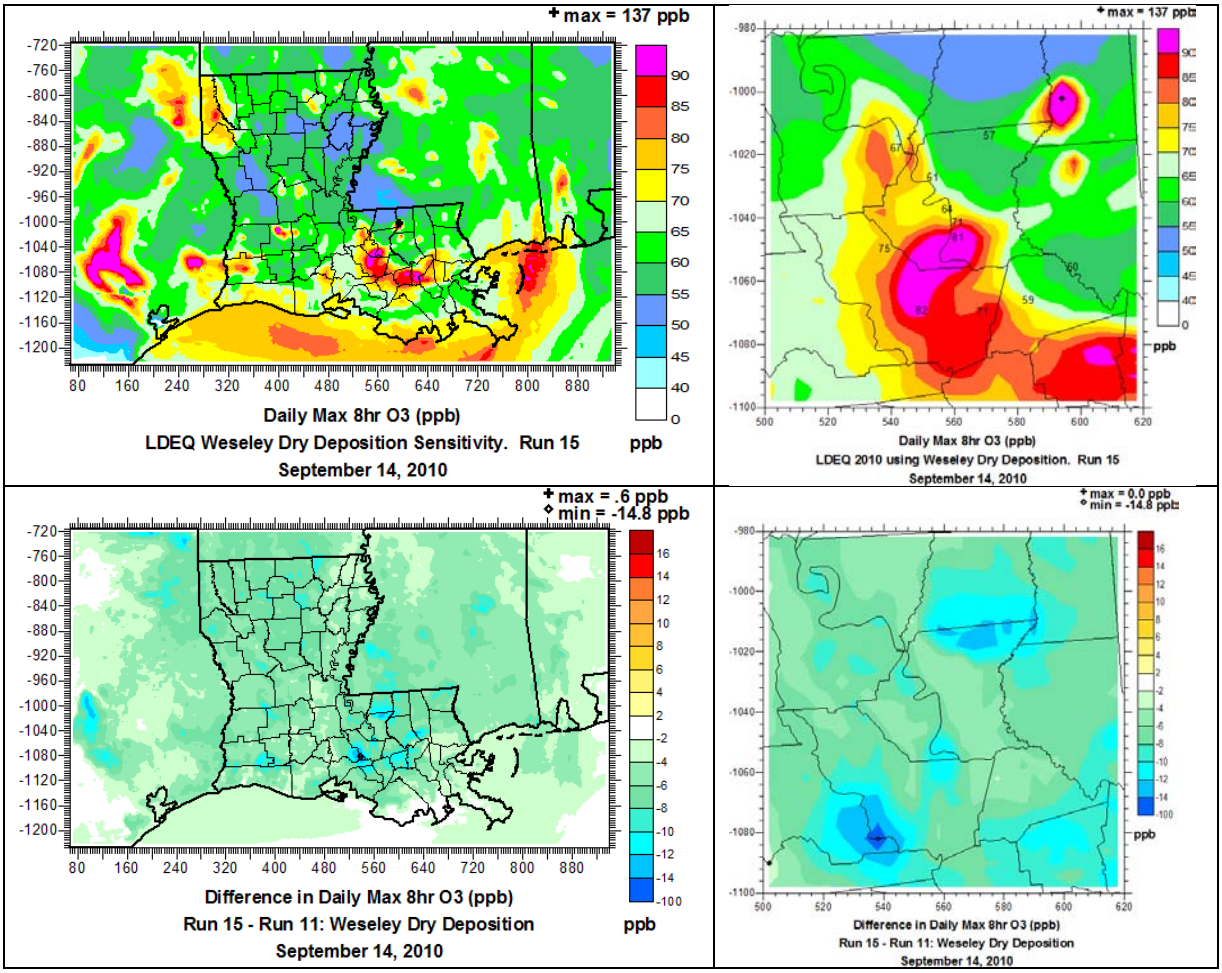


Figure 6-28. Top row: Spatial distribution of predicted MDA8 ozone (ppb) from Run 15 on September 14. Plots are shown for the entire 4 km modeling grid (left) and for south-central Louisiana focusing on Baton Rouge, with observed MDA8 ozone overlaid at monitor locations (right). Bottom row: Spatial distribution of differences (Run 15 – Run 11) in MDA8 on the 4 km modeling grid (left) and over south-central Louisiana (right).

grid. Average model bias for 1-hour ozone in Baton Rouge during September exceedance days was reduced to 6% in Run 15, compared to 13% in Run 11 (reduced biogenics), 23% in Run 10 (Phase 1 interim simulation), and 32% in Run 1.

6.6 Final Base Year CAMx Run

The final CAMx base year simulation ("Run 17") incorporated certain modifications from the sensitivity tests that collectively led to improved model performance for ozone. Otherwise, the simulation used identical inputs as in Run 1, and was performed for the entirety of September and October 2010 (including the August 15-31 spinup period). The CAMx configuration for the final base year simulation is listed below (red highlighted items note modifications from Run 1):

- Time zone: Central Standard Time (CST)
- I/O frequency: 1 hour
- Map projection: Lambert conformal (see Section 4.1)
- Nesting: 2-way fully interactive 36/12/4-km computational grids (Figure 4-1)
- Chemistry mechanism: CB05 gas-phase only (without PM)
- Chemistry solver: Euler-Backwards Iterative (EBI)
- Advection solver: Piecewise Parabolic Method (PPM)
- Plume-in-Grid sub-model: Off
- Probing Tools: Off
- Asymmetric Convective Model: On
- Photolysis Adjustments for Clouds: in-line TUV
- Photolysis Adjustment for Aerosols: input AHOMAP
- Dry deposition: Wesely89
- Wet deposition: On
- Biogenic emissions: EPA BEIS
- Wildfires: Reduced NOx, addition of aged NOy
- Kv Patch: No nighttime urban patch

Figure 6-29 presents spatial plots of MDA8 ozone over the 4-km nested grid on days when ozone exceeded the 2008 ozone NAAQS at any location in Louisiana (compare to Figure 6-1). Simulated ozone over predictions were reduced substantially on all of these days. The highest simulated ozone continued to occur on September 14, reaching 137 ppb in a very isolated area to the northeast of Baton Rouge, but the peak value of 57 ppb at Pride was well simulated. Closer to Baton Rouge, predicted ozone exceeded 90 ppb to the south of the city whereas peak observations reached 82 ppb at Bayou Plaquemine.

Another series of high ozone days occurred in the Baton Rouge area on October 8-10, with peak predictions reaching 82 to 89 ppb. However, these maxima occurred in areas well east of any monitoring sites so their magnitude cannot be verified. The model shows much lower ozone in the areas of the Baton Rouge monitors on these days, with concentrations in the 60-80 ppb range, which agrees rather well with measurements.

Time series of daily statistics for Baton Rouge are shown in Figure 6-30 (compare to Figure 6-2). Performance in September continued to be worse than in October, but the large errors prevalent in the initial base year run were dramatically reduced to the benchmarks for a well-performing model, particularly on high ozone days. Figure 6-31 presents the same data as Figure 6-30 but as goal plots; Figures 6-32 through 6-34 show results for New Orleans, Shreveport, and Lake Charles (compare to Figures 6-3 through 6-6). In all areas, performance on September high ozone days improved to within the statistical benchmarks. Performance in October shifted toward a slight under prediction tendency in most areas.

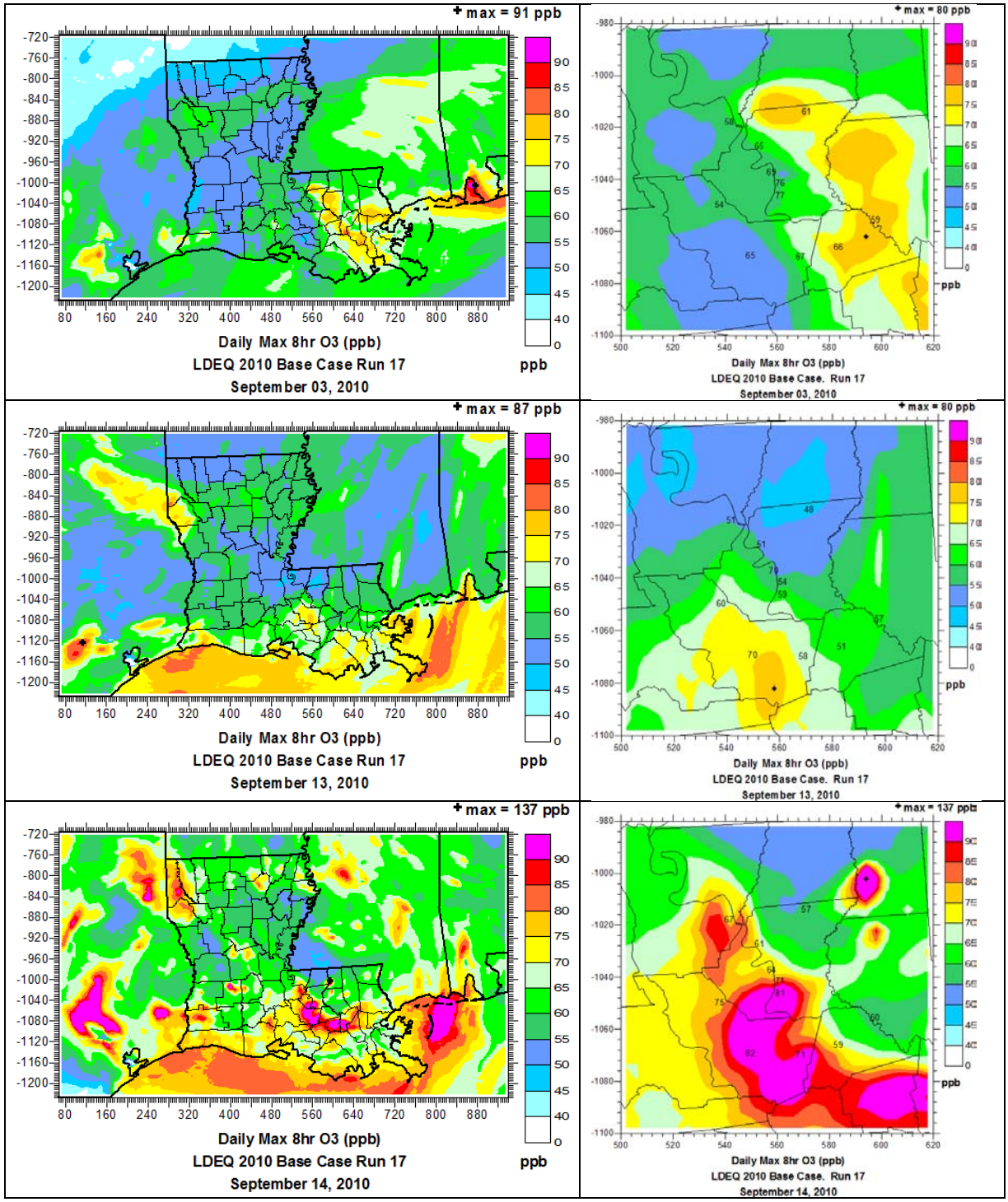


Figure 6-29. Spatial distribution of predicted MDA8 ozone (ppb) from the final base year run on days exceeding the 2008 ozone NAAQS in Louisiana. Plots are shown for the entire 4 km modeling grid (left) and for south-central Louisiana focusing on Baton Rouge, with observed MDA8 ozone overlaid at monitor locations (right).

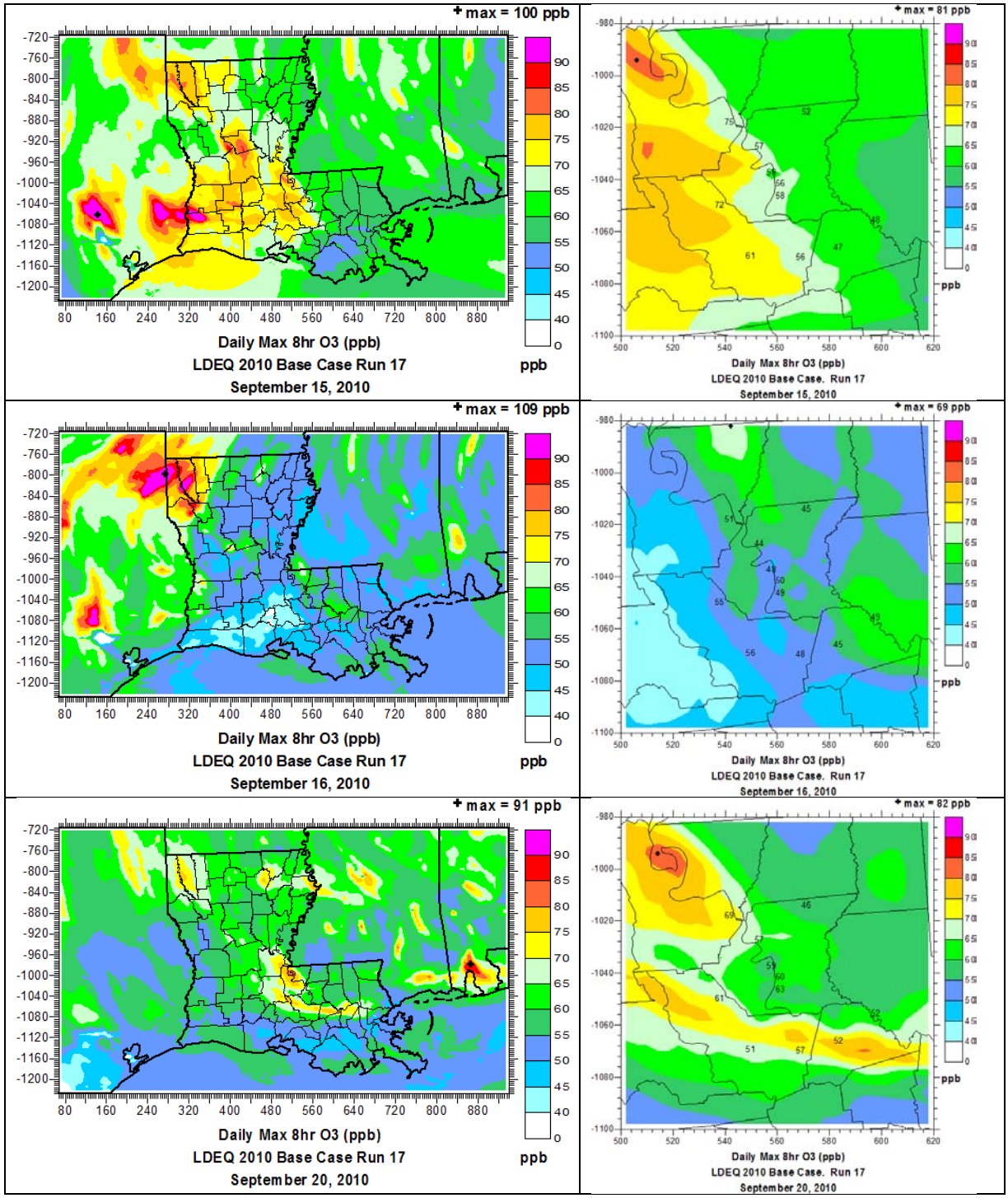


Figure 6-29 (continued).

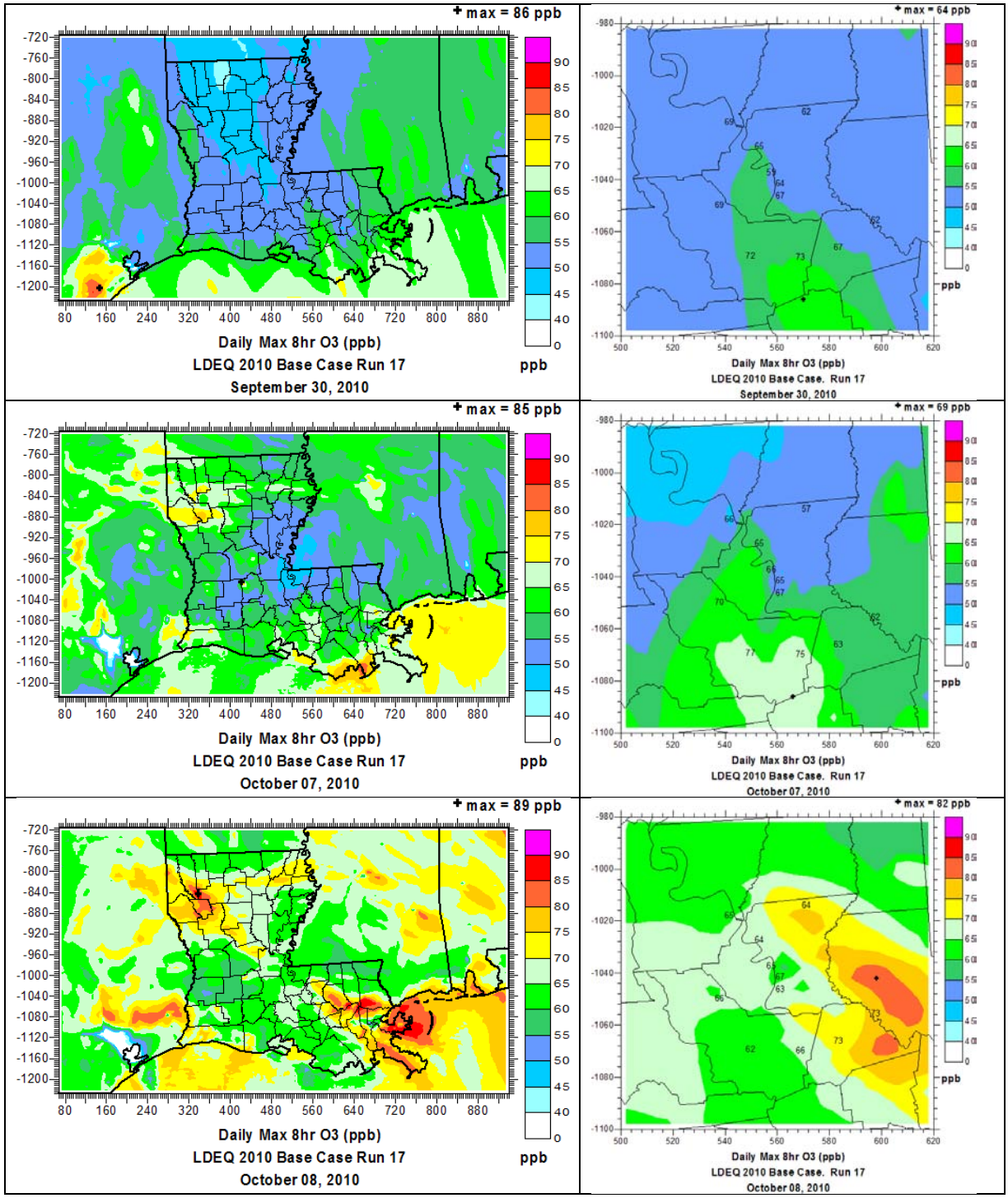


Figure 6-29 (continued).

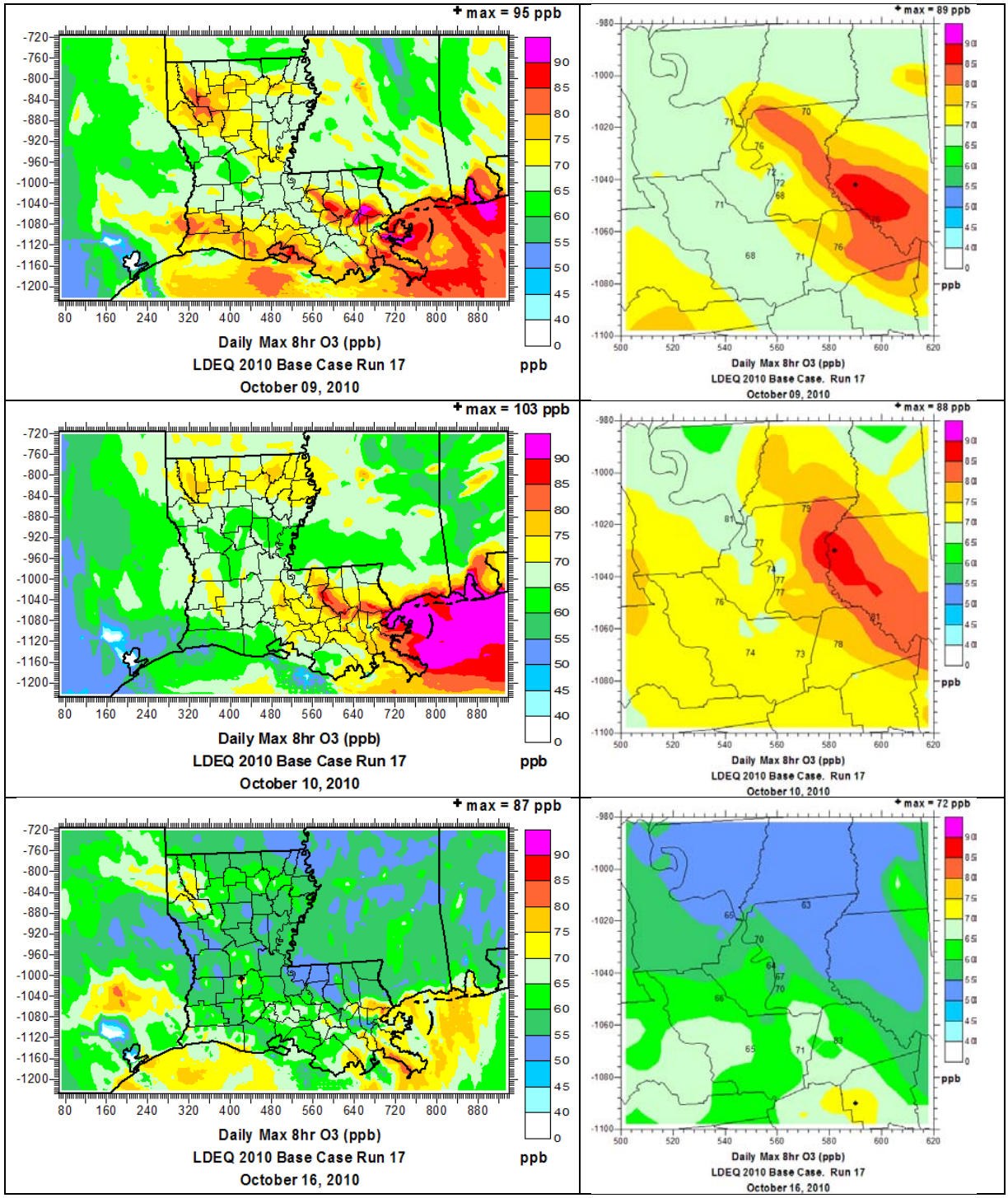


Figure 6-29 (continued).

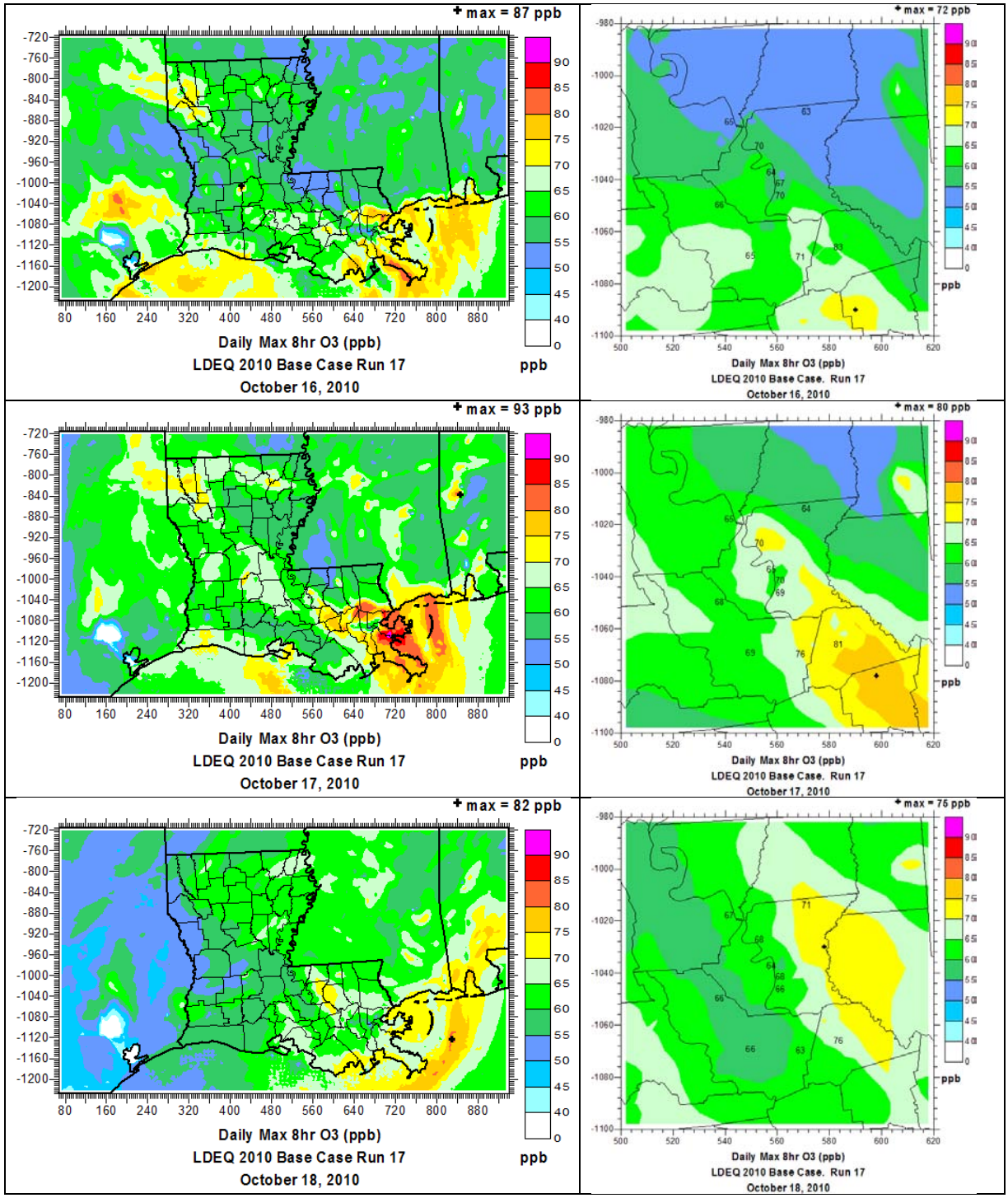


Figure 6-29 (concluded).

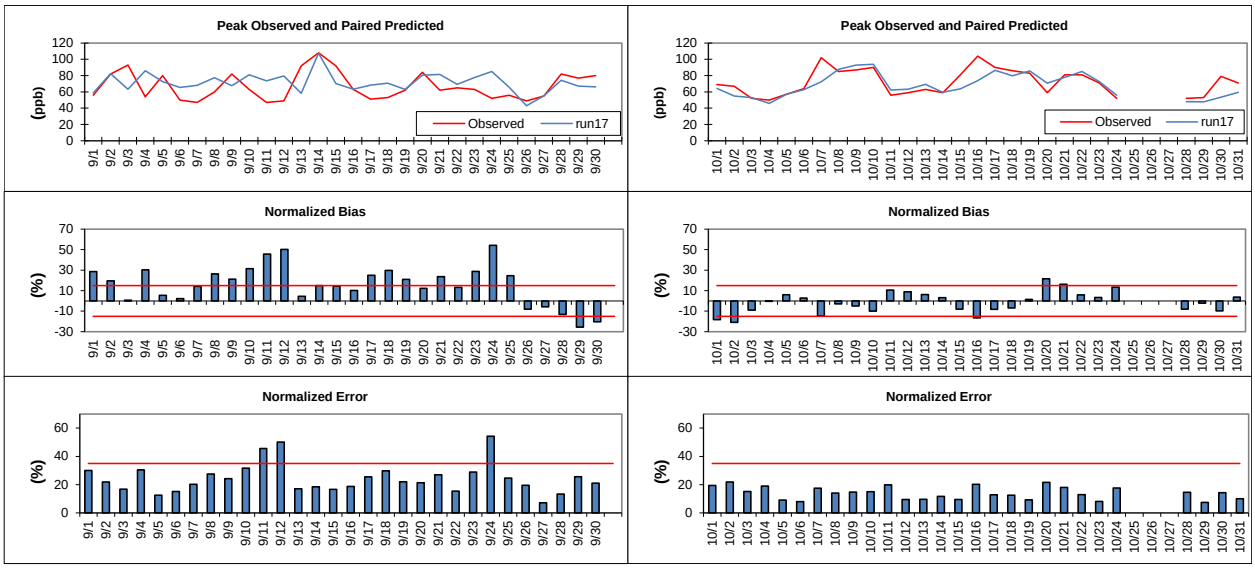


Figure 6-30. Daily statistical performance for the final base year run at all Baton Rouge monitoring sites and for all hours when observed ozone was greater than 40 ppb, for September (left) and October (right), 2010. Top row: maximum daily peak 1-hour observed ozone (red) and paired simulated peak at the same site (blue). Middle row: daily mean normalized bias (bars) with ±15% bias highlighted (red lines). Bottom row: daily mean normalized gross error (bars) with 35% error highlighted (red lines).

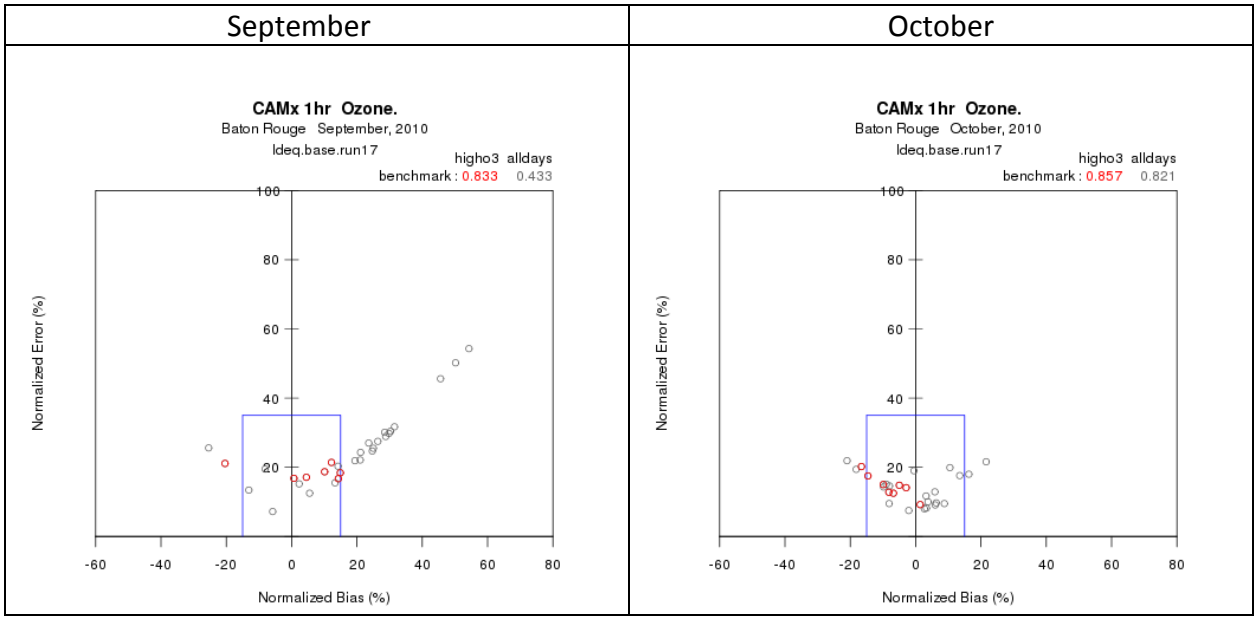


Figure 6-31. "Goal" plots of daily normalized bias and error from the final base year run in Baton Rouge for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days shown in Figure 6-1.

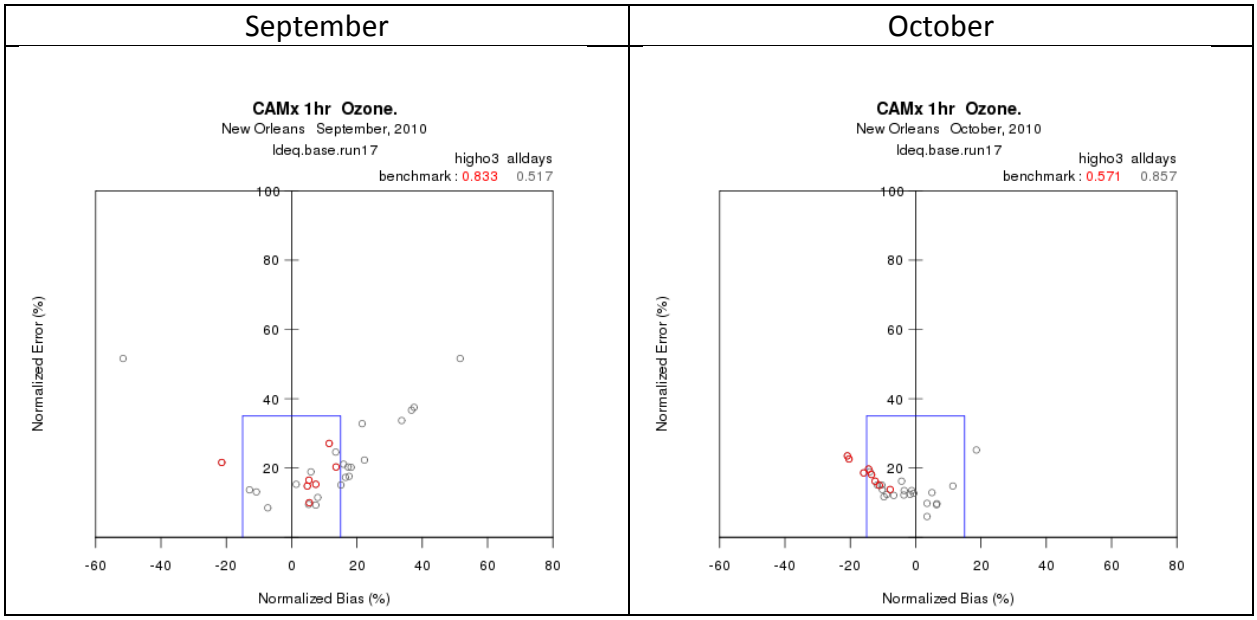


Figure 6-32. "Goal" plots of daily normalized bias and error from the final base year run in New Orleans for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days.

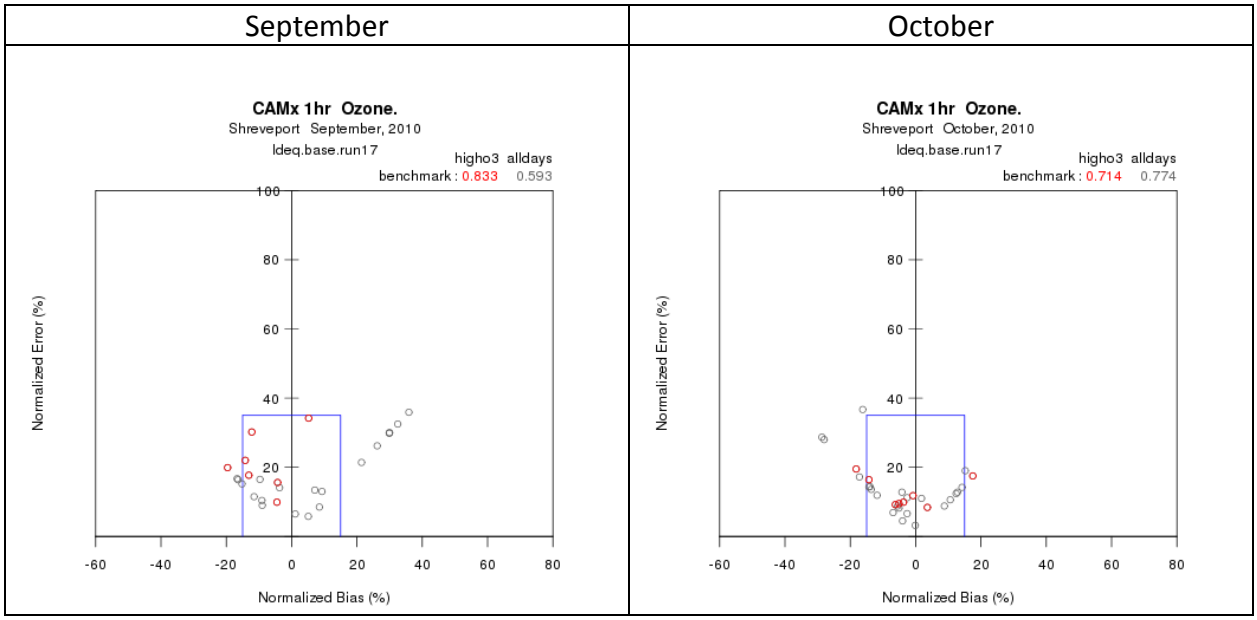


Figure 6-33. "Goal" plots of daily normalized bias and error from the final base year run in Shreveport for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days.

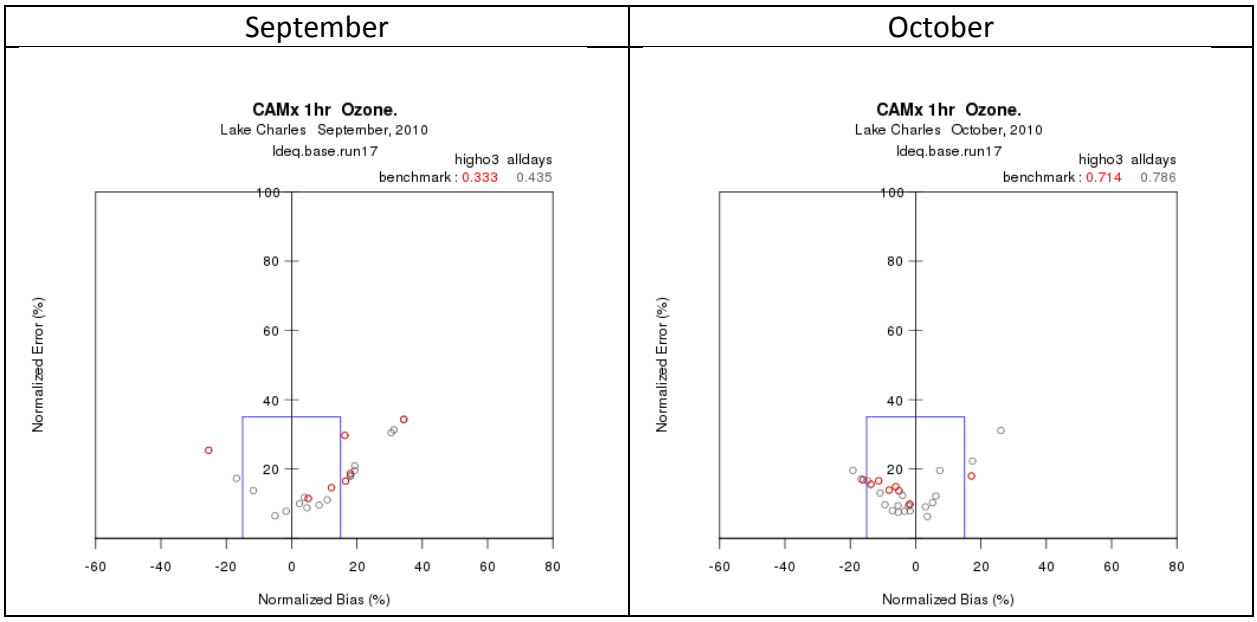


Figure 6-34. "Goal" plots of daily normalized bias and error from the final base year run in Lake Charles for September (left) and October (right). The blue goal denotes statistics within the 1-hour performance benchmarks. Red points are the high ozone days.

Time series of simulated and observed hourly ozone at the urban LSU monitor throughout September and October are shown in Figure 6-35 (compare to Figure 6-7). Performance in both September and October was quite good on an hourly basis, and the model properly captured the large intra-diurnal ranges of ozone. Similar time series for ozone are shown at the Dutchtown and Pride monitors in Figures 6-36 and 6-37 (compare to Figures 6-9 and 6-11). Again, performance was dramatically improved at both sites. However, nighttime ozone continued to be too high at Pride, taking on the characteristics typical of rural background ozone with small diurnal amplitude that is not influenced by scavenging from local NOx. Ozone observations suggest that a local NOx source contributed to nightly ozone reductions around the monitor that was not resolved by the model.

6.6.1 Regional Ozone Performance

September ozone over predictions in Louisiana may be related to various inaccuracies in local emission estimates to a certain extent (e.g., prescribed fire activity), but over predictions of regional (background) ozone entering Louisiana may contribute as well. We analyzed ozone performance in neighboring states to address this issue. Specifically, we identified CASTNET and AQS sites that are situated in rural areas to the east, north, and west of Louisiana (Figure 6-38) and calculated ozone performance statistics to gauge whether the model is adequately characterizing the amount of background surface ozone that should be entering Louisiana according to general wind patterns.

Figures 6-39 through 6-41 present daily normalized bias and gross error for 1-hour ozone on each day of September and October, in the form of bar chart time series, for the western, northern, and eastern groups of monitoring sites shown in Figure 6-38. In the west, a high bias prevailed in September but bias was much better and balanced in October, very similar to the bias patterns in Louisiana. The highest bias days were not associated with the highest ozone days in Louisiana. Good performance for gross error was achieved in both months. In the north, good performance was achieved for bias in both months, with a tendency for slight under prediction. All days except three were well within the ±15% benchmark. Very good performance for gross error was achieved, with typical values well below 20%. In the east, good performance was also achieved on most days of both months, with a more balanced positive and negative variability. Only six days exceeded the ±15% bias benchmark. Very good performance for gross error was achieved with values similar to the northern sites.

