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Robert L. Ehrlich, Jr.
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Secretary

Redesignation Request for Kent and Queen Anne's Counties 8-hour Ozone Nonattainment Area

Date:

March 15, 2006

Prepared for:

U.S. Environmental Protection Agency

Prepared by:

Maryland Department of the Environment

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Executive Summary

This document is a formal request for the U.S. EPA to redesignate Kent and Queen Anne's Counties to attainment of the 8-hour National Ambient Air Quality Standard (NAAQS) for ozone. It summarizes the progress of the area in attaining the ozone standard. In a separate but connected document the Maryland Department of the Environment (MDE) has prepared a maintenance plan to assure continued attainment of the 8-hour Ozone Standard.

Analyses included in this document show that measured ambient air quality data complies with the 8-hour NAAQS for ozone and that the emission reductions responsible for the air quality improvement are both permanent and enforceable. Under a separate cover, MDE has completed a maintenance plan that projects the emission inventory from these two counties to 2018. MDE is requesting that the EPA consider this redesignation request on a parallel track with the maintenance plan for the two counties although it is a separate document. The maintenance plan consists of the necessary requirements as outlined in EPA guidance: an attainment inventory, a maintenance demonstration, a monitoring network, verification of continued attainment, and a contingency plan.

On September 22 2004, EPA issued a final rule to reclassify Kent and Queen Anne’s Counties from moderate to marginal nonattainment for the 8-hour ozone standard (69 FR 56697). Even though they are an 8-hour Ozone marginal nonattainment area, their emission reduction strategies include almost all 1-hour ozone severe nonattainment area requirements and the Ozone Transport Region (OTR) requirements.

Introduction

Kent and Queen Anne's Counties were designated as marginal 8-hour ozone nonattainment areas on September 22, 2004. This document explains how the counties meet the five redesignation requirements as outlined in the 1990 Clean Air Act Amendments (CAAA).

In order for the EPA to redesignate an area as attainment, the area must meet five criteria. Section 107(d)(3) of the Act reads: "The administrator may not promulgate a redesignation of a nonattainment areas (or portion thereof) to attainment unless:

i. The Administrator determines that the area has attained the national ambient air quality standard;
ii. The Administrator has fully approved the applicable implementation plan for the area under section 110(k);
iii. The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable regulations;
iv. The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175; and
v. The State containing such areas has met all requirements applicable to the area under section 110 and part D."

Part One: Attainment of the National Standards in Kent and Queen Anne's Counties

On September 22, 2004, EPA issued a final rule to reclassify Kent and Queen Anne's Counties from moderate to marginal nonattainment under the 8-hour ozone standard (69 FR 56697). Section 181(b)(2)(A) of the Clean Air Act states that the EPA Administrator shall determine whether the area has achieved the standard based on the design value of the area. There is one ozone monitor that measures air quality in Kent and Queen Anne's Counties. It is located in the Millington Wildlife Management Area near Massey in Kent County (see Figure 1). The Millington station and monitor were installed at the EPA approved site in 1989 as a regional scale monitor for determination of regional background concentrations of ozone.

Figure 1: Millington Ozone Site in Kent County

Map: MDE – BJH

A design value is a way to determine if there have been violations of the NAAQS. Ozone attainment requires that the design value for the 8-hour NAAQS does not exceed the standard of 0.08 ppm, which under the averaging rule found in 40 CFR part 50 means the design value cannot be 0.085 ppm or more. Attainment is evaluated over a three-year period. The design value is calculated for ozone by taking the fourth highest value over a three-year period. The 8-hour ozone standard is found by averaging three consecutive years of the fourth highest maximum 8-hour ozone levels values in an area. This number, called the design value, must be lower than 85 parts per billion (ppb) to meet the standard.

In the last three-year period, 2003 – 2005, the Millington monitor recorded 8 exceedances of the 8-hour ozone standard: 4 in 2003, 1 in 2004, and 3 in 2005. The 2005 8-hour ozone design value for Millington is 0.082ppm. Thus these two counties, based upon monitored data, are in attainment of the 8-hour ozone NAAQS.

