Local Government Related Comments

Request for Information Response
Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas

Section 1 - Project Applicant Information

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Section 2 – VW Program and Solicitation Design Questions

1. How should DEQ prioritize projects?
   a. Determine where VW vehicles sold on a pro-rated basis,
   b. Determine areas with greatest air quality challenges,
   c. Ascertain largest impact on air quality based on both new vehicle technology and also on replacement vehicles, and
   d. Select projects with most cost-effective strategy in concert with high NOx reduction and sustained future investment opportunities.

2. What is the anticipated demand for each eligible project type?
   We see specific fuels, vehicle types and technology being sought by specific niche markets and fleet applications; therefore, the greater the flexibility of the funds and eligibility the broader demand across project types. The Coalitions recommend leaving great flexibility in the project types to allow for niche markets, innovative solutions and new technologies. However-

i. Currently, there is little known demand for Marine, Ports, Ferries and Tugs in North Carolina.
ii. Specific interest for NC school bus purchases in the form of alternative fuels and clean diesel.
iii. Identified a high demand for EVSE with local municipalities.

3. The percentage of trust funds, if any, that DEQ should devote to Light Duty Zero Emission Vehicle Supply Equipment.
    a. The Coalitions believe funding should be left as flexible as possible, to allow for emerging technologies and applications.
    b. The Coalitions recommend that some priority is given to DC Fast Charging equipment, especially to fill gaps in network including along DOE designated Alternative Fuel Highway Corridors. We also encourage DAQ to have continued discussions with Electrify America on the installation of DC Fast Charging equipment and to identify remaining gaps.

4. What is the anticipated demand for specific types of diesel emission reduction projects not eligible under the VW settlement but otherwise eligible under DERA or other state programs?
    Coalitions support the State allocating VW funds for DERA due to funding provision for light duty diesel vehicles that are not included in VW settlement categories.

5. Should a certain percentage of available VW funds be allocated to each eligible project type and if so how should the percentage be determined?
    Coalitions advised leaving this funding distribution as flexible as possible and would recommend not allocating funds to categories in the first round, but rather take a "wait-and-see" approach to see where demand is.

6. Should a certain percentage of available Mitigation Trust funds be reserved for government projects?
    Again, we recommend leaving as much flexibility as possible with the funds. However, DAQ should anticipate the government sector as a likely applicant due to more limited funding opportunities versus private sector.

7. Should funds be geographically distributed, and if so how?
    a. Coalitions recommend a pro-rated approach based on where vehicles sold and the areas with greatest air quality challenges.
    b. It is also recommended that the FHWA Alternative Fuel Corridors are considered and supported.

8. Should governmental entities be required to provide matching funds and if so, how much?
   Governments should be required to provide matching funds, to demonstrate commitment and ownership of the project. However, may consider terms that are more favorable and flexible to encourage adoption of program.

9. Should DEQ establish a minimum project size and if so, what size?
   Coalitions do recommend a minimum project size be implemented, in order to expedite project review and limit staff time. Clean Cities Coalitions can work to help bridge capacity to reduce administrative burden, while enabling smaller fleets and projects to participate.

10. In addition to evaluating a proposed project's total cost effectiveness ($/ton), what other key factors should DEQ consider when evaluating projects?
    Additional impacts to consider include:
    a. Larger strategy and organizational vision,
    b. Increased mobility options,
    c. Environmental justice,
    d. Partnership opportunities,
    e. Educational opportunities,
    f. Paring funding request with biodiesel use or other advanced technologies (telematics, idle reduction, etc), and
    g. Identify regions within the state most sensitive to air quality measures including WNC's Class I Areas under the Clean Air Act (GSM National Park and Wilderness Areas).

11. What other feedback do you have on project evaluation and/or scoring criteria?
    Make self-scoring possible through clear and understandable requirements. Provide support for applicants so that this step is not a barrier, but an opportunity for project assessment and chance to prepare the applicant for the greatest success.

12. What publicly available tool(s) should be used to quantify anticipated emission reductions/offsets for eligible mitigation projects?
    AFLEET - Alternative Fuel Life-Cycle Environment and Economic Transportation

13. What, if any, additional resources should be provided and made available?
    a. The Clean Cities Coalitions would urge DAQ to list our Coalitions as a resource to fleets.
    b. Additional tools may include:
       i. GREET - Greenhouse gases, Regulated Emissions, and Energy use in Transportation Model,
       ii. MOVES - Motor Vehicle Emissions Simulator,
       iii. Diesel Emissions Quantifier (DEQ), and

   iv. CMAQ Emission Calculator Toolkit for Alt Fuel Vehicles and Infrastructure
c. Additional local organizations include:
   i. Advanced Energy's Plug-In NC, and
   ii. NC Clean Energy Technology Center
d. Trade associations and companies and national education organizations:
   i. NGV America,
   ii. Propane Education and Research Council (PERC),
   iii. Electric Drive Transportation Association,
   iv. Plug-In America,
   v. NASEO VW Toolkit,
   vi. PSNC Energy,
   vii. Piedmont Natural Gas, and
   viii. Duke Energy

14. What methods could DEQ employ to reduce barriers and increase participation in future solicitations for projects?
    a. Consider an online based voucher or rebate program with a simplified application form and process.
    b. Consider funding regional entities (ie, Clean Cities Coalitions or COGs) that could then carry out funding opportunities that adhere to overarching state eligibility and selection guidelines but are carried out on a more flexible timeline and application process than the state can manage.
    c. State or contractor should do the emission calculations to ensure consistency.
    d. Utilize assistance of Clean Cities Coalitions for education and outreach and technical assistance to applicants.