Note that the similarities between performance for the western regional sites and sites within Louisiana may be related to two factors: (1) the western sites were contained within the Louisiana 4 km grid, whereas the northern and eastern sites were all in the 12 km grid, suggesting a grid-specific sensitivity for the ozone simulation; and (2) western sites located along the Texas-Louisiana border may have received outflow from Louisiana on many of these days, which would lead to similar performance as seen in Lake Charles and Shreveport. Overall, the model simulated ozone patterns rather well in the region surrounding Louisiana during the entire modeling period. There was no indication that ozone formation and subsequent transport from neighboring states is improperly characterized.

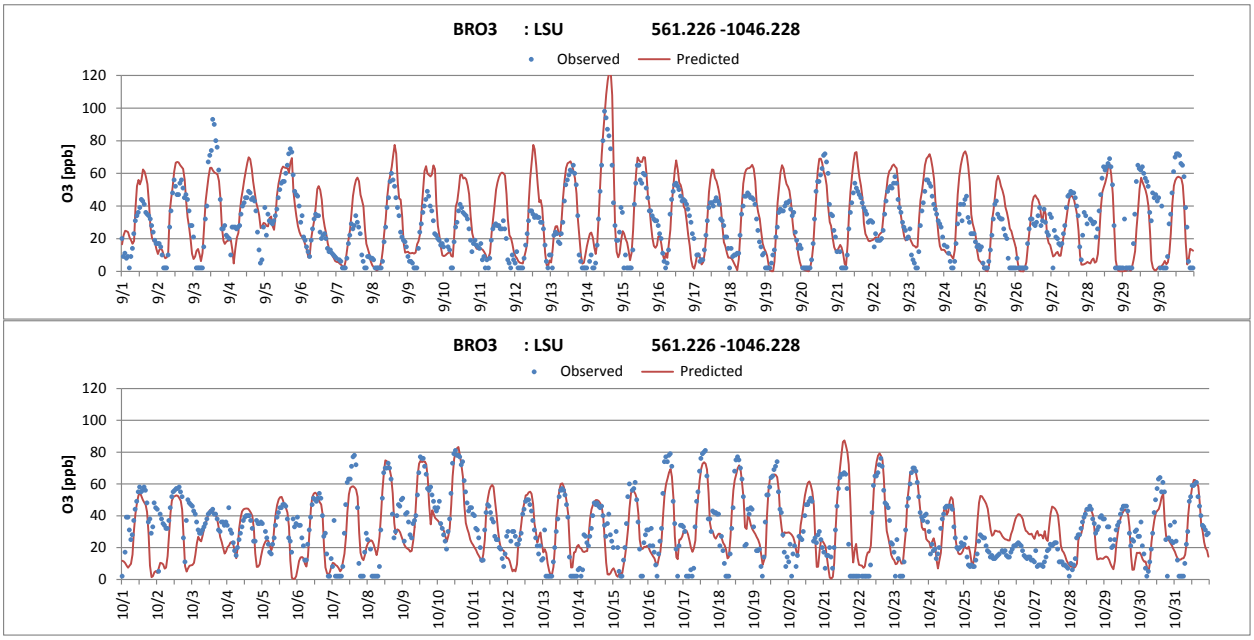


Figure 6-35. Hourly time series of observed (blue dots) and predicted (solid red line) ozone from the final base year run at the LSU monitoring site during September (top) and October (bottom).

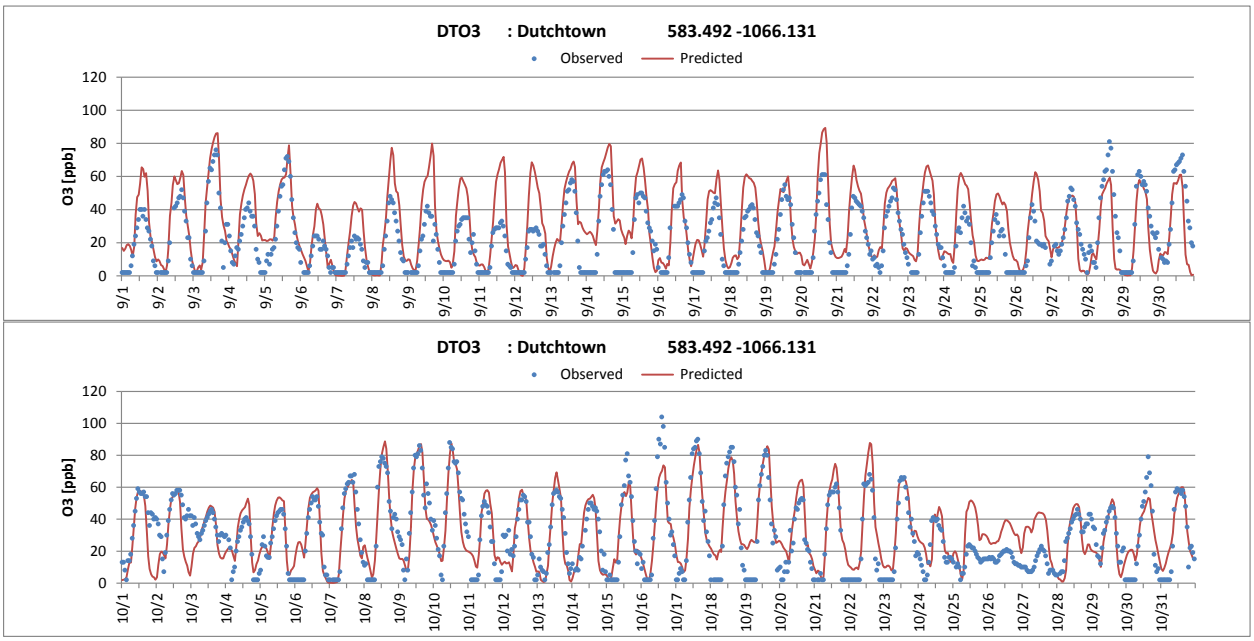


Figure 6-36. Hourly time series of observed (blue dots) and predicted (solid red line) ozone from the final base year run at the Dutchtown monitoring site during September (top) and October (bottom).

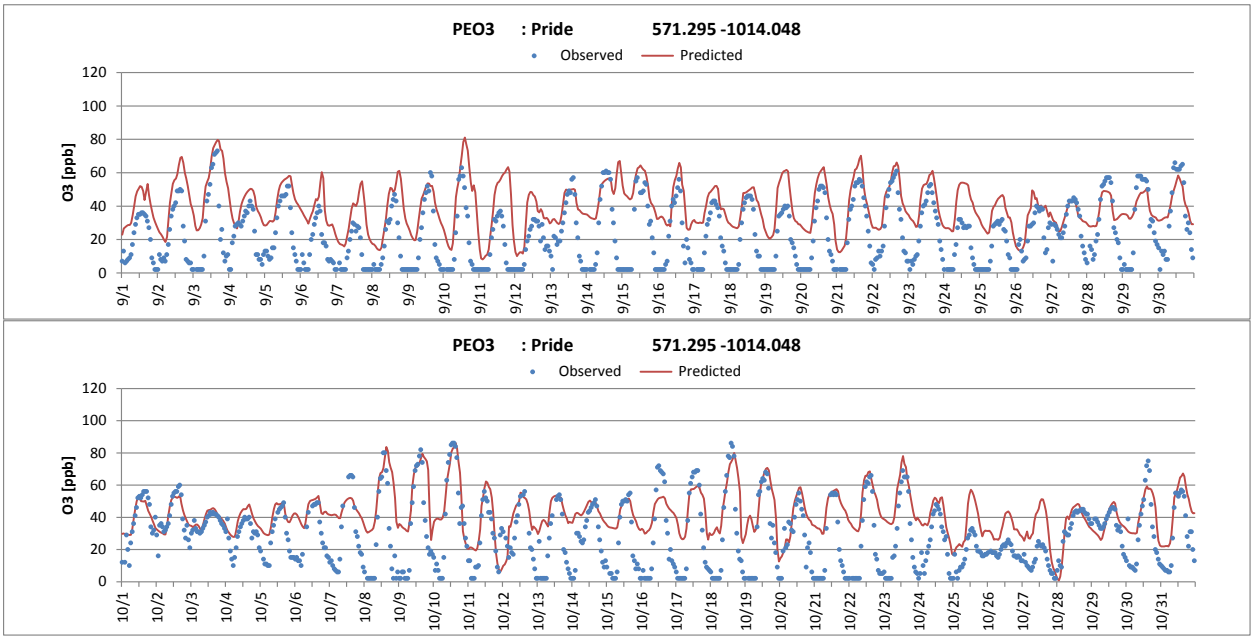


Figure 6-37. Hourly time series of observed (blue dots) and predicted (solid red line) ozone from the final base year run at the Pride monitoring site during September (top) and October (bottom).

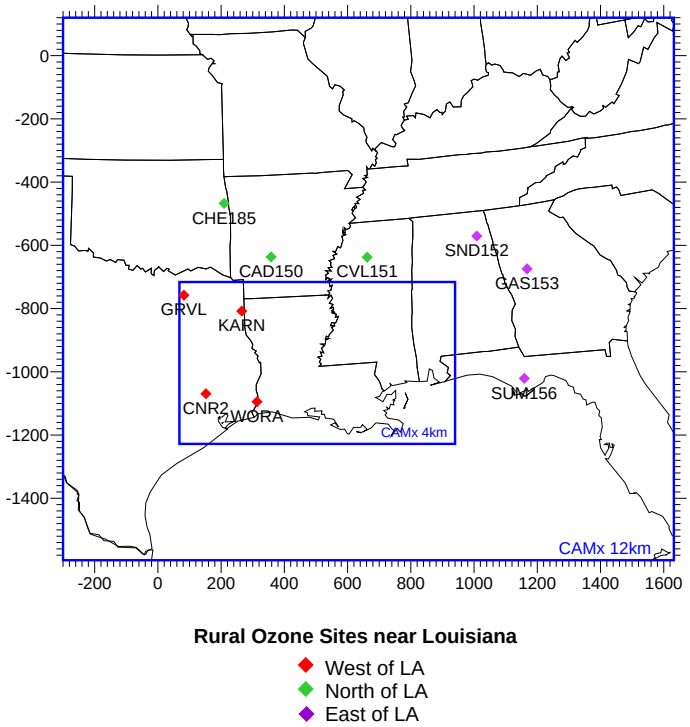


Figure 6-38. Locations of regional monitoring sites in areas surrounding Louisiana, relative to the CAMx modeling grid system.

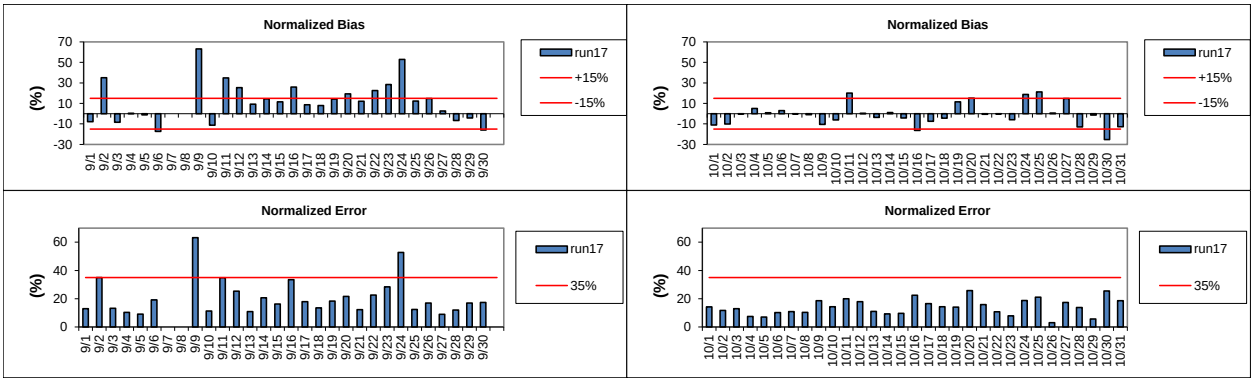


Figure 6-39. Daily statistical performance for the final base year run at all western regional monitoring sites and for all hours when observed ozone was greater than 40 ppb, for September (left) and October (right), 2010. Top row: daily mean normalized bias (bars) with ±15% bias highlighted (red lines). Bottom row: daily mean normalized gross error (bars) with 35% error highlighted (red lines).

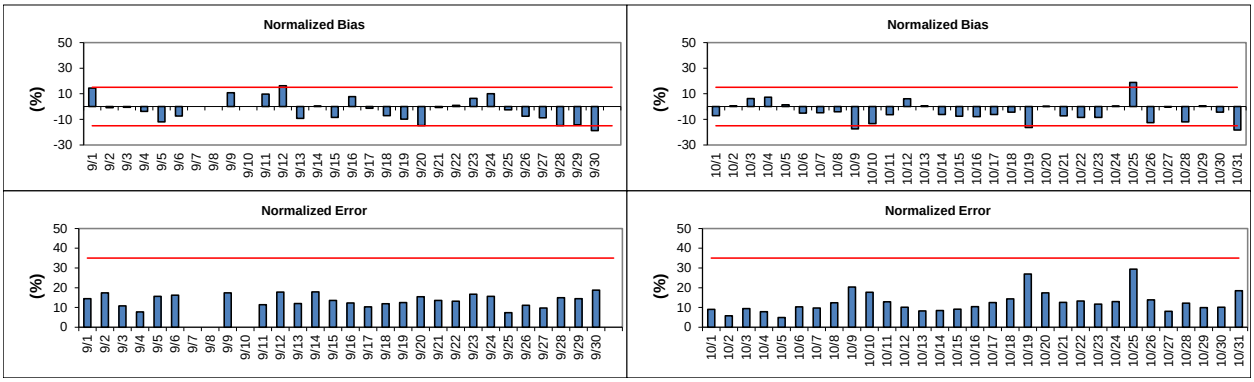


Figure 6-40. As in Figure 6-42, but at all northern regional monitoring sites.

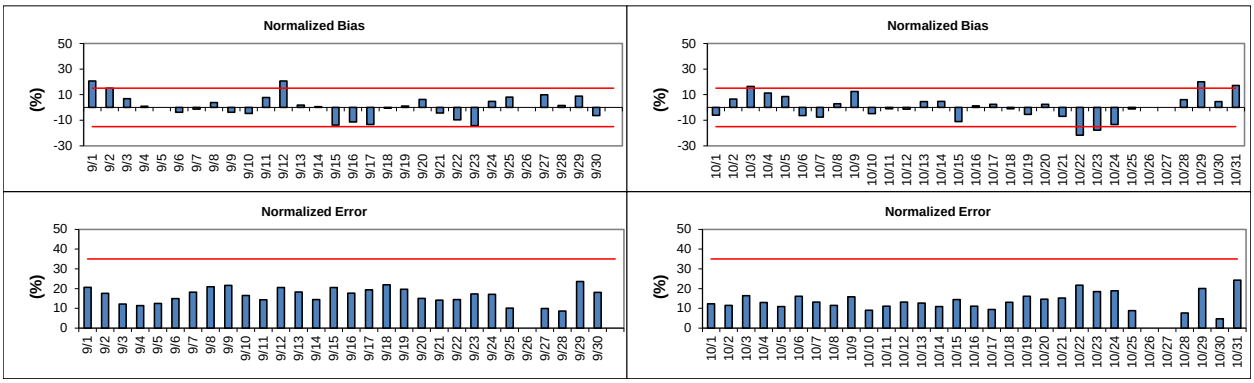


Figure 6-41. As in Figure 6-42, but at all eastern regional monitoring sites.

7.0 2017 FUTURE YEAR OZONE PROJECTION

7.1 Development of Future Year Emissions

Anthropogenic emission estimates for the September-October 2010 modeling period were projected to the 2017 future year. Details on the preparation of certain emission sectors are described in this section, specifically including Louisiana and Gulf of Mexico anthropogenic sources. Alpine Geophysics developed anthropogenic emission estimates for the remainder of the North American modeling domain. Day- and hour-specific BEIS biogenic and FINN fire emissions from the 2010 base year, as well as base year emissions estimates for Canada and Mexico, were used without modification for the 2017 future year.

As with the 2010 base year, emphasis was placed on developing 2017 emissions estimates within the State of Louisiana (LA) using EPS3 to convert the LA emission inventory into the hourly, chemically speciated, and gridded formats needed by CAMx. In some cases emissions were projected from 2010 to 2017 based on growth and control factors. In other cases emission modeling tools were used to estimate 2017 emissions for specific categories; MOVES/CONCEPT for on-road and NMIM for non-road sources. Area and point source emissions in Louisiana were prepared by ERG, working closely with the LDEQ. Gulf-wide offshore emissions were developed by ERG from the BOEM 2008 Gulf-wide Emission Inventory Study and by reviewing estimated oil and gas production rates for future years.

7.1.1 Emissions in Louisiana

The 2017 emissions were processed similarly to the approach used to develop the 2010 base year. EPS3 was set up to process criteria pollutant emissions into the CAMx configuration. EPS3 generated model-ready hourly point, area, non-road mobile, and on-road mobile emissions of CB6 compounds on the 36/12/4 km grid system. Certain CB6 VOCs were subsequently reverted back to CB05 speciation to be consistent with the decision to run the 2010 base year with CB05. Annual and ozone season emission estimates for most sectors were used to develop a representative weekday, Saturday and Sunday. Day specific estimates were developed for the on-road mobile sector. The remainder of this sub-section details the emissions processing by source category.

7.1.1.1 Point Sources

The 2017 point source emissions are based on the 2010 point source inventory provided by LDEQ (2012a). For the purposes of this project, it was decided that all point sources not part of the Acid Rain Program (ARP) or future interstate cap-and-trade programs were to be held constant at their 2010 estimates.

The hourly, day-specific 2010 ARP point source inventory was first converted to annual ("typical") emission estimates for each point source by summing their emissions over the entire year. These annual estimates were then adjusted to reflect relevant control programs. Two types of emission limits were applied to the ARP units; those developed under the Clean Air Interstate Rule (CAIR), and any current Plant-wide Applicability Limits (PAL). LDEQ provided the

Table 7-1. Louisiana 2015 CAIR Program annual NOx allocations.

Facility Name Unit Designation	Unit ID (ORIS)	Amount tons/year	Facility Name Unit Designation	Unit ID (ORIS)	Amount tons/year
Rodemacher - Unit 1	006190	233	Morgan City Electrical Gen Facility	001449	12
Rodemacher - Unit 2		2056	Houma - 15	001439	9
Rodemacher - Unit 3		2584	Houma - 16		8
RS Nelson - 6	001393	2780	D G Hunter - 3	006558	4
RS Nelson - 3		72	D G Hunter - 4		9
RS Nelson - 4		361	Hargis-Hebert Electric Gen - U-1	056283	20
Big Cajun 2 - 2B3	006055	2923	Hargis-Hebert Electric Gen - U-2		29
Big Cajun 2 - 2B1		2883	Natchitoches	001450	0
Big Cajun 2 - 2B2		3138	T J Labbe Electric - U-1	056108	12
Dolet Hills	000051	3487	T J Labbe Electric - U-2		10
Entergy Little Gypsy - 1	001402	118	Acadia Power Station - CT-1	055173	42
Entergy Little Gypsy - 2		209	Acadia Power Station - CT-2		62
Entergy Little Gypsy - 3		351	Acadia Power Station - CT-3		40
Monroe	001448	0	Acadia Power Station - CT-4		42
Entergy Ninemile Point - 1	001403	17	Bayou Cove Peaking Power - CTG-1	055433	3
Entergy Ninemile Point - 2		0	Bayou Cove Peaking Power - CTG-2		3
Entergy Ninemile Point - 3		43	Bayou Cove Peaking Power - CTG-3		3
Entergy Ninemile Point - 4		622	Bayou Cove Peaking Power - CTG-4		3
Entergy Ninemile Point - 5		467	Big Cajun 1 - CTG2	001464	12
Perryville Power Sta - 1-1	055620	110	Big Cajun 1 - CTG1		16
Perryville Power Sta - 1-2		203	Big Cajun 1 - 1B1		17
Perryville Power Sta - 2-1		82	Calcasieu Power, LLC - GTG2	055165	65
Sterlington - 10	001404	0	Calcasieu Power, LLC - GTG1		35
Sterlington - 7AB		2	Carville Energy Center - COG01	055404	132
Sterlington - 7C		3	Carville Energy Center - COG02		150
Entergy Waterford - 1	008056	152	Evangeline Power (Coughlin) - 7-2	001396	71
Entergy Waterford - 2		95	Evangeline Power (Coughlin) - 7-1		81
Entergy A B Paterson - 3	001407	0	Evangeline Power (Coughlin) - 6-1		52
Entergy A B Paterson - 4		0	Exxon Mobil Louisiana 1 - 1A	001391	140
Entergy Michoud - 1	001409	0	Exxon Mobil Louisiana 1 - 2A		150
Entergy Michoud - 2		163	Exxon Mobil Louisiana 1 - 3A		148
Entergy Michoud - 3		537	Exxon Mobil Louisiana 1 - 4A		908
Entergy Louisiana 2 - 10	001392	0	Exxon Mobil Louisiana 1 - 5A		284
Entergy Louisiana 2 - 11		0	Plaquemine Cogen Facility - 500	055419	93
Entergy Louisiana 2 - 12		0	Plaquemine Cogen Facility - 600		103
Entergy Willow Glen - 1	001394	10	Plaquemine Cogen Facility - 700		91
Entergy Willow Glen - 2		32	Plaquemine Cogen Facility - 800		96
Entergy Willow Glen - 3		0	Quachita Power, LLC - CTGEN1	055467	29
Entergy Willow Glen - 4		52	Quachita Power, LLC - CTGEN2		24

Facility Name Unit Designation	Unit ID (ORIS)	Amount tons/year	Facility Name Unit Designation	Unit ID (ORIS)	Amount tons/year
Entergy Willow Glen - 5		0	Quachita Power, LLC - CTGEN3		28
Teche Power Station - 2	001400	9	R S Cogen - RS-5	055117	375
Teche Power Station - 3		254	R S Cogen - RS-6		368
Arsenal Hill Power Plant	001416	28	Taft Cogeneration Facility - CT-2	055089	181
Lieberman Power Plant - 4	001417	22	Taft Cogeneration Facility - CT-1		171
Lieberman Power Plant - 3		18	Taft Cogeneration Facility - CT-3		179
Doc Bonin - 1	001443	4	NISCO - Unit 1A	050030	460
Doc Bonin - 2		26	NISCO - Unit 2A		660
Doc Bonin - 3		17			

2015 CAIR allocations for all such sources in the State of Louisiana (Table 7-1). The 2010 annual estimates were adjusted to the 2015 CAIR values. In addition, the Big Cajun 2 unit was adjusted to account for its Plant-wide Applicability Limit from a recent consent decree (LDEQ, 2013b). The Big Cajun 2 facility emissions, based on PAL, were estimated at 8950 TPY NOx, 35590 TPY CO, and 287 TPY VOC.

New facilities and expansion projects at existing facilities (e.g., adding new units, expanding capacity, etc.) were included in the 2017 emission inventory. LDEQ (2013a) provided information and estimated emissions for seven new and six expansion projects expected to be on-line by 2017.

The sources were temporally allocated to month, day of week, and hours, according to source category code using default EPA profiles and cross-reference files. All point source emissions were speciated to CB6 compounds using default EPA profiles and cross-reference files. All ARP point sources were treated as elevated sources. The non-ARP points were processed as elevated sources when stack information indicated a sufficient plume rise to warrant elevated treatment. All point source emissions were located in the CAMx grid system according to their reported coordinates.

7.1.1.2 Area Sources

The 2010 base year area source emissions inventory was projected to 2017 using a variety of projection factors based upon the projections of various surrogates, including: population, employment, vehicle miles travelled (VMT), and oil and gas production.

The population-based projection factor is based upon parish-level population estimates for 2010 and 2011 obtained from the US Census Bureau at the parish level (US Census, 2012). The annual population change (increase or decrease) was then applied for a 7-year period to develop the 2017 population based projection factor. Vehicle miles travelled (VMT) projection factors were based upon ENVIRON's development of 2017 on-road emissions and associated VMT activity. A state-wide VMT projection factor of 1.039 was estimated and applied to every parish.

Employment projections were obtained from the Louisiana Workforce Commission (LWC, 2013). The employment projections for 2020, based on a 2010 base year, were detailed by NAICS code and Regional Labor Market Area (RLMA); the specific RLMAs are defined below in Table 7-2. Employment projection factors were developed by linearly interpolating these data to 2017.

Table 7-2. Louisiana Regional Labor Market Areas (RLMAs)

Regional Labor Market Area	Parishes
RLMA 1 - (New Orleans)	Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany
RLMA 2 - (Baton Rouge)	Ascension, East Baton Rouge, East Feliciana, Iberville, Livingston, Pointe Coupee, St. Helena, Tangipahoa, Washington, West Baton Rouge, West Feliciana
RLMA 3 - (Houma)	Assumption, Lafourche, Terrebonne
RLMA 4 - (Lafayette)	Acadia, Evangeline, Iberia, Lafayette, St. Landry, St. Martin, St. Mary, Vermilion
RLMA 5 - (Lake Charles)	Allen, Beauregard, Calcasieu, Cameron, Jefferson Davis
RLMA 6 - (Alexandria)	Avoyelles, Catahoula, Concordia, Grant, LaSalle, Rapides, Vernon, Winn
RLMA 7 - (Shreveport)	Bienville, Bossier, Caddo, Claiborne, Desoto, Lincoln, Natchitoches, Red River, Sabine, Webster
RLMA 8 - (Monroe)	Caldwell, East Carroll, Franklin, Jackson, Madison, Morehouse, Ouachita, Richland, Tensas, Union, West Carroll

Oil and gas production projections were obtained from the *2013 Annual Energy Outlook (AEO)* published by the Energy Information Administration (EIA, 2012). The 2010 oil and gas production statistics and 2017 oil and gas production projections for the Onshore (Gulf Coast) and Offshore (Gulf – Shallow and Deep) regions were converted to a BTU basis for purposes of developing the projection factor; the resulting area source oil and gas projection factor was 1.594.

7.1.1.3 On-Road Mobile Sources

Emissions from on-road vehicles are expected to fall significantly by 2017. Louisiana statewide total on-road emissions of TOG, CO, and NOx are estimated to be 33%, 30%, and 43% lower, respectively, than in 2010. The reductions are due to fleet turnover as new vehicles meet the latest emission standards and older higher-emitting vehicles retire. Fleet turnover more strongly impacts vehicle emissions than the projected increase in both vehicle populations and vehicle-miles traveled (VMT). The effects of the latest emission standards on vehicle emission rates are incorporated into EPA's Motor Vehicle Emission Simulator (MOVES) model. LDEQ provided ENVIRON with estimates of 2017 VMT by functional class and parish. An overall VMT growth of 4% was estimated for all parishes and road types.

Similarly to the approach for the 2010 base year, MOVES version 2010a (with database "movesdb20100830") was run in the mode referred to as "County Domain/Scale in Emission Rate Calculation" for three representative parishes. Each parish-level MOVES run used local input data provided by the LDEQ, including fuel properties, age distribution, and inspection and maintenance programs. MOVES estimated the 2017 emission factors for each pollutant and emission process by source type (vehicle class), fuel type, and representative parish, over a wide range of vehicle speeds and ambient temperature and humidity. The emission factors

were formatted into a lookup table and then subsequently input to the emissions processor CONCEPT MV, a tool that replaces EPS3 for the on-road mobile sector.

First, CONCEPT calculated the emissions inventory by multiplying VMT and population with the appropriate MOVES emission factor for each grid cell and episode hour. The 2010 gridded temperature and humidity data were used in the emission factor lookup tables. A state-wide VMT projection factor of 1.039 was estimated and applied to every parish. CONCEPT then further processed the hourly gridded emissions into chemical species and output the emissions files formatted for CAMx. On-road statewide TOG, CO, and NOx emissions for 2017 totaled 153, 1,287, and 158 TPD, respectively.

7.1.1.4 Off-Road Sources

Emissions from off-road vehicles are expected to decrease by 2017. Similar to 2010, the EPA's NMIM was used to generate 2017 Louisiana statewide parish-level off-road equipment emissions estimates for the months of September and October. NMIM is a tool for estimating on-road and non-road emissions by county for the entire US to support NEI updates. For this modeling effort NMIM version NMIM20090504 was run with county database NCD20090531 and NONROAD2008a.

The 2017 NMIM emission estimates were processed using EPS3. The off-road emissions were speciated to CB6 compounds, temporally allocated to day of week and hour of day, and spatially allocated using EPA default source category cross-reference files. Louisiana statewide total 2017 non-road emissions for a September weekday for TOG, CO, and NOx are 36%, 18%, and 37% lower than in 2010, respectively.

NONROAD and NMIM do not include emission estimates for railroad locomotives, aircraft, and marine vessels (excluding maintenance equipment). The 2010 Louisiana emissions for locomotives and aircraft were projected to 2020 using the EPA's Modeling Clearinghouse 2008-based Modeling Platform. Louisiana statewide total of VOC, CO and NOx for these sources are projected to decrease by 23%, 1%, and 23% respectively.

Emissions from commercial marine vessels servicing the ports along the Mississippi River and the Port of Lake Charles were processed separately from other area sources. The 2010 base year emissions from commercial marine shipping channels and ports were held constant for the 2017 modeling.

7.1.1.5 Port Fourchon

The 2010 Port Fourchon emission estimates were projected to 2017 based on projections for Gulf oil and gas sources. Port Fourchon activity is directly linked to gulf development and production activity so it is reasonable to expect a similar future year pattern. Since the port emissions did not distinguish between fuel types, the base and future year gulf-wide non-platform estimates were used to develop pollutant-specific projection factors (see below for more information). The overall Gulf non-platform projections from 2010 to 2017 were 97% NOx, 96% CO, and 97% VOC.

7.1.1.6 Haynesville Shale

As stated in Section 5.2.6, a 2009 NETAC study was referenced to estimate 2010 emissions due to Haynesville Shale exploration and production (Grant et al., 2009). A more recent analysis of the Haynesville Shale (Grant et al., 2013) was used to develop projection factors to adjust the 2010 base year exploration and production sources to 2017 estimates. This recent analysis was used for the 2017 projection primarily because it more accurately reflects slower development activity in this area than previously projected. However, the updates provided by Grant et al. (2013) do not extend back to 2010 and so were unavailable for use in developing the original base year inventory. The 2011 and 2017 "median" scenarios from Grant et al. (2013) for both production (well/area sources) and exploration (drills/non-road sources) were used to develop projection factors, which were then applied to the respective 2010 emission estimates. As with the 2010 inventory, the reported Haynesville Shale midstream emissions (e.g., compressors and processing plants) were not included in this projection and were assumed to be incorporated in the point source permitting database. Note that these sources were held constant at their 2010 values (Section 7.1.1.1).

Though there is variation on a source by source basis, the Haynesville Shale projections to 2017 from well production and exploration show an overall decrease in NOx, CO, and VOC of 81%, 80%, and 62% respectively. The production source estimates increase by 13% to 120% depending on the specific source type. However, exploration source estimates decrease by more than 80%. Exploration sources constitute a higher fraction of emissions than production sources, and so the overall reduction in emission is driven by exploration sources.

Spatial allocation of the 2017 Haynesville Shale emission estimates was the same as the 2010 base year. No additional information on future well locations was available for the Haynesville Shale area.

7.1.2 Gulf Sources

The 2010 base year offshore emissions inventory was projected to 2017 using projection factors based on oil and gas production projections from the *2013 Annual Energy Outlook (AEO)* (EIA, 2012). The 2010 oil and gas production statistics and 2017 oil and gas production projections for the Offshore (Gulf – Shallow and Deep) region were converted to a BTU basis for purposes of developing the projection factors. Three different projection factors were developed: oil only (1.050), natural gas only (0.830), and oil and natural gas combined (1.003). All three factors were applied to platform sources depending upon whether a particular emission source could be assigned specifically to oil or natural gas production. For most non-platform source categories, the combined oil and natural gas projection was applied because the category was not specifically assigned to oil or natural gas production. For four non-platform source categories (i.e., biogenic and geogenic emissions, commercial marine vessels, fishing vessels, and military vessels), the projected 2017 emissions were assumed to be identical to the 2010 base year emissions.

7.1.3 Future Emissions Outside of Louisiana

Anthropogenic emission estimates for states outside of LA, as well as for commercial marine shipping outside the Gulf of Mexico, were developed by Alpine Geophysics. County-level future year estimates for all source categories (including the on-road sector and commercial marine shipping outside of the Gulf of Mexico) were taken from the EPA 2020 modeling inventory used in the EPA's 2012 PM NAAQs modeling analyses. The 2020 inventory is based on projections applied to the 2008 NEIv2 database. This inventory version was obtained from the EPA FTP site (ftp.epa.gov/EmisInventory/2007v5/ 2020re_v5_07c_inputs.tar) on January 24, 2013. Documentation on the contents of the inventory can be obtained at ftp.epa.gov/EmisInventory/2007v5/ README_pm_naaqs_2007ee_2007re_2020re.txt. Emissions from Canada and Mexico were held constant at their respective base year estimates.

The 2020 inventories were processed using SMOKE3.1 using the ancillary data for spatial, temporal, and speciation distribution supplied with the emissions input files. Alpine generated gridded, speciated, temporally allocated emissions for the 36, 12, and 4 km modeling domains. The 2020 data were used for the 2017 future year modeling without year-to-year adjustment.

7.1.4 2017 Emissions Summary

Parish-level 2017 anthropogenic emissions are reported in Table 7-3. As biogenic and fire emissions are not reported at the county level they are not included in this comparison. Table 7-4 presents the percentage change in emission estimates from 2010 to 2017.

Point source emissions contribute 46% of all anthropogenic NOx in the 2010 base year inventory. We see a reduction in point source NOx of 8% by 2017. Points contribute a larger percentage (54%) of total anthropogenic NOx in 2017 because both on-road and off-road mobile sources have a much larger NOx reductions throughout the State (43% and 37% respectively).

A few parish-level anomalies in Table 7-4 include: 1) a few very large decreases in off-road emissions due to the reduction in Haynesville Shale drilling; 2) some very large percentage increases in point source emissions attributed to new sources; and 3) large reductions in point source NOx are due to the CAIR allocations.

Figures 7-1 through 7-3 show examples of the spatial distribution of 2017 total model-ready low-level (gridded – not including elevated point sources) emission of NOx, CO, and VOC over the 4 km modeling domain.

Table 7-3. Summary of 2017 Louisiana emissions (tons/day) for typical September weekday.

Parish	NOx				CO				VOC	TOG	TOG	VOC
	Area	Off-road	On-road	Points	Area	Off-road	On-road	Points	Area	Off-road	On-road	Points
Acadia	1.15	1.08	3.09	8.10	2.20	5.32	24.22	2.89	4.45	0.66	3.05	1.27
Allen	0.37	0.55	1.23	1.65	1.37	1.50	8.82	2.95	1.86	0.13	1.13	0.19
Ascension	3.24	1.24	3.25	19.76	17.43	8.05	27.43	10.73	24.59	0.53	3.34	8.43
Assumption	0.89	0.31	2.05	3.33	13.27	1.73	19.22	2.52	2.15	0.19	3.86	1.42
Avoyelles	0.85	1.03	1.74	0.38	8.94	3.91	13.22	0.17	3.37	0.39	1.82	0.07
Beauregard	0.63	1.01	1.90	7.51	1.62	5.69	14.84	6.50	2.65	1.01	1.69	2.88
Bienville	0.58	0.76	1.66	5.58	1.22	1.81	10.74	2.92	1.50	0.25	0.98	1.51
Bossier	1.74	2.30	4.61	1.87	9.89	11.35	39.21	1.38	4.06	1.25	4.94	1.41
Caddo	5.25	5.71	8.61	3.68	6.55	47.06	72.29	2.18	15.30	3.66	8.73	3.15
Calcasieu	5.84	4.81	6.25	59.42	12.08	28.12	56.05	48.72	36.48	3.95	5.64	20.41
Caldwell	0.07	0.48	0.91	0.15	0.42	1.24	6.51	0.01	0.89	0.14	0.90	0.01
Cameron	0.33	0.79	0.55	22.05	1.77	6.88	4.09	21.81	1.29	1.83	0.49	2.70
Catahoula	0.23	0.60	0.84	0.00	2.28	2.22	5.69	0.00	1.05	0.27	0.67	0.00
Claiborne	0.24	0.23	1.23	0.70	0.70	2.90	8.02	1.01	1.69	0.55	0.98	0.22
Concordia	0.09	0.73	1.12	0.00	0.40	3.98	8.02	0.00	1.76	0.73	0.94	0.00
De Soto	0.87	5.03	2.62	16.13	2.24	6.49	17.73	8.69	4.49	1.50	1.57	7.44
E Baton Rouge	6.08	4.55	8.93	28.75	5.65	44.48	76.76	31.16	34.37	2.85	9.38	17.83
East Carroll	0.18	0.88	0.68	0.33	2.21	1.45	4.40	0.08	0.61	0.20	0.38	0.04
East Feliciana	0.16	0.21	0.88	0.79	0.58	2.20	6.28	0.25	0.92	0.47	0.87	1.31
Evangeline	0.56	0.62	1.57	3.05	3.41	3.48	11.31	8.89	6.11	0.61	1.42	0.46
Franklin	0.20	0.71	0.85	0.28	0.61	2.33	6.90	0.15	1.31	0.21	1.04	0.04
Grant	0.28	0.64	1.31	0.54	1.03	2.75	9.10	2.43	1.28	0.55	0.95	0.39
Iberia	2.73	1.26	1.25	4.63	21.49	10.11	10.41	4.49	6.55	0.83	1.27	1.96
Iberville	2.39	1.26	1.19	21.31	17.76	3.15	8.73	14.49	18.65	0.33	0.99	6.56
Jackson	0.68	0.12	0.95	4.81	1.12	1.56	6.55	4.66	1.17	0.18	0.85	2.04
Jefferson	7.90	11.79	7.73	7.79	6.51	58.66	76.77	4.91	28.40	4.96	10.73	2.17
Jefferson Davis	0.40	1.17	2.03	2.48	3.66	4.87	14.50	0.62	4.51	0.63	1.39	0.24
Lafayette	3.44	2.52	5.61	4.00	7.97	32.22	52.64	0.51	10.30	3.09	5.86	0.31
Lafourche	12.91	1.10	2.70	5.22	15.25	8.96	24.94	4.47	9.52	1.21	2.75	2.40
La Salle	0.23	0.30	1.06	0.42	0.45	2.13	7.05	0.11	1.47	0.26	0.81	0.04
Lincoln	0.82	0.77	2.64	4.10	2.40	5.39	19.83	1.47	3.13	0.34	1.85	0.87
Livingston	1.04	0.65	3.73	0.18	11.83	6.59	31.20	0.79	5.00	0.92	4.16	0.76
Madison	0.14	1.45	1.71	0.20	1.70	2.49	11.40	0.06	1.18	0.27	0.66	0.12
Morehouse	0.67	1.23	1.65	1.95	4.06	2.79	12.19	0.30	1.72	0.26	1.61	0.06
Natchitoches	1.25	0.77	3.24	6.53	3.41	3.48	21.93	3.81	4.67	0.39	2.00	3.39
Orleans	5.09	8.59	5.81	2.98	4.17	41.97	54.54	3.49	12.73	4.59	5.25	0.69
Ouachita	3.70	2.05	5.27	12.12	10.16	17.87	44.51	9.12	14.84	2.15	5.43	7.21
Plaquemines	0.88	16.81	0.70	20.42	1.44	14.06	5.77	8.95	3.63	3.31	0.98	5.42
Pointe Coup	1.26	1.12	1.03	29.39	21.37	3.79	7.76	102.61	2.72	0.35	0.80	2.10

Parish	NOx Area	NOx Off-road	NOx On-road	NOx Points	CO Area	CO Off-road	CO On-road	CO Points	VOC Area	TOG Off-road	TOG On-road	VOC Points
Rapides	1.93	2.02	6.39	16.44	7.82	13.81	49.93	9.31	9.84	1.33	5.33	1.86
Red River	0.35	2.72	1.04	0.56	0.76	3.49	7.94	0.42	0.64	0.96	1.27	0.34
Richland	0.51	1.00	1.82	2.00	6.53	2.09	11.84	0.94	2.03	0.17	1.00	0.31
Sabine	0.42	0.95	1.59	0.53	1.12	3.91	10.81	1.28	2.25	0.74	1.32	0.49
St. Bernard	0.80	1.32	0.49	10.52	0.69	7.52	5.20	4.87	1.18	1.48	0.82	3.45
St. Charles	2.21	2.21	1.96	27.21	2.40	6.74	17.03	22.52	15.48	0.80	1.69	12.65
St. Helena	0.11	0.06	0.51	1.11	0.47	0.60	4.01	0.33	1.51	0.06	0.58	0.25
St. James	0.94	0.88	0.80	14.62	1.16	2.12	6.22	6.50	6.30	0.19	0.66	3.91
St. J Baptist	1.12	8.92	2.04	6.56	2.92	5.39	16.56	4.97	5.65	0.96	1.74	4.71
St. Landry	1.27	1.83	3.78	3.81	8.72	7.49	29.07	1.51	5.60	0.87	3.45	2.11
St. Martin	1.56	0.57	2.14	2.72	15.19	5.91	17.05	1.80	4.70	1.21	2.05	1.34
St. Mary	2.58	1.25	1.48	17.99	13.92	8.32	13.30	19.42	10.01	0.81	1.46	3.67
St. Tammany	1.95	2.54	7.87	0.07	17.26	32.31	68.65	0.00	10.15	4.88	9.11	0.05
Tangipahoa	1.47	1.12	5.29	0.02	6.26	12.59	42.16	0.19	6.30	1.80	4.58	0.34
Tensas	0.18	0.73	0.65	0.00	3.61	1.69	3.94	0.00	1.38	0.26	0.32	0.00
Terrebonne	2.25	1.63	3.11	2.93	3.82	22.18	27.97	3.72	4.73	3.31	4.22	1.82
Union	0.76	0.25	1.44	0.55	3.29	3.24	9.51	0.32	2.49	0.33	1.18	0.45
Vermilion	1.34	1.10	1.93	9.40	11.69	10.05	15.14	3.52	3.96	1.72	2.15	1.46
Vernon	0.19	0.79	2.24	0.14	1.10	4.24	16.63	0.08	1.94	0.67	2.22	0.12
Washington	0.86	0.27	1.18	11.11	2.91	2.58	9.89	21.17	3.59	0.20	1.56	4.78
Webster	1.03	0.64	2.23	3.16	2.30	3.58	16.85	2.67	4.40	0.33	1.80	1.79
W Baton Rouge	1.33	1.60	1.21	2.17	6.38	6.71	8.89	6.28	4.41	0.78	0.81	1.65
West Carroll	0.37	0.38	0.49	2.38	7.20	1.14	3.76	0.23	1.19	0.09	0.54	0.06
West Feliciana	0.33	0.18	0.54	1.34	1.12	1.16	3.71	1.29	0.87	0.15	0.47	0.33
Winn	0.45	0.14	1.49	0.88	0.75	1.55	9.49	3.60	2.52	0.15	0.83	2.25
Total	101.65	122.32	157.94	450.81	360.00	585.42	1287.16	437.26	395.52	70.23	153.32	157.72

Table 7-4. Percent change in Louisiana emissions from 2010 to 2017. Empty entries indicate no emissions were reported or estimated in 2010 and 2017.

	NOx				CO				VOC	TOG	TOG	VOC
Parish	Area	Off-road	On-road	Points	Area	Off-road	On-road	Points	Area	Off-road	On-road	Points
Acadia	6.3	-30.7	-42.2	0.2	3.6	-15.3	-30.9	-8.4	4.4	-31.4	-32.3	-4.4
Allen	16.5	-32.9	-43.0	0.0	3.1	-15.3	-32.4	0.0	9.6	-31.5	-32.9	0.0
Ascension	7.9	-33.8	-40.6	0.0	10.7	-19.6	-25.8	0.0	11.5	-36.7	-29.5	0.0
Assumption	2.3	-31.0	-27.9	0.0	-0.3	-18.3	-26.0	0.0	-0.2	-38.7	-28.6	0.0
Avoyelles	3.8	-29.9	-41.4	0.0	-0.1	-17.6	-31.2	0.0	2.3	-35.0	-32.4	0.0
Beauregard	24.5	-32.1	-44.3	0.0	14.0	-9.9	-31.1	0.0	10.6	-28.4	-34.2	0.0
Bienville	0.2	-71.0	-46.6	0.0	0.4	-42.8	-33.3	0.0	3.8	-55.3	-36.5	0.0
Bossier	4.4	-58.0	-41.8	0.0	11.9	-22.2	-30.8	0.0	10.6	-39.7	-32.8	0.0
Caddo	0.8	-56.6	-42.7	-9.3	1.3	-18.2	-31.3	-8.9	9.9	-37.5	-34.0	-1.1
Calcasieu	25.2	-26.9	-43.7	8.8	11.2	-12.1	-28.3	24.3	16.0	-29.8	-31.8	7.4
Caldwell	-0.8	-32.8	-42.3	0.0	-4.5	-13.3	-31.7	0.0	-4.4	-32.4	-32.7	0.0
Cameron	7.7	-4.6	-45.5	488.3	0.1	-17.0	-32.0	1155.7	3.4	-38.6	-32.2	28.4
Catahoula	4.7	-29.8	-44.3		-0.3	-18.1	-32.7		2.2	-36.1	-33.1	
Claiborne	-3.8	-28.8	-44.6	0.0	-7.1	-9.1	-33.0	0.0	0.6	-27.3	-34.7	0.0
Concordia	5.0	-29.7	-44.0		2.4	-13.9	-32.7		6.1	-32.5	-33.8	
De Soto	21.9	-80.0	-46.2	-16.2	12.2	-66.9	-32.7	1.4	7.3	-67.7	-35.4	0.1
E Baton Rouge	6.2	-29.6	-44.0	-1.6	5.7	-14.4	-31.9	1.4	4.2	-31.4	-39.0	0.0
East Carroll	0.3	-27.0	-47.0	0.0	-0.3	-23.4	-34.7	0.0	-0.7	-36.0	-37.6	0.0
East Feliciana	2.7	-30.4	-42.0	0.0	-3.4	-9.2	-31.3	0.0	0.9	-27.4	-32.1	0.0
Evangeline	3.4	-29.5	-43.1	8.5	-0.1	-13.5	-32.0	-4.6	5.2	-30.1	-33.1	-11.4
Franklin	3.4	-30.6	-41.6	0.0	1.3	-18.2	-30.6	0.0	5.6	-33.3	-31.0	0.0
Grant	7.4	-31.4	-45.8	0.0	-0.7	-10.2	-30.7	0.0	4.4	-31.0	-33.3	0.0
Iberia	3.9	-30.8	-42.9	0.0	0.5	-16.8	-33.1	0.0	3.2	-36.0	-33.8	0.0
Iberville	3.6	-27.6	-42.7	-0.6	-0.3	-26.0	-26.8	-0.9	3.0	-41.6	-30.2	0.5
Jackson	4.3	-53.7	-43.2	0.0	3.1	-18.5	-32.0	0.0	0.9	-25.9	-32.5	0.0
Jefferson	5.2	-11.4	-38.3	-76.1	5.1	-13.6	-26.2	32.1	1.5	-32.7	-30.6	23.8
Jefferson Davis	5.3	-31.1	-45.5	0.0	0.7	-11.7	-32.4	0.0	5.1	-30.0	-34.8	0.0
Lafayette	6.6	-34.5	-42.1	-31.6	2.3	-12.1	-27.8	7.8	6.1	-29.8	-31.3	-10.7
Lafourche	2.0	-27.6	-42.6	0.0	1.6	-19.2	-28.7	0.0	8.3	-40.5	-31.5	0.0
La Salle	10.9	-36.5	-44.5	0.0	7.1	-16.0	-32.8	0.0	24.8	-35.5	-32.7	0.0
Lincoln	-1.1	-35.5	-45.6	0.0	0.9	-14.2	-32.5	0.0	2.1	-28.5	-35.7	0.0
Livingston	9.5	-38.3	-38.6	0.0	12.6	-15.7	-24.4	0.0	9.1	-33.2	-27.8	0.0
Madison	0.5	-29.2	-48.4	0.0	-0.2	-17.2	-33.3	0.0	2.1	-35.8	-40.0	0.0
Morehouse	2.0	-29.8	-42.7	0.0	-0.9	-20.3	-32.1	0.0	-0.5	-34.7	-33.4	0.0
Natchitoches	-1.8	-35.5	-45.8	0.0	-1.5	-21.2	-32.5	0.0	1.1	-37.2	-35.3	0.0
Orleans	9.0	-16.2	-45.1	-66.3	8.9	-13.9	-29.5	-28.2	21.2	-32.7	-34.6	-23.8
Ouachita	4.7	-33.5	-42.1	4.0	4.6	-14.0	-31.3	-0.2	6.2	-30.6	-33.0	-0.8
Plaquemines	6.0	-1.0	-34.3	0.0	5.9	-19.0	-28.0	0.0	7.1	-36.4	-28.2	0.0

Parish	NOx Area	NOx Off-road	NOx On-road	NOx Points	CO Area	CO Off-road	CO On-road	CO Points	VOC Area	TOG Off-road	TOG On-road	VOC Points
Pointe Coup	0.9	-30.0	-45.0	-34.7	-0.1	-15.7	-30.1	-2.3	0.2	-35.1	-33.0	0.4
Rapides	10.2	-31.7	-44.2	9.6	4.8	-13.2	-31.9	0.4	6.3	-31.3	-34.0	16.4
Red River	25.4	-80.0	-38.8	0.0	11.7	-66.8	-29.8	0.0	21.8	-64.7	-30.4	0.0
Richland	2.9	-30.7	-46.7	0.0	0.7	-18.3	-32.7	0.0	7.3	-36.2	-35.7	0.0
Sabine	0.2	-31.4	-43.7	0.0	4.2	-18.1	-32.5	0.0	4.0	-38.8	-32.8	0.0
St. Bernard	10.2	-9.0	-33.2	0.0	12.0	-21.4	-24.3	0.0	26.0	-40.5	-28.1	0.0
St. Charles	5.0	-19.5	-44.2	-25.4	3.8	-20.9	-28.2	0.3	3.5	-40.9	-32.1	-0.4
St. Helena	-0.7	-46.3	-42.9	0.0	-8.7	-17.3	-31.2	0.0	1.6	-23.8	-33.1	0.0
St. James	4.6	-24.9	-44.3	0.0	-0.6	-22.8	-28.6	0.0	1.6	-39.3	-32.2	0.0
St. J Baptist	4.3	-3.5	-43.9	7.9	1.3	-17.9	-30.9	10.7	1.4	-32.9	-33.9	11.3
St. Landry	4.4	-30.5	-43.0	0.0	0.9	-14.8	-31.2	0.0	2.8	-31.8	-33.0	0.0
St. Martin	4.5	-28.7	-42.3	0.0	2.4	-12.0	-30.7	0.0	4.8	-32.6	-32.0	0.0
St. Mary	4.7	-27.7	-43.0	-15.4	0.7	-19.5	-28.6	0.1	4.7	-39.7	-31.7	0.0
St. Tammany	7.2	-34.1	-40.7	0.0	9.2	-11.1	-30.1	0.0	5.3	-31.5	-32.4	0.0
Tangipahoa	7.2	-33.6	-43.8	0.0	8.1	-10.9	-31.1	0.0	5.8	-29.5	-33.7	0.0
Tensas	-1.9	-29.5	-47.7		-1.0	-21.4	-35.1		0.8	-36.9	-38.8	
Terrebonne	17.3	-29.0	-37.7	1.6	7.6	-14.6	-29.9	0.4	7.2	-35.4	-30.4	0.1
Union	3.6	-41.5	-44.2	0.0	0.9	-16.4	-32.8	0.0	-0.3	-30.4	-33.6	0.0
Vermilion	2.8	-25.0	-40.6	0.0	0.5	-13.6	-30.9	0.0	2.9	-33.1	-31.6	0.0
Vernon	2.4	-34.7	-42.6	0.0	-2.0	-10.5	-32.1	0.0	2.0	-28.3	-32.3	0.0
Washington	5.1	-40.0	-40.5	0.0	0.9	-19.4	-30.5	0.0	3.6	-34.4	-31.7	0.0
Webster	-1.2	-57.2	-44.5	0.0	0.5	-24.5	-32.3	0.0	2.5	-42.3	-34.5	0.0
W Baton Rouge	5.3	-15.0	-45.8	0.0	1.9	-12.8	-29.4	0.0	8.0	-29.0	-33.5	0.0
West Carroll	0.7	-30.9	-43.6	0.0	-0.1	-19.7	-31.3	0.0	0.9	-31.0	-31.4	0.0
West Feliciana	4.2	-39.7	-43.3	0.0	-3.4	-23.1	-32.1	0.0	0.4	-37.9	-33.0	0.0
Winn	10.0	-48.3	-47.0	0.0	-0.4	-18.7	-34.7	0.0	4.1	-28.9	-37.2	0.0
Total	6.0	-37.3	-42.8	-7.9	3.2	-17.6	-30.3	6.6	6.4	-36.0	-33.0	1.7

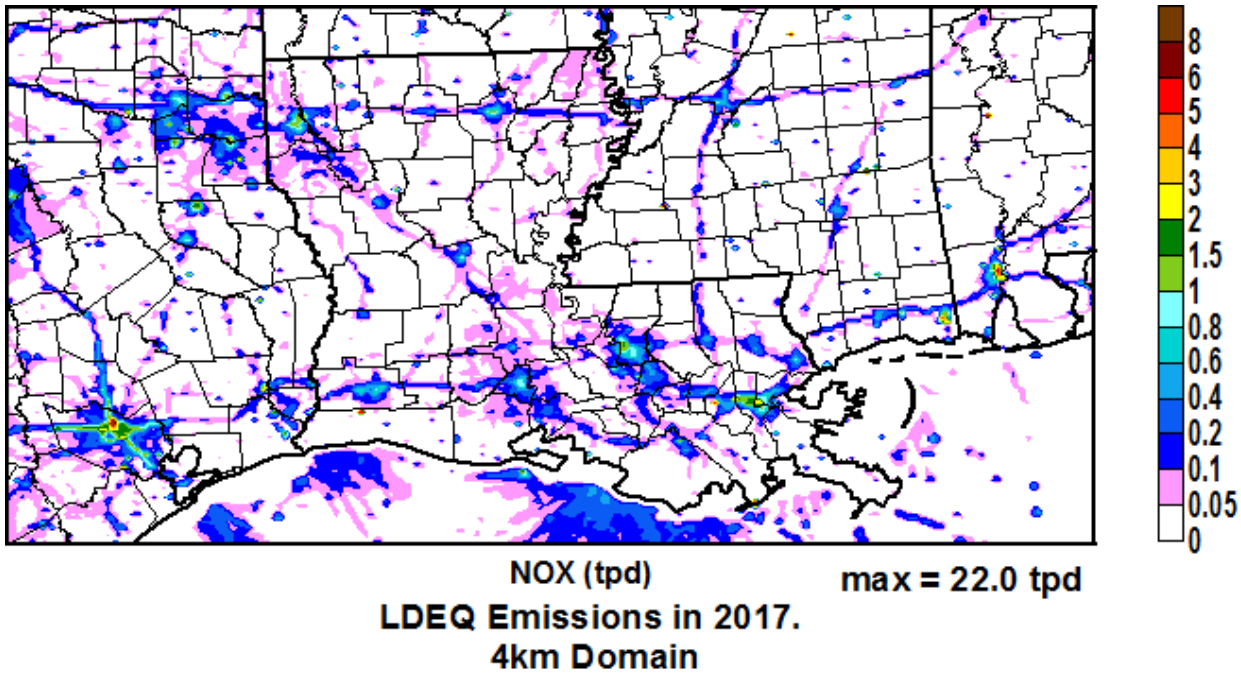


Figure 7-1. Spatial distribution of 2017 total (anthropogenic and biogenic) surface NOx emissions (tons/day).

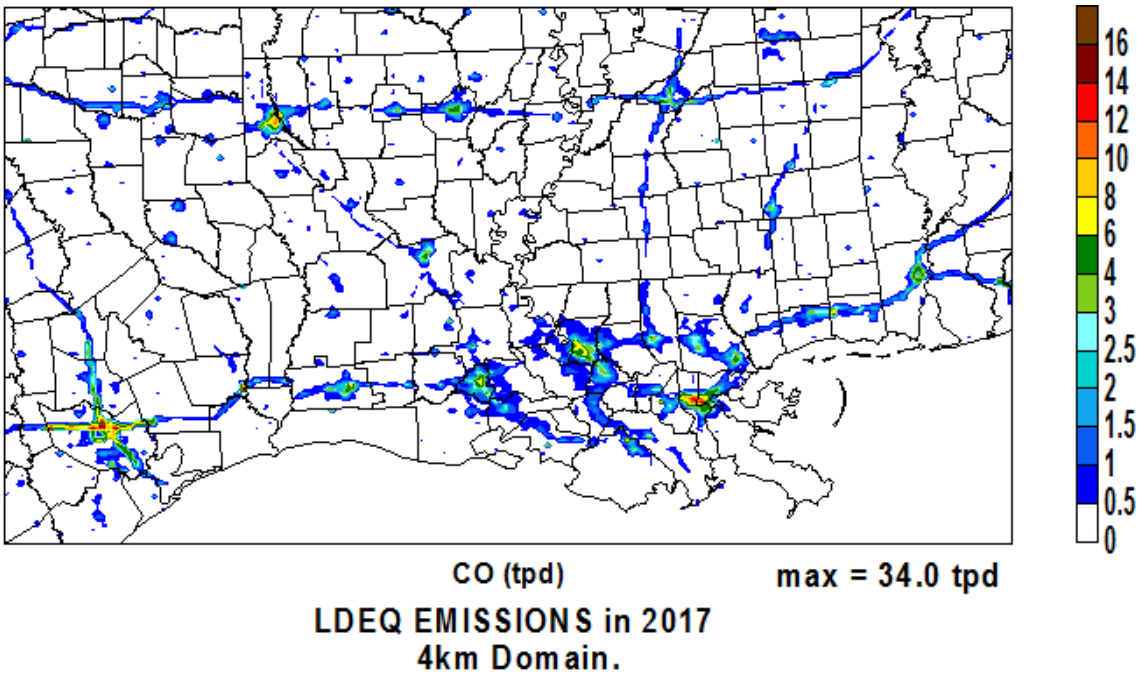


Figure 7-2. Spatial distribution of 2017 total surface CO emissions (tons/day).

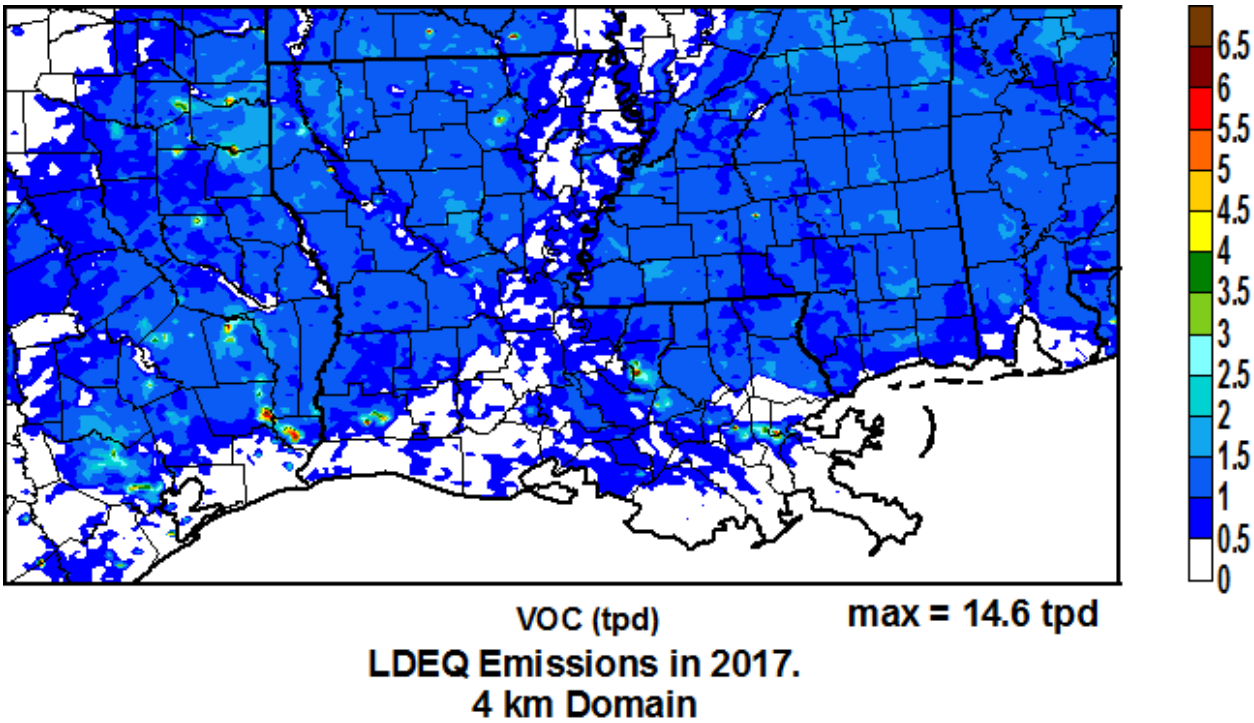


Figure 7-3. Spatial distribution of 2017 total (anthropogenic and biogenic) surface VOC emissions (tons/day).

7.2 Ozone Modeling and Attainment Test

CAMx was run using the final 2010 base year configuration (Run 17) described in Section 6.6, except that the 2010 "actual" emissions were exchanged with alternative inputs to yield two new runs: (1) "typical" 2010 base year emissions that reflect annual-averaged CAMD/ARP emissions (instead of day-specific); and (2) projected 2017 future year emissions as described above. Additionally, the 2017 emission estimates were converted to CB05 speciation to be consistent with the final base year configuration. Predicted daily maximum 8-hour ozone ($DM8O_3$) concentrations throughout the September-October modeling period were extracted from the CAMx results for both 2010 typical and 2017 future simulations. These modeled concentrations were supplied to the EPA Modeled Attainment Test Software (MATS) tool, which tabulated the change in $DM8O_3$ at each site, determined site-specific relative response factors (RRF) averaged over all high ozone days, and applied the RRFs to current design values (DV) to estimate the 2017 DV at each site. The steps in this procedure are outlined below.

7.2.1 Summary of the MATS Technique

EPA guidance (EPA, 2007) outlines the approach used by MATS to project base year DVs to a target attainment year. It begins by calculating the base year average DV for each monitoring site; in this case our base year is 2010. As exemplified below, the base year average DV is defined as a 3-year average of annual DVs centered on the base year, or more precisely, a weighted 5-year average of the annual 4th highest $DM8O_3$ at each site.

2010 DV: average of annual 4th highest $DM8O_3$ between 2008-2010
2011 DV: average of annual 4th highest $DM8O_3$ between 2009-2011
2012 DV: average of annual 4th highest $MD8O_3$ between 2010-2012

2010 average DV = (2010 DV + 2011 DV + 2012 DV)/3
= 1×(2008 4th highest $DM8O_3$)/9 +
2×(2009 4th highest $DM8O_3$)/9 +
3×(2010 4th highest $DM8O_3$)/9 +
2×(2011 4th highest $DM8O_3$)/9 +
1×(2012 4th highest $DM8O_3$)/9

MATS is distributed with official DV data through 2008. We imported official DV data for the years 2009-2012 for the whole US.

Model results are then used to calculate 2010-2017 RRFs for each site. Hence, model results are not used in an absolute sense to determine attainment in 2017, but rather used in an episode-averaged relative sense to scale the observation-based average DV. For a given site, the RRF is defined as the ratio of the episode-mean 2017 $DM8O_3$ to the episode-mean 2010 $DM8O_3$. Episode means are determined over the days when the model predicts 2010 $DM8O_3$ above a minimum concentration threshold, preferably the current ozone standard (75 ppb in this case). The RRF is then applied directly to the 2010-2012 average DV to project a 2017 DV for each site.

MATS provides options to define how the $DM8O_3$ is chosen from the model grid output to represent simulated ozone at each monitor location. The user selects whether to search a 1x1, 3x3, 5x5, or 7x7 array of grid cells centered on the monitor. EPA guidance states that a larger array of grid cells should be used with finer resolution grids; 1x1 for 36-km grids, 3x3 for 12-km grids, or 7x7 for 4-km grids. Further, MATS allows the user to choose whether an average over the grid array is extracted, or the maximum value among all cells in the array is extracted. In our case using 4 km grids over Louisiana, we set the search array to 7x7 and selected the maximum predicted value in that array.

MATS then determines the number of days over the modeling period when simulated base year $DM8O_3$ is above a minimum concentration threshold from which to calculate the episode-average RRF at each site. We configured MATS to first find the number of days above 75 ppb, and MATS checks that at least 10 days meet this criterion. If 10 days are not found for a given site, then MATS lowers the critical value by 1 ppb successively until 10 days are found. We set the lower limit to 60 ppb; if 10 days are still not found at the lower limit, then MATS reduces the number of days successively until a minimum of 5 days are found. If at 60 ppb the minimum 5 days are not found, then an RRF is not calculated for that site. If at some point the minimum criteria for $DM8O_3$ concentration and number of days are met, then the RRF calculation proceeds.

Finally, MATS performs an "unmonitored area analysis" by extrapolating site-specific future year DVs to the entire modeling grid using modeled spatial gradients to help form the resulting DV surface. These fields are then plotted to indicate any areas expected to exceed the ozone standard in unmonitored areas of the State.

7.2.2 2017 DV Projection Results

Table 7-5 presents the 2010-2012 average DVs at each active monitoring site in Louisiana and the corresponding future year DVs projected by MATS. Missing values in the table indicate insufficient observation data from which to calculate a valid base year DV. All sites are projected to be below the 75 ppb ozone NAAQS in 2017.

Figure 7-4 displays the unmonitored area calculation for the portion of the 4 km grid covering the State of Louisiana. All projected DVs are below the 75 ppb NAAQS throughout the State. Areas contoured in white show locations where DVs are either estimated to be below 40 ppb, or are missing because they could not be extrapolated by MATS.

7.2.3 2017 Sensitivity Tests

Two emission sensitivity tests were run for the 2017 future year to quantify effects from simple across-the-board reductions in Louisiana anthropogenic NOx and VOC emissions. An arbitrary reduction of 30% was applied first to NOx (no change to VOC) and then to VOC (no change to NOx). All 2017 model-ready anthropogenic emissions in grid cells covering the State were scaled downward, including all low-level (gridded) sources and point sources. Emissions outside the State were not affected, nor were biogenic and FINN fire sources throughout the 4 km grid.

Table 7-6 lists the site-specific 2017 DV projections for the NOx test and Figure 7-5 displays the corresponding State-wide unmonitored analysis projected from the 2010-2012 average DV. No areas of the State exceed the 75 ppb ozone NAAQS.

Table 7-7 lists the site-specific 2017 DV projections for the VOC test and Figure 7-6 displays the corresponding unmonitored analysis. Again, no area exceed the 75 ppb standard. However, ozone reductions are not as large as the NOx test by typically 2-3 ppb. This suggests that while both NOx and VOC reductions are effective in reducing ozone throughout the State, ozone tends to be somewhat more responsive to NOx reductions. This effect could be more quantitatively analyzed through the use of CAMx probing tools, such as the Ozone Source Apportionment Tool (OSAT) or the Decoupled Direct Method (DDM) of sensitivity analysis.

Table 7-5. Base year DM8O$_3$ design values at each active monitoring site in Louisiana for the 2010-2012 average and the 2017 projection. Values exceeding the current 75 ppb ozone NAAQS are highlighted in red. Blank entries indicate insufficient data from which to calculate the base year DV.

		Base Year	Future Year
AIRS Site ID	Parish	2010-12 DV	2017 DV
220050004	Ascension	76	70
220110002	Beauregard		
220150008	Bossier	77	68
220170001	Caddo	74	70
220190002	Calcasieu	74	68
220190008	Calcasieu	66	61
220190009	Calcasieu	73	67
220330003	E Baton Rouge	79	73
220330009	E Baton Rouge	75	69
220330013	E Baton Rouge	72	66
220331001	E Baton Rouge	72	66
220430001	Grant		
220470007	Iberville	71	64
220470009	Iberville	74	67
220470012	Iberville	75	68
220511001	Jefferson	75	68
220550005	Lafayette		
220550007	Lafayette	72	64
220570004	Lafourche	72	66
220630002	Livingston	75	69
220710012	Orleans	70	63
220730004	Ouachita	64	58
220770001	Pointe Coupee	75	70
220870002	St. Bernard		
220870009	St. Bernard	69	63
220890003	St. Charles	71	65
220930002	St. James	68	64
220950002	St. J. Baptist	74	69
221010003	St. Mary		
221030002	St. Tammany	74	65
221210001	W Baton Rouge	71	65

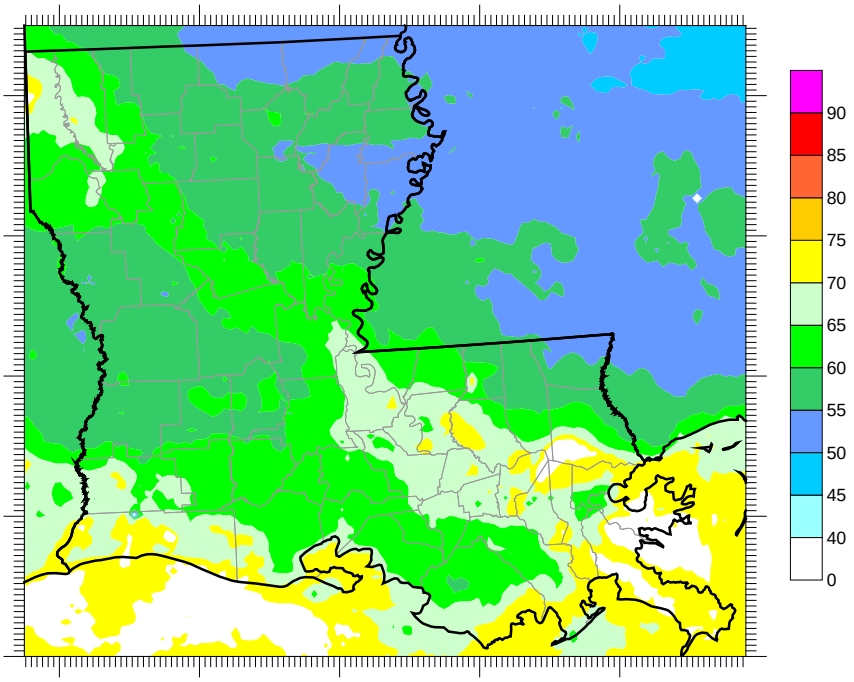


Figure 7-4. MATS-derived 2017 DM8O$_3$ design value projection from the 2010-2012 average design value for un-monitored areas in Louisiana.

Table 7-6. Base year DM8O$_3$ design values at each active monitoring site in Louisiana for the 2010-2012 average and the 2017 projection in response to an additional 30% across-the-board anthropogenic NOx reduction in Louisiana. Values exceeding the current 75 ppb ozone NAAQS are highlighted in red. Blank entries indicate insufficient data from which to calculate the base year DV.

		Base Year	Future Year
AIRS Site ID	Parish	2010-12 DV	2017 DV
220050004	Ascension	76	66
220110002	Beauregard		
220150008	Bossier	77	65
220170001	Caddo	74	69
220190002	Calcasieu	74	66
220190008	Calcasieu	66	60
220190009	Calcasieu	73	64
220330003	E Baton Rouge	79	70
220330009	E Baton Rouge	75	66
220330013	E Baton Rouge	72	63
220331001	E Baton Rouge	72	63
220430001	Grant		
220470007	Iberville	71	60
220470009	Iberville	74	63
220470012	Iberville	75	65
220511001	Jefferson	75	64
220550005	Lafayette		
220550007	Lafayette	72	61
220570004	Lafourche	72	62
220630002	Livingston	75	65
220710012	Orleans	70	60
220730004	Ouachita	64	54
220770001	Pointe Coupee	75	66
220870002	St. Bernard		
220870009	St. Bernard	69	60
220890003	St. Charles	71	62
220930002	St. James	68	60
220950002	St. J. Baptist	74	65
221010003	St. Mary		
221030002	St. Tammany	74	61
221210001	W Baton Rouge	71	63

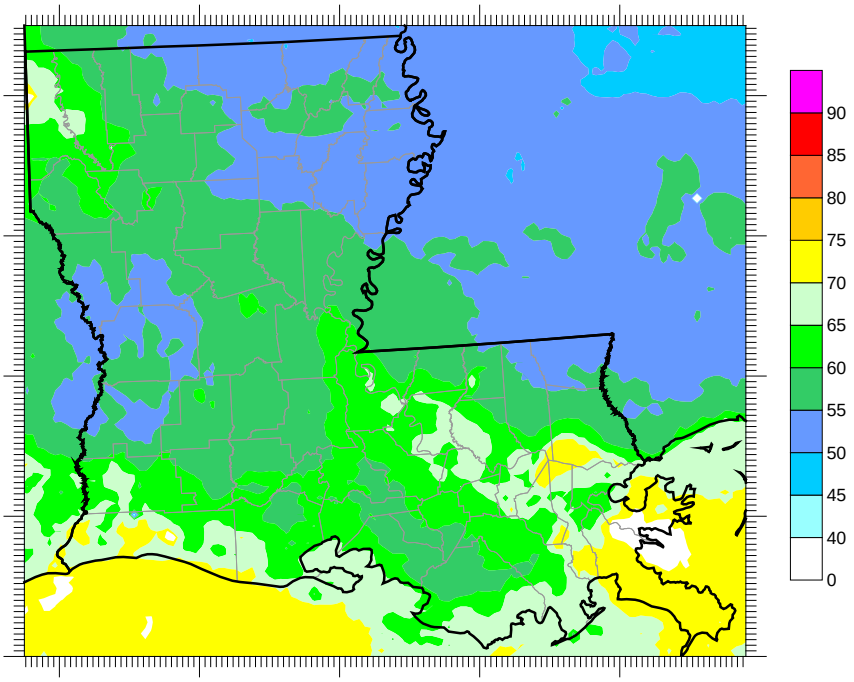


Figure 7-5. MATS-derived 2017 DM8O_3 design value projection from the 2010-2012 average design value for un-monitored areas in Louisiana; response to an additional 30% across-the-board anthropogenic NOx reduction in Louisiana.

Table 7-7. Base year DM8O$_3$ design values at each active monitoring site in Louisiana for the 2010-2012 average and the 2017 projection in response to an additional 30% across-the-board anthropogenic VOC reduction in Louisiana. Values exceeding the current 75 ppb ozone NAAQS are highlighted in red. Blank entries indicate insufficient data from which to calculate the base year DV.

		Base Year	Future Year
AIRS Site ID	Parish	2010-12 DV	2017 DV
220050004	Ascension	76	69
220110002	Beauregard		
220150008	Bossier	77	68
220170001	Caddo	74	70
220190002	Calcasieu	74	67
220190008	Calcasieu	66	61
220190009	Calcasieu	73	67
220330003	E Baton Rouge	79	72
220330009	E Baton Rouge	75	68
220330013	E Baton Rouge	72	66
220331001	E Baton Rouge	72	66
220430001	Grant		
220470007	Iberville	71	63
220470009	Iberville	74	66
220470012	Iberville	75	68
220511001	Jefferson	75	67
220550005	Lafayette		
220550007	Lafayette	72	64
220570004	Lafourche	72	65
220630002	Livingston	75	68
220710012	Orleans	70	62
220730004	Ouachita	64	57
220770001	Pointe Coupee	75	69
220870002	St. Bernard		
220870009	St. Bernard	69	62
220890003	St. Charles	71	64
220930002	St. James	68	63
220950002	St. J. Baptist	74	68
221010003	St. Mary		
221030002	St. Tammany	74	64
221210001	W Baton Rouge	71	65

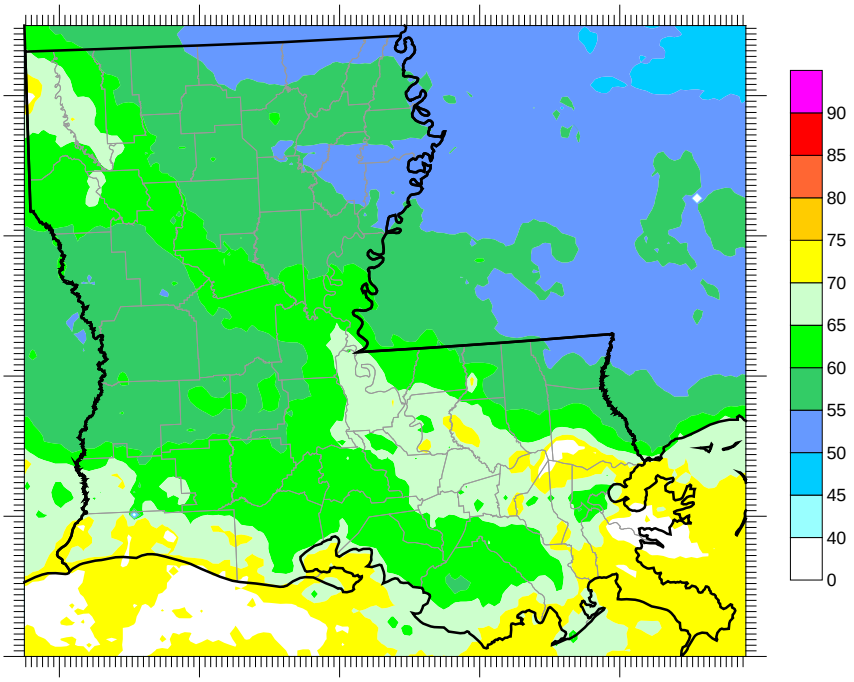


Figure 7-6. MATS-derived 2017 DM8O$_3$ design value projection from the 2010-2012 average design value for un-monitored areas in Louisiana; response to an additional 30% across-the-board anthropogenic VOC reduction in Louisiana.

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APPENDIX F: TECHNICAL SUPPORT DOCUMENT - FUTURE YEAR EMISSION INVENTORY PROJECTIONS FOR THE BATON ROUGE 5-PARISH OZONE NONATTAINMENT AREA

Technical Support Document

Future Year Emission Inventory Projections for the Baton Rouge 5-Parish Ozone Nonattainment Area

Prepared for:
Air Permits Division
Louisiana Department of Environmental Quality
602 North Fifth Street
Baton Rouge, Louisiana 70802

Prepared by:
ENVIRON International Corporation
773 San Marin Drive, Suite 2115
Novato, California, 94998

and

Eastern Research Group, Inc.
8950 Cal Center Drive, Suite 325
Sacramento, CA 95826

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1.0 INTRODUCTION

ENVIRON International Corporation (ENVIRON) and Eastern Research Group, Inc. (ERG) have developed future year emission inventory projections for the Baton Rouge Ozone Nonattainment Area. The nonattainment area comprises the five parishes of Ascension, East Baton Rouge, Iberville, Livingston and West Baton Rouge. A 2027 inventory consists of all anthropogenic source sectors emitting ozone precursors, including nitrogen oxides (NOx), volatile organic compounds (VOC), and carbon monoxide (CO). The 2027 year was developed to support the Louisiana Department of Environmental Quality (LDEQ) with their Baton Rouge ozone nonattainment redesignation request. An interim year 2022 emissions inventory was also developed that includes only on-road mobile sources for the same compounds. The 2022 inventory was developed to support the Capitol Region Planning Commission (CRPC) with their future conformity analyses.

EPA-accepted tools, datasets, and methodologies were applied to develop the 2027 and 2022 emission projections for the area. Each are described in the following sections: Section 2 describes the models and data used to estimate on-road mobile emissions; Section 3 describes the development of off-road mobile emissions; Section 4 describes the source of baseline (2011) stationary area and point source emissions, as well as data and methods by which to derive projection factors by individual source category.

Note that on-road mobile emissions were derived using the MOtor Vehicle Emission Simulator (MOVES2010b) run in “inventory” mode, supplied with local vehicle activity/age/fleet mix, fuel, and control program data. Although an initial version of MOVES2014 was available for this project, our testing of the model in combination with other circumstantial accounts from EPA indicated some remaining technical issues with the initial version. Based on this information, and the fact that EPA is allowing a two-year grace period on the use of MOVES2010b, the LDEQ and CRPC collectively agreed on the use of MOVES2010b for this project. The National Mobile Inventory Model (NMIM) was used to generate parish-level off-road equipment emissions estimates.

Table 1-1 presents a summary of NOx, VOC, and CO emissions for 2027 by parish and by major source category. Table 1-2 presents a similar summary for 2022 on-road mobile sources. More detailed future year emission estimates are provided in accompanying spreadsheets comprising the deliverables for the project.

Table 1-1. Summary of Daily Emissions (tons/day) by Parish and Major Source Category for Calendar Year 2027. Mobile source emissions represent an average August day, stationary area and point emissions represent an average annual day.

FIPS	Parish	2027 Daily Emissions (tons/day)		
		CO	NOX	VOC
Point Source				
22005	Ascension Parish	14.5	29.7	13.3
22033	East Baton Rouge Parish	32.9	31.3	24.5
22047	Iberville Parish	21.8	36.9	11.2
22063	Livingston Parish	1.2	0.3	1.3
22121	West Baton Rouge Parish	10.2	3.7	2.9
Sub Total	***5-Parish Area***	***80.6***	***101.9***	***53.2***
Area Source*				
22005	Ascension Parish	12.1	4.0	53.3
22033	East Baton Rouge Parish	12.1	9.4	71.4
22047	Iberville Parish	21.4	3.9	66.0
22063	Livingston Parish	21.6	2.3	75.3
22121	West Baton Rouge Parish	9.8	2.5	23.2
Sub Total	***5-Parish Area***	***76.9***	***22.1***	***289.1***
Offroad Source				
22005	Ascension Parish	10.2	2.7	0.6
22033	East Baton Rouge Parish	53.2	5.6	3.0
22047	Iberville Parish	6.0	4.0	0.5
22063	Livingston Parish	10.9	0.6	1.1
22121	West Baton Rouge Parish	9.5	2.3	0.9
Sub Total	***5-Parish Area***	***89.8***	***15.3***	***6.1***
On-road Source				
22005	Ascension Parish	24.7	2.2	2.5
22033	East Baton Rouge Parish	53.9	4.6	5.0
22047	Iberville Parish	6.1	0.7	0.4
22063	Livingston Parish	27.5	2.6	3.1
22121	West Baton Rouge Parish	7.5	0.9	0.4
Sub Total	***5-Parish Area***	***119.8***	***11.0***	***11.4***
All Sources				
22005	Ascension Parish	61.6	38.7	69.6
22033	East Baton Rouge Parish	152.0	50.9	103.9
22047	Iberville Parish	55.4	45.6	78.0
22063	Livingston Parish	61.2	5.7	80.8
22121	West Baton Rouge Parish	37.0	9.3	27.4
Total	***5-Parish Area***	***367.1***	***150.2***	***359.8***

* Includes refueling emissions

Table 1-2. Summary of Daily On-road Emissions (tons/day) by Parish for Calendar Year 2022. Emissions represent an average August day.