15. What information/resources would be most valuable for stakeholders interested in submitting projects and what is the best way to communicate those?
    a. Technical support workshops, webinars, and staff available to run through ideas and proposal ideas to determine eligibility and feasibility, reviews of proposals, etc.
    b. Existing groups and associations that can help assemble key partnerships and strategically impactful proposals.
    c. Ensure that resources and support with regional/local knowledge are available to applicant.
    d. Inclusion of a FAQ on the DAQ website.

MECKLENBURG COUNTY
Land Use and Environmental Services Agency
- AIR QUALITY -

December 28, 2017

Transmitted Via Email

NC VW Settlement RFI

Division of Air Quality – Mobile Sources

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MAIL SERVICE CENTER RALEIGH NC 27699-1641.

daq.NC_VWGrants@ncdenr.gov

Mr. Abraczinskas,

Thank you for the opportunity to provide input into the North Carolina VW Mitigation Plan. This funding represents a unique opportunity to improve public health by mitigating the excess emissions caused by affected Volkswagen vehicles.

Mecklenburg County Air Quality (MCAQ) intends to apply for mitigation funding for eligible projects in the Charlotte region. As a local air quality agency with the goal to improve ambient air quality and reduce exposure to unhealthy airborne pollutants, our mission aligns well with the goals of the VW mitigation funding. MCAQ would use VW funding to help maintain compliance with National Ambient Air Quality Standards (NAAQS) by reducing ozone-forming nitrogen oxide (NOx) emissions.

The following comments related to project evaluation criteria and solicitation design are submitted for your consideration:

Project Evaluation Criteria

Rank projects by cost-effectiveness ($/ton of NOx reduced). Ranking projects by cost effectiveness will maximize emission reductions and public health benefits.

Prioritize projects in areas with a history of nonattainment with the health-based ozone standard or prioritize areas by current ozone design value. After decades of nonattainment with the Ozone NAAQS, Mecklenburg County and the Charlotte region were designated attainment for the ground-level ozone NAAQS in 2017. However, the region continues to have the highest design value in the state.

Prioritize projects in areas where mobile sources contribute most of the ozone-forming emissions. In Mecklenburg County, almost 90% of ozone-forming NOx emissions come from mobile sources.

Prioritize projects in areas with large populations. As the state's largest metropolitan area, reducing emissions in the Charlotte region will benefit 2.5 million North Carolinians.

Prioritize projects from organizations that have a successfully completed grant-funded projects in the past. MCAQ has a successful track record of administering grant-funded programs that benefit citizens. In 2007, MCAQ launched an innovative air quality improvement program called **G**rants to **R**eplace **A**ging

Diesel **E**ngines or GRADE. GRADE is designed to reduce oxides of nitrogen (NOx) from mobile sources, by providing businesses and organizations funding incentives to replace or repower heavy-duty on-road and non-road equipment with newer, cleaner, less polluting engines. GRADE relies heavily on receiving federal grants which are then sub-granted to applicants not only in Mecklenburg County, but also in the many counties surrounding it. To date, GRADE projects have achieved a total of 714 tons of actual NOx reductions for the region. This large reduction in NOx, a precursor to ozone, helped the region reach attainment for the ozone NAAQS.

Solicitation Design

The North Carolina Department of Environmental Quality (NCDEQ) should design a solicitation process that is simple and provides easily comparable data in order to rank projects. The solicitation design should include the following components:

- Minimize application paperwork, target having a one-page application.
- NCDEQ staff or their designee should perform all emissions calculations.
- NCDEQ staff or their designee should be available by phone or in person meeting to answer questions and assist companies with the funding process.
- North Carolina's VW website should house needed forms, call for project information, and if possible, a video to explain the process and highlight the benefits of completing a project.

Lastly, NCDEQ should consider spending some of the WV funding on marketing. MCAQ's experience administering GRADE showed that direct phone marketing was an effective way to reach busy equipment and vehicles owners. This type of marketing also results in a database of company and municipality contacts that could be eligible for funding.

Again, thank you for the opportunity to provide input into the North Carolina VW Mitigation Plan. If you have any questions about the comments above, please contact Megan Green of my staff at 980-314-3368 or Megan.Green@MecklenburgCountyNC.gov.

Sincerely,

Leslie W. Rhodes

Leslie Rhodes

Air Quality Director

C:

Megan Green

Jennifer Fickler

PJ McKenzie

Forsyth County General Services Department

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Section 1
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Section 3

1. Class 8 Local Freight Trucks and Port Drayage Trucks with 1992-2009 model year engines and a Gross Vehicle Weight Rating (GVWR) greater than 33,000 pounds (lbs).

3. Class 4-7 Local Freight Trucks with 1992-2009 model year engines and a GVWR between 14,001 and 33,000 lbs.

Project Summary:

Both vehicles being submitted under the request are utilized in the County of Forsyth.

Dump trucks for local government use.

Vehicle replacement with cleaner engine technology.

2 vehicles for replacement.

Emission reduction will be achieved with newer technology that allows for lower emission ratings.

Total cost of project will be $214,130.48

The overall benefit of the project will be reduction in PM 2.5, CO, NOX, SO2, and VOC. The break down per truck is listed below.
1997 International Truck
-3.62 kg/yr PM 2.5
-6.18 kg/yr CO
-27.00 kg/yr NOX
-.33 kg/yr SO2
.2.20 kg/yr VOC

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2002 GMC Truck
-1.57 kg/yr PM 2.5
-5.02 kg/yr CO
-13.90 kg/yr NOX
-.22 kg/yr SO2
-1.79 kg/yr VOC

Project Detail:

1. 1997 International Dump Truck. Vin# 1HTGGAUR6WH507040.