FIPS	Parish	2022 Daily Emissions (tons/day)		
		CO	NOX	VOC
On-road Source				
22005	Ascension Parish	24.8	2.6	2.6
22033	East Baton Rouge Parish	61.4	6.4	6.2
22047	Iberville Parish	7.4	1.1	0.5
22063	Livingston Parish	28.1	3.1	3.2
22121	West Baton Rouge Parish	8.4	1.1	0.5
Total	***5-Parish Area***	***130.2***	***14.4***	***13.0***

2.0 ON-ROAD MOBILE SOURCES

On-road mobile emissions are pollutants emitted from highway motor vehicles during driving operation and while parked. Driving emissions are released through vehicle exhaust and evaporative processes such as permeation and leaks. Parked emissions, also referred to as off-network, are associated with engine starts, and evaporative processes including diurnal vapor venting and hot soaks.

EPA's MOVES was used to estimate on-road emissions for the five-parish area of Baton Rouge for calendar years 2022 and 2027. The model and database version used for this work were MOVES2010b and MOVESdb20121030, respectively. The MOVES model was run in "inventory" mode for each of the five Baton Rouge parishes using the County Domain with local data inputs provided by state and regional agencies. Under this configuration, each run output consists of parish-wide emissions (in grams) for an average day in August. Emissions estimates are available by pollutant, process, and Source Classification Code (SCC) which details the road type, vehicle class and fuel type.

2.1 Model Inputs

Using parish-specific parameters generally yields more representative estimates of regional motor vehicle emissions (EPA, 2010). Important input data that shapes emissions outputs in the MOVES model include ambient temperature and humidity, fuel specifications, inspection and maintenance (I/M) programs, vehicle fleet age distribution, speeds distribution by road type, and estimates of vehicle-miles traveled (VMT) and vehicle population. Under the direction of LDEQ, the Louisiana Department of Transportation and Development (LDOTD) and the CRPC contributed local datasets necessary for the development of Baton Rouge on-road emission estimates, including:

- Average August day VMT by road type and parish for 2022 and 2027
- VMT estimates by vehicle type for each road type
- 2011 and 2017 Vehicle population by age for each parish and four source types:
    1. Motorcycle (source type 11)
    2. Passenger Car (source type 21)
    3. Passenger Truck (source type 31)
    4. Light Commercial Truck (source type 32)
- Hourly speed distribution by road type and by parish

A previous photochemical modeling study for the Baton Rouge nonattainment area and the rest of Louisiana (ENVIRON and ERG, 2013) included the development of base year (2010) and projected future year (2017) model-ready emissions of ozone precursors from on-road sources. Specific local on-road data from that study were applied in the present work to prepare required model inputs. MOVES inputs taken from previous work include fuel specifications, age

distribution for heavy duty vehicles, I/M coverage information, VMT hourly temporal distribution, and 2017 VMT estimates (indirectly used to scale vehicle population).

CRPC provided August average day VMT by parish and road type for 2022 and 2027, which was derived from travel demand model (TransCAD) applications representing roadway network activity for the respective years. VMT was disaggregated to the 16 MOBILE6 vehicle types using the VMT fractions provided by CRPC, then subsequently processed with EPA's MOVES tools (EPA, 2014a) to convert into the 6 HPMS vehicle classes required for MOVES. The HPMS VMT is summarized in Table 2-1. The estimated VMT by HPMS vehicle class (Figure 2-1) indicates that passenger cars represent over 61% of the area-wide VMT, passenger and light commercial trucks represent about 32% of the VMT, with combined VMT contribution of 6% from buses and combination and single unit trucks.

Table 2-1. Vehicle miles traveled by Parish and HPMS Vehicle Class for 2022 and 2027.

Year	HPMS Vtype	Daily Vehicle Miles Traveled					
		Ascension	East Baton Rouge	Iberville	Livingston	West Baton Rouge	Area-wide
2022	Motorcycles	65,530	148,734	14,299	54,443	14,031	297,036
	Passenger Cars	3,382,191	8,508,126	886,217	3,156,245	1,196,356	17,129,135
	Passenger and Light Commercial Trucks	1,793,762	4,179,220	598,003	1,807,246	737,113	9,115,343
	Buses	13,290	24,487	7,635	15,421	8,201	69,033
	Single Unit Trucks	79,090	145,923	46,463	93,644	47,886	413,005
	Combination Trucks	230,916	423,894	136,671	274,087	140,616	1,206,184
2022 Total		**5,564,779**	**13,430,383**	**1,689,287**	**5,401,085**	**2,144,203**	**28,229,737**
2027	Motorcycles	75,841	146,921	13,740	62,885	14,287	313,673
	Passenger Cars	3,923,786	8,519,139	862,704	3,648,719	1,242,203	18,196,550
	Passenger and Light Commercial Trucks	2,077,912	4,185,273	581,633	2,086,853	765,057	9,696,727
	Buses	15,364	24,532	7,383	17,825	8,435	73,539
	Single Unit Trucks	91,545	145,884	44,914	108,226	49,246	439,815
	Combination Trucks	267,283	423,772	132,112	316,767	144,596	1,284,529
2027 Total		**6,451,730**	**13,445,520**	**1,642,486**	**6,241,274**	**2,223,824**	**30,004,834**

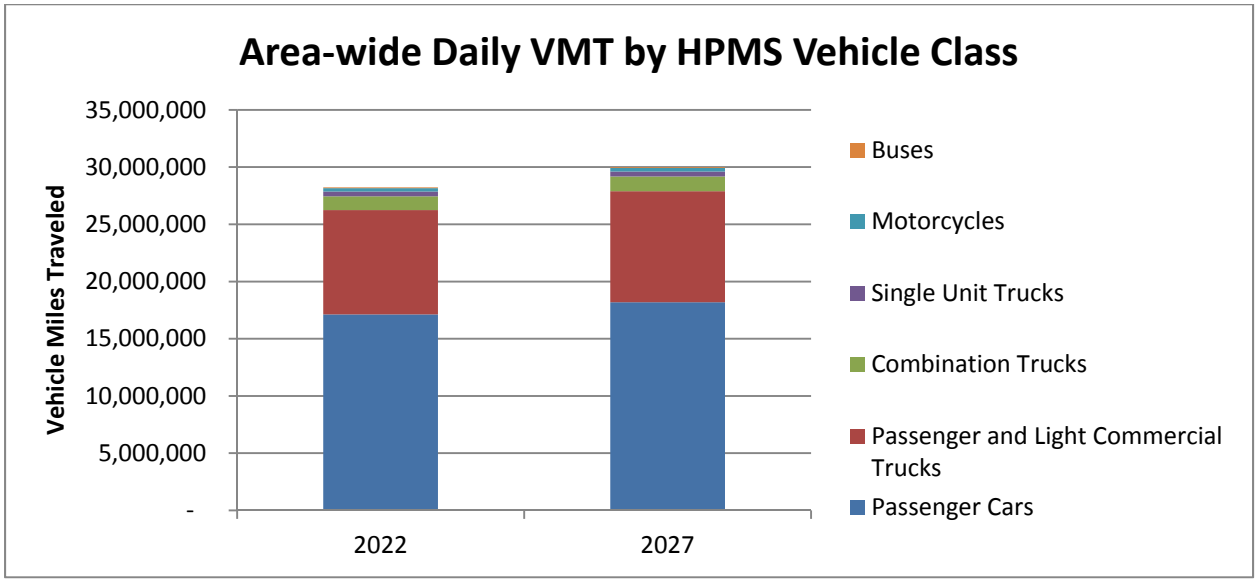

Figure 2-1. August average daily Baton Rouge 5-parish area-wide vehicle miles traveled by HPMS vehicle classes for 2022 and 2027.

Vehicle population by source type is an important local MOVES input given that it is used to calculate start and evaporative emissions. The 2011 and 2017 population data provided by parish included four of the 13 MOVES source types: motorcycle, passenger car, passenger truck, and light commercial truck. The light duty vehicle population for the five-parish area was scaled by source type to 2022 and 2027 by applying the ratio of 2017 population to 2017 VMT to the 2022 and 2027 VMT by source type. For the nine source types not included in the LDEQ dataset, we used MOVES2010b default annual mileage accumulation rates (miles/vehicle/year) by source type and 2022 and 2027 VMT estimates by source type to estimate the population. The population projections by source type are summarized in Table 2-2 below.

Table 2-2. Vehicle population by source type for the Baton Rouge Area in 2022 and 2027.

Source type	2022 Population	2027 Population
Passenger Car	466,417	493,316
Passenger Truck	294,547	316,820
Motorcycle	147,864	160,266
Light Commercial Truck	91,636	98,550
Single Unit Short-haul Truck	8,787	9,338
Combination Short-haul Truck	5,856	5,896
Combination Long-haul Truck	2,612	2,886
Motor Home	1,811	2,008
School Bus	1,266	1,352
Single Unit Long-haul Truck	616	647
Refuse Truck	253	268
Transit Bus	122	128
Intercity Bus	22	24

The parish-level age distributions for light duty vehicles (sources 11, 21, 31, 32) were derived from the 2011 vehicle registration data provided by LDEQ. The registration data included age distributions formatted for input to the MOBILE6 model; EPA's VMT converter tools were used to translate the age distribution to the appropriate source types for MOVES. Vehicle registration data provided by LDEQ covered only four out of 13 MOVES source types. Age distributions for the other nine source types by parish were taken from ENVIRON and ERG (2013).

Fuel formulations and I/M program specification were set by parish based on data provided by LDEQ (ENVIRON and ERG, 2013) and MOVES defaults. Gasoline Reid Vapor Pressure (RVP) for the 5-parish nonattainment area was set at 7.8 psi. All gasoline properties except RVP and diesel fuel properties were based on MOVES defaults, consistent with previous on-road emissions modeling for Baton Rouge (ENVIRON and ERG, 2013). In addition, LDEQ specified using 2005 I/M programs represented in Table 2-3. These I/M programs consist of annual testing requirements for passenger cars, passenger trucks and light commercial trucks that ultimately help reduce hydrocarbon, CO and NOx emissions.

Table 2-3. Inspection and Maintenance Programs in 5-parish Baton Rouge non-attainment area .

IM Test Standard	Pollutants Affected	Model Years Covered		Compliance Factor		
		Begin Model Year	End Model Year	Passenger Car	Passenger Truck	Light Commercial Truck
Evaporative Gas Cap Check	Total Gaseous Hydrocarbons	1980	2027	96	93.12	89.28
	Total Gaseous Hydrocarbons	1980	2027	96	93.12	89.28
Evaporative System OBD Check	Total Gaseous Hydrocarbons	1980	2025	96	93.12	89.28
	Total Gaseous Hydrocarbons	1980	2025	96	93.12	89.28
Exhaust OBD Check	Total Gaseous Hydrocarbons	1996	2025	96	93.12	89.28
	Total Gaseous Hydrocarbons	1996	2025	96	93.12	89.28
	CO	1996	2025	96	93.12	89.28
	CO	1996	2025	96	93.12	89.28
	NOx	1996	2025	96	93.12	89.28
	NOx	1996	2025	96	93.12	89.28

Speed is another key determinant of emission rates. Hourly average-speed distributions were provided by CRPC for each MOVES road type (2 - Rural Restricted Access, 3 - Rural Unrestricted Access, 4 - Urban Restricted Access and 5 - Urban Unrestricted Access). A single profile was provided per road type; hence it was assumed that hourly speed profiles by road type were the same across all parishes and vehicle classes. Figure 2-2 shows the average speed distributions by hour of the day for the four MOVES road types, and for two of the five parishes in study.

East Baton Rouge (EBR) and Iberville were selected as examples for presentation based on their distinctive VMT distribution by road type and daily VMT, which accordingly affects hourly speeds. EBR has the largest VMT in the area and being more urban, highway speeds (road type 4) appear to be generally lower and peak down deeper during rush hour traffic (8AM, 5PM) than in the more rural Iberville.

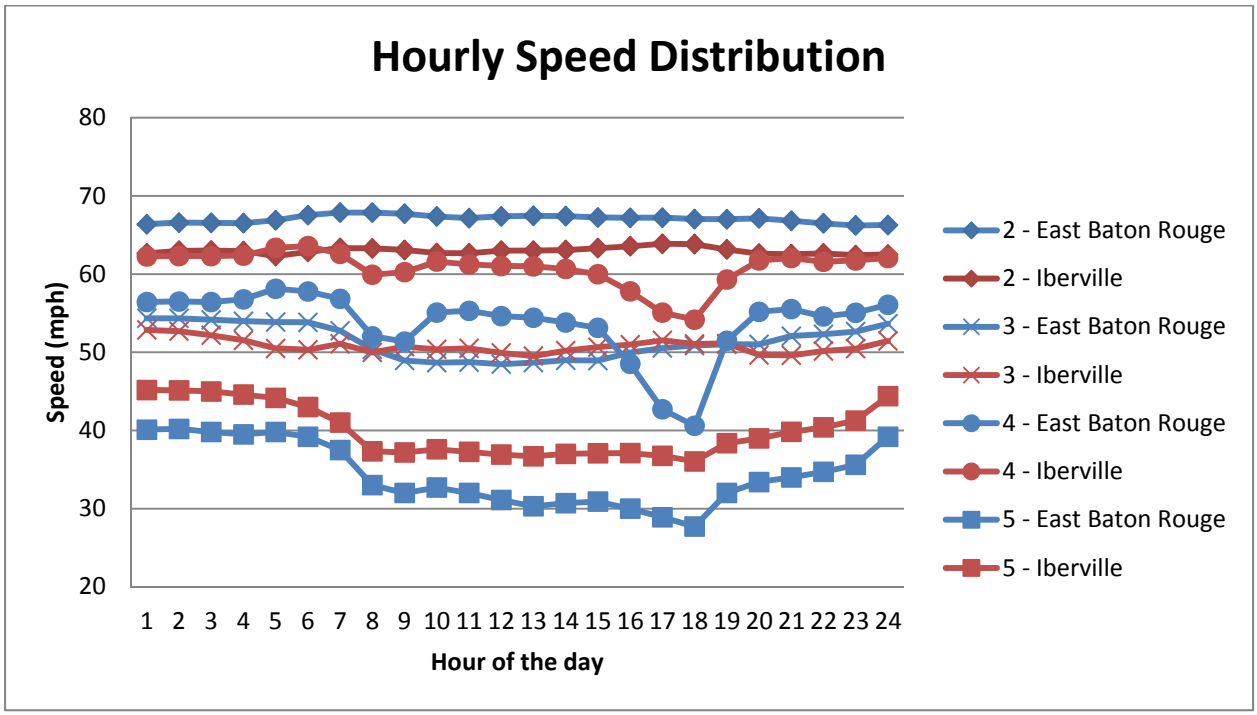

Figure 2-2. Hourly speed distribution profiles for East Baton Rouge and Iberville parishes by road type (2 - Rural Restricted Access, 3 - Rural Unrestricted Access, 4 - Urban Restricted Access and 5 - Urban Unrestricted Access).

Lastly, daily VMT was distributed to hours of the day through a temporal profile input (labeled hourvmtfraction) based on ENVIRON and ERG (2013).

After preparing all MOVES inputs, ten county-domain runs (5 parishes x 2 years) were set up and launched in MOVES2010b. The model runs output consisted of parish-level emissions for an average August day detailed by year, SCCs, 12 *Part5SCC* vehicle classes, 12 HPMS functional classes, pollutants, and process groups (evaporative, exhaust, tirewear and brakewear).

Thorough quality assurance checks were performed during the preparation of inputs and run specifications, as well as during the review of the resulting inventory. Checks for completeness and soundness of input data were performed by comparing the 2022 and 2027 inputs to inputs from ENVIRON and ERG (2013) and MOVES defaults. In addition, grams-per-mile emission rates by vehicle class were back calculated from the area-wide emissions and activity outputs, and compared with emission rates derived from equivalent-year-and-county runs with MOVES default inputs. Emission rates were within the same order of magnitude, and differences

observed between emission rates for key pollutants (VOC, NOx) were correlated back to differences between input data used for each run such as I/M coverage, age distribution, and speed distributions.

2.2 On-road Emission Inventory Results

The area-wide daily emissions estimates by vehicle class are shown in Table 2-4; the largest contributor to emissions from each pollutant is displayed in red text. Results show that light duty gasoline trucks (LDGT1) and heavy duty diesel trucks (HHDDV) are the two largest sources of on-road NOx emissions in the area, while gasoline passenger cars (LDGV) and motorcycles (MC) are the two largest sources of on-road VOC emissions. These results are consistent with the large fraction of area-wide VMT that passenger cars and light duty trucks represent (~90%), shown in Figure 2-1. Despite the small fraction of total VMT that is from HHDDVs, HHDDVs are large contributors to emission because their engines typically generate NOx emissions at significantly higher rates (1.3-1.9 g/mile in this work) than light duty gasoline trucks (0.28-0.4 g/mile in this work). In addition, HHDDV are also known to idle for extended periods of time (known as hoteling), thus contributing to off-network emissions. Table 2-4 shows on-road emissions by vehicle type.

Table 2-4. Daily average area-wide emissions in tons per day for 2022 and 2027.

YEAR	SCC	Vehicle Type	Area-wide Emissions (Tons per day)		
			NOx	CO	VOC
2022	2201001000	LDGV	3.020	**52.446**	**3.845**
	2201020000	LDGT1	**3.729**	41.435	3.097
	2201040000	LDGT2	1.921	21.345	1.595
	2201070000	HDGV	0.785	8.744	0.466
	2201080000	MC	0.159	3.177	3.676
	2230001000	LDDV	0.015	0.210	0.003
	2230060000	LDDT	0.165	0.219	0.015
	2230071000	2BHDDV	0.077	0.103	0.007
	2230072000	LHDDV	0.374	0.495	0.035
	2230073000	MHDDV	0.717	0.471	0.043
	2230074000	HHDDV	3.232	1.400	0.218
	2230075000	BUSES	0.171	0.114	0.012
	Grand Total		**14.37**	**130.16**	**13.01**
2027	2201001000	LDGV	2.375	**50.976**	3.484
	2201020000	LDGT1	**2.640**	36.147	2.258
	2201040000	LDGT2	1.360	18.621	1.163
	2201070000	HDGV	0.644	7.991	0.350
	2201080000	MC	0.161	3.183	**3.865**
	2230001000	LDDV	0.011	0.260	0.004
	2230060000	LDDT	0.138	0.228	0.011
	2230071000	2BHDDV	0.064	0.107	0.005
	2230072000	LHDDV	0.304	0.504	0.024
	2230073000	MHDDV	0.541	0.428	0.029
	2230074000	HHDDV	2.608	1.254	0.183
	2230075000	BUSES	0.106	0.096	0.007
	Grand Total		**10.95**	**119.80**	**11.38**

Much of the on-road VOC emissions are generated off-network, that is, while vehicles are parked. These off-network emissions are produced from engine starts or through vapor permeation, fuel leaks and diurnal and/or hot soak vapor venting. VOC emissions generated on roads are produced through combustion or released through permeation and leaks. Figure 2-3 shows hydrocarbon emissions by process and by location (off-network versus on roads). Inventory results show that about 80% of total VOC emissions in each analysis year occur while vehicles are parked.

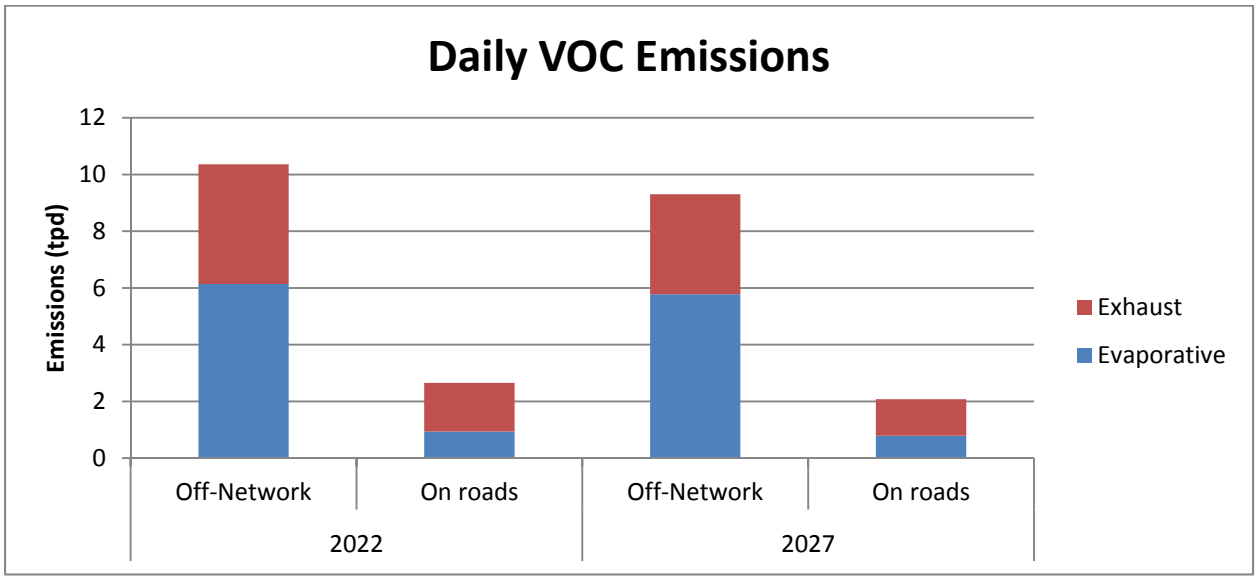

Figure 2-3. Daily VOC emissions for 2022 and 2027 by emissions process and location.

Emissions for 2010 and 2017 (ENVIRON and ERG, 2013) were compared with estimates developed for 2022 and 2027. Figure 2-4 shows emissions for 2010, 2017, 2022, and 2027 by parish. Despite the forecasted monotonic increase in VMT from 2010 to 2027, NOX and TOG emissions are estimated to decrease monotonically over the same period due to fleet turnover to newer vehicles in future years.

2.3 Stage II Refueling Emissions

The two types of Stage II refueling emissions included in MOVES are vapor displacement and spills. MOVES includes default parish-level Stage II control efficiencies and separates the Stage II control efficiency into two factors, a refueling vapor adjustment factor, and a spillage adjustment factor, which are measures of the efficiency of the Stage II program at reducing vapor displacement and spillage. MOVES2010b default adjustment factors for the Baton Rouge 5-parish area were applied to the calculations, as indicated by LDEQ. The default control factor for refueling vapor losses is 95%, whereas the control factor for spillage losses is 50%. Controlled Stage II refueling emissions of VOC for the Baton Rouge parishes for 2022 and 2027 are summarized in Table 2-5. Controlled refueling emissions represent about 1.5% of the total VOC on-road emissions inventory estimated in this work.

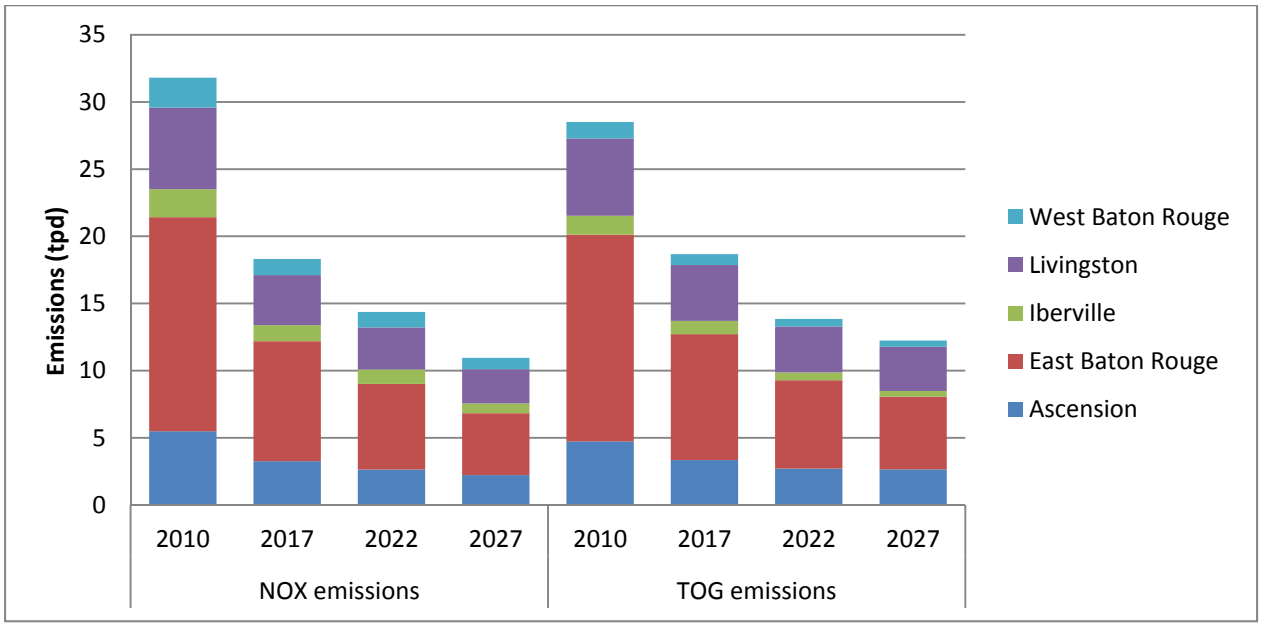

Figure 2-4. Baton Rouge 5-parish area daily NOx and VOC emissions for 2010 and 2017 (ENVIRON and ERG, 2013); 2022 and 2027 (estimated in this work) by parish.

Table 2-5. Daily average VOC emissions by Parish for Controlled Stage II refueling in tons per day for 2022 and 2027.

Parish	SCC	Process	VOC (tpd)	
			2022	2027
Ascension	2501060102	Refueling Displacement Vapor Loss	0.004	0.003
Ascension	2501060103	Refueling Spillage Loss	0.030	0.032
East Baton Rouge	2501060102	Refueling Displacement Vapor Loss	0.009	0.007
East Baton Rouge	2501060103	Refueling Spillage Loss	0.074	0.067
Iberville	2501060102	Refueling Displacement Vapor Loss	0.001	0.001
Iberville	2501060103	Refueling Spillage Loss	0.012	0.010
Livingston	2501060102	Refueling Displacement Vapor Loss	0.004	0.003
Livingston	2501060103	Refueling Spillage Loss	0.032	0.034
West Baton Rouge	2501060102	Refueling Displacement Vapor Loss	0.002	0.001
West Baton Rouge	2501060103	Refueling Spillage Loss	0.014	0.013
TOTAL			**0.182**	**0.171**

3.0 OFF-ROAD MOBILE SOURCES

3.1 NONROAD Equipment

The EPA's National Mobile Inventory Model (NMIM) was used to generate Louisiana parish-level off-road equipment emissions estimates for August 2027 in the Baton Rouge 5-parish area. NMIM is a tool for estimating non-road emissions by county for the entire US to support National Emission Inventory Updates (NEI) updates. For this modeling effort NMIM version NMIM20090504 was run with county database NCD20090531. Emissions are estimated from off-road equipment in the following categories:

- Agricultural equipment, such as tractors, combines, and balers;
- Airport ground support, such as terminal tractors and supply vehicles;
- Construction equipment, such as graders and back hoes;
- Industrial and commercial equipment, such as fork lifts and sweepers;
- Residential and commercial lawn and garden equipment, such as leaf blowers;
- Logging equipment, such as shredders and large chain saws;
- Recreational equipment, such as off-road motorbikes and ATVs; and
- Recreational marine vessels, such as power boats.

Local data were used for gasoline fuel parameters, consistent with the on-road mobile inventory (Section 2.0). All non-gasoline equipment fuel properties were default parameters.

3.2 Aircraft

Aircraft emissions for the Baton Rouge 5-parish area were forecasted to 2027 from EPA 2011 NEI based on methodology similar to the methodology used by EPA to forecast the 2011 NEI estimates to 2018 (EPA, 2014c). Growth in aircraft activity was estimated based on aircraft operations data extracted from the Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) database (http://aspm.faa.gov/apowtaf/). For airports with aircraft operations data available from the FAA TAF, growth forecasts were estimated based on the ratio of 2027 to 2011 operations by aircraft type (i.e. commercial, air taxi, general aviation, and military) for each individual airport. For smaller airports where airport specific data was not available from the FAA TAF database, growth forecasts were estimated based on the ratio of 2027 to 2011 operations by aircraft type state-wide. Similar to EPA forecasts, no additional emissions control was assumed for aircraft after 2011.

3.3 Locomotive

Locomotive emissions for the Baton Rouge 5-parish area were forecasted to 2027 from the EPA 2011 NEI based on methodology similar to the methodology used by EPA to forecast the 2011 NEI estimates to 2018 (EPA, 2014c) accounting for both activity growth and emissions control due to turnover of the fleet to cleaner engines over time. EPA 2008 Regulatory Impact Analysis (RIA) (EPA, 2009a) estimates of the ratio of nationwide 2027 to 2011 locomotive emissions were applied to 2011 NEI locomotive emission estimates to estimate emissions in 2027.

3.4 Commercial Marine

Commercial marine category 1 and category 2 engine emissions (compression-ignition engines below 30 liters per cylinder) for the Baton Rouge 5-parish area were forecasted to 2027 from the EPA 2011 NEI based on methodology similar to the methodology used by EPA to forecast the 2011 NEI estimates to 2018 (EPA, 2014c) accounting for both activity growth and emissions control due to turnover of the fleet to cleaner engines over time. The EPA 2008 Regulatory Impact Analysis (RIA) (EPA, 2009a) estimates of the ratio of nationwide 2027 to 2011 category 1 and category 2 marine emissions were applied to 2011 NEI emission estimates to estimate emissions in 2027.

Commercial marine category 3 engine emissions (compression-ignition engines at or above 30 liters per cylinder) for the Baton Rouge 5-parish area were forecasted to 2027 from the EPA 2011 NEI based on methodology similar to the methodology used by EPA to forecast the 2011 NEI estimates to 2018 (EPA, 2014c) accounting for both activity growth as well as control due to fleet turnover and reductions in fuel sulfur content. The EPA final rule RIA for category 3 engines (EPA, 2009b) estimates of activity growth and emission control for the Gulf Coast were applied to 2011 NEI emissions to estimate 2027 emissions.

4.0 STATIONARY AREA AND POINT EMISSIONS

4.1 2011 Base Year Emissions

The 2011 point and area source emissions for the 5-parish Baton Rouge nonattainment area were obtained from the EPA 2011 National Emissions Inventory (NEI), Version 2 (EPA, 2014b). This version of the 2011 NEI was released on December 12, 2014 and ERG downloaded the files on December 16, 2014. One exception to this was that Stage II emissions were not included in the 2011 NEI, Version 2 files; ENVIRON gap-filled the missing Stage II emissions using output from the MOVES model runs for on-road motor vehicles. All emissions related to aircraft, railroads, and commercial marine vessels were also removed from the 2011 base year point and area source files.

4.2 2027 Projected Year Emissions

4.2.1 Point Sources

The base year 2011 point source emissions inventory was projected to 2027 based upon information from the Energy Information Administration's (EIA) Annual Energy Outlook (AEO) (EIA, 2014). Specific projection factor assignments were made based upon Source Classification Codes (SCCs) and North American Industry Classification System (NAICS) codes.

Electric power projections from the AEO for the SERC Delta electricity market module region (i.e., portions of Arkansas, Louisiana, Mississippi, and Texas) were used to develop projection factors for the electricity generation units (EGUs) in the 5-parish Baton Rouge nonattainment area. The projections did not include effects from the proposed Clean Power Plan (EPA, 2014d). Since the EGUs in the nonattainment area were all natural gas, only the natural gas-fired electric power projections were used.

On-shore oil and gas production projections from AEO were used to develop projection factors for point source oil and gas sources. The AEO Oil and gas production projections were published at the oil and gas supply model region; projections data for the Gulf Coast oil and gas supply model region (i.e., Alabama, Florida, Louisiana, Mississippi, and portions of Texas) were used.

National sector-level energy consumption projections from the 2014 AEO were used to develop the remaining point source projection factors. Total energy consumption projections data for the following industry sectors were used:

- Refining industry (refining activity only)
- Chemical industry (total feedstocks)
- Food industry (total energy)
- Paper industry (total energy)
- Metal durables industry (fabricated metals products and transportation equipment)
- Aluminum industry (total energy)

- Other industry (plastics and miscellaneous)

4.2.2 Area Sources

The base year 2011 area source emissions inventory was also projected to 2027 using projection factors based upon surrogates, including: population, energy consumption, oil and gas production, and vehicle miles travelled (VMT). Projection factor assignments were made at the SCC-level.

Parish-level population projections were used to develop population-based growth factors (Blanchard, 2014). These latest projections accounted for the lingering population shifts due to Hurricanes Katrina and Rita in 2005. Because the population projections were only developed for every 5 years (i.e., 2005, 2010, 2015, 2020, 2025, and 2030), linear interpolation was used to develop population values for the 2011 base year and the 2027 projection year. As recommended by the documentation for the population projections, the "Middle Series" population scenario was used. The population projection factors were greater than 1 for Ascension and Livingston parishes, while the population projection factors were less than 1 for East Baton Rouge, Iberville, and West Baton Rouge parishes.

Sector-level energy consumption projections from the 2014 AEO were used develop many area source projection factors (EIA, 2014). The AEO consumption projections data were published at the census division-level; projections data for the West South Central census division (i.e., Arkansas, Louisiana, Oklahoma, and Texas) were used. Consumption projections data for the following sectors and fuel types were used:

- Industrial sector – coal, distillate, kerosene, other petroleum, propane, renewable, residual, and total;
- Commercial sector – kerosene, natural gas, propane, and renewable;
- Residential sector – distillate, kerosene, natural gas, and propane; and
- Transportation sector – other petroleum.

As with the point sources, AEO on-shore oil and gas production projections were also used to develop projection factors for oil and gas area sources.

Projections of VMT were also used to develop projection factors. These VMT projections were developed by ENVIRON in support of the on-road motor vehicle projections (Section 2). Projection factors were developed for each of the 5 parishes in the nonattainment area, as well as for the nonattainment area as a whole.

Finally, in addition to the projection factors described above, an "unchanged" factor (i.e., a value of 1.0) was applied to a few area source categories where it was felt that future year emissions would likely be unchanged.

Appendix A provides a complete list of area source projection categories and related 2011-2027 factors by source category code and by parish.

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APPENDIX A

Parish and Source Category Breakout of Area Source Projection Categories and 2011-2027 Growth Factors

Table A-1. Parish and Source Category Breakout of Area Source Projection Categories and 2011-2027 Growth Factors.

Parish	SCC	SCC Description	Projection Category	Projection Factor
All	2102002000	Industrial Coal Combustion	Industrial - Coal	1.1109
All	2102004001	Industrial Distillate Combustion - Boilers	Industrial - Distillate	1.1457
All	2102004002	Industrial Distillate Combustion - IC Engines	Industrial - Distillate	1.1457
All	2102005000	Industrial Residual Combustion	Industrial - Residual	1.2222
All	2102007000	Industrial LPG Combustion	Industrial - Propane	1.3330
All	2102008000	Industrial Wood Combustion	Industrial - Renewable	1.2377
All	2102011000	Industrial Kerosene Combustion	Industrial - Kerosene	1.1457
All	2103006000	Commercial/Institutional Natural Gas Combustion	Commercial - Natural Gas	1.0112
All	2103007000	Commercial/Institutional LPG Combustion	Commercial - Propane	1.2147
All	2103008000	Commercial/Institutional Wood Combustion	Commercial - Renewable	0.9867
All	2103011000	Commercial/Institutional Kerosene Combustion	Commercial - Kerosene	1.0769
All	2104004000	Residential Distillate Combustion	Residential - Distillate	0.9375
All	2104006000	Residential Natural Gas Combustion	Residential - Natural Gas	0.9253
All	2104007000	Residential LPG Combustion	Residential - Propane	0.7002
Ascension	2104008100	Residential Wood Combustion - Fireplaces	Population - Ascension	1.6055
East Baton Rouge	2104008100	Residential Wood Combustion - Fireplaces	Population - East Baton Rouge	0.9775
Iberville	2104008100	Residential Wood Combustion - Fireplaces	Population - Iberville	0.8392
Livingston	2104008100	Residential Wood Combustion - Fireplaces	Population - Livingston	1.6621
West Baton Rouge	2104008100	Residential Wood Combustion - Fireplaces	Population - West Baton Rouge	0.9447
Ascension	2104008210	Residential Wood Combustion - Fireplace Inserts - Non-EPA Certified	Population - Ascension	1.6055
East Baton Rouge	2104008210	Residential Wood Combustion - Fireplace Inserts - Non-EPA Certified	Population - East Baton Rouge	0.9775
Iberville	2104008210	Residential Wood Combustion - Fireplace Inserts - Non-EPA Certified	Population - Iberville	0.8392
Livingston	2104008210	Residential Wood Combustion - Fireplace Inserts - Non-EPA Certified	Population - Livingston	1.6621
West Baton Rouge	2104008210	Residential Wood Combustion - Fireplace Inserts - Non-EPA Certified	Population - West Baton Rouge	0.9447
Ascension	2104008220	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Non-catalytic	Population - Ascension	1.6055
East Baton Rouge	2104008220	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Non-catalytic	Population - East Baton Rouge	0.9775
Iberville	2104008220	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Non-catalytic	Population - Iberville	0.8392
Livingston	2104008220	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Non-catalytic	Population - Livingston	1.6621
West Baton Rouge	2104008220	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Non-catalytic	Population - West Baton Rouge	0.9447
Ascension	2104008230	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Catalytic	Population - Ascension	1.6055
East Baton Rouge	2104008230	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Catalytic	Population - East Baton Rouge	0.9775
Iberville	2104008230	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Catalytic	Population - Iberville	0.8392
Livingston	2104008230	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Catalytic	Population - Livingston	1.6621

Parish	SCC	SCC Description	Projection Category	Projection Factor
West Baton Rouge	2104008230	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Catalytic	Population - West Baton Rouge	0.9447
Ascension	2104008320	Residential Wood Combustion - Woodstoves - EPA Certified - Non-catalytic	Population - Ascension	1.6055
East Baton Rouge	2104008320	Residential Wood Combustion - Woodstoves - EPA Certified - Non-catalytic	Population - East Baton Rouge	0.9775
Iberville	2104008320	Residential Wood Combustion - Woodstoves - EPA Certified - Non-catalytic	Population - Iberville	0.8392
Livingston	2104008320	Residential Wood Combustion - Woodstoves - EPA Certified - Non-catalytic	Population - Livingston	1.6621
West Baton Rouge	2104008320	Residential Wood Combustion - Woodstoves - EPA Certified - Non-catalytic	Population - West Baton Rouge	0.9447
Ascension	2104008330	Residential Wood Combustion - Woodstoves - EPA Certified - Catalytic	Population - Ascension	1.6055
East Baton Rouge	2104008330	Residential Wood Combustion - Woodstoves - EPA Certified - Catalytic	Population - East Baton Rouge	0.9775
Iberville	2104008330	Residential Wood Combustion - Woodstoves - EPA Certified - Catalytic	Population - Iberville	0.8392
Livingston	2104008330	Residential Wood Combustion - Woodstoves - EPA Certified - Catalytic	Population - Livingston	1.6621
West Baton Rouge	2104008330	Residential Wood Combustion - Woodstoves - EPA Certified - Catalytic	Population - West Baton Rouge	0.9447
Ascension	2104008400	Residential Wood Combustion - Pellet Stoves	Population - Ascension	1.6055
East Baton Rouge	2104008400	Residential Wood Combustion - Pellet Stoves	Population - East Baton Rouge	0.9775
Iberville	2104008400	Residential Wood Combustion - Pellet Stoves	Population - Iberville	0.8392
Livingston	2104008400	Residential Wood Combustion - Pellet Stoves	Population - Livingston	1.6621
West Baton Rouge	2104008400	Residential Wood Combustion - Pellet Stoves	Population - West Baton Rouge	0.9447
Iberville	2104008610	Residential Wood Combustion - Hydronic Heaters	Population - Iberville	0.8392
Livingston	2104008610	Residential Wood Combustion - Hydronic Heaters	Population - Livingston	1.6621
West Baton Rouge	2104008610	Residential Wood Combustion - Hydronic Heaters	Population - West Baton Rouge	0.9447
Ascension	2104008700	Residential Wood Combustion - Other (Fire-pits, chimeas, etc.)	Population - Ascension	1.6055
East Baton Rouge	2104008700	Residential Wood Combustion - Other (Fire-pits, chimeas, etc.)	Population - East Baton Rouge	0.9775
Iberville	2104008700	Residential Wood Combustion - Other (Fire-pits, chimeas, etc.)	Population - Iberville	0.8392
Livingston	2104008700	Residential Wood Combustion - Other (Fire-pits, chimeas, etc.)	Population - Livingston	1.6621
West Baton Rouge	2104008700	Residential Wood Combustion - Other (Fire-pits, chimeas, etc.)	Population - West Baton Rouge	0.9447
Ascension	2104009000	Residential Wood Combustion - Firelogs	Population - Ascension	1.6055
East Baton Rouge	2104009000	Residential Wood Combustion - Firelogs	Population - East Baton Rouge	0.9775
Iberville	2104009000	Residential Wood Combustion - Firelogs	Population - Iberville	0.8392
Livingston	2104009000	Residential Wood Combustion - Firelogs	Population - Livingston	1.6621
West Baton Rouge	2104009000	Residential Wood Combustion - Firelogs	Population - West Baton Rouge	0.9447
All	2104011000	Residential Kerosene Combustion	Residential - Kerosene	0.2000
All	2301030000	Pharmaceutical Manufacturing - Process Emissions	Unchanged	1.0000
Ascension	2302002100	Commercial Cooking - Conveyorized Charbroiling	Population - Ascension	1.6055
East Baton Rouge	2302002100	Commercial Cooking - Conveyorized Charbroiling	Population - East Baton Rouge	0.9775
Iberville	2302002100	Commercial Cooking - Conveyorized Charbroiling	Population - Iberville	0.8392