Engine type is L-10 Cummins

Model Year is 1997
Diesel Fuel

230 Gallons used in a year

2,052 miles driven per year.

Current mileage, 43,351.

Replacement Vehicle.

2019 International 7400 SBA 6X4 (SF625)

Engine Size Cummins L9

Reduction in emissions.

Tier level. Not specified

Fuel type. Diesel

2. 2002 GMC Dump Truck. Vin# 1GDM7H1C62J516716.

Engine type is 3126 Cat Engine

Forsyth County General Services Department

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Model year is 2002

Diesel Fuel

143 Gallons used in a year

1,995 miles driven per year.

Current mileage, 46,601.

Replacement Vehicle.

2019 International 4300 SBA 4X2 (MA025)

Engine type is Cummins B 6.7
Reduction in emissions.

Tire level: Not Specified

Fuel type: Diesel

Capital and project cost: @214,130.48 for replacement of both trucks.

Expected proposed project benefits: The expected benefits is a great reduction in emissions. As listed below the breakdown per vehicle is provided.

1997 International Truck
-3.62 kg/yr PM 2.5
-6.18 kg/yr CO
-27.00 kg/yr NOX
-.33 kg/yr SO2
.2.20 kg/yr VOC
2002 GMC Truck
-1.57 kg/yr PM 2.5
-5.02 kg/yr CO
-13.90 kg/yr NOX
-.22 kg/yr SO2
-1.79 kg/yr VOC

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Planning Today for Clean Air Tomorrow

FAYETTEVILLE METROPOLITAN AREA AIR QUALITY STAKEHOLDERS

GARY SLATER
Chair Emeritus

CAROLYN JUSTICE-HINSON
Vice-Chair

29 Dec 2017

In the light of the $92 million allocation from the Volkswagen Settlement to North Carolina, The Fayetteville Metropolitan Area Air Quality Stakeholders make the following recommendations for projects:

- To implement a primary focus of allocations on transitioning from older diesel engines to electric vehicles.
- Including allocation of funds to be used for the purpose of swapping short-range driving diesel vehicles to electric vehicles, including: municipal, utility and fleet vehicles, fleet vehicles used on college and university campuses, airport ground transportation, etc.
- Allocate a portion of the funds to encourage private sector diesel engine owners of vehicles or equipment 7-25 years old or older to transition to newer, cleaner burning engines, either through upgrading or by purchasing new equipment. This allocation may be in the form of rebates or other incentive programs of a sufficient amount to ensure a measurable impact.
    - Proposed model would allocate 1% of total VW Settlement for retrofit of catalytic converters and PM Filters for up to 200 older diesel engines statewide with an incentive of $5,000 per engine, reducing NOX by a minimum of 70% and particulate matter by up to 90% per vehicle. [1]

[1] Based on available EPA verified technologies for reducing diesel emissions.

A healthful environment for all current and future citizens of Cumberland County and the Fayetteville Metropolitan Planning Area

Ozone Advance Program

Action Plan

Cumberland County, North Carolina

A joint effort by USEPA Region 4, North Carolina Department of Environment and Natural Resources, and the Cumberland County Board of Commissioners, Town of Falcon, City of Fayetteville, Fort Bragg Military Reservation, Town of Godwin, Town of Hope Mills, Town of Linden, Town of Spring Lake, Town of Stedman and Town of Wade and the Fayetteville Area Metropolitan Planning Organization

Table of Contents

1. Purpose of the Ozone Advance Program

1.0 Introduction

The Ozone Advance is a collaborative effort between the EPA, states, tribes, and local governments. The program encourages expedition emission reductions in ozone attainment areas to help these areas continue to meet the National Ambient Air Quality Standards (NAAQS) for ground-level ozone. Specifically, the Ozone Advance Program will:

- Help attainment areas reduce emissions to ensure continued health protection,
- Better position areas to remain in attainment, and
- Efficiently direct available resources towards actions to address ozone problems quickly.

Ozone Advance promotes local actions to reduce ozone precursors in attainment areas to help these areas continue to maintain the ozone NAAQS. The program encourages states, tribes, and local governments to take proactive steps to keep their air clean.

Ozone Advance is distinct from the former Early Action Compact (EAC) program in that it focuses on attainment areas, and it does not provide regulatory flexibility in the form of deferred designations or otherwise. The programs are similar, however, in terms of their encouragement of early actions to reduce ozone precursors, and the development of stakeholder groups.

1.1 Background and Stakeholders Involvement

The Clean Air Act (CAA), as amended in 1990, is the most recent version of a law first passed in 1970. The 1990 Amendment made some major changes in the Act, by empowering the US Environmental Protection Agency (EPA) to set up permitting and enforcing programs for larger sources that release pollutants into the air.

On July 17, 1997, the EPA promulgated revised National Ambient and Air Quality Standards, addressing changes in the Ozone and moving from 1-hour standard to an 8-hour standard, as longer exposure to ozone have been proven to have a significant impact on people and the environment. The new primary and secondary standard was set to 0.08 parts per million (ppm) for ground-level ozone.

In 2002, the EPA proposed a new program: The Early Action Compact (EAC), to areas in the country that would meet certain criteria. Each participating area was to have an Early Action Compact Memorandum of Agreement signed by December 31, 2002. The Chairman of the Cumberland County Board of Commissioners originally signed the EAC Memorandum of Agreement on December 13, 2002. The Early Action Plan, a document outlining local, state, and federal strategies to reduce ozone precursors, followed. Milestones set by EPA were met by Cumberland County resulting in designation as an Ozone Attainment Area in April 2008. Ground level ozone standards were changed once more in 2008 and set at 0.075 ppm and updated again in 2015 to .070ppm. Cumberland County elected to continue with the air quality regional efforts in

the hope that uninterrupted work would further the ozone precursors reduction. The Cumberland County Air Quality Stakeholders Committee, which was formed as a part of the EAC and met monthly to discuss and implement air quality improvement strategies.

As a former Early Action Compact Region this area decided it was advantageous to participate in this program and the Cumberland County Board of Commissioners approved participation in the Ozone Advance (OA) Program to continue the efforts initiated in 2002. Chairman W. Marshall Faircloth signed the letter of interest on September 4, 2012. Every municipality within Cumberland County signed a resolution of support and commitment to participate in the OA program in 2013. All municipalities, including Cumberland County, were approached in early 2017 to commit to supporting Ozone Advanced again this time with the updated standard. City of Fayetteville, Town of Hope Mills, Town of Spring Lake, Town of Eastover, and Town of Wade each passed resolutions of commitment. Town of Godwin, Town of Stedman and Cumberland County are pending for spring 2018.

The Stakeholders underwent major organizational changes beginning in 2016. These changes began with revising the by-laws in early 2016 to mandate a quarterly meeting schedule in conjunction with the Combined Air Team (CombAT). CombAT members are listed as AQ stakeholders. During 2016 and into early 2017 the Stakeholders were moved as a committee under the jurisdiction of Cumberland County, to a committee of the Fayetteville Area Metropolitan Planning Organization (FAMPO). The jurisdictional change resulted in an expanded coverage area for stakeholder group, and extended the term limits of the Air Quality Stakeholder members. The stakeholder group now includes all areas of the FAMPO services area and all communities in Cumberland County. Under FAMPO there are no term limits for members. The Stakeholders adopted a new name, *The Fayetteville Planning Area Air Quality Stakeholders* and By Laws in 2017.

The new areas represented in the Fayetteville Planning Area Air Quality Stakeholders will be approached in early 2018 to sign a commitment to Ozone Advanced. These areas include the Town of Raeford, Hoke County, and the Town of Parkton. Demographic information about the FAMPO region is included in this report along with updates from the Town of Parkton.

The Stakeholders' committee was previously supported by Combined Air Team (CombAT) that includes members of Cumberland County, City of Fayetteville, Fayetteville State University, Public Works Commission, Fayetteville Area System of Transit (FAST), the Fort Bragg Air Team. These members are listed as AQ Stakeholders as they meet regularly with the AQ Stakeholders. Some previous members of CombAT are on call to provide the Stakeholders with technical information and administrative assistance.

The Public Involvement does not end with the Stakeholders. An aggressive process of education and outreach into the community has been documented since the beginning of this endeavor, to include involvement of the Public-School Systems (Cumberland County and Fort Bragg), utility providers, the Plant Managers Association, and any Organization requesting presentations. The Air Quality web page, maintained by FAMPO staff, provides information on the local effort and related links (http://www.fampo.org/airquality.htm). FAMPO contracts with Sustainable Sandhills to plan and implement air quality related programs throughout their region. Minutes of the Stakeholders' meetings and list of outreach and presentations are on file and open to the public.

Table 1. Fayetteville Planning Area Air Quality Stakeholders

NAME	STAKEHOLDER
Carolyn Justice Hinson	PWC
Gary Slater	DAQ Americas
Tracy Jackson	Cumberland County Representative
Councilwoman Kathy Jensen	City of Fayetteville
Daniel Rodriguez	Citizen/Soldier
Robert Van Geons	Fayetteville Cumberland County Economic Development Chamber
Hanah Ehrenreich	Sustainable Sandhills
Open	Town of Falcon
Johnny Lanthorn	Town of Wade
John Gillis (?)	Homebuilders Association
Jon Parsons	Environmental Rep/Energy Manager @ FSU
Celestine Raineri-Smith	Board of Health
Christopher Frank	Citizen
Gabriel Marshall	Hoke County Citizen
Gregory Bean	Citizen
Erik Mitchell	Ft. Bragg DPW
Lee Worsley	Triangle J Council of Government Executive Director
Eloise M. Sahlstrom	Planning Dept./Development Services City of Fayetteville
Jennifer McHone Sides	Senior Environmental Technician at NC DENR, Division of Air Quality
Open	Environmental Services Director at City of Fayetteville
Kim Nazarchyk	Town of Eastover Town Manager
Tim Garner	Stormwater Administrator @ Spring Lake
Al McMillan	Town of Parkton Mayor
Commissioner Bryan A. Marley	Hope Mills
Open Position	City of Raeford
Open Position	Robeson County
Glenn Prillaman	RLUAC
David McRae	Harnett County Planning
Janet Robertson	Lumber River Council of Governments
Eric Lindstrom	Architect

Regional Characteristics

The new AQ Stakeholder region includes all the FAMPO area and all of Cumberland County (**Figure 1).** FAMPO was established in 1975 by the federal surface transportation assistance act of 1973. Any urbanized area with a population greater than 50,000 was designated as a Metropolitan Planning Organization (MPO). Until 2010 the MPO boundaries included Fayetteville, Hope Mills, Spring Lake, Fort Bragg, Pope Army Field, and portions of Harnett and Cumberland county. Following the 2010 Census the boundaries were expanded to include portions of Robeson County, including the town of Parkton and portions of Hoke County including the town of Raeford. The total population of the planning area in 2010 was 372,000.