Parish	SCC	SCC Description	Projection Category	Projection Factor
Livingston	2302002100	Commercial Cooking - Conveyorized Charbroiling	Population - Livingston	1.6621
West Baton Rouge	2302002100	Commercial Cooking - Conveyorized Charbroiling	Population - West Baton Rouge	0.9447
Ascension	2302002200	Commercial Cooking - Under-fired Charbroiling	Population - Ascension	1.6055
East Baton Rouge	2302002200	Commercial Cooking - Under-fired Charbroiling	Population - East Baton Rouge	0.9775
Iberville	2302002200	Commercial Cooking - Under-fired Charbroiling	Population - Iberville	0.8392
Livingston	2302002200	Commercial Cooking - Under-fired Charbroiling	Population - Livingston	1.6621
West Baton Rouge	2302002200	Commercial Cooking - Under-fired Charbroiling	Population - West Baton Rouge	0.9447
Ascension	2302003000	Commercial Cooking - Deep Fat Frying	Population - Ascension	1.6055
East Baton Rouge	2302003000	Commercial Cooking - Deep Fat Frying	Population - East Baton Rouge	0.9775
Iberville	2302003000	Commercial Cooking - Deep Fat Frying	Population - Iberville	0.8392
Livingston	2302003000	Commercial Cooking - Deep Fat Frying	Population - Livingston	1.6621
West Baton Rouge	2302003000	Commercial Cooking - Deep Fat Frying	Population - West Baton Rouge	0.9447
Ascension	2302003100	Commercial Cooking - Flat Griddle Frying	Population - Ascension	1.6055
East Baton Rouge	2302003100	Commercial Cooking - Flat Griddle Frying	Population - East Baton Rouge	0.9775
Iberville	2302003100	Commercial Cooking - Flat Griddle Frying	Population - Iberville	0.8392
Livingston	2302003100	Commercial Cooking - Flat Griddle Frying	Population - Livingston	1.6621
West Baton Rouge	2302003100	Commercial Cooking - Flat Griddle Frying	Population - West Baton Rouge	0.9447
Ascension	2302003200	Commercial Cooking - Clamshell Griddle Frying	Population - Ascension	1.6055
East Baton Rouge	2302003200	Commercial Cooking - Clamshell Griddle Frying	Population - East Baton Rouge	0.9775
Iberville	2302003200	Commercial Cooking - Clamshell Griddle Frying	Population - Iberville	0.8392
Livingston	2302003200	Commercial Cooking - Clamshell Griddle Frying	Population - Livingston	1.6621
West Baton Rouge	2302003200	Commercial Cooking - Clamshell Griddle Frying	Population - West Baton Rouge	0.9447
All	2310000220	Oil & Gas Exploration & Production - Drill Rigs	Oil - On-Shore	3.0449
All	2310000330	Oil & Gas Exploration & Production - Artificial Lift	Oil - On-Shore	3.0449
All	2310000550	Oil & Gas Exploration & Production - Produced Water	Oil - On-Shore	3.0449
All	2310000660	Oil & Gas Exploration & Production - Hydraulic Fracturing	Oil - On-Shore	3.0449
All	2310010100	Oil & Gas Exploration & Production - Oil Well Heaters	Oil - On-Shore	3.0449
All	2310010200	Oil & Gas Exploration & Production - Oil Well Tanks	Oil - On-Shore	3.0449
All	2310010300	Oil & Gas Exploration & Production - Oil Well Pneumatic Devices	Oil - On-Shore	3.0449
All	2310011000	On-Shore Oil Production - All Processes	Oil - On-Shore	3.0449
All	2310011201	On-Shore Oil Production - Tank Truck and Railcare Loading - Crude Oil	Oil - On-Shore	3.0449
All	2310011501	On-Shore Oil Production - Fugitives - Connectors	Oil - On-Shore	3.0449
All	2310011502	On-Shore Oil Production - Fugitives - Flanges	Oil - On-Shore	3.0449
All	2310011503	On-Shore Oil Production - Fugitives - Open Ended Lines	Oil - On-Shore	3.0449

Parish	SCC	SCC Description	Projection Category	Projection Factor
All	2310011505	On-Shore Oil Production - Fugitives - Valves	Oil - On-Shore	3.0449
All	2310021010	On-Shore Gas Production - Storage Tanks - Condensate	Natural Gas - On-Shore	1.7035
All	2310021030	On-Shore Gas Production - Tank Truck and Railcar Loading - Condensate	Natural Gas - On-Shore	1.7035
All	2310021100	On-Shore Gas Production - Storage Tanks - Gas Well Heaters	Natural Gas - On-Shore	1.7035
All	2310021202	On-Shore Gas Production - 4Cycle Compressors (50-499 hp) - Lean Burn	Natural Gas - On-Shore	1.7035
All	2310021251	On-Shore Gas Production - 4Cycle Lateral Compressors - Lean Burn	Natural Gas - On-Shore	1.7035
All	2310021300	On-Shore Gas Production - Gas Well Pneumatic Devices	Natural Gas - On-Shore	1.7035
All	2310021302	On-Shore Gas Production - 4Cycle Compressors (50-499 hp) - Rich Burn	Natural Gas - On-Shore	1.7035
All	2310021351	On-Shore Gas Production - 4Cycle Lateral Compressors - Rich Burn	Natural Gas - On-Shore	1.7035
All	2310021400	On-Shore Gas Production - Gas Well Dehydrators	Natural Gas - On-Shore	1.7035
All	2310021501	On-Shore Gas Production - Fugitives - Connectors	Natural Gas - On-Shore	1.7035
All	2310021502	On-Shore Gas Production - Fugitives - Flanges	Natural Gas - On-Shore	1.7035
All	2310021503	On-Shore Gas Production - Fugitives - Open Ended Lines	Natural Gas - On-Shore	1.7035
All	2310021505	On-Shore Gas Production - Fugitives - Valves	Natural Gas - On-Shore	1.7035
All	2310021506	On-Shore Gas Production - Fugitives - Other	Natural Gas - On-Shore	1.7035
All	2310021603	On-Shore Gas Production - Gas Well Venting - Blowdowns	Natural Gas - On-Shore	1.7035
All	2310111100	On-Shore Oil Exploration - Mud Degassing	Oil - On-Shore	3.0449
All	2310111401	On-Shore Oil Exploration - Oil Well Pneumatic Pumps	Oil - On-Shore	3.0449
All	2310111700	On-Shore Oil Exploration - Oil Well Completions	Oil - On-Shore	3.0449
All	2310121100	On-Shore Gas Exploration - Mud Degassing	Natural Gas - On-Shore	1.7035
All	2310121401	On-Shore Gas Exploration - Gas Well Pneumatic Pumps	Natural Gas - On-Shore	1.7035
All	2310121700	On-Shore Gas Exploration - Gas Well Completions	Natural Gas - On-Shore	1.7035
Ascension	2401001000	Surface Coating - Architectural Coatings	Population - Ascension	1.6055
East Baton Rouge	2401001000	Surface Coating - Architectural Coatings	Population - East Baton Rouge	0.9775
Iberville	2401001000	Surface Coating - Architectural Coatings	Population - Iberville	0.8392
Livingston	2401001000	Surface Coating - Architectural Coatings	Population - Livingston	1.6621
West Baton Rouge	2401001000	Surface Coating - Architectural Coatings	Population - West Baton Rouge	0.9447
All	2401005000	Surface Coating - Auto Refinishing	Industrial - Total	1.2615
Ascension	2401008000	Surface Coating - Traffic Markings	VMT - Ascension	2.4560
East Baton Rouge	2401008000	Surface Coating - Traffic Markings	VMT - East Baton Rouge	1.7169
Iberville	2401008000	Surface Coating - Traffic Markings	VMT - Iberville	1.5229
Livingston	2401008000	Surface Coating - Traffic Markings	VMT - Livingston	2.5060
West Baton Rouge	2401008000	Surface Coating - Traffic Markings	VMT - West Baton Rouge	1.8135
All	2401015000	Surface Coating - Factory Finish Wood	Industrial - Total	1.2615

Parish	SCC	SCC Description	Projection Category	Projection Factor
All	2401020000	Surface Coating - Wood Furniture	Industrial - Total	1.2615
All	2401040000	Surface Coating - Metal Cans	Industrial - Total	1.2615
All	2401055000	Surface Coating - Machinery & Equipment	Industrial - Total	1.2615
All	2401065000	Surface Coating - Electronic & Other Electrical	Industrial - Total	1.2615
All	2401070000	Surface Coating - Motor Vehicles	Industrial - Total	1.2615
All	2401080000	Surface Coating - Marine	Industrial - Total	1.2615
All	2401090000	Surface Coating - Miscellaneous Manufacturing	Industrial - Total	1.2615
All	2401100000	Surface Coating - Industrial Maintenance Coatings	Industrial - Total	1.2615
All	2401200000	Surface Coating - Other Special Purpose Coatings	Industrial - Total	1.2615
All	2415000000	Degreasing	Industrial - Total	1.2615
Ascension	2420000000	Dry Cleaning	Population - Ascension	1.6055
East Baton Rouge	2420000000	Dry Cleaning	Population - East Baton Rouge	0.9775
Iberville	2420000000	Dry Cleaning	Population - Iberville	0.8392
Livingston	2420000000	Dry Cleaning	Population - Livingston	1.6621
Ascension	2425000000	Graphic Arts	Population - Ascension	1.6055
East Baton Rouge	2425000000	Graphic Arts	Population - East Baton Rouge	0.9775
Iberville	2425000000	Graphic Arts	Population - Iberville	0.8392
Livingston	2425000000	Graphic Arts	Population - Livingston	1.6621
All	2430000000	Rubber/Plastics - All Processes	Industrial - Total	1.2615
All	2440000000	Miscellaneous Industrial - All Processes	Industrial - Total	1.2615
All	2440020000	Miscellaneous Industrial - Adhesive Application	Industrial - Total	1.2615
Ascension	2460200000	Consumer & Commercial Solvents - All Household	Population - Ascension	1.6055
East Baton Rouge	2460200000	Consumer & Commercial Solvents - All Household	Population - East Baton Rouge	0.9775
Iberville	2460200000	Consumer & Commercial Solvents - All Household	Population - Iberville	0.8392
Livingston	2460200000	Consumer & Commercial Solvents - All Household	Population - Livingston	1.6621
West Baton Rouge	2460200000	Consumer & Commercial Solvents - All Household	Population - West Baton Rouge	0.9447
Ascension	2460500000	Consumer & Commercial Solvents - Coating & Related Products	Population - Ascension	1.6055
East Baton Rouge	2460500000	Consumer & Commercial Solvents - Coating & Related Products	Population - East Baton Rouge	0.9775
Iberville	2460500000	Consumer & Commercial Solvents - Coating & Related Products	Population - Iberville	0.8392
Livingston	2460500000	Consumer & Commercial Solvents - Coating & Related Products	Population - Livingston	1.6621
West Baton Rouge	2460500000	Consumer & Commercial Solvents - Coating & Related Products	Population - West Baton Rouge	0.9447
Ascension	2460600000	Consumer & Commercial Solvents - Adhesives & Sealants	Population - Ascension	1.6055
East Baton Rouge	2460600000	Consumer & Commercial Solvents - Adhesives & Sealants	Population - East Baton Rouge	0.9775
Iberville	2460600000	Consumer & Commercial Solvents - Adhesives & Sealants	Population - Iberville	0.8392

Parish	SCC	SCC Description	Projection Category	Projection Factor
Livingston	2460600000	Consumer & Commercial Solvents - Adhesives & Sealants	Population - Livingston	1.6621
West Baton Rouge	2460600000	Consumer & Commercial Solvents - Adhesives & Sealants	Population - West Baton Rouge	0.9447
Ascension	2460800000	Consumer & Commercial Solvents - FIFRA Related Products	Population - Ascension	1.6055
East Baton Rouge	2460800000	Consumer & Commercial Solvents - FIFRA Related Products	Population - East Baton Rouge	0.9775
Iberville	2460800000	Consumer & Commercial Solvents - FIFRA Related Products	Population - Iberville	0.8392
Livingston	2460800000	Consumer & Commercial Solvents - FIFRA Related Products	Population - Livingston	1.6621
West Baton Rouge	2460800000	Consumer & Commercial Solvents - FIFRA Related Products	Population - West Baton Rouge	0.9447
Ascension	2460900000	Consumer & Commercial Solvents - Miscellaneous Products	Population - Ascension	1.6055
East Baton Rouge	2460900000	Consumer & Commercial Solvents - Miscellaneous Products	Population - East Baton Rouge	0.9775
Iberville	2460900000	Consumer & Commercial Solvents - Miscellaneous Products	Population - Iberville	0.8392
Livingston	2460900000	Consumer & Commercial Solvents - Miscellaneous Products	Population - Livingston	1.6621
West Baton Rouge	2460900000	Consumer & Commercial Solvents - Miscellaneous Products	Population - West Baton Rouge	0.9447
All	2461021000	Cutback Asphalt Application	Industrial - Other Petroleum	1.0060
All	2461022000	Emulsified Asphalt Application	Industrial - Other Petroleum	1.0060
Ascension	2465000000	Consumer Solvents - All Products	Population - Ascension	1.6055
East Baton Rouge	2465000000	Consumer Solvents - All Products	Population - East Baton Rouge	0.9775
Iberville	2465000000	Consumer Solvents - All Products	Population - Iberville	0.8392
Livingston	2465000000	Consumer Solvents - All Products	Population - Livingston	1.6621
West Baton Rouge	2465000000	Consumer Solvents - All Products	Population - West Baton Rouge	0.9447
Ascension	2465100000	Consumer Solvents - Personal Care Products	Population - Ascension	1.6055
East Baton Rouge	2465100000	Consumer Solvents - Personal Care Products	Population - East Baton Rouge	0.9775
Iberville	2465100000	Consumer Solvents - Personal Care Products	Population - Iberville	0.8392
Livingston	2465100000	Consumer Solvents - Personal Care Products	Population - Livingston	1.6621
West Baton Rouge	2465100000	Consumer Solvents - Personal Care Products	Population - West Baton Rouge	0.9447
Ascension	2465200000	Consumer Solvents - Household Care Products	Population - Ascension	1.6055
East Baton Rouge	2465200000	Consumer Solvents - Household Care Products	Population - East Baton Rouge	0.9775
Iberville	2465200000	Consumer Solvents - Household Care Products	Population - Iberville	0.8392
Livingston	2465200000	Consumer Solvents - Household Care Products	Population - Livingston	1.6621
West Baton Rouge	2465200000	Consumer Solvents - Household Care Products	Population - West Baton Rouge	0.9447
Ascension	2465400000	Consumer Solvents - Auto Aftermarket Products	Population - Ascension	1.6055
East Baton Rouge	2465400000	Consumer Solvents - Auto Aftermarket Products	Population - East Baton Rouge	0.9775
Iberville	2465400000	Consumer Solvents - Auto Aftermarket Products	Population - Iberville	0.8392
Livingston	2465400000	Consumer Solvents - Auto Aftermarket Products	Population - Livingston	1.6621
West Baton Rouge	2465400000	Consumer Solvents - Auto Aftermarket Products	Population - West Baton Rouge	0.9447

Parish	SCC	SCC Description	Projection Category	Projection Factor
Ascension	2465800000	Consumer Solvents - Pesticide Application	Population - Ascension	1.6055
East Baton Rouge	2465800000	Consumer Solvents - Pesticide Application	Population - East Baton Rouge	0.9775
Iberville	2465800000	Consumer Solvents - Pesticide Application	Population - Iberville	0.8392
Livingston	2465800000	Consumer Solvents - Pesticide Application	Population - Livingston	1.6621
West Baton Rouge	2465800000	Consumer Solvents - Pesticide Application	Population - West Baton Rouge	0.9447
All	2501050120	Petroleum & Petroleum Product Storage - Bulk Terminals	VMT - Total	1.9671
All	2501055120	Petroleum & Petroleum Product Storage - Bulk Plants	VMT - Total	1.9671
Ascension	2501060052	Gasoline Stations - Stage 1 - Splash Fill	VMT - Ascension	2.4560
East Baton Rouge	2501060052	Gasoline Stations - Stage 1 - Splash Fill	VMT - East Baton Rouge	1.7169
Iberville	2501060052	Gasoline Stations - Stage 1 - Splash Fill	VMT - Iberville	1.5229
Livingston	2501060052	Gasoline Stations - Stage 1 - Splash Fill	VMT - Livingston	2.5060
West Baton Rouge	2501060052	Gasoline Stations - Stage 1 - Splash Fill	VMT - West Baton Rouge	1.8135
Ascension	2501060053	Gasoline Stations - Stage 1 - Balanced Submerged Fill	VMT - Ascension	2.4560
East Baton Rouge	2501060053	Gasoline Stations - Stage 1 - Balanced Submerged Fill	VMT - East Baton Rouge	1.7169
Iberville	2501060053	Gasoline Stations - Stage 1 - Balanced Submerged Fill	VMT - Iberville	1.5229
Livingston	2501060053	Gasoline Stations - Stage 1 - Balanced Submerged Fill	VMT - Livingston	2.5060
West Baton Rouge	2501060053	Gasoline Stations - Stage 1 - Balanced Submerged Fill	VMT - West Baton Rouge	1.8135
Ascension	2501060201	Gasoline Stations - Underground Tank Breathing and Emptying	VMT - Ascension	2.4560
East Baton Rouge	2501060201	Gasoline Stations - Underground Tank Breathing and Emptying	VMT - East Baton Rouge	1.7169
Iberville	2501060201	Gasoline Stations - Underground Tank Breathing and Emptying	VMT - Iberville	1.5229
Livingston	2501060201	Gasoline Stations - Underground Tank Breathing and Emptying	VMT - Livingston	2.5060
West Baton Rouge	2501060201	Gasoline Stations - Underground Tank Breathing and Emptying	VMT - West Baton Rouge	1.8135
All	2501080050	Petroleum & Petroleum Product Storage - Aviation Gasoline - Stage 1	Transportation - Other Petroleum	0.9778
All	2501080100	Petroleum & Petroleum Product Storage - Aviation Gasoline - Stage 2	Transportation - Other Petroleum	0.9778
Ascension	2505000120	Petroleum & Petroleum Product Transport - Gasoline - All Transport Types	VMT - Ascension	2.4560
East Baton Rouge	2505000120	Petroleum & Petroleum Product Transport - Gasoline - All Transport Types	VMT - East Baton Rouge	1.7169
Iberville	2505000120	Petroleum & Petroleum Product Transport - Gasoline - All Transport Types	VMT - Iberville	1.5229
Livingston	2505000120	Petroleum & Petroleum Product Transport - Gasoline - All Transport Types	VMT - Livingston	2.5060
West Baton Rouge	2505000120	Petroleum & Petroleum Product Transport - Gasoline - All Transport Types	VMT - West Baton Rouge	1.8135
Ascension	2505030120	Petroleum & Petroleum Product Transport - Gasoline - Truck	VMT - Ascension	2.4560
East Baton Rouge	2505030120	Petroleum & Petroleum Product Transport - Gasoline - Truck	VMT - East Baton Rouge	1.7169
Iberville	2505030120	Petroleum & Petroleum Product Transport - Gasoline - Truck	VMT - Iberville	1.5229
Livingston	2505030120	Petroleum & Petroleum Product Transport - Gasoline - Truck	VMT - Livingston	2.5060
West Baton Rouge	2505030120	Petroleum & Petroleum Product Transport - Gasoline - Truck	VMT - West Baton Rouge	1.8135

Parish	SCC	SCC Description	Projection Category	Projection Factor
Ascension	2505040120	Petroleum & Petroleum Product Transport - Gasoline - Pipeline	VMT - Ascension	2.4560
East Baton Rouge	2505040120	Petroleum & Petroleum Product Transport - Gasoline - Pipeline	VMT - East Baton Rouge	1.7169
Iberville	2505040120	Petroleum & Petroleum Product Transport - Gasoline - Pipeline	VMT - Iberville	1.5229
Livingston	2505040120	Petroleum & Petroleum Product Transport - Gasoline - Pipeline	VMT - Livingston	2.5060
West Baton Rouge	2505040120	Petroleum & Petroleum Product Transport - Gasoline - Pipeline	VMT - West Baton Rouge	1.8135
All	2601000000	On-site Incineration - Total	Unchanged	1.0000
All	2601020000	On-site Incineration - Commercial/Institutional	Unchanged	1.0000
Iberville	2610000100	Open Burning - Yard Waste - Leaves	Population - Iberville	0.8392
Livingston	2610000100	Open Burning - Yard Waste - Leaves	Population - Livingston	1.6621
West Baton Rouge	2610000100	Open Burning - Yard Waste - Leaves	Population - West Baton Rouge	0.9447
Iberville	2610000400	Open Burning - Yard Waste - Brush	Population - Iberville	0.8392
Livingston	2610000400	Open Burning - Yard Waste - Brush	Population - Livingston	1.6621
West Baton Rouge	2610000400	Open Burning - Yard Waste - Brush	Population - West Baton Rouge	0.9447
Iberville	2610000500	Open Burning - Land Clearing Debris	Population - Iberville	0.8392
Livingston	2610000500	Open Burning - Land Clearing Debris	Population - Livingston	1.6621
West Baton Rouge	2610000500	Open Burning - Land Clearing Debris	Population - West Baton Rouge	0.9447
Iberville	2610030000	Open Burning - Household Waste	Population - Iberville	0.8392
Livingston	2610030000	Open Burning - Household Waste	Population - Livingston	1.6621
West Baton Rouge	2610030000	Open Burning - Household Waste	Population - West Baton Rouge	0.9447
Ascension	2630020000	Wastewater Treatment - Public Owned	Population - Ascension	1.6055
East Baton Rouge	2630020000	Wastewater Treatment - Public Owned	Population - East Baton Rouge	0.9775
Iberville	2630020000	Wastewater Treatment - Public Owned	Population - Iberville	0.8392
Livingston	2630020000	Wastewater Treatment - Public Owned	Population - Livingston	1.6621
West Baton Rouge	2630020000	Wastewater Treatment - Public Owned	Population - West Baton Rouge	0.9447
All	2701200000	Biogenic - Vegetation - Total	Unchanged	1.0000
All	2701220000	Biogenic - Vegetation/Agriculture - Total	Unchanged	1.0000
All	2801500170	Agricultural Burning - Grasses	Unchanged	1.0000
All	2801500181	Agricultural Burning - Wild Hay	Unchanged	1.0000
All	2801500250	Agricultural Burning - Sugar Cane	Unchanged	1.0000
All	2801500261	Agricultural Burning - Wheat	Unchanged	1.0000
Ascension	2810030000	Structure Fires	Population - Ascension	1.6055
East Baton Rouge	2810030000	Structure Fires	Population - East Baton Rouge	0.9775
Iberville	2810030000	Structure Fires	Population - Iberville	0.8392
Livingston	2810030000	Structure Fires	Population - Livingston	1.6621

Parish	SCC	SCC Description	Projection Category	Projection Factor
West Baton Rouge	2810030000	Structure Fires	Population - West Baton Rouge	0.9447
Ascension	2810060100	Cremation	Population - Ascension	1.6055
East Baton Rouge	2810060100	Cremation	Population - East Baton Rouge	0.9775
Iberville	2810060100	Cremation	Population - Iberville	0.8392
Livingston	2810060100	Cremation	Population - Livingston	1.6621
West Baton Rouge	2810060100	Cremation	Population - West Baton Rouge	0.9447

APPENDIX G: POINT SOURCES SUBMITTING EIS

AGENCY INTEREST NUMBER	FACILITY
248	Deltech Corp - Baton Rouge Facility
285	ExxonMobil Chemical Co - Baton Rouge Plastics Plant
286	ExxonMobil Baton Rouge Chemical Plant
288	Formosa Plastics Corp Louisiana
289	Honeywell International Inc - Baton Rouge Plant
302	TT Barge Services Mile 237
332	ExxonMobil Corp - Baton Rouge Terminal #5005
529	Univar USA - Geismar Facility
582	Plantation Pipe Line Co - Baton Rouge Breakout Tank Farm
669	Albemarle Corp - Process Development Center
858	ExxonMobil Refining & Supply Co - Anchorage Tank Farm
1000	Nexeo Solutions LLC
1093	Air Liquide Large Industries US LP - Geismar Utility Services
1136	Shell Chemical LP - Geismar Plant
1138	Westlake Vinyls Co LP
1157	Stupp Corp
1186	Entergy Gulf States LA LLC - Louisiana Station Electrical Generating Plant
1306	Cora-Texas Manufacturing Co LLC - White Castle Facility
1314	Eco Services Operations LLC - Sulfuric Acid Plant
1395	East West Copolymer LLC
1396	Baton Rouge Recycling Center
1409	The Dow Chemical Co - Louisiana Operations
1413	UOP LLC - Baton Rouge Plant
1433	Lion Copolymer Geismar LLC - Geismar Facility
1468	Rubicon LLC - Geismar Plant
1516	Clean Harbors Baton Rouge LLC
1607	TOTAL Petrochemicals & Refining USA Inc - COS-MAR Co
1648	BP Lubricants USA Inc - Port Allen Facility
2043	Boardwalk LA Midstream LLC - Choctaw Terminal
2049	BASF Corp - Geismar Site
2082	Honeywell International Inc - Geismar Plant
2218	Praxair Inc - Geismar Plant
2245	CF Industries Nitrogen LLC - Donaldsonville Nitrogen Complex
2366	Placid Refining Co LLC - Placid Refining Co
2367	Syngenta Crop Protection LLC - St Gabriel Plant
2416	CF Industries Nitrogen, LLC - Donaldsonville Nitrogen Complex
2455	Axiall LLC - Plaquemine Facility
2617	Georgia-Pacific Consumer Operations LLC - Port Hudson Operations
2625	Entergy Gulf States LA LLC - Willow Glen Plant
2638	ExxonMobil Baton Rouge Refinery
2644	Pioneer Americas LLC dba Olin Chlor Alkali Products - St Gabriel Facility
2679	Air Products & Chemicals Inc - Geismar 1 SMR Facility
2937	Shaw SSS Fabricators Inc - Addis Facility

AGENCY INTEREST NUMBER	FACILITY
3085	Ethyl Corp - Baton Rouge Plant
3230	ExxonMobil Chemical Co - Baton Rouge Resin Finishing Plant
3263	Taminco US Inc
3302	EnLink Processing Services LLC - Riverside Facility
3387	BASF Corp - Zachary Site
3400	Occidental Chemical Corporation - Geismar Plant
3420	Almatis Burnside Inc - Burnside Alumina Plant
3492	LBC Baton Rouge LLC - Sunshine Terminal
3519	ExxonMobil Chemical Co - Baton Rouge Polyolefins Plant
3587	Nexeo Solutions LLC
3732	PCS Nitrogen Fertilizer LP - Geismar Agricultural Nitrogen & Phosphate Plant
3991	Genesis Crude Oil LP - Port Hudson Trucking Facility
4174	Sid Richardson Carbon Co - Addis Plant
4197	Southern Natural Gas Co - White Castle Compressor Station
4407	EBR City Parish - Renewable Energy Center
4762	Enterprise Gas Processing LLC - Tebone Fractionation Plant
4803	BFI Waste Systems of Louisiana LLC - Colonial Landfill
4921	Delta Petroleum Co Inc
4990	Lockhart Crossing CF #1
5176	TOTAL Petrochemicals & Refining USA Inc-Carville Polystyrene Plant
5190	Quala Services LLC
5540	Louisiana State University - LSU
5565	Williams Olefins LLC - Geismar Ethylene Plant
6858	Griffin Industries LLC
7359	White Castle Compressor Station
8007	Florida Gas Transmission Co - Zachary Compressor Station #8
8055	Louisiana Army National Guard - Gillis W Long Center
8056	Chem Carriers LLC - Plaquemine Point Shipyard
8072	Bayou Bouillon Production Facility
8142	Darrow Field Facility - Darrow Field
9154	CB&I Walker LA LLC
9495	BASF Corp - Port Allen Works
11059	Specialty Application Services Inc - Port Allen Facility
11416	Bridgeline Holdings LP - Sorrento Underground Gas Storage Facility
11595	Flowers Baking Co of Baton Rouge LLC - Baton Rouge Facility
11767	Waste Management of Louisiana LLC - Woodside Landfill & Recycling Center
12096	Westway Terminal Co LLC
12680	Troy Mfg (Texas) Inc
14139	Plains Marketing LP - St Gabriel Terminal
14535	Mexichem Fluor Inc - KLEA 134a Plant
17042	Lockhart Crossing Central Facility #3
17129	Comite Field Facility
17161	Harvest Pipeline Co - Baton Rouge Gas Plant
17383	EnLink LIG LLC - Myrtle Grove Station
17771	T T Barge Cleaning Mile 183 Inc
19184	EnLink LIG Liquids LLC - Plaquemine Gas Plant

AGENCY INTEREST NUMBER	FACILITY
19338	Center Point Terminal Co LLC - Port Allen Terminal
19556	Intercontinental Terminals Company LLC - Anchorage Chemical Terminal
19875	Weyerhaeuser NR Co - Holden Wood Products
20506	Enterprise Products Operating LLC - Sorrento Products Handling Terminal
22750	EDO Specialty Plastics - Perkins Road Facility
23773	Nelson Service Co
25344	Criterion Catalysts & Technologies LP - Port Allen Plant
25383	Interstate Logos LLC dba Lamar Graphics
26034	Louisiana Energy & Power Authority (LEPA) - Plaquemine Steam Electric Power Plant
26217	Turner Industries Group LLC
27495	BCP Ingredients Inc
27508	CSI - Coatings Group - St Gabriel Facility
27559	Stupp Coatings LLC
27834	ExxonMobil Pipeline Co - Sorrento Storage Facility
29884	Oxbow Calcining LLC - Baton Rouge Calcined Coke Plant
30073	BASF Corp - DNT Plant
31128	East Baton Rouge Parish North Landfill
31512	Air Products & Chemicals Inc - Geismar 2 - Syngas Separation Unit
31513	Air Liquide Large Industries US LP - Geismar
32045	Manchac Point Oil & Gas Field Facility
32056	ExxonMobil Refining & Supply Co - Process Research Laboratories
32135	White Castle Field Production Facility
32141	Bridgeline Holdings LP - Tally Ho Compressor Station
32145	Northwest Bayou Choctaw Production Facility
32151	Schwing Production Facility
32160	Bayou Bleu Field Production Facility
32161	Bayou Henry Field Production Facility
32465	LVG WX1 RA SU LB Facility - Livingston Field
32466	Erva S Mayers # 1
33667	Brock Services Ltd - Sandblast & Spray Paint Yard
39633	Command Services Inc
39978	Kinder Morgan Liquids Terminals St Gabriel LLC
40037	State Lease 14371 Production Facility
40198	Enterprise Products Operating LLC - Baton Rouge Fractionator & Propylene Concentrator Unit
41417	Enterprise Products Operating Co LLP- Dome Storage Facility
43436	Sullivan Equipment Co - Asphalt Plant #2
43634	Trinity Marine Products Inc - Plant #48
46968	Mid-America Resources Corp - Sorrento Field Production Facility
51854	Carville Energy LLC - Carville Energy Center
67572	E l Dupont de Nemours & Co Inc - Burnside Plant A H2SO4 Contact Facility
80537	Delta Environmental Division of Pentair Flow Technologies LLC
83425	Shintech Louisiana LLC - Addis Plant A
83718	Lone Star NGL Refinery Services LLC - Geismar Fractionation Plant
85393	Bayou Henry Central Facility
85899	Industrial Coatings Contractors Inc - Geismar Paint & Blast Yard

AGENCY INTEREST NUMBER	FACILITY
87501	ExxonMobil Pipeline Co - West Bank Valve Site
87956	Dennis Stewart Equipment Rental Inc - Portable Concrete Crushing/Screening Unit
88139	Port Hudson Central Tank Battery
88164	Enterprise Products Operating LLC - Sorrento Loading Facility
89237	INEOS Oxide - A Division of INEOS Americas LLC
89512	Dugas & LeBlanc Ltd et al #1 Production Facility
90176	Genesis Crude Oil LP - Port Hudson Terminal
92534	Hexion Inc - Formaldehyde Plant
95859	University Field Production Facility
96336	US Composite Pipe South LLC - Baton Rouge Plant
97675	Athlon Solutions LLC
98796	ExxonMobil Pipeline Co - Anchorage Terminal
100651	Lone Star NGL Refinery Services LLC - Sorrento Gas Plant
101588	EEX Corp Production Facility #1
113166	Bayou Bouillon Production Facility
113313	Destec Ventures Facility
114658	Siegen Production Facility - Siegen Field
114659	Woodside #1 Tank Battery - Port Hudson Field
115181	Weyerhaeuser #2 Production Facility
118389	Bayou Bleu Central Facility #1
119007	Duplantier Tank Battery - University Field
119008	Nelson Tank Battery - University Field
119219	White Castle Deep Production Facility
121482	Associated Terminals of Baton Rouge LLC
122402	IMTT - Geismar
122663	Ann Fitz #2 Tank Battery - Port Hudson Field
123784	Wilbert E-1 Wellsite
123785	Wilbert B-3 Well Site
125816	Pennington #1 Tank Battery - SN 229775 Port Hudson Field
126487	Dent et al #1 Production Facility - Musson Field
126578	Shintech Louisiana LLC - Shintech Plaquemine Plant
126748	Schwing 10 Production Facility - Frog Lake Field
128638	Forest Home Partnership Facility
129715	EnLink LIG LLC - False River Station
138716	North Burtville Field Facility - North Burtville Field
139063	Oliver #1 Tank Battery - Profit Island Field
140247	Cooper Bayou Tank Battery - Port Hudson Field
143779	A Wilbert's Sons LLC 93 #1 Production Facility
144826	Crown Paper #1 Production Facility - Profit Island Field
145270	Sorrento Production Facility
146741	Lockhart Crossing EOR Facility
146877	Crown Paper #1 Treating Facility - Profit Island Field
147113	Delta Terminal Services LLC - Geismar Logistics Terminal
150951	Northwest Bayou Choctaw Sales Station
152236	Hoffman Heirs #1 - Sardine Point Field
152431	Mansfield Industrial Inc - Grosse Tete Facility

AGENCY INTEREST NUMBER	FACILITY
152442	Wilbert #4 Tank Battery - White Castle Field
154867	Air Products & Chemicals Inc - Baton Rouge Hydrogen Plant - Steam Methane Reforming Facility
156077	A Wilbert's Sons LLC 88 #2 Production Facility
156867	A Wilberts Son et al #1 Production Facility - White Castle Field
158540	REG Geismar LLC
158722	Lockhart Crossing Field Oil Loading Facility
162612	Southern Aggregates LLC - Plants 2 & 8
162653	Cashio #2 Tank Battery - W Maringouin Field
166443	FloPam Inc - Flopam Facility
168708	Acme Brick #1 Production Facility
170349	Weyerhaeuser 18 #1 & 19 #1 Production Facility
170748	A Wilbert Sons 26 #1 Production Facility
171765	Plant Maintenance Services - PMS St Gabriel Plant
173682	AA Sulfuric Corp - Sulfuric Acid Plant
175505	DEXCO Polymers LP - Plaquemine Manufacturing Plant
176031	Bengas Midstream LLC - Iberville Sales Station
176183	Laurel Ridge Field Production Facility
176441	St Gabriel Tank Wash LLC
176962	Emerald Biofuels LLC
178512	St Gabriel Field
179572	Cetane Renewable Energy Products - Iberville
179634	LogiBio Louisiana LLC - Louisiana Transloading Facility
180423	Petrin Corp
180463	Southern Filter Media LLC
181192	Methanex USA LLC - Geismar Methanol Plant
181441	H H Gueymard #1 Production Facility - St Gabriel Field
182797	VUC Weyerhaeuser 9 #1 Production Facility - Bills Branch Field
183703	SE Tylose USA Inc & Its Affiliates - Plaquemine Plant
184173	Circle Graphics Inc
184682	Darrow South Facility
184873	EnLink Processing Services LLC - Plaquemine NGL Fractionation Plant
184971	Barber etal #1 Tank Battery - Comite Field
185634	LogiBio Louisiana LLC - Port Allen Terminal
185924	Kinder Morgan Liquid Terminals LLC - Geismar Methanol Terminal
186554	Genesis Rail Services LLC - Scenic Station
187106	Lorio RC SUA Wilbert Sons LLC
187164	Randolph Templet 001
187421	DuPont 96-4 Production Facility
187463	Riverbank Investments #1
188321	Wilberts 8-1 Production Facility
188768	C W Row III etal #6 Production Facility
186450	SL 20712 #1 Production Facility
26324	Louisiana Energy & Power Authority (LEPA) Plaquemine Diesel Power Plant
117899	Oil Well Harris 28-1 #1
33687	Cooper T Smith Stevedoring Co - Terrence Derrick

AGENCY INTEREST NUMBER	FACILITY
101098	Booher Engineering Inc - Crown Z Facility
188726	Safway Group Holding LLC
193924	Solvay USA Inc - CathyVal Plant
15346	Marcello Distributors/Thibaut Oil Co Inc - Donaldsonville Facility
187303	WX RB SUB Starns 38 #1 Production Facility

APPENDIX H: RULES AND APPLICABILITY CHARTS

H. 1 SIP ASSOCIATED STATE RULES

CHAPTER 21. CONTROL OF EMISSION OF ORGANIC COMPOUNDS

2101. Compliance Schedules
2103. Storage of Volatile Organic Compounds
2104. Crude Oil and Condensate
2107. Volatile Organic Compounds – Loading
2108. Marine Vapor Recovery
2109. Oil/Water – Separation
2111. Pumps and Compressors
2113. Housekeeping
2115. Waste Gas Disposal
2116. Glycol Dehydrators
2117. Exemptions
2119. Variances
2121. Fugitive Emission Control
2122. Fugitive Emission Control for Ozone Nonattainment Areas and Specified Parishes
2123. Organic Solvents
2125. Solvent Degreasers
2127. Cutback Paving Asphalt
2131. Filling of Gasoline Storage Vessels
2132. Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities
2133. Gasoline Bulk Plants
2135. Bulk Gasoline Terminals
2137. Gasoline Terminal Vapor – Tight Control Procedure
2139. Refinery Vacuum Producing Systems
2141. Refinery Process Unit Turnarounds
2143. Graphic Arts (Printing) by Rotogravure, Flexographic, Offset Lithographic, Letterpress, and Flexible Package Printing Processes
2145. Pharmaceutical Manufacturing Facilities
2147. Limiting VOC Emissions from SOCMI Reactor Process and Distillation Operations
2149. Limiting VOC Emissions from Batch Processing
2151. Limiting VOC Emissions from Cleanup Solvent Processing
2153. Limiting VOC Emissions from Industrial Wastewater

CHAPTER 22. CONTROL OF EMISSIONS OF NITROGEN OXIDES (NOX)

2201. Affected Facilities in the Baton Rouge Nonattainment Area and the Region of Influence
2202. Contingency Plan

H.2 APPLICABILITY CHARTS

AI			LAC 33:III. Chapter 21																								LAC 33:III. Chapter 22	
NUMBER	FACILITY	PARISH	2103	2104	2107	2108	2109	2111	2113	2115	2116	2121	2122	2123	2125	2131	2132	2133	2135	2137	2139	2141	2147	2149	2151	2153	2201	2202
6	River Cement Sales Co - Burnside Facility	Ascension																										
248	Deltech Corp - Baton Rouge Facility	East Baton Rouge	X					X	X				X														X	
285	ExxonMobil Chemical Co - Baton Rouge Plastics Plant	East Baton Rouge	X					X	X	X			X														X	
286	ExxonMobil Baton Rouge Chemical Plant	East Baton Rouge	X		X		X	X	X	X			X										X	X	X	X	X	
288	Formosa Plastics Corp Louisiana	East Baton Rouge	X		X			X	X	X			X														X	
289	Honeywell International Inc - Baton Rouge Plant	East Baton Rouge	X						X	X			X	X										X			X	
302	TT Barge Services Mile 237	West Baton Rouge	X						X																			
332	ExxonMobil Corp - Baton Rouge Terminal #5005	East Baton Rouge	X		X		X	X	X										X	X								
529	Univar USA - Geismar Facility	Ascension							X																			
582	Plantation Pipe Line Co - Baton Rouge Breakout Tank Farm	East Baton Rouge	X				X	X	X																			
669	Albemarle Corp - Process Development Center	East Baton Rouge	X	X	X	X		X	X		X																	
690	Transport Service Co - Geismar Plant	Ascension							X																			
858	ExxonMobil Refining & Supply Co - Anchorage Tank Farm	West Baton Rouge	X					X	X																X			
1093	Air Liquide Large Industries US LP - Geismar Utility Services	Ascension	X						X																		X	
1136	Shell Chemical LP - Geismar Plant	Ascension	X		X	X	X	X	X	X			X										X	X			X	
1138	Westlake Vinyls Co LP	Ascension	X					X	X				X													X	X	
1157	Stupp Corp	East Baton Rouge	X						X																			
1186	Entergy Gulf States LA LLC - Louisiana Station Electrical Generating Plant	East Baton Rouge	X					X	X																		X	X
1306	Cora-Texas Manufacturing Co LLC - White Castle Facility	Iberville	X						X																			
1314	Eco Services Operations LLC - Sulfuric Acid Plant	East Baton Rouge	X					X	X	X			X										X	X		X		
1395	East West Copolymer LLC	East Baton Rouge	X					X	X				X														X	
1396	Baton Rouge Recycling Center	East Baton Rouge	X						X																			
1409	The Dow Chemical Co - Louisiana Operations	Iberville	X		X		X	X	X	X			X	X	X									X	X	X	X	
1413	UOP LLC - Baton Rouge Plant	East Baton Rouge	X																									
1433	Lion Copolymer Geismar LLC - Geismar Facility	Ascension	X					X	X	X			X				X											
1468	Rubicon LLC - Geismar Plant	Ascension	X				X	X	X				X										X	X				
1516	Clean Harbors Baton Rouge LLC	East Baton Rouge	X																							X		
1607	TOTAL Petrochemicals & Refining USA Inc - COS-MAR Co	Iberville	X						X				X														X	
1648	BP Lubricants USA Inc - Port Allen Facility	West Baton Rouge	X				X		X																			
1694	Kleinpeter Farms Dairy LLC	East Baton Rouge							X																			
1707	Transport Service Co of Illinois	East Baton Rouge																										
2043	Boardwalk Louisiana Midstream LLC - Choctaw Terminal	Iberville						X	X																			
2049	BASF Corp - Geismar Site	Ascension	X		X			X	X	X			X													X	X	
2082	Honeywell International Inc - Geismar Plant	Ascension	X						X	X			X														X	
2178	Louisiana State University - Research & Development - Process Development Center	East Baton Rouge																										
2218	Praxair Inc - Geismar Plant	Ascension	X					X	X				X														X	
2300	Adsorbent Solutions LLC - Adsorbent Solutions Carbon Reactivation Plant	Iberville							X	X																		
2366	Placid Refining Co LLC - Placid Refining Co	West Baton Rouge	X		X	X	X		X	X			X						X	X	X	X					X	X
2367	Syngenta Crop Protection LLC - St Gabriel Plant	Iberville	X					X	X	X																X	X	
2416	CF Industries Nitrogen, LLC - Donaldsonville Nitrogen Complex	Ascension	X						X	X						X											X	X
2455	Axiall LLC - Plaquemine Facility	Iberville	X		X			X	X	X			X														X	
2617	Georgia-Pacific Consumer Operations LLC - Port Hudson Operations	East Baton Rouge	X						X																		X	
2625	Entergy Gulf States LA LLC - Willow Glen Plant	Iberville	X						X																		X	
2638	ExxonMobil Baton Rouge Refinery	East Baton Rouge	X			X	X	X	X	X			X				X				X	X			X		X	X
2644	Pioneer Americas LLC dba Olin Chlor Alkali Products - St Gabriel Facility	Iberville	X						X																		X	
2679	Air Products & Chemicals Inc - Geismar 1 SMR Facility	Ascension							X																		X	
2937	Shaw SSS Fabricators Inc - Addis Facility	West Baton Rouge	X						X					X														
2964	Delta Process Equipment Inc - Denham Springs Facility	Livingston							X					X														
3085	Ethyl Corp - Baton Rouge Plant	East Baton Rouge							X																			
3230	ExxonMobil Chemical Co - Baton Rouge Resin Finishing Plant	East Baton Rouge	X					X	X	X															X			
3241	ERGON - Baton Rouge Inc	East Baton Rouge	X			X			X																			
3263	Taminco US Inc	Iberville	X		X			X	X				X										X				X	
3302	EnLink Processing Services LLC - Riverside Facility	Ascension	X	X	X	X	X	X	X				X														X	
3387	BASF Corp - Zachary Site	East Baton Rouge	X					X	X				X															
3400	Occidental Chemical Corporation - Geismar Plant	Ascension	X		X			X	X	X																	X	
3420	Almatis Burnside Inc - Burnside Alumina Plant	Ascension	X						X																		X	
3424	Bercen Inc - A Division of Cranston Print Works	Livingston						X	X																			
3492	LBC Baton Rouge LLC - Sunshine Terminal	Iberville	X		X	X		X	X									X	X									
3519	ExxonMobil Chemical Co - Baton Rouge Polyolefins Plant	East Baton Rouge	X					X	X	X			X														X	

AI			LAC 33:III. Chapter 21																								LAC 33:III. Chapter 22	
NUMBER	FACILITY	PARISH	2103	2104	2107	2108	2109	2111	2113	2115	2116	2121	2122	2123	2125	2131	2132	2133	2135	2137	2139	2141	2147	2149	2151	2153	2201	2202
3587	Nexeo Solutions LLC	East Baton Rouge	X					X	X																			
3732	PCS Nitrogen Fertilizer LP - Geismar Agricultural Nitrogen & Phosphate Plant	Ascension	X						X																		X	
3976	Southern University A&M College - Baton Rouge Campus	East Baton Rouge							X																			
3991	Genesis Crude Oil LP - Port Hudson Trucking Facility	East Baton Rouge	X						X																			
4174	Sid Richardson Carbon Co - Addis Plant	West Baton Rouge	X						X																			
4197	Southern Natural Gas Co - White Castle Compressor Station	Iberville	X					X	X																		X	
4407	EBR City Parish - Renewable Energy Center	East Baton Rouge							X	X																		
4762	Enterprise Gas Processing LLC - Tebone Fractionation Plant	Ascension	X		X			X	X		X		X															X
4803	BFI Waste Systems of Louisiana LLC - Colonial Landfill	Ascension	X						X																			
4863	M-I SWACO - Port Allen	West Baton Rouge							X																			
4921	Delta Petroleum Co Inc	Iberville			X				X																			
4990	Lockhart Crossing CF #1	Livingston	X					X	X		X		X															
5176	TOTAL Petrochemicals & Refining USA Inc-Carville Polystyrene Plant	Iberville	X					X	X				X														X	
5540	Louisiana State University - LSU	East Baton Rouge	X						X							X											X	
5565	Williams Olefins LLC - Geismar Ethylene Plant	Ascension	X					X	X																		X	
6264	Lhoist North America of Missouri Inc - Port Allen Terminal	West Baton Rouge							X																			
6858	Griffin Industries LLC	Livingston							X																			
7359	White Castle Compressor Station	Iberville						X	X																		X	
8007	Florida Gas Transmission Co - Zachary Compressor Station #8	East Baton Rouge			X			X	X																		X	
8008	R J Daigle & Sons Contractors Inc - Central Asphalt Plant	East Baton Rouge							X																			
8055	Louisiana Army National Guard - Gillis W Long Center	Iberville	X						X																			
8056	Chem Carriers LLC - Plaquemine Point Shipyard	Iberville	X					X	X					X														
8072	Bayou Bouillon Production Facility	Iberville						X	X																			
8142	Darrow Field Facility - Darrow Field	Ascension	X	X		X		X	X	X	X																X	
9154	CB&I Walker LA LLC	Livingston	X						X					X														
9503	Community Coffee Co LLC - Port Allen Plant	West Baton Rouge							X																			
11059	Specialty Application Services Inc - Port Allen Facility	West Baton Rouge							X					X														
11416	Bridgeline Holdings LP - Sorrento Underground Gas Storage Facility	Ascension	X					X	X		X																X	X
11566	Carmeuse Lime & Stone Inc - Pelican Operation	East Baton Rouge																										
11595	Flowers Baking Co of Baton Rouge LLC - Baton Rouge Facility	East Baton Rouge							X																			
11767	Waste Management of Louisiana LLC - Woodside Landfill & Recycling Center	Livingston	X						X																			
12096	Westway Terminal Co LLC	West Baton Rouge							X																			
12680	Troy Mfg (Texas) Inc	Iberville							X																			
13724	NALCO Company	West Baton Rouge	X					X	X																			
14067	Qualawash Holdings LLC	Iberville							X																			
14139	Plains Marketing LP - St Gabriel Terminal	Iberville	X					X	X																			
14535	Mexichem Fluor Inc - KLEA 134a Plant	Iberville							X					X														
17042	Lockhart Crossing Central Facility #3	Livingston		X				X	X																			
17129	Comite Field Facility	East Baton Rouge						X	X		X																	
17383	EnLink LIG LLC - Myrtle Grove Station	Iberville						X	X																		X	X
17771	T T Barge Cleaning Mile 183 Inc	Ascension	X						X					X														
18202	ExxonMobil Corp	West Baton Rouge							X																			
19184	EnLink LIG Liquids LLC - Plaquemine Gas Plant	Iberville	X		X				X	X	X		X															
19338	Center Point Terminal Co LLC - Port Allen Terminal	West Baton Rouge							X																			
19556	Intercontinental Terminals Company LLC - Anchorage Chemical Terminal	West Baton Rouge			X	X		X	X																			
19875	Weyerhaeuser NR Co - Holden Wood Products	Livingston							X																			
19884	LD Commodities Port Allen Export Elevator LLC	West Baton Rouge	X						X																			
20411	Bayou Bleu Central Facility #2	Iberville							X																			
20506	Enterprise Products Operating LLC - Sorrento Products Handling Terminal	Ascension			X				X																			
22750	EDO Specialty Plastics - Perkins Road Facility	East Baton Rouge							X																			
23162	Holcim US Inc	East Baton Rouge																										
23773	Nelson Service Co	Livingston							X																			
23946	Bayou Railcar Services Inc	Livingston																										
25186	CMC Construction Services - Concrete Accessories	East Baton Rouge	X						X					X														
25344	Criterion Catalysts & Technologies LP - Port Allen Plant	West Baton Rouge							X																			
25383	Interstate Logos LLC dba Lamar Graphics	East Baton Rouge							X					X														
25891	Motiva Enterprises LLC - Sorrento Off Site Storage Caverns Facility	Ascension																										
26034	Louisiana Energy & Power Authority (LEPA) - Plaquemine Steam Electric Power Plant	Iberville							X																			
26217	Turner Industries Group LLC	West Baton Rouge							X					X														

AI			LAC 33:III. Chapter 21																								LAC 33:III. Chapter 22	
NUMBER	FACILITY	PARISH	2103	2104	2107	2108	2109	2111	2113	2115	2116	2121	2122	2123	2125	2131	2132	2133	2135	2137	2139	2141	2147	2149	2151	2153	2201	2202
26272	Trimac Transportation Inc	Ascension	X				X		X																			
26324	Louisiana Energy & Power Authority (LEPA) Plaquemine Diesel Power Plant	Iberville							X																			
26345	HCM Louisiana LLC - Southland Block	East Baton Rouge																										
26984	Nachurs Alpine Solutions Corp	Iberville							X																			
27495	BCP Ingredients Inc	Iberville			X			X	X																			
27508	CSI - Coatings Group - St Gabriel Facility	Iberville							X					X														
27559	Stupp Coatings LLC	East Baton Rouge							X					X														
27823	Air Liquide Large Industries US LP - Plaquemine Facility	Iberville							X																			
27834	ExxonMobil Pipeline Co - Sorrento Storage Facility	Ascension						X	X																			
29881	The Scotts Co LLC - Hyponex Geismar Facility	Ascension																										
29884	Oxbow Calcining LLC - Baton Rouge Calcined Coke Plant	East Baton Rouge	X						X																			
30073	BASF Corp - DNT Plant	Ascension	X					X	X	X			X															
31128	East Baton Rouge Parish North Landfill	East Baton Rouge							X																			
31512	Air Products & Chemicals Inc - Geismar 2 - Syngas Separation Unit	Ascension							X																			
31513	Air Liquide Large Industries US LP - Geismar	Ascension							X																			
32042	Shell Pipeline Co LP - Equilon Plantation Terminal Station	East Baton Rouge	X						X																			
32045	Manchac Point Oil & Gas Field Facility	East Baton Rouge						X	X		X																	
32135	White Castle Field Production Facility	Iberville						X	X		X																X	
32140	Klondike Field	Iberville	X	X		X		X	X	X	X																X	
32145	Northwest Bayou Choctaw Production Facility	Iberville						X	X		X																	
32151	Schwing Production Facility	Iberville	X					X	X		X																	
32156	Kaneb Pipe Line Operating Partnership LP - White Castle Ammonia Pump Station	Iberville							X																			
32157	NuStar Pipeline Operating Partnership LP - Ramah Ammonia Pump Station	Iberville							X																			
32160	Bayou Bleu Field Production Facility	Iberville	X	X	X	X		X	X		X																	
32465	LVG WX1 RA SU LB Facility - Livingston Field	Livingston	X	X	X	X		X	X		X																	
32467	Evergreen Memorial	Livingston																										
33531	Coastal Bridge Co LLC - Port Allen Asphalt Plant	West Baton Rouge																										
33564	Cooper T Smith Stevedoring Co - America Weigh Rig Loading & Transfer Facility	Ascension							X																			
39633	Command Services Inc	Iberville							X					X														
39945	Impala Warehousing (US) LLC - Burnside Terminal	Ascension	X						X																			
39978	Kinder Morgan Liquids Terminals St Gabriel LLC	Iberville	X		X	X		X	X																			
40037	State Lease 14371 Production Facility	Iberville	X	X	X	X		X	X		X																	
40198	Enterprise Products Operating LLC - Baton Rouge Fractionator & Propylene Concentrator Unit	West Baton Rouge						X	X	X			X															
41417	Enterprise Products Operating Co LLP- Dome Storage Facility	Ascension	X					X	X																			
42414	MINTEQ International Inc - Baton Rouge Facility	East Baton Rouge																										
43303	Southern Ionics Inc	East Baton Rouge							X																			
43436	Sullivan Equipment Co - Asphalt Plant #2	West Baton Rouge							X																			
43599	Sunbelt Chemicals Corp	West Baton Rouge							X																			
43634	Trinity Marine Products Inc - Plant #48	West Baton Rouge	X						X					X														
46968	Sorrento Field Production Facility	Ascension	X	X		X		X	X	X	X																X	
51854	Carville Energy LLC - Carville Energy Center	Iberville						X	X																			
67572	E I Dupont de Nemours & Co Inc - Burnside Plant A H2SO4 Contact Facility	Ascension	X		X				X																			
80537	Delta Environmental Division of Pentair Flow Technologies LLC	Livingston							X					X														
81855	Riverland Industries Inc	East Baton Rouge							X																			
83425	Shintech Louisiana LLC - Addis Plant A	West Baton Rouge	X						X				X														X	
83718	Lone Star NGL Refinery Services LLC - Geismar Fractionation Plant	Ascension	X		X			X	X	X			X															
84377	Bayou Des Glaises Field Production Facility - Wilbert Mineral B Lease	Iberville						X	X																			
85393	Bayou Henry Central Facility	Iberville	X	X		X		X	X	X	X																X	
85899	Industrial Coatings Contractors Inc - Geismar Paint & Blast Yard	Ascension							X					X														
87501	ExxonMobil Pipeline Co - West Bank Valve Site	West Baton Rouge						X	X																			
87956	Dennis Stewart Equipment Rental Inc - Portable Concrete Crushing/Screening Unit	East Baton Rouge							X																			
88139	Port Hudson Central Tank Battery	East Baton Rouge		X				X	X		X																	
88164	Enterprise Products Operating LLC - Sorrento Loading Facility	Ascension			X				X																			
89237	INEOS Oxide - A Division of INEOS Americas LLC	Iberville	X					X	X				X										X	X		X		
89277	Univar USA Inc - Geismar Terminal	Ascension																										
89512	Dugas & LeBlanc Ltd et al #1 Production Facility	Iberville							X																			
89982	American Pride Fabricators LLC	East Baton Rouge																										
90176	Genesis Crude Oil LP - Port Hudson Terminal	East Baton Rouge	X			X		X	X																			
90295	Cooper/ T Smith Stevedoring Co Inc - Babe Derrick Barge	Ascension							X																			

AI			LAC 33:III. Chapter 21																								LAC 33:III. Chapter 22	
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92534	Hexion Inc - Formaldehyde Plant	Ascension	X					X	X				X															
95770	Ascension Ready Mix Inc - Choctaw Plant	East Baton Rouge																										
96336	US Composite Pipe South LLC - Baton Rouge Plant	East Baton Rouge	X						X																			
97675	Athlon Solutions LLC	Ascension	X						X																			
97908	ExxonMobil Pipeline Co - Plastic Plant Meter Site	East Baton Rouge																										
98796	ExxonMobil Pipeline Co - Anchorage Terminal	West Baton Rouge						X	X																			
99355	Atlantic Southeast Airlines Inc - ASA Inc - Baton Rouge Station	East Baton Rouge							X																			
100581	Williams Olefins LLC - Hydrocarbon Barge Loading - Honeywell Dock	Ascension																										
101588	EEX Corp Production Facility #1	Iberville						X	X		X																	
102971	Turner Specialty Services LLC - TIS 415 Yard	West Baton Rouge							X																			
113166	Bayou Bouillon Production Facility	Iberville	X	X		X		X	X	X	X																X	
113313	Destec Ventures Facility	Iberville	X	X		X		X	X	X	X																X	
114658	Siegen Production Facility - Siegen Field	East Baton Rouge	X	X	X	X		X	X		X																	
114659	Woodside #1 Tank Battery - Port Hudson Field	East Baton Rouge	X	X	X	X		X	X		X																	
115181	Weyerhaeuser #2 Production Facility	Livingston	X	X	X	X		X	X		X																	
115789	Air Liquide America US LP - Air Liquide America LP Facility	Ascension							X																			
118389	Bayou Bleu Central Facility #1	Iberville							X																			
119007	Duplantier Tank Battery - University Field	East Baton Rouge						X	X																			
119008	Nelson Tank Battery - University Field	East Baton Rouge	X	X	X	X		X	X	X	X																X	
119219	White Castle Deep Production Facility	Iberville						X	X																			
121482	Associated Terminals of Baton Rouge LLC	West Baton Rouge																										
122402	IMTT - Geismar	Ascension	X		X				X																			
122663	Ann Fitz #2 Tank Battery - Port Hudson Field	East Baton Rouge	X	X		X		X	X	X	X																X	
123784	Wilbert E-1 Wellsite	Iberville	X	X	X	X		X	X		X																	
123785	Wilbert B-3 Well Site	Iberville	X	X	X	X		X	X		X																	
124129	R Lip LLC - Tristar Woodwaste Processing Facility	Iberville							X																			
124274	Rust Buster's Facility	West Baton Rouge							X					X														
124995	ABB DE Inc	Ascension	X						X					X														
125816	Pennington #1 Tank Battery - SN 229775 Port Hudson Field	East Baton Rouge							X		X																	
126487	Dent et al #1 Production Facility - Musson Field	Iberville						X	X		X																	
126578	Shintech Louisiana LLC - Shintech Plaquemine Plant	Iberville	X		X	X		X	X	X																X	X	
126748	Schwing 10 Production Facility - Frog Lake Field	Iberville	X	X		X		X	X	X	X																X	
128638	Forest Home Partnership Facility	Iberville		X					X		X																	
129715	EnLink LIG LLC - False River Station	West Baton Rouge	X					X	X																			
130220	Resthaven Gardens of Memory Cemetery & Funeral Home	East Baton Rouge																										
130816	Kanorado Terminals Corp - Baton Rouge Facility	East Baton Rouge																										
134725	Northwest Bayou Choctaw SWD Facility	Iberville	X	X		X		X	X	X	X																X	
138716	North Burtville Field Facility - North Burtville Field	East Baton Rouge	X	X		X		X	X	X	X																X	
140247	Cooper Bayou Tank Battery - Port Hudson Field	East Baton Rouge	X	X		X		X	X	X	X																X	
143779	A Wilbert's Sons LLC 93 #1 Production Facility	West Baton Rouge	X	X		X		X	X	X	X																X	
144826	Crown Paper #1 Production Facility - Profit Island Field	East Baton Rouge	X	X		X		X	X	X	X																X	
145270	Sorrento Production Facility	Ascension	X	X		X		X	X	X	X																X	
146741	Lockhart Crossing EOR Facility	Livingston		X				X	X																			
146877	Crown Paper #1 Treating Facility - Profit Island Field	East Baton Rouge							X																			
147113	Delta Terminal Services LLC - Geismar Logistics Terminal	Ascension	X					X	X																			
147121	Turner Specialty Services LLC - Module Fabrication Facility	West Baton Rouge							X																			
147402	USALCO Port Allen Plant LLC	West Baton Rouge							X																			
150240	Coca-Cola Bottling Co United Inc	East Baton Rouge						X	X																			
150951	Northwest Bayou Choctaw Sales Station	Iberville	X	X		X		X	X	X	X																X	
151945	Angelle Concrete Group LLC - Westport Plant	West Baton Rouge																										
152236	Hoffman Heirs #1 - Sardine Point Field	East Baton Rouge						X	X		X																	
152431	Mansfield Industrial Inc - Grosse Tete Facility	Iberville							X					X														
153296	Marathon Pipe Line LLC - Plantation Storage Facility	East Baton Rouge	X						X																			
154058	Kaneb Pipe Line Operating Partnership LP - Plaquemine Delivery Site	Iberville																										
154502	Gator Environmental Waste Solutions LLC - Gator Type III C&D Debris Landfill	Ascension							X																			
154867	Air Products & Chemicals Inc - Baton Rouge Hydrogen Plant	East Baton Rouge						X	X																			
155459	Southern Ionics Inc - Baton Rouge North	East Baton Rouge							X																			
156077	A Wilbert's Sons LLC 88 #2 Production Facility	West Baton Rouge	X	X		X		X	X	X	X																X	
156867	A Wilberts Son et al #1 Production Facility - White Castle Field	Iberville	X	X		X		X	X	X	X																X	

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157056	Cavern Well #25 Compressor Station	Iberville						X	X																			
158540	REG Geismar LLC	Ascension	X		X				X	X																		
158722	Lockhart Crossing Field Oil Loading Facility	Livingston	X						X																			
161805	Boardwalk Storage Co LLC - Florida Gas Meter Station	Iberville							X																			
162612	Southern Aggregates LLC - Plants 2 & 8	Livingston							X																			
162653	Cashio #2 Tank Battery - W Maringouin Field	Iberville																										
165288	ICI Process Technologies LLC - ICI Process Technologies Port Allen Facility	West Baton Rouge	X				X	X	X				X															
166443	FloPam Inc - Flopam Facility	Iberville	X					X	X						X		X											
168708	Acme Brick #1 Production Facility	East Baton Rouge							X		X																	
170349	Weyerhaeuser 18 #1 & 19 #1 Production Facility	Livingston							X																			
170748	A Wilbert Sons 26 #1 Production Facility	West Baton Rouge						X	X		X																	
171765	Plant Maintenance Services - PMS St Gabriel Plant	Iberville							X																			
171846	Industrial Coatings Production Facility - Darrow Field	Ascension							X																			
172468	Great Southern Galvanizing Inc - Great States Galvanizing	East Baton Rouge							X																			
173682	AA Sulfuric Corp - Sulfuric Acid Plant	Ascension							X																			
174213	Gilchrist Construction Co LLC - Asphalt Plant #2	Livingston							X																			
175505	DEXCO Polymers LP - Plaquemine Manufacturing Plant	Iberville	X					X	X																	X		
176031	Bengas Midstream LLC - Iberville Sales Station	Iberville	X	X		X		X	X	X	X																X	
176183	Laurel Ridge Field Production Facility	Iberville							X		X																	
176441	St Gabriel Tank Wash LLC	Iberville							X																			
178512	St Gabriel Field	Iberville							X		X																	
179634	LogiBio Louisiana LLC - Louisiana Transloading Facility	West Baton Rouge						X	X																			
180423	Petrin Corp	West Baton Rouge	X						X					X														
180463	Southern Filter Media LLC	East Baton Rouge	X						X																			
180668	Southern Aggregates LLC - Hood Plant	Livingston							X																			
181192	Methanex USA LLC - Geismar Methanol Plant	Ascension	X					X	X				X															
181441	H H Gueymard #1 Production Facility - St Gabriel Field	Iberville	X						X		X																	
182567	DEXCO Polymers LP - Research & Development Facility	Iberville							X																			
182797	VUC Weyerhaeuser 9 #1 Production Facility - Bills Branch Field	Livingston	X	X		X		X	X	X	X																X	
183703	SE Tylose USA Inc & Its Affilates - Plaquemine Plant	Iberville	X					X	X			X																
184173	Circle Graphics Inc	East Baton Rouge							X																			
184682	Darrow South Facility	Ascension	X	X		X		X	X	X	X																X	
184873	EnLink Processing Services LLC - Plaquemine NGL Fractionation Plant	Iberville		X				X	X	X			X														X	
185634	LogiBio Louisiana LLC - Port Allen Terminal	West Baton Rouge	X					X	X																			
185924	Kinder Morgan Liquid Terminals LLC - Geismar Methanol Terminal	Ascension	X		X	X		X	X																			
186450	SL 20712 #1 Production Facility	Iberville	X	X		X		X	X	X	X																X	
186554	Genesis Rail Services LLC - Scenic Station	East Baton Rouge	X					X	X																			
186785	Baton Rouge Transit LLC - Baton Rouge Transit	West Baton Rouge							X																			
187106	Lorio RC SUA Wilbert Sons LLC	Iberville	X	X		X		X	X	X	X																X	
187164	Randolph Templet 001	Iberville	X	X		X		X	X	X	X																X	
187303	WX RB SUB Starns 38 #1 Production Facility	Livingston	X	X		X		X	X	X	X																X	
187421	DuPont 96-4 Production Facility	West Baton Rouge						X	X																			
187463	Riverbank Investments #1	East Baton Rouge						X	X																			
188321	Wilberts 8-1 Production Facility	West Baton Rouge	X						X																			
188726	Safway Group Holding LLC	Ascension	X						X					X														
188768	C W Row III etal #6 Production Facility	Iberville						X	X																			
189291	Forest Home Facility - Whitecastle Field	Iberville																										
189445	Gueymard A-1 Production Facility	Iberville	X	X		X		X	X	X	X																X	
190229	NFR BioEnergy CT LLC - NFR BioEnergy CT	Iberville																										
190267	Belle Grove #1 Facility	Iberville							X		X																	
190482	E B Adams #1 Tank Battery - White Castle Field	Iberville						X	X																			
190953	Chevron Midstream Pipelines LLC - Sorrento TENDS Pumping Station	Ascension							X																			
191279	Farewell #5-Alt Production Facility - False River Field	West Baton Rouge							X																			
191451	BR Port Services LLC - Baton Rouge Terminal	West Baton Rouge	X						X																			
191612	LSU Board of Supervisors #1 Production Facility - University Field	East Baton Rouge							X		X																	
191840	BR Port Services LLC - Baton Rouge Terminal Dock	West Baton Rouge				X		X	X																			
193924	Solvay USA Inc - CathyVal Plant	East Baton Rouge							X																			
194474	PerformanX Specialty Chemicals - St. Gabriel Operations	Iberville							X																			
194852	John Evans etal #1 Production Facility - Laurel Ridge Field	Iberville	X					X	X		X																	

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194969	Ann Fitz #3 Tank Battery - Port Hudson Field	East Baton Rouge	X	X		X		X	X	X	X																X	
195308	MAACO Collision & Auto Repair	Ascension	X						X					X														
195357	Marlborough Oil & Gas LLC #1 Tank Battery - Bayou Choctaw Field	West Baton Rouge						X	X																			
195578	Wilbert Mineral Corp #93 Wellsite Facility - Bayou Choctaw Field	Iberville						X	X																			
195579	Wilbert Mineral Corp #84 Wellsite Facility - Bayou Choctaw Field	Iberville						X	X																			
195580	Bayou Choctaw Field Central Tank Battery	Iberville	X	X		X		X	X	X	X																X	
195964	Port Allen Land LLC	West Baton Rouge							X																			
196426	Hutchinson #1 Production Facility	Livingston	X	X		X		X	X	X	X																X	

APPENDIX I: MVEB DOCUMENTATION

I.1 MINUTES AND EMAIL DISCUSSION

This deviation is effective from December 15, 2011 until January 17, 2012.

Coordination will be through Public Notice and Local Notice to Mariners upon date of publication in the **Federal Register**.

In accordance with 33 CFR 117.35(e), the drawbridge must return to its regular operating schedule immediately at the end of the designated time period.

This deviation from the operating regulations is authorized under 33 CFR 117.35.

Dated: November 3, 2011.

David M. Frank,

Bridge Administrator.

[FR Doc. 2011–30636 Filed 11–29–11; 8:45 am]

BILLING CODE 9110–04–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 52 and 81

[EPA–R06–OAR–2010–0776; FRL–9498–2]

Approval and Promulgation of Implementation Plans and Designation of Areas for Air Quality Planning; Louisiana; Baton Rouge Area: Redesignation to Attainment for the 1997 8-Hour Ozone Standard

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: EPA is taking final action to approve the State of Louisiana's request to redesignate the Baton Rouge, Louisiana moderate 1997 8-hour ozone nonattainment area to attainment of the 1997 8-hour ozone standard. As a part of this action, EPA is also approving, as a revision to the Louisiana State Implementation Plan (SIP), the state's 1997 8-hour ozone maintenance plan with a 2022 Motor Vehicle Emissions Budget (MVEB) for the Baton Rouge Nonattainment Area (BRNA or BR), revisions to the Louisiana SIP that meet the Reasonably Available Control Technology (RACT) requirements (for nitrogen oxides (NO_X) and volatile organic compounds (VOCs)) for the 1-hour and 1997 8-hour ozone standard requirements, and a state rule establishing a maintenance plan contingency measure. EPA finds that with this final approval the area has a fully approved SIP that meets all of its applicable 1997 8-hour ozone requirements and 1-hour anti-backsliding requirements under section 110 and Part D of the Federal Clean Air Act (CAA or Act) for purposes of redesignation.

DATE: This rule is effective December 30, 2011.

ADDRESSES: EPA has established a docket for this action under Docket Identification No. EPA–R06–OAR–2010–0776. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *i.e.*, Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at the Air Planning Section, Air Planning Branch, Multimedia Planning and Permitting Division, U.S. Environmental Protection Agency, Region 6, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202–2733. EPA requests that if at all possible, you contact the person listed in the **FOR FURTHER INFORMATION CONTACT** section to schedule your inspection. The Regional Office's official hours of business is Monday through Friday, 8:30 to 4:30, excluding Federal holidays.

FOR FURTHER INFORMATION CONTACT: Ms. Sandra Rennie, Air Planning Section (6PD–L), Environmental Protection Agency, Region 6, 1445 Ross Avenue, Suite 700, Dallas, Texas 75202–2733, telephone (214) 665–7367; fax number (214) 665–7263; email address *rennie.sandra@epa.gov.*

SUPPLEMENTARY INFORMATION: Throughout this document, ''we,'' ''us,'' and ''our'' means EPA.

Table of Contents

I. What is the background for this rule?
II. What comments did we receive on the proposed rule?
III. What actions is EPA taking?
IV. Statutory and Executive Order Reviews

I. What is the background for this rule?

The background for today's action is discussed in detail in EPA's August 30, 2011, proposal to approve Louisiana's redesignation request (76 FR 53853). In that proposed action, we noted that, under EPA regulations at 40 CFR part 50, the 1997 8-hour ozone standard is attained when the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentrations is less than or equal to 0.08 parts per million (ppm) (see 69 FR 23858, April 30, 2004, for more information). Under the CAA, EPA may redesignate a nonattainment area to attainment if sufficient complete, quality-assured data are available to determine that the area has attained the standard and if it meets the other CAA redesignation requirements in section 107(d)(3)(E).

The LDEQ, on August 31, 2010, submitted a request [1] to redesignate the Baton Rouge area to attainment for the 1997 8-hour ozone standard. EPA has previously determined that the BRNA ozone nonattainment area attained both the 1997 8-hour and 1-hour ozone standards. The EPA determined that the BRNA had attained the 1997 8-hour ozone standard on September 8, 2010, at 75 FR 54779. Complete, quality-assured monitoring data for 2006–2010 also show that the area continues to attain the 1997 8-hour ozone standard. EPA also determined that the BR area met the 1-hour ozone standard on February 10, 2010 (75 FR 6570). This determination was also based on complete, quality-assured, and certified ambient air quality monitoring data for the 2006–2008 ozone seasons, as well as certified data for 2009 and 2010 that indicate the area continues to attain the 1-hour ozone NAAQS. Preliminary data available for the 2011 ozone season indicate that the area continues to be in attainment for both ozone standards.[2]

Our proposed rule and Technical Support Document provide a detailed analysis of how Louisiana met the redesignation requirements and other CAA requirements. The state's Control Techniques Guidelines rule upon which this action depends, was signed on November 7, 2011, and will be published in a separate rulemaking. Implementation of Reformulated Gasoline (RFG) in the Baton Rouge 5-parish area remains stayed by court order. Implementation of RFG is not required for purposes of redesignation.

II. What comments did we receive on the proposed rule?

EPA provided a 30-day review and comment period, which closed on September 29, 2011. EPA received 3 comment letters in response to the proposed rulemaking, submitted on behalf of the Louisiana Chemical Association, Louisiana Mid-Continent Oil and Gas Association, and the Baton Rouge Area Chamber of Commerce, that expressed overall support for EPA's

[1] The submittal was supplemented by technical amendments on February 14, 2011, May 16, 2011, and June 6, 2011. All submitted documents are in the docket for this rulemaking.

[2] On September 22, 2011, EPA moved ahead to implement the 2008 8-hour ozone standard of 0.075 ppm. Memorandum from Gina McCarthy to Air Division Directors, Regions 1–10. EPA will continue to work with the state to implement this new standard.

proposed approval to redesignate the BR ozone nonattainment area to attainment for the 1997 8-hour ozone standard. The comment letters are available for review in the docket for this rulemaking.

III. What actions is EPA taking?

EPA is taking final action to approve several related actions under the Act for the BR ozone nonattainment area, consisting of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge Parishes. Consistent with the Act, EPA is taking final action to approve a request from the state of Louisiana to redesignate the BRNA to attainment of the 1997 8-hour ozone standard.

EPA is taking final action to approve into the SIP, as meeting section 175A and 107(d)(3)(E)(iv) of the Act, Louisiana's maintenance plan for the BR area for the 1997 8-hour ozone NAAQS. The maintenance plan shows maintenance of the standard through 2022. Additionally, EPA has found adequate and is approving the 2022 MVEBs for NO_X and VOC. The submitted NO_X and VOC MVEB for the BR area is defined in Table 1 below.

TABLE 1—NO_X AND VOC MVEB

[Summer season tons per day]

Pollutant	2022
NO_X	6.96
VOC	7.55

We are also taking final action to approve a contingency measure for the maintenance plan.

Consequently, EPA is taking final action to approve the State's request to redesignate the area from nonattainment to attainment for the 1997 8-hour ozone NAAQS. After evaluating Louisiana's redesignation request, EPA has determined that with this final approval of the above-identified SIP elements and the maintenance plan, the area meets the redesignation criteria set forth in section 107(d)(3)(E) and section 175A of the Act. The final approval of this redesignation request changes the official designation in 40 CFR part 81 for the BR area from nonattainment to attainment for the 1997 8-hour ozone standard.

We find that the BR area meets all the applicable CAA requirements for purposes of redesignation of the 1997 8-hour standard that includes all of the antibacksliding CAA requirements for the BR 1-hour severe ozone nonattainment area. Therefore, along with this final redesignation to attainment for the 1997 8-hour ozone standard and our previous determination of attainment of the 1-hour ozone standard, the 1-hour anti-backsliding obligations to submit planning SIPs to meet the attainment demonstration reasonably available control measures (RACM) requirements, ROP and contingency measures requirements, cease to apply. In addition, after final redesignation to attainment for the 1997 8-hour ozone standard, EPA does not require the continued application of nonattainment New Source Review. Louisiana's Prevention of Significant Deterioration (PSD) program can apply in the Baton Rouge area so long as Louisiana interprets its SIP as applying PSD to the BRNA in these circumstances. As we noted in the proposal, Louisiana's PSD program will become effective in BRNA upon redesignation to attainment unless a SIP revision is necessary; then it must adopt and submit that to EPA for action.

IV. Statutory and Executive Order Reviews

Under the Clean Air Act, redesignation of an area to attainment and the accompanying approval of a maintenance plan under section 107(d)(3)(E) are actions that affect the status of a geographical area and do not impose any additional regulatory requirements on sources beyond those imposed by State law. A redesignation to attainment does not in and of itself create any new requirements, but rather results in the applicability of requirements contained in the Clean Air Act for areas that have been redesignated to attainment. Moreover, the Administrator is required to approve a SIP submission that complies with the provisions of the Act and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve State choices, provided that they meet the criteria of the Clean Air Act. Accordingly, these actions merely do not impose additional requirements beyond those imposed by State law and the Clean Air Act. For that reason, these actions:

- Are not ''significant regulatory actions'' subject to review by the Office of Management and Budget under Executive Order 12866 (58 FR 51735, October 4, 1993);
- Do not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- Are certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*);
- Do not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4);
- Do not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- Are not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- Is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- Are not subject to requirements of section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the Clean Air Act; and
- Do not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this rule does not have Tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the State, and EPA notes that it will not impose substantial direct costs on Tribal governments or preempt Tribal law.

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this action and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

Under section 307(b)(1) of the Clean Air Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by December 20, 2010. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this action for the purposes of judicial review nor does it extend the time

within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. (*See* section 307(b)(2).)

List of Subjects

40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Ozone, Nitrogen dioxide, Reporting and recordkeeping requirements, Volatile organic compounds.

40 CFR Part 81

Environmental protection, Air pollution control.

Dated: November 7, 2011.

Al Armendariz,

Regional Administrator, Region 6.

40 CFR parts 52 and 81 are amended as follows:

PART 52—[AMENDED]

■ 1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart T—Louisiana

■ 2. Section 52.970 is amended as follows:

■ a. The table in paragraph (c) entitled, ''EPA Approved Louisiana Regulations in the Louisiana SIP'' is amended under Chapter 22, Control of Emissions of Nitrogen Oxides (NO_X), by adding a new entry for Section 2201, and, immediately following the entry for Section 2201.H.3, by adding a new entry for Section 2202;

■ b. The second table in paragraph (e) entitled, ''EPA-Approved Louisiana Nonregulatory Provisions and Quasi-Regulatory Measures'' is amended by adding a new entry at the end.

The additions read as follows:

§ 52.970 Identification of plan.

* * * * *

(c) * * *

EPA-APPROVED LOUISIANA REGULATIONS IN THE LOUISIANA SIP

State citation	Title/subject	State approval date	EPA approval date	Comments
*	*	*	*	*
Chapter 22—Control of Emissions of Nitrogen Oxides (NO_X)				
Section 2201	Affected Facilities in the Baton Rouge Nonattainment Area and the Region of Influence.	1/20/2010	11/30/11, [Insert FR page number where document begins].	Revisions to Section 2201 approved in the Louisiana Register January 20, 2010 (LR 36:60).
*	*	*	*	*
Section 2202	Contingency Plan	1/20/2010	11/30/11, [Insert FR page number where document begins].	Section 2202 approved in the Louisiana Register January 20, 2010 (LR 36:63).
*	*	*	*	*

(e) * * *

* * * * *

EPA-APPROVED LOUISIANA NONREGULATORY PROVISIONS AND QUASI-REGULATORY MEASURES

Name of SIP provision	Applicable geographic or nonattainment area	State submittal date/effective date	EPA approval date	Explanation
*	*	*	*	*
Baton Rouge Ozone Nonattainment Area Redesignation Request and Maintenance Plan.	Baton Rouge, LA	8/31/2010	11/30/11, [Insert FR page number where document begins].	

■ 3. Section 52.977 is amended by adding paragraph (d) to read as follows:

§ 52.977 Control strategy and regulations: Ozone.

* * * * *

(d) Redesignation for the 1997 8-hour Ozone Standard. Effective December 30, 2011, EPA has redesignated the Baton Rouge area to attainment for the 1997 8-hour ozone standard. With this final redesignation to attainment for the 1997 8-hour ozone NAAQS and the final determination of attainment for the 1-hour ozone NAAQS in paragraph (a) of this section, the 1-hour anti-backsliding obligations to submit planning SIPs to meet the attainment demonstration and reasonably available control measures requirements, the rate of progress and contingency measures requirements, and any other outstanding 1-hour requirements, cease to apply.

PART 81—[AMENDED]

■ 4. The authority citation for part 81 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

■ 5. In § 81.319, the table entitled, ''Louisiana—Ozone (8-Hour Standard)''

is amended by: revising the entries for Baton Rouge Area; and adding a new footnote 2 at the end of the table.

The revisions and addition read as follows:

§ 81.319 Louisiana.

* * * * *

LOUISIANA—OZONE (8-HOUR STANDARD)

Designated area	Designation [a]		Category/classification	
	Date [1]	Type	Date [1]	Type
Baton Rouge Area:				
Ascension Parish	(2)	Attainment.		
East Baton Rouge Parish	(2)	Attainment.		
Iberville Parish	(2)	Attainment.		
Livingston Parish	(2)	Attainment.		
West Baton Rouge Parish	(2)	Attainment.		
* * *	*	*	*	*

[1] This date is June 15, 2004, unless otherwise noted.
[2] Effective December 30, 2011.