Cumberland County is a mixture of urban and rural areas. The 2014 census population was updated for Cumberland County was 326,328. The 2010 census population for Cumberland County was 319,431 of which 42,702 rural population and 276,729 located within the Urbanized Area.

Population density is varied, as shown in **Table 2A.** Because of the difference in land use and densities, care was exercised when proposing and selecting strategies to be implemented by several jurisdictions.

Figure1. Map of FAMPO Region and Cumberland County

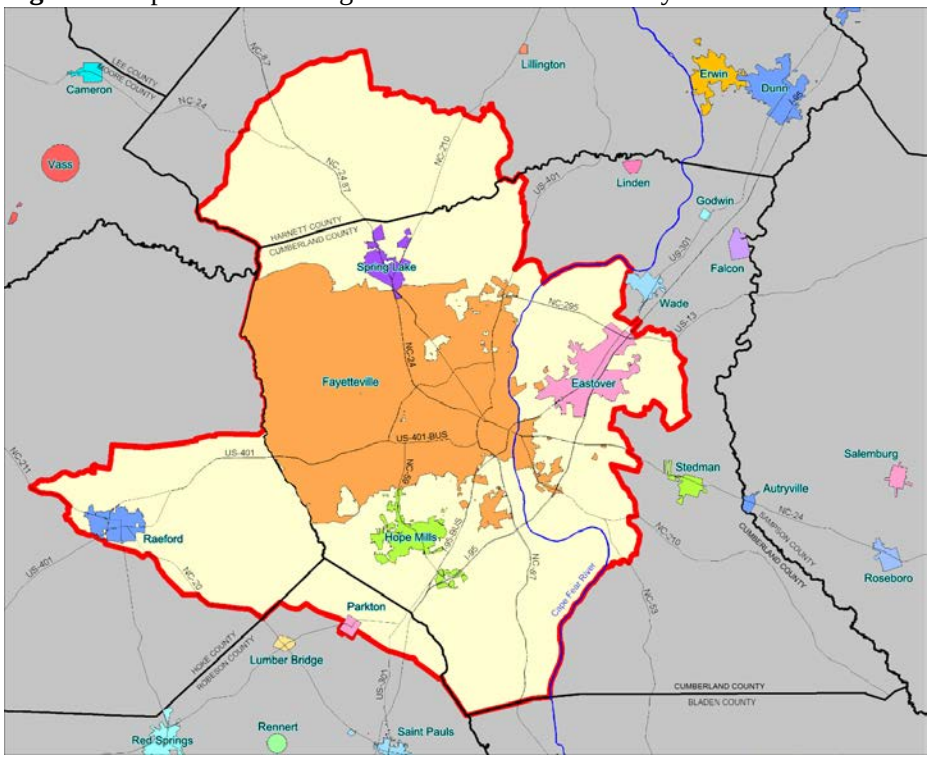


Table 2A. Census 2010 Demographic Information

JURISDICTION	POPULATION	LAND AREA/Sq.Mi.	DENSITY/Sq.Mi.
Eastover	3,628	11.33	320.3/sq.mi
Falcon(Part)	258	1.21	213.2/sq.mi
Fayetteville	200,564	145.84	1375.2/sq.mi
Godwin	139	0.52	269/sq.mi
Hope Mills	15,176	6.94	2186/sq.mi
Linden	130	0.51	257.2/sq.mi
Spring Lake	11,964	23.06	518.8/sq.mi
Stedman	1,028	2.08	493.9/sq.mi
Wade	556	1.79	311.4/sq.mi
Cumberland County	**319,431**	**652.31**	**489.7/sq.mi**
Parkton	436	.62	703.23/sq.mi
Raeford	4,611	3.8	1213/sq.mi
FAMPO	**372,000**		

1.3 Local Efforts

In April 2001, Fort Bragg Military Reservation began planning and implementing strategies to become a sustainable installation. As part of this effort, several individuals within the surrounding Counties began working with the Military Installation to aid in the process, including the planning and implementation schedule of air quality initiatives for the metropolitan statistical area. At that point, building partnerships in support of a sustainable region was the next logical and necessary step. In partnership with the North Carolina Department of Environment and Natural Resources and stakeholders from the surrounding counties and communities, this partnership evolved into an independent community-based environmental nonprofit called Sustainable Sandhills in February 2003, with the mission to provide education, demonstration, and collaboration to preserve the environment of the Sandhills within a six-county region. In 2017 Sustainable Sandhills expanded to include two additional counties, bringing the total reach to eight counties.

The local and regional efforts to attain sustainability began prior to the development of the EPA's Early Action Compact, demonstrating the commitment of this area in attaining and maintaining healthy environment now, and for generations to come. The Air Quality Stakeholders/Technical Committee, Fort Bragg, and Sustainable Sandhills participants are working together to ensure a united campaign and to avoid duplicated efforts.

2. Overview of Air Quality in Cumberland County

The NCDAQ monitors levels of all criteria pollutants in Cumberland County and reports these levels to the EPA. According to the most recent data, Cumberland County is meeting NAAQS for all the pollutants. Federal enforcement of the ozone NAAQS is based on a 3-year monitor "design value". The design value for each monitor is obtained by averaging the annual fourth highest daily maximum 8-hour ozone values over three consecutive years. If a monitor's design value exceeds the NAAQS, that monitor is in violation of the standard. The EPA may designate part or all of the metropolitan statistical area (MSA) as nonattainment even if only one monitor in the MSA violates the NAAQS. There are two ozone monitors in Cumberland County. One of the monitors is located northeast of Fayetteville (**Wade**) and the other was formerly located in Golfview but switched to a new location southeast of Fayetteville (**Honeycutt**) in Spring 2015 (March/April). For the 2017 update there is no design values for Honeycutt. The tables below will show Golfview for historical context.

Figure 2. Map of Ozone Monitor Locations

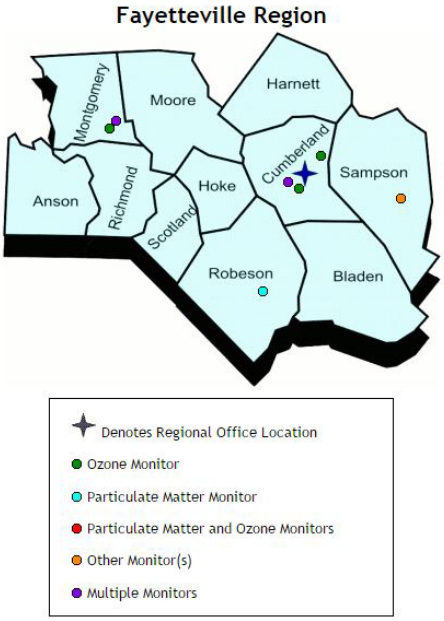


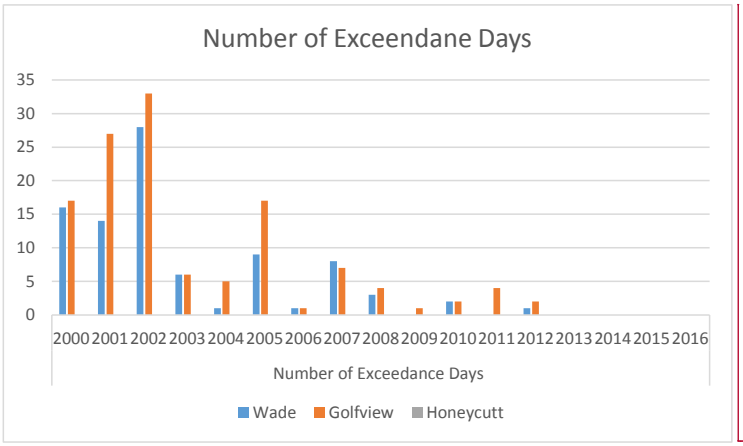
Table 3. Summary of 4th Highest 8-Hour Ozone Values (ppm)

	4th Highest Maximum Daily 8-Hour Average Ozone Concentration (ppm)																
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Wade	86	80	94	86	72	84	72	80	75	64	71	73	68	62	61	60	64
Golfview*	83	84	95	82	77	91	74	82	75	65	73	76	69	62	66	--	--
Honeycutt*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	64

Table 3A. Number of Exceedance Days (Maximum Daily 8-hr Average Ozone Concentration*)

	Number of Exceedance Days																
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Wade	16	14	28	6	1	9	1	8	3	0	2	0	1	0	0	0	0
Golfview*	17	27	33	6	5	17	1	7	4	1	2	4	2	0	0	--	--
Honeycutt*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0

Graph 1. Number of Exceedance Days



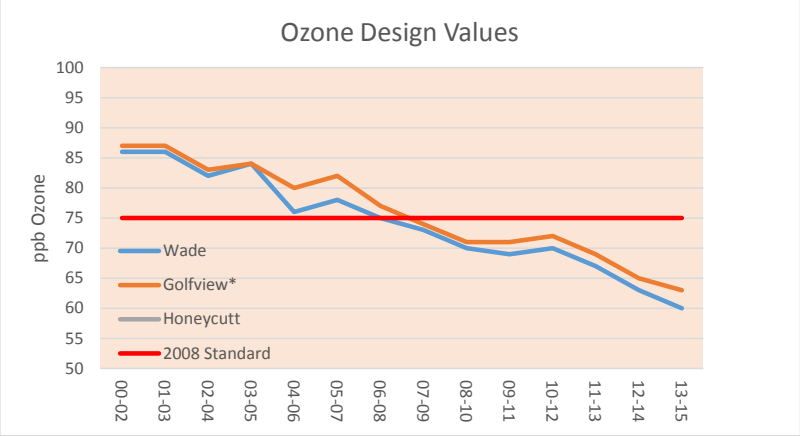
Commented [NJ1]: Change this!

*2000 -2014 exceedance days based on maximum Ozone Concentration of >75ppb. 2015-2016 exceedance days based on maximum Ozone Concentration of >70ppb

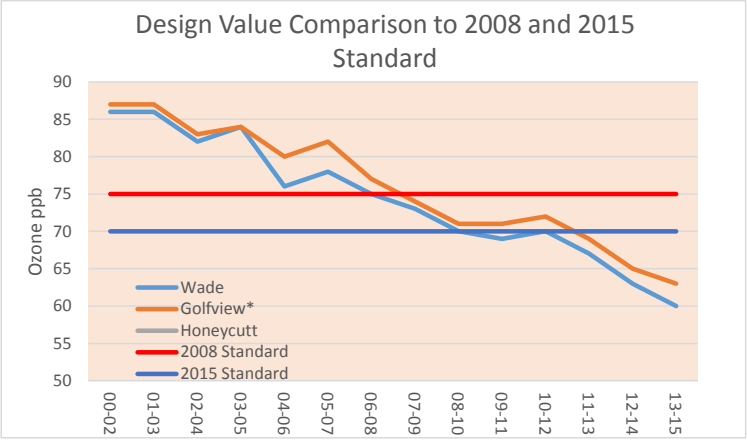
Table 4. Summary of Design Values (ppm) – Shaded areas exceeded 0.075 pm O_3 NAAQS Standard