* * * * *

[FR Doc. 2011–30785 Filed 11–29–11; 8:45 am]
BILLING CODE 6560–50–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 635

[Docket No. 090508897–1635–03]

RIN 0648–AX85

Atlantic Highly Migratory Species; Adjustments to the Atlantic Bluefin Tuna General and Harpoon Category Regulations

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS is adjusting the Atlantic bluefin tuna (BFT) fishery regulations to: Increase the General category maximum daily retention limit; allow the General category season to remain open until the January subquota is reached, or March 31, whichever happens first; and increase the Harpoon category daily incidental retention limit. This action is intended to enable more thorough utilization of the available U.S. BFT quota for the General and Harpoon (commercial handgear) categories; minimize bycatch and bycatch mortality to the extent practicable; expand fishing opportunities for participants in the commercial winter General category fishery; and increase NMFS' flexibility for setting the General category retention limit depending on available quota.

DATES: This rule is effective December 30, 2011, except for § 635.23(a)(4) and § 635.27(a)(1)(i)(A), which are effective *November 30, 2011.*

ADDRESSES: Supporting documents, including the Environmental Assessment, Regulatory Impact Review, and Final Regulatory Flexibility Analysis (EA/RIR/FRFA), are available from Sarah McLaughlin, Highly Migratory Species (HMS) Management Division, Office of Sustainable Fisheries (F/SF1), NMFS, 55 Great Republic Drive, Gloucester, MA 01930. These documents and others, such as the Fishery Management Plans described below, also may be downloaded from the HMS Web site at *www.nmfs.noaa.gov/sfa/hms/.*

FOR FURTHER INFORMATION CONTACT: Sarah McLaughlin or Tom Warren, (978) 281–9260.

SUPPLEMENTARY INFORMATION: Atlantic tunas are managed under the dual authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the Atlantic Tunas Convention Act (ATCA). ATCA requires the Secretary of Commerce (Secretary) to promulgate regulations, as may be necessary and appropriate, to implement recommendations of the International Commission for the Conservation of Atlantic Tunas (ICCAT). The authority to issue regulations under the Magnuson-Stevens Act and ATCA has been delegated from the Secretary to the Assistant Administrator for Fisheries, NMFS.

Background

Background information about the need for amendment of the regulations regarding the BFT General category maximum daily retention limit, General category season, and Harpoon category daily incidental retention limit was provided in the preamble to the proposed rule (74 FR 57128, November 4, 2009) and is not repeated here.

At the proposed rulemaking stage in 2009, the proposed rule was titled ''Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Season and Retention Limit Adjustments.'' As the rule has evolved through the notice and comment process, NMFS has determined that keeping the proposed rule title at this stage would confuse the regulated public; therefore, to clarify the purpose and content of the rulemaking, NMFS has changed the title of the rule to ''Atlantic Highly Migratory Species; Adjustments to the Atlantic Bluefin Tuna General and Harpoon Category Regulations.'' Any changes to the rule's provisions that were made between the proposed and final rule are discussed in depth below.

NMFS extended the original 45-day comment period on the proposed rule through March 31, 2010, based on public, Congressional, and non-governmental organization requests for NMFS to wait to complete any related final rulemaking until after the March 2010 meeting regarding the Convention on the International Trade in Endangered Species of Wild Flora and Fauna, and until the 2010 publication of new research.

NMFS delayed issuing a final rule pending a new ICCAT BFT stock assessment and subsequent ICCAT recommendation on BFT conservation and management in 2010, as well as the decision on a May 2010 petition to list BFT as threatened or endangered under the Endangered Species Act (ESA). In May 2011, NMFS determined that listing BFT as threatened or endangered under the ESA was not warranted, but listed BFT as a species of concern. NMFS will revisit the status of BFT under the ESA in 2013. Because the

I.2 INTERAGENCY CONSULTATION

Redesignation Package & MVEB's
Air Quality Interagency Consultation Meeting Minutes

August 27, 2014 at 1:00 PM
Capital Region Planning Commission Offices

Meeting Attendees

Dan Broussard - DOTD
John Fu - DOTD
Brandon Buckner - FHWA
Jeff Riley - EPA (Web Conf)
Yasoob Zia - DEQ
Vivian H. Aucoin - DEQ
Jamie Setze - CRPC
Ahmed Khalek - CRPC
Pong Wu – CRPC
Ravi Ponnapureddy – CRPC
Dr. Mike McDaniel - BRCAC
Chris Emery – ENVIRON (Web Conf)

- Re-designation Process Recap, CRPC
  Ravi Ponnapureddy briefly talked about the process and provided a recap on the earlier IA meetings pertaining to VMT data for re-designation package and MVEB development.

- Model Expansion, CRPC
  Ravi Ponnapureddy provided the following update to the committee:
  1. Transportation consultant completed expanding the model and transmitted to CRPC on August 20th.
  2. CRPC staff modeled various scenarios as shown below

Travel Demand Model Alternatives		
Alternative	**Scenarios**	**Network**
2010 Base Year	Existing	Existing
2022 A	Adopted Existing + Committed Projects (Stage 1) + Part of Stage2 Projects	Existing + Stage1 Projects + Propropsed Part of Stage2 Projects
2022 B	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects
2027 A	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects
2027 B	2022 B + DOTD Proposed Stage 2 Projects	2022 B + DOTD Proposed Stage 2 Projects

Scenarios with suffix A has the same mix of projects for 2022 and 207 as in the latest conformity analysis that was approved in 2013.

Scenarios with suffix B has the mix of projects for 2022 and 2027 as per the July 22, 2014 meeting at LADOTD.
(*CRPC slide presentation is included in Attachment A, and Stage 2 and Stage 3 projects are shown in Attachment B.*)

3. The model network does not consist of all the local roads. These are represented by centroid connectors. CRPC staff estimated the local VMT by calculating the VMT on all the centroid connectors.
4. Next Steps
    a. For comparison purposes, CRPC staff will also estimate local road VMT by using intra-zonal VMT methodology available in TransCAD.
    b. Adjust the model VMT to HPMS VMT and apply DOTD seasonal factors.

- HPMS VMT, LADOTD
  John Fu presented the HPMS VMT data for 2013, 2022 and 2027. The VMT data for outside the modeled area did not look correct. DOTD will review and email the corrected data

- Environ Modeling, DEQ/Environ
  Needs the VMT data for the five parish non-attainment are broken down by functional classification.

- Other
  After detailed discussion, the IA committee agreed to use
    1. MOVES 2010b model for the purposes of submitting the re-designation package.
    2. August instead of July for seasonal VMT adjustment purposes as it is representative of both meteorological and traffic conditions in the Baton Rouge MPO area.

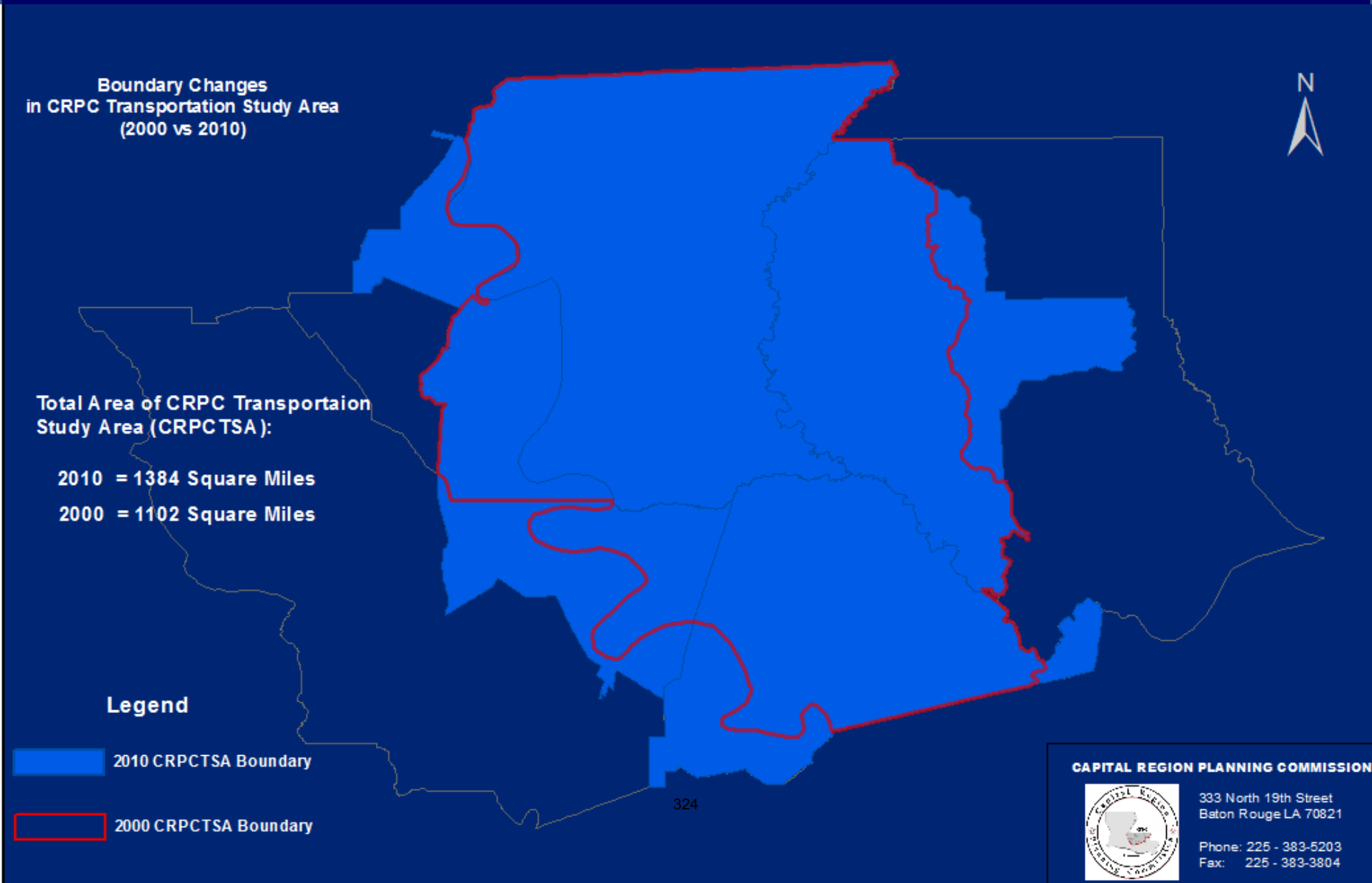
- Action Items
    1. CRPC to schedule follow up IA meeting for September 11 from 2:00PM to 3:00 PM
    2. DOTD to revise the HPMS VMT and transmit it to CRPC
    3. CRPC to work on the next steps listed above.

Attachment A
CRPC Presentation

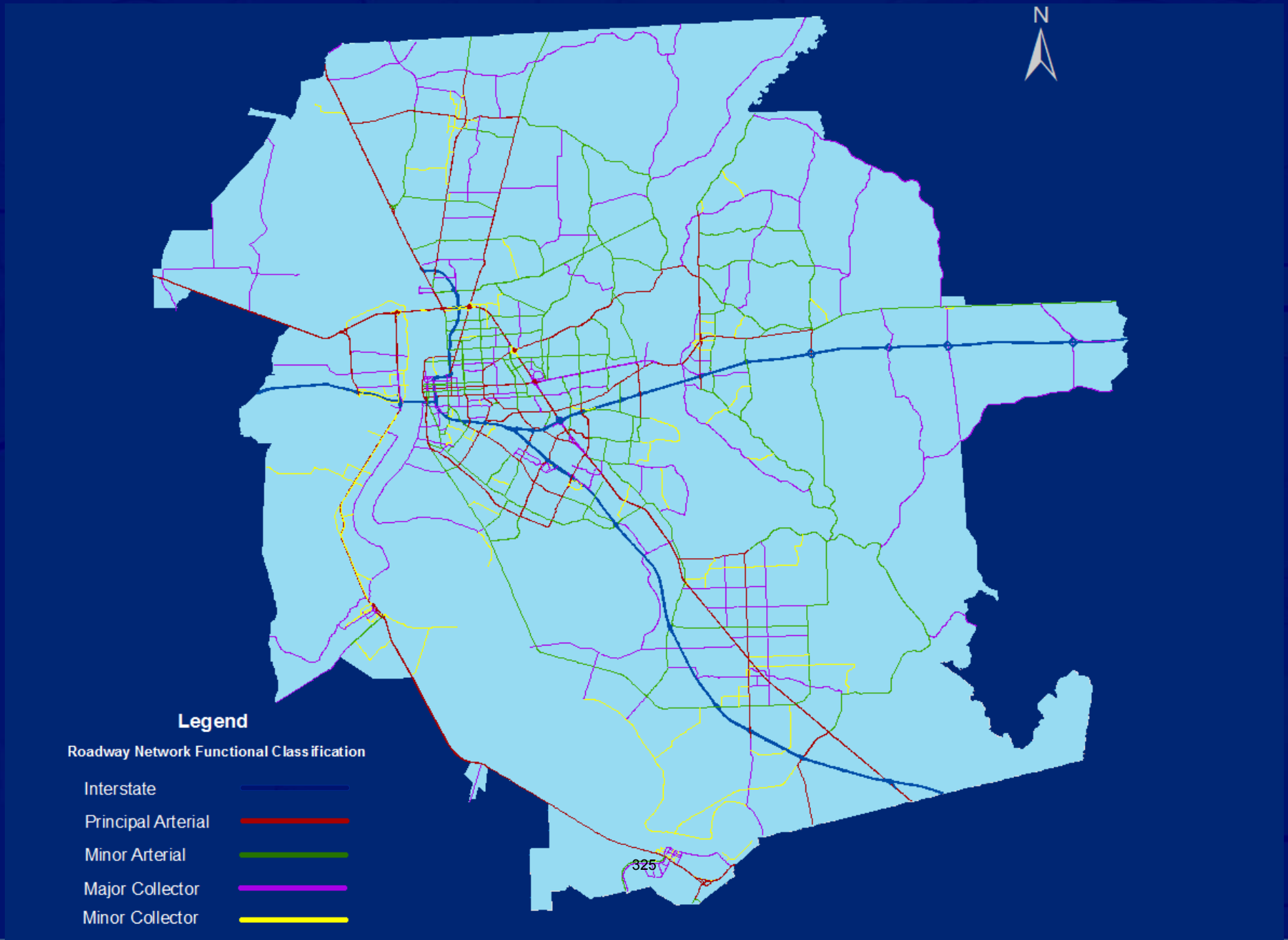
Estimating Baton Rouge MPO Roadway Network VMT Using a Travel Demand Model

Capital Region Planning Commission

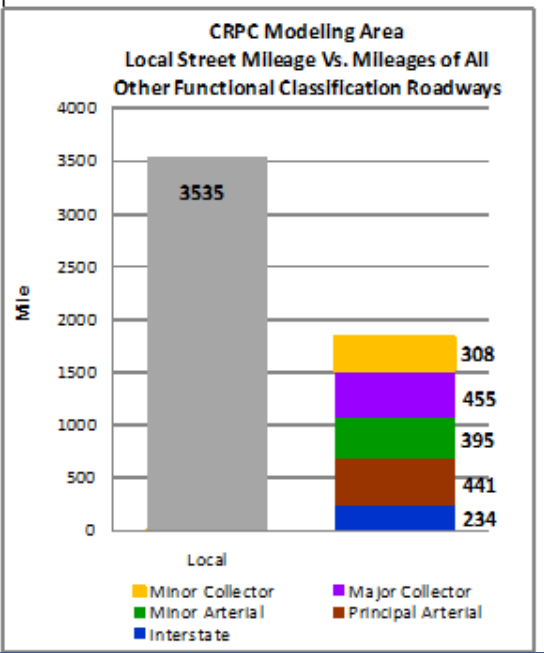
Estimating Regional Roadway Network VMT Using a Travel Demand Model



Estimating Regional Roadway Network VMT Using a Travel Demand Model

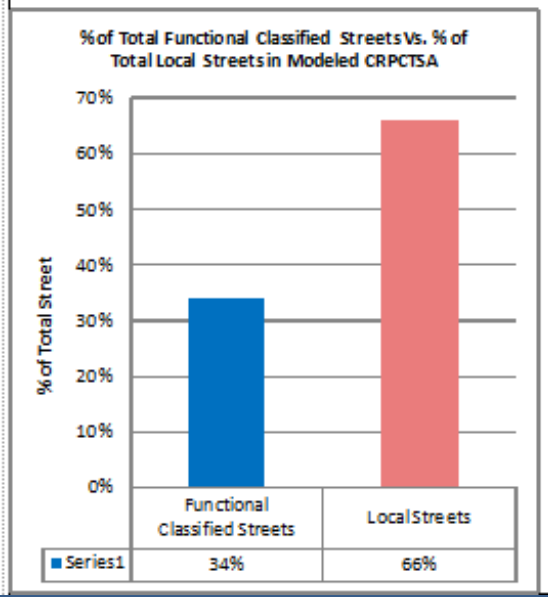


CRPC/MPO Roadway System in Modeling Area By DOTD Functional Classification (Local Streets Vs. All Other FC Streets)

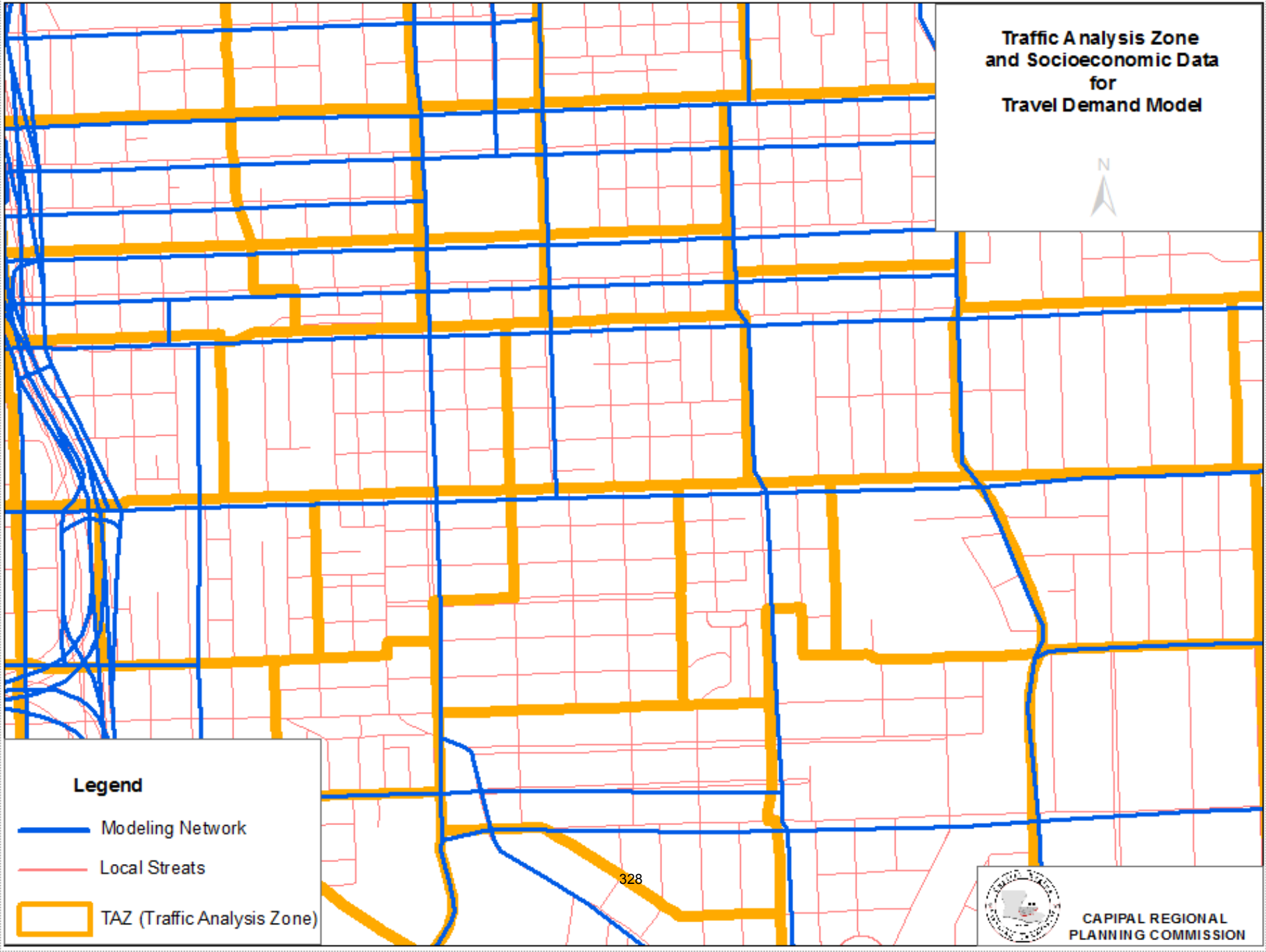


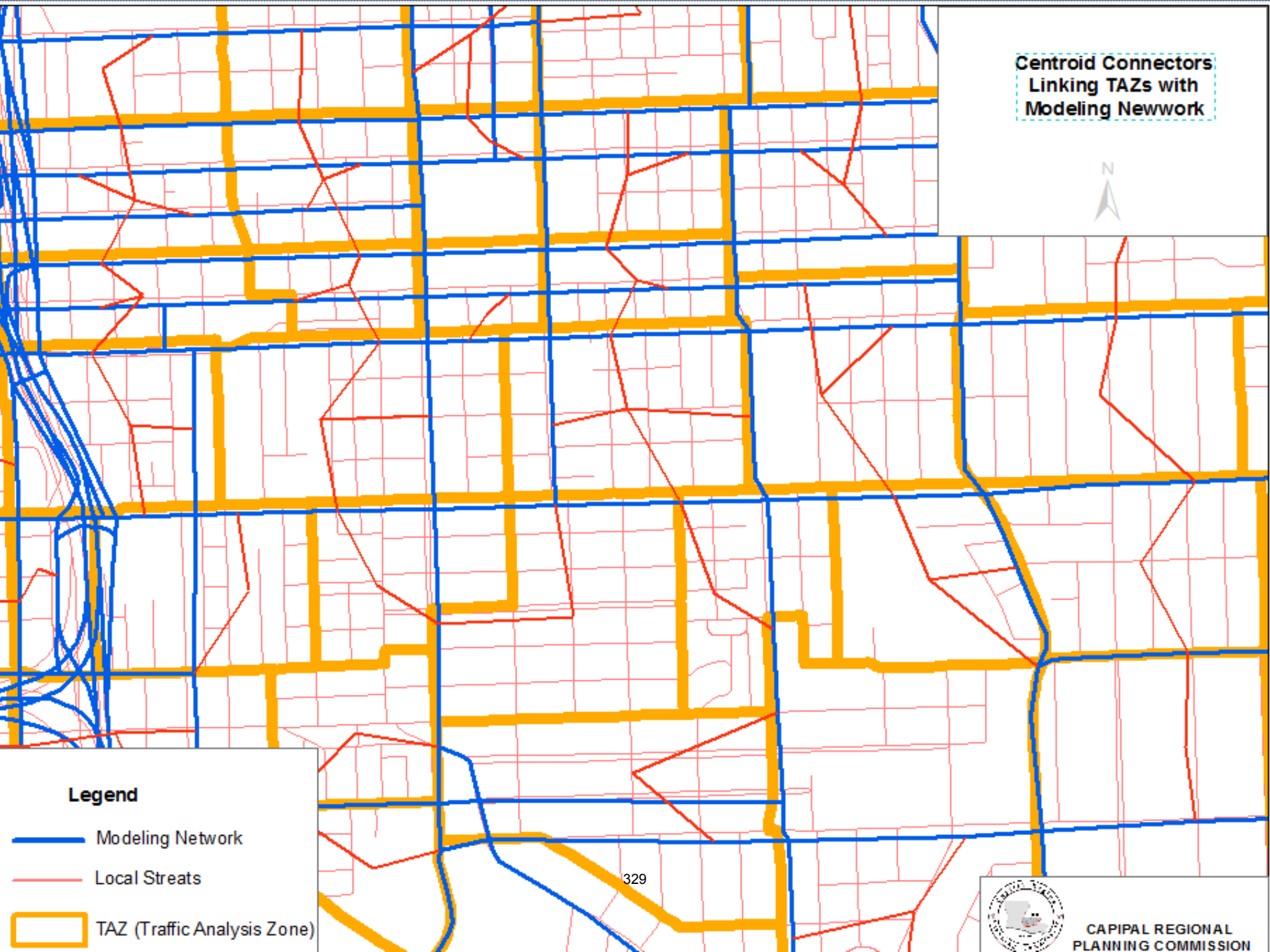
CAPIPAL REGIONAL PLANNING COMMISSION

Modeling Network Vs. Overall Roadway Network in CRPC Transportation Study Area



CAPIPAL REGIONAL PLANNING COMMISSION


Traffic Analysis Zone
and Socioeconomic Data
for
Travel Demand Model
N
Legend
Modeling Network
Local Streats
TAZ (Traffic Analysis Zone)
CAPIPAL REGIONAL
PLANNING COMMISSION


Centroid Connectors Linking TAZs with Modeling Newwork
N
Legend
Modeling Network
Local Streats
TAZ (Traffic Analysis Zone)
CAPIPAL REGIONAL PLANNING COMMISSION

VMT Guidelines

– Using travel demand model to Transportation Study region

– Setting a base year and horizon year

– Ensuring consistency in base and horizon year approach

Methodology

- Run a travel demand model Highway Assignment for each scenario
- Use either diagonal rows of trip tables or Centroid Connectors trip for intra-zonal trips and VMT resulting from local streets within TAZ

Estimating Regional Roadway Network VMT Using a Travel Demand Model

Tools and Scenarios

- A Travel Demand Model
- A Geographic Information System (GIS)
- A Spread Sheet

Travel Demand Model Alternatives		
Alternative	**Scenarios**	**Network**
2010 Base Year	Existing	Existing
2022 A	Adopted Existing + Committed Projects (Stage 1) + Part of Stage2 Projects	Existing + Stage1 Projects + Propropsed Part of Stage2 Projects
2022 B	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects
2027 A	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects
2027 B	2022 B + DOTD Proposed Stage 2 Projects	2022 B + DOTD Proposed Stage 2 Projects

Estimating Regional Roadway Network VMT Using a Travel Demand Model

2010 Base Year	
Row Labels	VMT
Rural Interstate	663563
Rural Major Collector	475185
Rural Minor Arterial	245412
Rural Minor Collector	256313
Rural Principal Arterial	662612
Urban Collector	1570020
Urban Interstate	5468335
Urban Minor Arterial	3705565
Urban Principal Arterial	5807642
Local Street	2110620
Total	**20,965,265**
% VMT on Local Street	10.07%

Travel Demand Model Alternatives		
Alternative	**Scenarios**	**Network**
2010 Base Year	Existing	Existing
2022 A	Adopted Existing + Committed Projects (Stage 1) + Part of Stage2 Projects	Existing + Stage1 Projects + Propropsed Part of Stage2 Projects
2022 B	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects
2027 A	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects
2027 B	2022 B + DOTD Proposed Stage 2 Projects	2022 B + DOTD Proposed Stage 2 Projects

Estimating Regional Roadway Network VMT Using a Travel Demand Model

2022A		2022B DOTD	
Row Labels	VMT	Row Labels	VMT
Rural Interstate	1,222,409	Rural Interstate	1,220,701
Rural Major Collector	586,835	Rural Major Collector	570,033
Rural Minor Arterial	289,228	Rural Minor Arterial	457,931
Rural Minor Collector	311,200	Rural Minor Collector	303,807
Rural Principal Arterial	820,841	Rural Principal Arterial	599,112
Urban Collector	1,835,480	Urban Collector	1,854,820
Urban Interstate	6,211,441	Urban Interstate	6,166,401
Urban Minor Arterial	4,401,376	Urban Minor Arterial	4,382,886
Urban Principal Arterial	6,322,485	Urban Principal Arterial	6,376,226
Local Street	2,584,863	Local Street	2,591,691
Grand Total	**24,586,159**	**Grand Total**	**24,523,608**
% VMT on Local Street	10.51%	% VMT on Local Street	10.57%

Travel Demand Model Alternatives

Alternative	Scenarios	Network
2010 Base Year	Existing	Existing
2022 A	Adopted Existing + Committed Projects (Stage 1) + Part of Stage2 Projects	Existing + Stage1 Projects + Propropsed Part of Stage2 Projects
2022 B	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects
2027 A	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects
2027 B	2022 B + DOTD Proposed Stage 2 Projects	2022 B + DOTD Proposed Stage 2 Projects

Estimating Regional Roadway Network VMT Using a Travel Demand Model

2027A		2027 B DOTD	
Row Labels	VMT	Row Labels	VMT
Rural Interstate	1,340,124	Rural Interstate	1,344,653
Rural Major Collector	630,514	Rural Major Collector	608,184
Rural Minor Arterial	316,482	Rural Minor Arterial	489,690
Rural Minor Collector	341,595	Rural Minor Collector	326,969
Rural Principal Arterial	859,932	Rural Principal Arterial	732,461
Urban Collector	1,883,946	Urban Collector	1,936,739
Urban Interstate	6,483,099	Urban Interstate	6,501,674
Urban Minor Arterial	4,738,738	Urban Minor Arterial	4,638,438
Urban Principal Arterial	6,698,679	Urban Principal Arterial	6,791,313
Local Street	2,749,815	Local Street	2,734,473
Grand Total	**26,042,923**	**Grand Total**	**26,104,595**
% VMT on Local Street	10.56%	% VMT on Local Street	10.48%

Travel Demand Model Alternatives

Alternative	Scenarios	Network
2010 Base Year	Existing	Existing
2022 A	Adopted Existing + Committed Projects (Stage 1) + Part of Stage2 Projects	Existing + Stage1 Projects + Propropsed Part of Stage2 Projects
2022 B	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects	Adopted Existing + Committed Projects (Stage 1) + DOTD Proposed 2022 Projects
2027 A	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects	Adopted Existing + Committed Projects (Stage 1) + All Stage2 Projects
2027 B	2022 B + DOTD Proposed Stage 2 Projects	2022 B + DOTD Proposed Stage 2 Projects

Next Step

- For comparison purposes, we will use TransCAD default method to calculate VMT on local streets by estimating intra-zonal trips for each TAZ after today's meeting

- Adjust model VMT to HPMS and apply DOTD's seasonal factors (July or August).

Questions ?

Attachment B
Stage 2 and Stage 3 Projects List

Baton Rouge MTP 2037 Update
Stage II (2018-2027) Projects

Map No.	Parish	Open to Traffic 2022*	Open to Traffic 2027**	Open to Traffic 2022(July 22, 2014	Open to Traffic 2027(July 22, 2014)	Route	Location	Improvement	Length (Miles)	Project Cost (000)
201	ASC	No	Yes	No	Yes	LA 73 (Old Jefferson Hwy)	I-10 to Airline Hwy	Widen to 4 Lanes	2.30	20,334
202	ASC	No	Yes	No	Yes	LA 73 (Old Jefferson Hwy)	LA 74 to I-10	Widen to 4 Lanes	1.04	9,243
203	ASC	No	Yes	No	Yes	US 61 (Airline Hwy)	Jefferson Hwy to Perkins Rd	Widen to 6 Lanes (is coded as 8 in the model)	2.23	19,742
204	ASC	No	Yes	No	Yes	LA 30 (Nicholson Dr)	Ashland Rd to Burnside Ave	Widen to 4 Lanes	2.51	22,218
205	ASC	Yes	Yes	Yes	Yes	LA 73 (Old Jefferson Hwy)	Airline Hwy	Intersection Improvement / Realignment	0.20	1,771
206	ASC	No	Yes	No	Yes	LA 940 (Orice Roth Rd)	E Ascension School Rd to Burnside Ave	Widen to 4 Lanes	0.99	8,732
207	ASC	Yes	Yes	No	Yes	I-10	LA 73 to LA 22	Widen to 6 Lanes	9.60	275,576
208	ASC/EBR	No	Yes	No	Yes	US 61 (Airline Hwy)	Perkins Rd to Highland Rd	Widen to 6 Lanes	2.33	20,627
209	EBR	Yes	Yes	No	Yes	S Choctaw Rd	Flannery Rd to Central Thwy	Widen to 4 Lanes	1.44	12,726
210	EBR	No	Yes	No	Yes	Sharp Rd	Florida Blvd to Old Hammond Hwy	Widen to 4 Lanes	1.60	14,191
211	EBR	Yes	Yes	Yes	Yes	LA 427 (Perkins Rd)	Pecue Ln to Highland Rd	Widen to 5 Lanes	1.76	15,543
212	EBR	No	Yes	No	Yes	Cedarcrest Ave	Airline Hwy to Old Hammond Hwy	Widen to 4 Lanes	1.49	13,207
213	EBR	No	Yes	No	Yes	LA 1068 (Drusilla Ln)	Jefferson Hwy to Old Hammond Hwy	Widen to 4 Lanes	1.04	9,233
214	EBR	No	Yes	No	Yes	US 61 (Airline Hwy) Phase 1-C	Florida Blvd to Florline Blvd	Widen to 6 Lanes	0.24	2,168
215	EBR	No	Yes	No	Yes	US 61 (Airline Hwy) Phase 2-B	Greenwell Springs Rd to I-110	Widen to 6 Lanes	3.66	32,437
216	EBR	No	Yes	No	Yes	US 61 (Airline Hwy) Phase 3	Florline Blvd to Greenwell Springs Rd	Widen to 6 Lanes	1.68	14,891
217	EBR	No	Yes	No	Yes	US 190 (Florida Blvd)	Airline Hwy to Monterey Blvd	Widen to 8 Lanes	0.88	7,749
218	EBR	No	Yes	No	Yes	LA 42 (Burbank Dr)	Nicholson Dr to 0.8 mi east	Done	0.82	7,272
219	EBR	Yes	Yes	No	Yes	LA 67 (Plank Rd)	Airline Hwy to Hooper Rd / Harding Blvd	Widen to 6 Lanes	0.76	6,717
220	EBR	No	Yes	No	Yes	S Sherwood Forest Blvd	Old Hammond Hwy to Florida Blvd	Widen to 4 Lanes	1.48	13,119
221	EBR	Yes	Yes	No	Yes	LA 426 (Old Hammond Hwy)	O'Neal Ln to Florida Blvd	Widen to 4 Lanes	0.85	7,565
222	EBR	No	Yes	No	Yes	S Flannery Rd	Old Hammond Hwy to Florida Blvd	Widen to 4 Lanes / Realign with Millerville Rd	1.18	10,465
223	EBR	Yes	Yes	No	Yes	I-12	Essen Ln	New WB Exit Ramp	0.47	7,082
224	EBR	No	Yes	No	Yes	US 61 (Airline Hwy)	Jefferson Hwy to Cedarcrest Ave	Widen to 6 Lanes	1.55	13,722
225	EBR	No	Yes	No	Yes	LA 408 (Hooper Rd)	Plank Rd to Mickens Rd	Widen to 6 Lanes	1.16	10,294
226	EBR	Yes	Yes	Yes	Yes	LA 408 (Hooper Rd)	Devall Rd to Greenwell Springs Rd	Widen to 4 Lanes	2.63	23,293
227	EBR	Yes	Yes	No	Yes	LA 37 (Greenwell Springs Rd)	Sullivan Rd to Magnolia Bridge Rd	Widen to 5 Lanes	2.84	25,166
228	EBR	No	Yes	No	Yes	Groom Rd Ext	Old Scenic Hwy to Samuels Rd	New 2 Lane Roadway	0.88	6,241
229	EBR	Yes	Yes	Yes	Yes	Tiger Bend Road	Jones Creek Ro to Antioch Rd	Widen to 4 Lanes	0.70	6,197
230	EBR/LIV	No	Yes	No	No	LA 408 Ext (Hooper Rd)	Greenwell Springs Rd to LA 16	New 4 Lane Roadway/Bridge	2.30	63,242
231	LIV	Yes	Yes	No	Yes	US 190 (Florida Ave)	Pete's Hwy to Burgess Ave	Widen to 4 Lanes	2.25	19,879

* Only projects stated as "Yes" are modeled in 2022
**Projects stated as "No" are modeled in 2037

Baton Rouge MTP 2037 Update
Stage II (2018-2027) Projects

Map No.	Parish	Open to Traffic 2022*	Open to Traffic 2027**	Open to Traffic 2022(July 22, 2014	Open to Traffic 2027(July 22, 2014)	Route	Location	Improvement	Length (Miles)	Project Cost (000)
232	LIV	No	Yes	No	No	Juban Rd Ext	Florida Ave to Lockhart Rd	New 4 Lane Roadway	1.11	17,670
233	LIV	No	Yes	No	Yes	LA 64 (Magnolia Beach Rd)	Amite River to N Range Ave	Widen to 4 Lanes	1.14	10,103
234	LIV	Yes	Yes	No	No	LA 1026 (Juban Rd)	Wax Rd to I-10	Widen to 4 Lanes	1.06	9,384
235	LIV	Yes	Yes	Yes	Yes	LA 1026 (Juban Rd)	I-10 to Florida Ave	Widen to 4 Lanes	1.42	12,571
236	LIV	No	Yes	No	Yes	LA 3003 (Rushing Rd)	0.5 mi West of S Range Rd to Pete's Hwy	Widen to 4 Lanes	1.22	10,790
237	LIV	Yes	Yes	No	Yes	LA 16 (Pete's Hwy)	Centerville Street to Vincent Rd	Widen to 4 Lanes	3.01	26,679
238	LIV	No	Yes	No	Yes	LA 447 (Walker Rd)	Duff Rd to Burgess Ave	Widen to 4 Lanes	0.76	6,728
239	LIV	No	Yes	No	Yes	New Roadway	Pendarvis Lane to Florida Ave	New 2 Lane Roadway	0.18	1,266
240	LIV	No	Yes	No	Yes	Satsuma Rd Ext	Florida Ave to Cane Market Rd	New 2 Lane Roadway	0.55	3,885
241	LIV	No	Yes	No	Yes	LA 1032 (4-H Club Rd)	Vincent Rd to Florida Ave	Widen to 4 Lanes	1.15	7,395
242	LIV	Yes	Yes	Yes	Yes	I-12	Pete's Hwy	New Interchange	0.64	45,150
243	WBR	Yes	Yes	No	Yes	LA 1	Lukeville Ln to I-10	Widen to 6 Lanes	4.63	40,968
244	LIV	Yes	Yes	Yes	Yes	I-12	Satsuma to Study Area Boundary	Widen to 6 Lanes	1.20	26,498
401	ASC			Yes	Yes	LA 70	LA 22 to Sunshine Bridge	Widen to 4 Lanes		
	Study Area					Line Item	Various	Enhancement	--	7,530
	Study Area					Line Item	Various	Safety	--	27,355
	Study Area					Line Item	Various	Bridge	--	47,869
	Study Area					Line Item	Various	Overlay	--	45,150
	Study Area					Line Item	Various	Maintenance	--	2,510
	Study Area					Line Item	Various	Operations	--	5,226
								Total Cost Stage II	**72.95**	**1,075,371**

* Only projects stated as "Yes" are modeled in 2022
**Projects stated as "No" are modeled in 2037

Baton Rouge MTP 2037 Update
Stage III (2028-2037) Projects

Map No.	Parish	Open to Traffic 2037	Open to Traffic 2037(July 22,2014)	Route	Location	Improvement	Length (Miles)	Project Cost (000)
301	ASC	Yes	Yes	LA 44 (N Burnside Ave)	Cante Rd to Oak Grove-Port Vincent Hwy	Widen to 4 Lanes	3.75	42,498
302	ASC	Yes	Yes (Yes for 2027)	LA 621	Old Jefferson Hwy to Airline Hwy	Widen to 4 Lanes	2.47	28,024
303	ASC	Yes	Yes	US 61 (Airline Hwy)	N Burnside Ave to Jefferson Hwy	Widen to 6 Lanes (is coded as 8 in the model)	5.00	56,680
304	ASC	Yes	Yes (Yes for 2027)	LA 73 (Old Jefferson Hwy)	Airline Hwy to LA 42	Widen to 4 Lanes	1.01	11,470
305	ASC/EBR	Yes	Yes	Old Perkins Rd	Highland Rd to Airline Hwy	Widen to 4 Lanes	3.45	39,109
306	ASC/EBR/LIV	Yes	Yes	LA 929 (Hornsby Rd) Ext	Oak Grove-Port Vincent Hwy to 4-H Club Rd	New 2 Lane Roadway with Bridge	5.86	121,159
307	EBR	Yes	Yes	LA 64 (Greenwell Springs-Port Hudson Rd)	Plank Rd to Joor Rd	Widen to 4 Lanes	3.80	43,080
308	EBR	Yes	Yes (Yes for 2027)	US 61 (Airline Hwy)	Highland Rd to Jefferson Hwy	Widen to 6 Lanes	4.00	45,344
309	EBR	Yes	Yes	LA 67 (Plank Rd)	Groom Rd to Main St	Widen to 4 Lanes	4.97	56,335
310	EBR	Yes	Yes	Mickens Rd	Hooper Rd to Joor Rd	Widen to 4 Lanes	3.01	34,085
311	EBR	Yes	Yes	Highland Rd	Perkins Rd to Seigen Ln	Widen to 4 Lanes	3.32	37,636
312	EBR	Yes	Yes	LA 3246 (Siegen Ln)	Perkins Rd to I-10	Widen to 6 Lanes	1.00	11,283
313	LIV	Yes	Yes	LA 447 (Walker Rd)	I-12 to Hood Rd	Widen to 4 Lanes	5.48	62,121
314	WBR	Yes	Yes	LA 1/I-10 Connector	Lobdell Hwy to LA 1	New 2 Lane Roadway	2.70	137,886
	Study Area			Line Item	Various	Enhancement	--	9,638
	Study Area			Line Item	Various	Safety	--	35,017
	Study Area			Line Item	Various	Bridge	--	61,277
	Study Area			Line Item	Various	Overlay	--	57,796
	Study Area			Line Item	Various	Maintenance	--	3,213
	Study Area			Line Item	Various	Operations	--	6,690
						Total Cost Stage III	**49.82**	**900,341**

I.3 INTERAGENCY MEMOS

CAPITAL REGION PLANNING COMMISSION

333 North 19th Street
Post Office Box 3355
Baton Rouge, LA 70821-3355

Phone: 225.383.5203
Fax: 225.383.3804
E-Mail: CRPC@brgov.com

03/17/2016

RE: Baton Rouge 5-Parish Ozone Nonattainment Area Redesignation Request and Maintenance Plan for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)

To whom it may concern:

The Louisiana Department of Environmental Quality (LDEQ) submitted a draft maintenance plan to the US Environmental Protection Agency (US EPA) on behalf of the 5-parish ozone nonattainment area on June 20, 2015. Following a review of the emissions inventory information contained in the maintenance plan, EPA has requested the LDEQ provide a more clearly identified motor vehicle emissions budget (MVEB).

On July 9, 2013, the Capital Region Planning Commission in conjunction with US EPA, US DOT, LA DOT and LDEQ, adopted an air quality conformity analysis that was based on the MVEB established in the Baton Rouge 8-Hour Maintenance Plan with a budget year 2022. This budget was formed using the former Mobile6.2 model and was set at 7.55 tons per day of VOC and 6.96 tons per day of NOx.

The most recent emissions inventory, which had a 2011 base year, was run with EPA's approved MOVES model and was modeled for both 2022 and 2027. While this model is more conservative than the former Mobile6.2, on-road emissions estimates decline substantially over time for NOx and VOC due to fleet turnover even with expected annual growth in vehicle miles traveled (VMT). This calculation is as follows:

Pollutant	Updated 2022 MVEB	Proposed 2027 MVEB
Oxides of Nitrogen (NOx)	14.37 tons per day	10.95 tons per day
Volatile Organic Compound (VOC)	13.19 tons per day	11.55 tons per day

On behalf of CRPC, I concur with the 2022 and 2027 emissions inventory budgets for the 5-parish Baton Rouge ozone nonattainment area.

Sincerely,

Jamie C. Setze

Jamie Setze,
Executive Director, CRPC

C: Vivian Aucoin, LDEQ

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Transportation Planning
PO Box 94245 | Baton Rouge, LA 70804-9245
ph: 225-379-1208 | fx: 225-379-1807

John Bel Edwards, Governor
Shawn D. Wilson, Ph.D., Secretary

Date: 3/17/2016

RE: Baton Rouge 5-Parish Ozone Nonattainment Area Redesignation Request and Maintenance Plan for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)

To whom it may concern:

The Louisiana Department of Environmental Quality (LDEQ) submitted a draft maintenance plan to the US Environmental Protection Agency (US EPA) on behalf of the 5-parish ozone nonattainment area on June 20, 2015. Following a review of the emissions inventory information contained in the maintenance plan, EPA has requested the LDEQ provide a more clearly identified motor vehicle emissions budget (MVEB).

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The most recent emissions inventory, which had a 2011 base year, was run with EPA's approved MOVES model and was modeled for both 2022 and 2027. While this model is more conservative than the former Mobile6.2, on-road emissions estimates decline substantially over time for NOx and VOC due to fleet turnover even with expected annual growth in vehicle miles traveled (VMT). This calculation is as follows:

Pollutant	Updated 2022 MVEB	Proposed 2027 MVEB
Oxides of Nitrogen (NOx)	14.37 tons per day	10.95 tons per day
Volatile Organic Compound (VOC)	13.19 tons per day	11.55 tons per day

On behalf of LA DOTD, I concur with the 2022 and 2027 emissions inventory budgets for the 5-parish Baton Rouge ozone nonattainment area.

Sincerely,

Daniel J. Broussard, P.E.
Statewide Planning Engineer

c: Brandon Buckner, FHWA
Jamie Setze, CRPC
John Fu, LA DOTD
Vivian Aucoin, LDEQ

U.S. Department of Transportation
Federal Highway Administration

FHWA Louisiana Division Office
5304 Flanders Drive, Suite A
Baton Rouge, Louisiana 70808
(225) 757-7600
(225) 757-7601 (Fax)

March 17, 2016

RE: Baton Rouge 5-Parish Ozone Nonattainment Area Redesignation Request and Maintenance Plan for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)

To whom it may concern:

The Louisiana Department of Environmental Quality (LDEQ) submitted a draft maintenance plan to the US Environmental Protection Agency (US EPA) on behalf of the 5-parish ozone nonattainment area on June 20, 2015. Following a review of the emissions inventory information contained in the maintenance plan, EPA has requested the LDEQ provide a more clearly identified motor vehicle emissions budget (MVEB).

On July 9, 2013, the Capital Region Planning Commission in conjunction with US EPA, US DOT, LA DOT and LDEQ, adopted an air quality conformity analysis that was based on the MVEB established in the Baton Rouge 8-Hour Maintenance Plan with a budget year 2022. This budget was formed using the former Mobile6.2 model and was set at 7.55 tons per day of VOC and 6.96 tons per day of NOx.

The most recent emissions inventory, which had a 2011 base year, was run with EPA's approved MOVES model and was modeled for both 2022 and 2027. While this model is more conservative than the former Mobile6.2, on-road emissions estimates decline substantially over time for NOx and VOC due to fleet turnover even with expected annual growth in vehicle miles traveled (VMT). This calculation is as follows:

Pollutant	Updated 2022 MVEB	Proposed 2027 MVEB
Oxides of Nitrogen (NOx)	14.37 tons per day	10.95 tons per day
Volatile Organic Compound (VOC)	13.19 tons per day	11.55 tons per day

On behalf of FHWA, I concur with the 2022 and 2027 emissions inventory budgets for the 5-parish Baton Rouge ozone nonattainment area. Should you have any questions or concerns, please contact Mr. Brandon Buckner, of the FHWA Louisiana Division, at (225) 757-7622.

Sincerely yours,

Charles W. Bolinger
Division Administrator
Federal Highway Administration

cc: Vivian Aucoin, LDEQ

APPENDIX J: AQ355

NOTICE OF INTENT

Department of Environmental Quality
Office of the Secretary
Legal Division

Offset Requirements in Specified Parishes
(LAC 33:III.504) (AQ355)

Under the authority of the Environmental Quality Act, R.S. 30:2001 et seq., and in accordance with the provisions of the Administrative Procedure Act, R.S. 49:950 et seq., the secretary gives notice that rulemaking procedures have been initiated to amend the Air regulations, LAC 33:III.504 (AQ355).

This rule will revise the offset requirements that apply to certain projects in the Baton Rouge area (i.e., the parishes of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge). Currently, if a physical change or change in the method of operation at an existing stationary source (with a potential to emit 50 tons per year (TPY) or more of NOX/VOC) will increase NOX/VOC emissions by 25 TPY or more, the owner/operator must determine the net emissions increase over the contemporaneous period. If the net emissions increase is 25 TPY or more, the owner/operator must provide NOX/VOC offsets for the project at a 1.1 to 1 ratio. This rule will revise the trigger values and offset ratio as follows:

Netting Thresholds in Tons per Year for Significant Net Increases
in VOC and NOX Emissions and Offset Ratio

	VOC	NOX	Offset Ratio
Existing:	25	25	1.1 to 1
Proposed:	40	40	1.0 to 1

This rule will also establish an exemption for pollution control projects. At present, the Baton Rouge area is designated as a marginal nonattainment area with respect to the 2008 8-hour national ambient air quality standard (NAAQS) for ozone (i.e., 75 parts per billion (ppb)). However, the design value of each ambient air monitor in the region is compliant with this NAAQS, and LDEQ has requested that EPA redesignate the area to attainment. LDEQ anticipates that EPA will approve LDEQ's request in early 2016.

On October 1, 2015, EPA revised the 8-hour ozone NAAQS to 70 ppb, a standard with which the Baton Rouge area does not currently comply. However, designations will not be enacted for up to 2 years from the date the new standard is promulgated (see §107(d)(1)(B)(i) of the Clean Air Act). Thus, during the period between the effective date of the area's redesignation to attainment of the 2008 ozone NAAQS and that of its (potential) nonattainment designation with respect to the 2015 ozone NAAQS, offsets will not be required by the Clean Air Act.

However, LDEQ has elected to retain the offset requirements under LAC 33:III.504.M as an anti-backsliding measure, but align the netting and significant net increase trigger values with those for marginal nonattainment areas (cf. Table 1 of LAC 33:III.504.L), set the offset ratio at 1.0 to 1, and establish an exemption for NOX and VOC increases that are a direct result of and

incidental to the installation of abatement equipment or implementation of a control technique designed to control emissions of another pollutant. The basis and rationale for this rule are to revise the offset requirements that apply to projects in the Baton Rouge area. This rule meets an exception listed in R.S. 30:2019(D)(2) and R.S. 49:953(G)(3); therefore, no report regarding environmental/health benefits and social/economic costs is required.

This rule has no known impact on family formation, stability, and autonomy as described in R.S. 49:972.

This rule has no known impact on poverty as described in R.S. 49:973.

This rule has no known impact on providers as described in HCR 170 of 2014.

A public hearing will be held on January 27, 2016, at 1:30 p.m. in the Galvez Building, Oliver Pollock Conference Room, 602 N. Fifth Street, Baton Rouge, LA 70802. Interested persons are invited to attend and submit oral comments on the proposed amendments. Should individuals with a disability need an accommodation in order to participate, contact Deidra Johnson at the address given below or at (225) 219-3985. Two hours of free parking are allowed in the Galvez Garage with a validated parking ticket.

All interested persons are invited to submit written comments on the proposed regulation. Persons commenting should reference this proposed regulation by AQ355. Such comments must be received no later than February 3, 2016, at 4:30 p.m., and should be sent to Deidra Johnson, Attorney Supervisor, Office of the Secretary, Legal Division, P.O. Box 4302, Baton Rouge, LA 70821-4302 or to FAX (225) 219-4068 or by e-mail to deidra.johnson@la.gov. Copies of these proposed regulations can be purchased by contacting the DEQ Public Records Center at (225) 219-3168. Check or money order is required in advance for each copy of AQ355. These proposed regulations are available on the Internet at www.deq.louisiana.gov/portal/tabid/1669/default.aspx.

These proposed regulations are available for inspection at the following DEQ office locations from 8 a.m. until 4:30 p.m.: 602 N. Fifth Street, Baton Rouge, LA 70802; 1823 Highway 546, West Monroe, LA 71292; State Office Building, 1525 Fairfield Avenue, Shreveport, LA 71101; 1301 Gadwall Street, Lake Charles, LA 70615; 111 New Center Drive, Lafayette, LA 70508; 110 Barataria Street, Lockport, LA 70374; 201 Evans Road, Bldg. 4, Suite 420, New Orleans, LA 70123.

Herman Robinson, CPM
General Counsel

Title 33
ENVIRONMENTAL QUALITY
Part III. Air

Chapter 5. Permit Procedures

§504. Nonattainment New Source Review (NNSR) Procedures and Offset Requirements in Specified Parishes

A. – L. …

* * *

M. Offset Requirements in Specified Parishes. Except as provided in Paragraph M.4 of this Section, the provisions of this Subsection shall apply to stationary sources located in the parishes of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge if the parish's designation with respect to the 8-hour national ambient air quality standard (NAAQS) for ozone is attainment, marginal nonattainment, or moderate nonattainment.

1. …

2. Existing Stationary Sources

a. Consideration of the net emissions increase shall be triggered for any physical change or change in the method of operation that would increase emissions of VOC or NO_X by ~~25~~40 tons per year or more, without regard to any project decreases.

b. The owner or operator of an existing stationary source with a potential to emit 50 tons per year or more of VOC shall provide VOC offsets for each physical change or change in the method of operation that would result in a net emissions increase of ~~25~~40 tons per year or more of VOC.

c. The owner or operator of an existing stationary source with a potential to emit 50 tons per year or more of NO_X shall provide NO_X offsets for each physical change or change in the method of operation that would result in a net emissions increase of ~~25~~40 tons per year or more of NO_X.

3. Offsets shall be required at a ratio of 1.~~1~~0 to 1.

4. …

5. The provisions of this Subsection shall not apply to any increase in NO_X or VOC emissions that is a direct result of and incidental to the:

a. installation of abatement equipment or implementation of a control technique required to comply with another state or federal regulation, consent decree, or other enforcement action; or

b. voluntary installation of a pollution control project on an existing emissions unit that reduces emissions of air pollutants from such unit.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:2054.

HISTORICAL NOTE: Promulgated by the Department of Environmental Quality, Office of Air Quality and Radiation Protection, Air Quality Division, LR 19:176 (February 1993), repromulgated LR 19:486 (April 1993), amended LR 19:1420 (November 1993), LR

21:1332 (December 1995), LR 23:197 (February 1997), amended by the Office of Environmental Assessment, Environmental Planning Division, LR 26:2445 (November 2000), LR 27:2225 (December 2001), LR 30:752 (April 2004), amended by the Office of Environmental Assessment, LR 30:2801 (December 2004), amended by the Office of the Secretary, Legal Affairs Division, LR 31:2436 (October 2005), LR 31:3123, 3155 (December 2005), LR 32:1599 (September 2006), LR 33:2082 (October 2007), LR 34:1890 (September 2008), LR 37:1568 (June 2011), LR 38:1232 (May 2012), amended by the Office of the Secretary, Legal Division, LR 38:2766 (November 2012), LR 41:2134 (October 2015), LR 42:**.

APPENDIX K: TECHNICAL SUPPORT DOCUMENT - REFINED AREA AND POINT SOURCE CATEGORY FUTURE EMISSIONS

TECHNICAL SUPPORT DOCUMENT

REFINED AREA AND POINT SOURCE CATEGORY FUTURE EMISSIONS

Louisiana Department of Environmental Quality
602 North 5th Street
Baton Rouge, Louisiana 70802

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EXECUTIVE SUMMARY

Executive Summary

In response to comments received from the United States Environmental Protection Agency, Region 6 on the Louisiana Department of Environmental Quality's draft proposal for redesignation to attainment for the 2008 8-hour Ozone National Ambient Air Quality Standard for the 5-parish Baton Rouge Nonattainment Area, an effort was initiated to build upon and refine the point and nonpoint source growth projections originally presented in the proposal.

Refined growth factors for the years 2022 and 2027 were developed using accepted tools, datasets, and methodologies. The factors were derived from regional and state specific data presented in the following: energy projections from the Energy Information Administration's Annual Energy Outlook, economic forecasts from Economy.com, and BRNA-specific vehicle traffic projections. The refined growth factors were applied to the 2011 base year emissions inventory to project emissions for the years 2022 and 2027.

INTRODUCTION

Introduction

Projected emission inventories are a fundamental component of air quality analyses and estimate the quantity of emissions generated by a wide range of source types. Specifically, this projected inventory will serve as a portion of the projected emissions inventory used to demonstrate maintenance of the 2008 8-hour Ozone National Ambient Air Quality Standard (NAAQS).

In preparation for the Baton Rouge Nonattainment Area (BRNA) redesignation request following three years of monitored compliance with the 2008 8-hour Ozone NAAQS and subsequent clean data determination (72 FR 21178), the Louisiana Department of Environmental Quality (Department) commissioned a future year emissions inventory for the year 2027. The work was completed by Ramboll Environ and Eastern Research Group, Inc. and the Department was provided the resulting report: The Future Year Emission Inventory Projections for the Baton Rouge 5-Parish Ozone Nonattainment Area (Environ Report). The Environ Report contains in-depth discussions on the methodology and reference documentation for the development of the projected emissions.

In response to comments received from the United States Environmental Protection Agency, Region 6 (US EPA R6) that the projected inventories were not properly developed and did not demonstrate maintenance, the Department examined the growth factors and projected emissions provided in the Environ Report. A review of the growth factors used in the Environ Report revealed that the growth factors for point and non-point emissions were overly conservative and did not account for existing rules that will remain in full force and effect after redesignation. In addition, US EPA R6 requested that an intermediate year projection was also needed to support the future year projections. Therefore, a workgroup was developed with representatives from the Department and US EPA R6 to build upon and refine the growth projections.

US EPA R6 staff indicated that the methodologies utilized for the nonpoint emissions inventory projection included in the Clean Air Act Redesignation Substitute for the Houston-Galveston-Brazoria 1- Hour Ozone Nonattainment Area; Texas (Texas Projections) finalized in 80 FR 63429 could be applied in the redevelopment of the BRNA's nonpoint projections. As a result, the Department reviewed the technical support document for the Texas Projections and applied the methodology where appropriate.

The Department reviewed the point source category for more appropriate growth factors that would account for rules that would apply to any potential projects commencing in the BRNA, that all projects must go through the Prevention of Significant Deterioration (PSD) program, or any other federal emission reduction efforts that have been proposed. With these considerations, and a review of recent year actual point source emissions trend data, the Department determined that a zero growth for point source emissions is more appropriate than those provided in the Environ Report.

Growth factors developed under this project do not account for the effects of controls via regulation, rule effectiveness, rule penetration, or technology improvements, etc. Although the effects of controls should be considered, the effects are not quantified.

INTRODUCTION

The future year inventory projections were revised by applying the derived growth factors to the 2011 base year emissions. The remainder of this report details the Department's steps in developing refined point and nonpoint source growth for the BRNA.

2011 Base Year

To allow for the seamless integration of this work with the onroad and nonroad sector emissions inventory projections previously developed, the Department utilized the 2011 base year point and nonpoint emissions from the Environ Report. That emissions data was derived as follows:

"The 2011 area source emissions for the 5-parish Baton Rouge nonattainment area were obtained from the EPA 2011 National Emissions Inventory (NEI), Version 2 (EPA, 2014b). This version of the 2011 NEI was released on December 12, 2014 and ERG downloaded the files on December 16, 2014. One exception to this was that Stage II emissions were not included in the 2011 NEI, Version 2 files; Ramboll Environ gap-filled the missing Stage II emissions using output from the MOVES model runs for on-road motor vehicles. All emissions related to aircraft, railroads, and commercial marine vessels were also removed from the 2011 base year point and area source files."

Area Source Inventory

DATA SOURCES

In the past, source category growth factors reflected projections data that was incorporated into US EPA's Economic Growth Analysis System (EGAS). The latest EGAS projections data was derived from two main resources: Regional Economic Models Incorporated's State-level economic models (REMI); and the United States Department of Energy's Energy Information Administration(EIA) - Energy Information Administration (AEO).

In keeping with past US EPA practice that assumed changes in industry sector output, or sales, are directly related to changes in emission activity for most non-fuel combustion stationary source categories, the AEO was used as the starting point to obtain national and regional specific data. In lieu of REMI, the Department utilized state specific data from Moody's Economy.com to garner data more closely related to the BRNA. Finally, the Department supplemented updated parish population and vehicle data where appropriate. This falls in line with the methodology used in the Texas Projections as previously discussed.

Annual Energy Outlook Data Collection

The EIA published the AEO with projections to 2035. The AEO provides sector-specific consumption projections, as well as production projections at the regional level. Information regarding national petroleum refining capacity projections is also provided.

National projection data was used for the following category:

- On-shore oil and gas production projections

West South Central regional projection data was used for the following categories:

- Industrial sector – coal, distillate, kerosene, other petroleum, propane, renewable, residual, and total
- Commercial sector – kerosene, natural gas, propane, and renewable
- Residential sector – distillate, kerosene, natural gas, and propane
- Transportation sector – other petroleum

Economy.com Economic Data Collection

Moody's Economy.com future year projections are recalibrated each month based upon the most recent monthly economic indicators. As a result, economic changes are gradually reflected over time in the future year projections. Historical economic data and future year economic projections were obtained from Economy.com.

The Department obtained state level gross domestic product expressed in millions of constant 2000 dollars from Economy.com. The data was obtained in March 2016 through the Louisiana Economic Development's license with Economy.com. The Department utilized the more specific state level projections for the following categories:

- Leisure & Hospitality
- Textile, Fiber, & Printing Manufacturing.

Population Data Collection

The Department carried over population growth rates from the Environ Report which obtained growth rates as follows:

"Parish-level population projections were used to develop population-based growth factors (Blanchard, 2014). These latest projections accounted for the lingering population shifts due to Hurricanes Katrina and Rita in 2005. Because the population projections were only developed for every 5 years (i.e., 2005, 2010, 2015, 2020, 2025, and 2030), linear interpolation was used to develop population values for the 2011 base year and the 2027 projection year. As recommended by the documentation for the population projections, the "Middle Series" population scenario was used."

Aggregate population growth was not used for the BRNA in order to account for parish specific activity. Instead, parish level projections for each parish in the BRNA were utilized. The population projection factors indicate population growth in Ascension and Livingston parishes and population decline in East Baton Rouge, Iberville, and West Baton Rouge parishes.

Vehicle Miles Traveled Data Collection

Updated growth rates for vehicle miles traveled (VMT) were established based on projected VMT provided by the Capital Regional Planning Commission (CRPC).

The CRPC developed VMT projections to the years 2022 and 2027 using modeling and Highway Performance Monitoring System (HPMS) totals. The modeled VMT is adjusted to be consistent with the HPMS reported totals and to account for temporality. The model represents a typical, presumably average, weekday. HPMS represents average annual daily traffic, an overall average day of the year including weekend days. But, the emissions projection should be computed for a typical August weekday, so adjustments to both the modeled VMT and reported HPMS VMT totals were needed.

To be consistent, the Department utilized the parish level projections for each parish in the BRNA where appropriate.

VMT	BASE	2027	2027 Growth Rate

Ascension	3,613,486	6,451,730	1.78
East Baton Rouge	13,397,083	13,445,520	1.00
Iberville	1,792,250	1,642,486	0.91
Livingston	3,552,669	6,241,274	1.75
West Baton Rouge	1,969,036	2,223,824	1.23
Total	**24,324,523**	**30,004,834**	**1.12**

GROWTH FACTOR APPLICATION

Projection factor assignments were made at the source category code (SCC) level where the most appropriate growth rate category was associated with the related SCC. These assignments were adjusted from the Environ Report based on the growth rate categories used in the Texas Projections, the previously used EGAS model assigned flat or no growth factors for several source categories that were not expected to vary significantly from year to year or appropriate activity data could not be reasonably assigned; an unchanged projection factor was applied to these source categories.

The table below includes a comprehensive list of all nonpoint source categories and the corresponding projection category used to project growth.

SCC	SCC Description	Projection Category	Data Source
2102002000	Industrial Coal Combustion	Industrial - Coal	2010 AEO
2102004001	Industrial Distillate Combustion - Boilers	Industrial - Distillate	2010 AEO
2102004002	Industrial Distillate Combustion - IC Engines	Industrial - Distillate	2010 AEO
2102005000	Industrial Residual Combustion	Industrial - Residual	2010 AEO
2102007000	Industrial LPG Combustion	Industrial - Propane	2010 AEO
2102008000	Industrial Wood Combustion	Industrial - Renewable	2010 AEO
2102011000	Industrial Kerosene Combustion	Industrial - Kerosene	2010 AEO
2103006000	Commercial/Institutional Natural Gas Combustion	Commercial - Natural Gas	2010 AEO
2103007000	Commercial/Institutional LPG Combustion	Commercial - Propane	2010 AEO
2103008000	Commercial/Institutional Wood Combustion	Commercial - Renewable	2010 AEO
2103011000	Commercial/Institutional Kerosene Combustion	Commercial - Kerosene	2010 AEO
2104004000	Residential Distillate Combustion	Residential - Distillate	2010 AEO
2104006000	Residential Natural Gas Combustion	Residential - Natural Gas	2010 AEO
2104007000	Residential LPG Combustion	Residential - Propane	2010 AEO
2104008100	Residential Wood Combustion - Fireplaces	Residential - Renewable	2010 AEO
2104008210	Residential Wood Combustion - Fireplace Inserts - Non-EPA Certified	Residential - Renewable	2010 AEO
2104008220	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Non-catalytic	Residential - Renewable	2010 AEO

2104008230	Residential Wood Combustion - Fireplace Inserts - EPA Certified - Catalytic	Residential - Renewable	2010 AEO
2104008320	Residential Wood Combustion - Woodstoves - EPA Certified - Non-catalytic	Residential - Renewable	2010 AEO
2104008330	Residential Wood Combustion - Woodstoves - EPA Certified - Catalytic	Residential - Renewable	2010 AEO
2104008400	Residential Wood Combustion - Pellet Stoves	Residential - Renewable	2010 AEO
2104008610	Residential Wood Combustion - Hydronic Heaters	Residential - Renewable	2010 AEO
2104008700	Residential Wood Combustion - Other (Fire-pits, chimeas, etc.)	Residential - Renewable	2010 AEO
2104009000	Residential Wood Combustion - Firelogs	Residential - Renewable	2010 AEO
2104011000	Residential Kerosene Combustion	Residential - Kerosene	2010 AEO
2301030000	Pharmaceutical Manufacturing - Process Emissions	Unchanged	Unchanged
2302002100	Commercial Cooking - Conveyorized Charbroiling	Leisure & Hospitality	Economy.com state GDP
2302002200	Commercial Cooking - Under-fired Charbroiling	Leisure & Hospitality	Economy.com state GDP
2302003000	Commercial Cooking - Deep Fat Frying	Leisure & Hospitality	Economy.com state GDP
2302003100	Commercial Cooking - Flat Griddle Frying	Leisure & Hospitality	Economy.com state GDP
2302003200	Commercial Cooking - Clamshell Griddle Frying	Leisure & Hospitality	Economy.com state GDP
2310000220	Oil & Gas Exploration & Production - Drill Rigs	Oil - On-Shore	2010 AEO
2310000330	Oil & Gas Exploration & Production - Artificial Lift	Oil - On-Shore	2010 AEO
2310000550	Oil & Gas Exploration & Production - Produced Water	Oil - On-Shore	2010 AEO
2310000660	Oil & Gas Exploration & Production - Hydraulic Fracturing	Oil - On-Shore	2010 AEO
2310010100	Oil & Gas Exploration & Production - Oil Well Heaters	Oil - On-Shore	2010 AEO
2310010200	Oil & Gas Exploration & Production - Oil Well Tanks	Oil - On-Shore	2010 AEO
2310010300	Oil & Gas Exploration & Production - Oil Well Pneumatic Devices	Oil - On-Shore	2010 AEO
2310011000	On-Shore Oil Production - All Processes	Oil - On-Shore	2010 AEO
2310011201	On-Shore Oil Production - Tank Truck and Railcar Loading - Crude Oil	Oil - On-Shore	2010 AEO
2310011501	On-Shore Oil Production - Fugitives - Connectors	Oil - On-Shore	2010 AEO
2310011502	On-Shore Oil Production - Fugitives - Flanges	Oil - On-Shore	2010 AEO
2310011503	On-Shore Oil Production - Fugitives - Open Ended Lines	Oil - On-Shore	2010 AEO
2310011505	On-Shore Oil Production - Fugitives - Valves	Oil - On-Shore	2010 AEO

2310021010	On-Shore Gas Production - Storage Tanks - Condensate	Natural Gas - On-Shore	2010 AEO
2310021030	On-Shore Gas Production - Tank Truck and Railcar Loading - Condensate	Natural Gas - On-Shore	2010 AEO
2310021100	On-Shore Gas Production - Storage Tanks - Gas Well Heaters	Natural Gas - On-Shore	2010 AEO
2310021202	On-Shore Gas Production - 4Cycle Compressors (50-499 hp) - Lean Burn	Natural Gas - On-Shore	2010 AEO
2310021251	On-Shore Gas Production - 4Cycle Lateral Compressors - Lean Burn	Natural Gas - On-Shore	2010 AEO
2310021300	On-Shore Gas Production - Gas Well Pneumatic Devices	Natural Gas - On-Shore	2010 AEO
2310021302	On-Shore Gas Production - 4Cycle Compressors (50-499 hp) - Rich Burn	Natural Gas - On-Shore	2010 AEO
2310021351	On-Shore Gas Production - 4Cycle Lateral Compressors - Rich Burn	Natural Gas - On-Shore	2010 AEO
2310021400	On-Shore Gas Production - Gas Well Dehydrators	Natural Gas - On-Shore	2010 AEO
2310021501	On-Shore Gas Production - Fugitives - Connectors	Natural Gas - On-Shore	2010 AEO
2310021502	On-Shore Gas Production - Fugitives - Flanges	Natural Gas - On-Shore	2010 AEO
2310021503	On-Shore Gas Production - Fugitives - Open Ended Lines	Natural Gas - On-Shore	2010 AEO
2310021505	On-Shore Gas Production - Fugitives - Valves	Natural Gas - On-Shore	2010 AEO
2310021506	On-Shore Gas Production - Fugitives - Other	Natural Gas - On-Shore	2010 AEO
2310021603	On-Shore Gas Production - Gas Well Venting - Blowdowns	Natural Gas - On-Shore	2010 AEO
2310111100	On-Shore Oil Exploration - Mud Degassing	Oil - On-Shore	2010 AEO
2310111401	On-Shore Oil Exploration - Oil Well Pneumatic Pumps	Oil - On-Shore	2010 AEO
2310111700	On-Shore Oil Exploration - Oil Well Completions	Oil - On-Shore	2010 AEO
2310121100	On-Shore Gas Exploration - Mud Degassing	Natural Gas - On-Shore	2010 AEO
2310121401	On-Shore Gas Exploration - Gas Well Pneumatic Pumps	Natural Gas - On-Shore	2010 AEO
2310121700	On-Shore Gas Exploration - Gas Well Completions	Natural Gas - On-Shore	2010 AEO
2401001000	Surface Coating - Architectural Coatings	Population – Parish Specific	Environ Report
2401005000	Surface Coating - Auto Refinishing	Industrial - Total	2010 AEO
2401008000	Surface Coating - Traffic Markings	VMT – Parish Specific	CRPC VMT
2401015000	Surface Coating - Factory Finish Wood	Industrial - Total	2010 AEO
2401020000	Surface Coating - Wood Furniture	Industrial - Total	2010 AEO

2401040000	Surface Coating - Metal Cans	Industrial - Total	2010 AEO
2401055000	Surface Coating - Machinery & Equipment	Industrial - Total	2010 AEO
2401065000	Surface Coating - Electronic & Other Electrical	Industrial - Total	2010 AEO
2401070000	Surface Coating - Motor Vehicles	Industrial - Total	2010 AEO
2401080000	Surface Coating - Marine	Industrial - Total	2010 AEO
2401090000	Surface Coating - Miscellaneous Manufacturing	Industrial - Total	2010 AEO
2401100000	Surface Coating - Industrial Maintenance Coatings	Industrial - Total	2010 AEO
2401200000	Surface Coating - Other Special Purpose Coatings	Industrial - Total	2010 AEO
2415000000	Degreasing	Industrial - Total	2010 AEO
2420000000	Dry Cleaning	Population – Parish Specific	Environ Report
2425000000	Graphic Arts	Textile, Fiber, & Printing Mfg.	2010 AEO
2430000000	Rubber/Plastics - All Processes	Industrial - Total	2010 AEO
2440000000	Miscellaneous Industrial - All Processes	Industrial - Total	2010 AEO
2440020000	Miscellaneous Industrial - Adhesive Application	Industrial - Total	2010 AEO
2460200000	Consumer & Commercial Solvents - All Household	Population - Parish Specific	Environ Report
2460500000	Consumer & Commercial Solvents - Coating & Related Products	Population - Parish Specific	Environ Report
2460600000	Consumer & Commercial Solvents - Adhesives & Sealants	Population - Parish Specific	Environ Report
2460800000	Consumer & Commercial Solvents - FIFRA Related Products	Population - Parish Specific	Environ Report
2460900000	Consumer & Commercial Solvents - Miscellaneous Products	Population - Parish Specific	Environ Report
2461021000	Cutback Asphalt Application	Industrial - Other Petroleum	2010 AEO
2461022000	Emulsified Asphalt Application	Industrial - Other Petroleum	2010 AEO
2465000000	Consumer Solvents - All Products	Population - Parish Specific	Environ Report
2465100000	Consumer Solvents - Personal Care Products	Population - Parish Specific	Environ Report
2465200000	Consumer Solvents - Household Care Products	Population - Parish Specific	Environ Report
2465400000	Consumer Solvents - Auto Aftermarket Products	Population - Parish Specific	Environ Report
2465800000	Consumer Solvents - Pesticide Application	Population - Parish Specific	Environ Report
2501011011	Residential Portable Gas Cans /Permeation	Population - Parish Specific	Environ Report
2501011012	Residential Portable Gas Cans /Evaporation (includes Diurnal losses)	Population - Parish Specific	Environ Report
2501011013	Residential Portable Gas Cans /Spillage During Transport	Population - Parish Specific	Environ Report
2501011014	Residential Portable Gas Cans /Refilling at the Pump - Vapor Displacement	Population - Parish Specific	Environ Report

2501011015	Residential Portable Gas Cans /Refilling at the Pump - Spillage	Population - Parish Specific	Environ Report
2501012011	Commercial Portable Gas Cans /Permeation	Commercial - Gasoline	2010 AEO
2501012012	Commercial Portable Gas Cans /Evaporation (includes Diurnal losses)	Commercial - Gasoline	2010 AEO
2501012013	Commercial Portable Gas Cans /Spillage During Transport	Commercial - Gasoline	2010 AEO
2501012014	Commercial Portable Gas Cans /Refilling at the Pump - Vapor Displacement	Commercial - Gasoline	2010 AEO
2501012015	Commercial Portable Gas Cans /Refilling at the Pump - Spillage	Commercial - Gasoline	2010 AEO
2501050120	Petroleum & Petroleum Product Storage - Bulk Terminals	VMT - Total	CRPC VMT
2501055120	Petroleum & Petroleum Product Storage - Bulk Plants	VMT - Total	CRPC VMT
2501060052	Gasoline Stations - Stage 1 - Splash Fill	VMT - Parish Specific	CRPC VMT
2501060053	Gasoline Stations - Stage 1 - Balanced Submerged Fill	VMT - Parish Specific	CRPC VMT
2501060201	Gasoline Stations - Underground Tank Breathing and Emptying	VMT - Parish Specific	CRPC VMT
2501080050	Petroleum & Petroleum Product Storage - Aviation Gasoline - Stage 1	Transportation - Other Petroleum	2010 AEO
2501080100	Petroleum & Petroleum Product Storage - Aviation Gasoline - Stage 2	Transportation - Other Petroleum	2010 AEO
2505000120	Petroleum & Petroleum Product Transport - Gasoline - All Transport Types	VMT - Parish Specific	CRPC VMT
2505030120	Petroleum & Petroleum Product Transport - Gasoline - Truck	VMT - Parish Specific	CRPC VMT
2505040120	Petroleum & Petroleum Product Transport - Gasoline - Pipeline	VMT - Parish Specific	CRPC VMT
2601000000	On-site Incineration - Total	Unchanged	Unchanged
2601020000	On-site Incineration - Commercial/Institutional	Unchanged	Unchanged
2610000100	Open Burning - Yard Waste - Leaves	Population – Parish Specific	Environ Report
2610000400	Open Burning - Yard Waste - Brush	Population – Parish Specific	Environ Report
2610000500	Open Burning - Land Clearing Debris	Population – Parish Specific	Environ Report
2610030000	Open Burning - Household Waste	Population – Parish Specific	Environ Report
2630020000	Wastewater Treatment - Public Owned	Population - Parish Specific	Environ Report
2701200000	Biogenic - Vegetation - Total	Unchanged	Unchanged

2701220000	Biogenic - Vegetation/Agriculture - Total	Unchanged	Unchanged
2801500170	Agricultural Burning - Grasses	Unchanged	Unchanged
2801500181	Agricultural Burning - Wild Hay	Unchanged	Unchanged
2801500250	Agricultural Burning - Sugar Cane	Unchanged	Unchanged
2801500261	Agricultural Burning - Wheat	Unchanged	Unchanged
2801500262	NEW	Unchanged	Unchanged
2810030000	Structure Fires	Population - Parish Specific	Environ Report
2810060100	Cremation	Population - Parish Specific	Environ Report

PROJECTED EMISSIONS

The base year 2011 nonpoint source emissions inventory were projected to 2022 and 2027 using the growth factors derived as discussed above. The results are presented in the table below in tons per day (tpd).

	Nonpoint NOx			Net Change
	2011	2022	2027	2011-2027
Ascension	3.1	3.2	3.2	**0.1**
East Baton Rouge	7.8	8.1	8.1	**0.3**
Iberville	2.9	3.0	3.0	**0.1**
Livingston	1.5	1.6	1.7	**0.2**
West Baton Rouge	1.9	1.9	1.9	**0.0**
BRNA Total	**17.1**	**17.8**	**17.9**	**0.8**
	Nonpoint VOC			**Net Change**
	2011	**2022**	**2027**	**Total**
Ascension	20.7	25.1	26.6	**5.9**
East Baton Rouge	30.8	31.8	31.8	**1.1**
Iberville	18.5	18.7	18.4	**-0.1**
Livingston	8.5	10.6	11.6	**3.1**
West Baton Rouge	4.1	4.2	4.2	**0.1**
BRNA Total	**82.6**	**90.4**	**92.5**	**10.1**

Point Source Inventory

A review of the point source category projected emissions in the Environ Report revealed unrealistic expectations of growth based on AEO projections that are not specific to the BRNA area. The Department reviewed the point source category for more appropriate growth factors that would account for rules that would apply to any potential projects commencing in the BRNA, that all projects must go through the Prevention of Significant Deterioration (PSD) program, or any other federal emission reduction efforts that have been proposed. To more appropriately project point source growth, the Department can appropriately estimate that point source emissions will remain constant rather than increase by the 1.37 and 1.58 growth factors used in the Environ Report for NOx and VOC, respectively.

Louisiana is committed to maintaining all of the current point source emission control measures for VOC and NOx after the BRNA area is redesignated and will continue to implement the PSD program. In addition, the Department has elected to retain the offset requirements under LAC 33:III.504.M as an anti-backsliding measure.

Lastly, actual point source inventory data from 2011 to present supports an assumption of zero growth. Linear trend lines applied to the actual annual point source emissions reveal decreases for both NOx and VOC of 36.79 tpd and 2.82 tpd, respectively. Therefore, an assumption of zero growth is a conservative, realistic projection based on the expected decrease in NOx emissions evident from actual emissions data.

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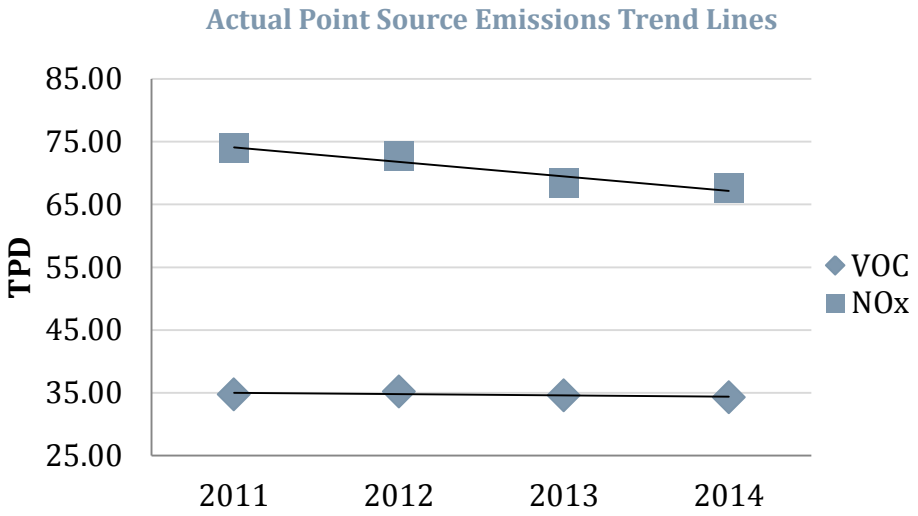

PROJECTED EMISSIONS

The base year 2011 point source emissions inventory projected to 2022 and 2027 will remain constant, as discussed above. The results are presented in the table below in tpd.

POINT SOURCE INVENTORY

	Point NOx			Net Change
	2011	2022	2027	2011-2027
Ascension	20.9	20.9	20.9	**0**
East Baton Rouge	24.8	24.8	24.8	**0**
Iberville	25.6	25.6	25.6	**0**
Livingston	0.2	0.2	0.2	**0**
West Baton Rouge	2.7	2.7	2.7	**0**
BRNA Total	**74.2**	**74.2**	**74.2**	**0**
	Point VOC			**Net Change**
	2011	**2022**	**2027**	**Total**
Ascension	8.5	8.5	8.5	**0**
East Baton Rouge	15.1	15.1	15.1	**0**
Iberville	7.2	7.2	7.2	**0**
Livingston	0.9	0.9	0.9	**0**
West Baton Rouge	2.0	2.0	2.0	**0**
BRNA Total	**33.6**	**33.6**	**33.6**	**0**