	Ozone Design Values (ppb)													
	00-02	01-03	02-04	03-05	04-06	05-07	06-08	07-09	08-10	09-11	10-12	11-13	12-14	13-15
Wade	86	86	82	84	76	78	75	73	70	69	70	67	63	60
Golfview*	87	87	83	84	80	82	77	74	71	71	72	69	65	63
Honeycutt	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Graph 2. Fayetteville Monitoring Sites Design Values



Graph 2A. Design Value Comparison to 2008 and Proposed Standards



On September 7, 2016 EPA finalize the Cross-State Air Pollution Rule for the 2008 National Ambient Air Quality Standards. The rule will go into effect in 2017 to reduce NOx further reducing ground level ozone.

EPA Cross State air pollution projections for the area in 2013 show both region monitors with ozone values below 70 parts per billion (ppb) as indicated in **Table 5.** The trends in actual ozone values following 2013 have demonstrated the projections to be correct.

Additional published projections can be found shown on **Table 6** from the **Appendix B 8-Hour Ozone Design Values for Air Quality Modeling Scenarios** of the 2012 *Air Quality Modeling Technical Support Document: 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards Final Rule* (EPA-45/R-12-004)

Table 5. EPA Cross State air pollution rule projections in ppb

Table 5. EPA Cross State air pollution rule projections in ppb

Monitor Location	**A**	**B**	**C**	**D**		**E**	**F**	**G**	**H**
Wade	78.0	80.0	67.7	69.4		65.4	67.1	**65.0**	**66.7**
Golfview	81.7	83.0	70.7	71.8		68.4	69.5	**68.1**	**69.2**
A: 2003-2007 Average Ambient Values B: 2003-2007 Maximum Ambient Values C: 2012 Base Case Average Values D: 2012 Base Case Maximum Values					E: 2014 Base Case Average Values F: 2014 Base Case Maximum Values G: 2014 Remedy Average Values H: 2014 Remedy				

					Maximum Values				
The Base cases are emissions that are “on the books”. The Remedy case includes emissions reductions from the Cross State air pollution rule. The modeling indicates ozone design values should be below 70ppb by 2014.									

Table 6. Model Ozone Projections

Monitor Location	2009-2013 Average Design Value	2009-2013 Maximum Design Value	2017 Projected Average Design Value	2017 Projected Maximum Design Value
Cumberland (Wade)	68.7	70.0	59.3	60.4
Cumberland (Golfview)	70.7	72.0	60.2	61.3
According to the EPA Transport for the 2008 Ozone NAAQS: 2009-2013 base period and projected 2017 design values at individual monitoring sites based upon EPA's updated air quality modeling released in the July 2015 Notice of Data Availability. The 2009 - 2013 base period average and maximum design values. The projected 2017 average and maximum design values. http://www.epa.gov/airtransport/ozonetransportNAAQS.html				

Table 7. 8-Hour Ozone Design Values for 2017-2025 LD GHG Scenarios (units per ppb)

State	County	2005 Baseline DV	2030 Reference Case DV	2030 Control Case DV
North Carolina	Cumberland	81.7	**57.62**	**57.68**
Where Reference Case DV is with projections without new vehicle standards and Control Case DV is with projections that include new vehicle standards Source: http://www.epa.gov/otaq/climate/documents/454r12004.pdf				

Both observed data and projected data reinforce the downward trend that shows a reduction of NOx and VOCs, with ground level ozone values ranging from 0.094/95 ppm in 2002 to 0.068/69 ppm in 2012 and projected DVs of 0.062 ppm in 2018 and 0.57 ppm in 2030.

3. Ozone Health Effects and Sources

3.0 Overview of Ozone

Ozone (O_3) is a tri-atomic ion of oxygen. In the stratosphere or upper atmosphere, ozone occurs naturally and protects the Earth's surface from ultraviolet radiation. Ozone in the lower atmosphere is often called ground-level ozone, tropospheric ozone, or ozone pollution to distinguish from upper-atmospheric or stratospheric ozone. Ozone does occur naturally in the lower atmosphere (troposphere), but only in relatively low background concentrations of about 0.030 parts per million (ppm), well below the NAAQS. The term "smog" is also commonly used to refer to ozone pollution. Although ozone is a component of smog, smog is a combination of ozone and airborne particles having a brownish or dirty appearance. It is possible for ozone levels to be elevated even on clear days with no obvious "smog". In the lower atmosphere, ozone is formed when airborne chemicals, primarily nitrogen oxides (NOx) and volatile organic compounds (VOCs), combine in a chemical reaction driven by heat and sunlight. These ozone-forming chemicals are called precursors to ozone. Man-made NOx and VOC precursors contribute to ozone concentrations above natural background levels. Since ozone formation is greatest on hot, sunny days with little wind, elevated ozone concentrations tend to occur during the warm weather months, generally May through September. In agreement with EPA's guidance, North Carolina operates ozone monitors from April 1 through October 31 to capture high ozone events.

3.1 Ozone Health Effects

The form of oxygen humans need to breathe is O_2. When we breathe ozone, it acts as an irritant to our lungs. Short-term, infrequent exposure to ozone can result in throat and eye irritation, difficulty drawing a deep breath, and coughing. Long-term and repeated exposure to ozone concentrations above the NAAQS can result in reduction of lung function as the cells lining the lungs are damaged. Repeated cycles of damage and healing may result in scarring of lung tissue and permanently reduced lung function. Health studies have indicated that high ambient ozone concentrations may impair lung function growth in children, resulting in reduced lung function into adulthood. In adults, ozone exposure may accelerate the natural decline in lung function that occurs as a part of the normal aging process. Ozone may also aggravate chronic lung diseases such as emphysema and bronchitis and reduce the immune

system's ability to fight off bacterial infections in the respiratory system. Asthmatics and other individuals with respiratory disease are especially at risk from elevated ozone concentrations. Ozone can aggravate asthma, increasing the risk of asthma attacks that require a doctor's attention or the use of additional medication. According to the EPA, one reason for this increased risk is that ozone increases susceptibility to allergens, which are the most common triggers for asthma attack. In addition, asthmatics are more severely affected by the reduced lung function and irritation that ozone causes in the respiratory system. There is increasing evidence that ozone may trigger, not just exacerbate, asthma attacks in some individuals.

All children are at risk from ozone exposure because the often spend a large part of the summer playing outdoors, their lungs are still developing, they breathe more air per pound of body weight, and they are less likely to notice symptoms. Children and adults who frequently exercise outdoors are particularly vulnerable to ozone's negative health effects because they are repeatedly exposed to elevated ozone concentrations while breathing at an increased respiratory rate.

3.2 Ozone Sources

Ozone-forming pollutants or precursors are volatile organic compounds (VOCs) and nitrogen oxides (NOx).

3.2.1 Volatile Organic Compounds

Volatile organic compounds (VOCs) are sometimes referred to as hydrocarbons. In North Carolina, large portions of precursor VOCs are produced by natural, or biogenic, sources, which are primarily trees. Man-made or anthropogenic VOCs also contribute to ozone production, particularly in urban areas. Sources of anthropogenic VOCs include unburned gasoline fumes evaporating from gas stations and cars, industrial emissions, and consumer products such as paints, solvents, and the fragrances in personal care products.

3.2.2 Nitrogen Oxides

Nitrogen oxides (NOx) are produced when fuels are burned and result from the reaction atmospheric nitrogen at the high temperatures produced by burning fuels. Power plants and highway motor vehicles are the major contributors in urban areas, and off-road mobile source equipment (such as construction equipment, lawn care equipment, trains, boats, etc.) are the major sources of NOx. Other NOx sources include "area" sources (small, widely-distributed

sources) such as fires (forest fires, backyard burning, house fires, etc.), and natural gas hot water heaters. Generally, North Carolina, including the Fayetteville area, is considered "NOx-limited" because of the abundance of VOC emissions from biogenic sources. Therefore, current ozone strategies focus on reducing NOx. However, VOC reduction strategies, such as control of evaporative emissions from gas stations and vehicles, could reduce ozone in urban areas where biogenic VOC emissions are not as high.

3.2.3 NOx and VOCs

The following lists the sources, by category, that contribute to NOx and VOC emissions:

Biogenic: Trees and other natural sources
Mobile: Vehicles traveling on paved roads: cars, trucks, buses, motorcycles, etc.
Non-road: Vehicles not traveling on paved roads: construction, agricultural, and lawn care equipment, motorboats, locomotives, etc.
Point: "Smokestack" sources: industry and utilities
Area: Sources not falling into above categories. For VOCs, includes gas stations, dry cleaners, print shops, consumer products, etc. For NOx, includes forest and residential fires, natural gas hot water heaters, etc.

Table 8. Cumberland County Emissions Estimates (ton/year)

	Point		**Area**		**On-road**		**Non-road**	
Year	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC
2007	669	1,078	231	3,925	9,222	4,618	1,575	1,246
2011	379	811	234	2,666	6,415	3,366	808	853
2018	370	808	234	2,666	3,008	1,603	485	620

ftp://ftp.epa.gov/EmisInventory/2011v6/v2platform/reports/2011ed_2018ed_2011eh_2017eh_county_annual_totals.xlsx ftp://ftp.epa.gov/EmisInventory/2011v6/v2platform/reports/DetailsAboutEmissionsDataFiles07232015.pdf

4. Control Measures

Several control measures are already in place and being implemented as part of the original Early Action Compact Plan for Cumberland County, which continues to focus on reductions in point, highway mobile, and non-road mobile source emissions. Fort Bragg Military Reservation continues to implement strategies to meet its sustainability goals, to include zero waste, construction of US Green Building Council LEED certified buildings, transportation multi-modal choices, and reforestation. Retrofitted and new municipal buildings still include white/light roofing and are

periodically inspected, through the energy saving guarantee program, to verify that they still meet energy efficiency goals.

4.0 Proposed Local Control Measures

The following list of Air Quality Action strategies indicate several new and ongoing techniques that will be used locally to reduce ozone precursors. Although some are not quantifiable, all of these strategies are directionally correct. Strategies marked as “Ongoing” continue to serve the objectives of reducing ozone levels. As part of the Ozone Advance Program Action Plan, Cumberland County will submit an annual report verifying activities and implementations. Additional strategies may be communicated as they develop.

Appendix A. Air Quality Proclamations

Appendix B. Local Resolutions of Participation

Prepared by Sustainable Sandhills staff Denise Bruce , Environmental Outreach Coordinator, and Hanah Ehrenreich, Executive Director, in cooperation with the Air Quality Stakeholders of Cumberland County, Gary Slater, Chair, and Carolyn Justice Hinson, Vice-Chair, the Combined Air Team (CombAT) including US Army Fort Bragg, the North Carolina Department of Environment and Natural Resources Division of Air Quality and the Fayetteville Area Metropolitan Planning Organization

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