Figure 2 shows the trend in number of exceedances of the 8-hour ozone standard measured at the Millington monitor in Kent County. As can be seen in the graph, there is a consistent downward trend from 1997 to 2005, the most recent year of monitoring at the Millington site. Figure 3 illustrates the trend in design values for the Millington monitor from 1997 to 2005. The trend in design values is also toward lower numbers with the 2005 design value (from the 2003, 2004 and 2005 ozone seasons) being less than the standard.

Figure 2: Number of Exceedances of the 8-hour Standard for Ozone at the Millington Monitor from 1997 to 2005

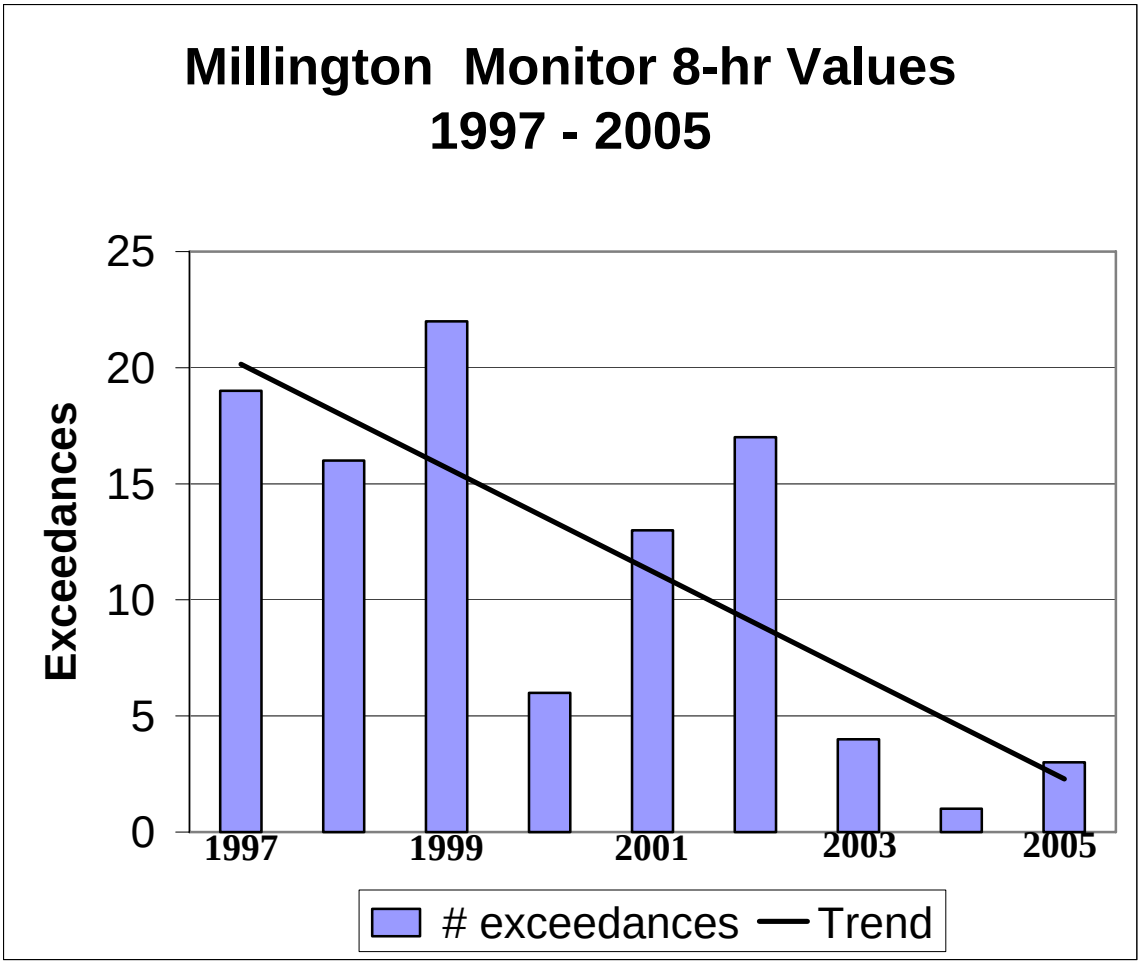
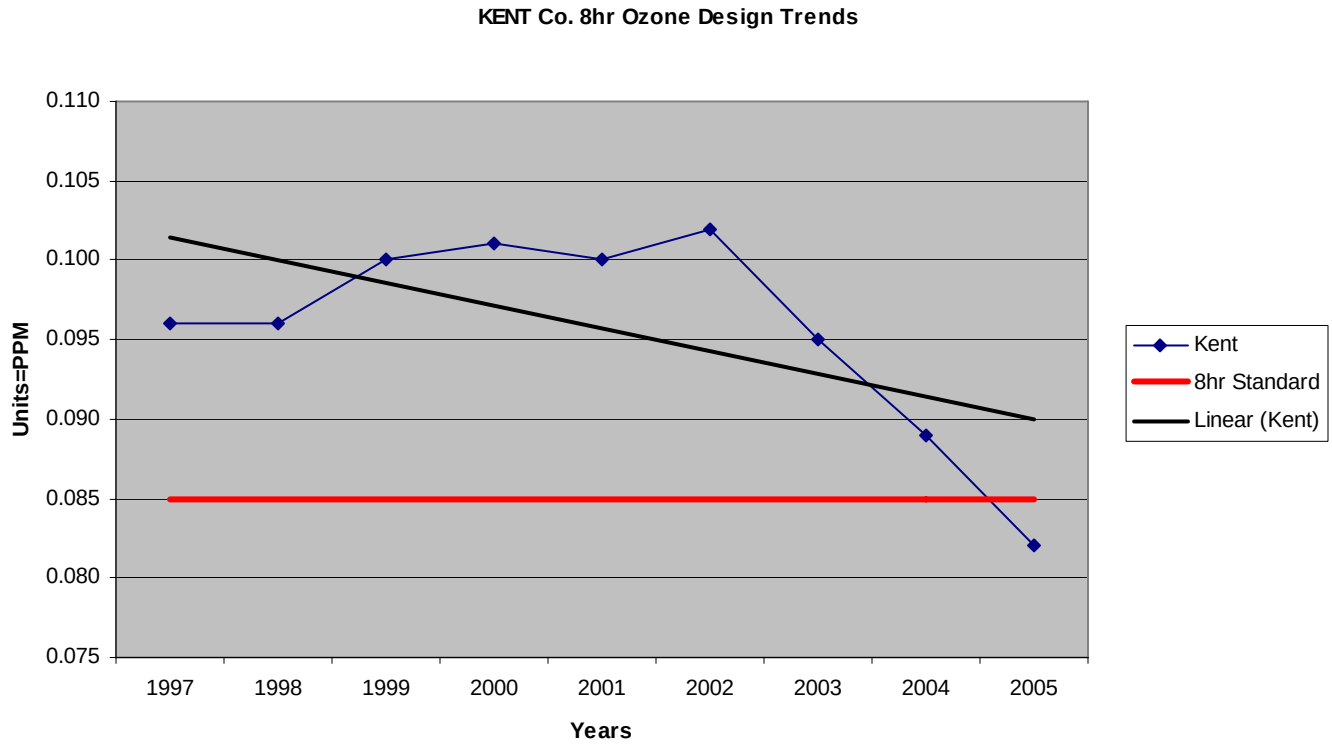


Figure 3: Eight-hour Ozone Design Value Trend for the Millington Monitor From 1997 to 2005



Graph: Courtesy Edwin Gluth, MDE-ARMA Air Monitoring Division

The Maryland Department of the Environment (MDE) is confident that the monitoring data used in this report is representative of air quality in the two counties. The monitor is located at a regional scale site approved by EPA. The data was quality assured in accordance with 40 CFR 58. MDE uses regular precision checks, calibrations, and audits to ensure the validity of the data. MDE also uses the Aerometric Information Retrieval System (AIRS) as the permanent database to maintain its data and quality assures the data transfers and content for accuracy. In addition, EPA's annual network reviews have repeatedly verified the integrity of Maryland's air monitoring network (see Appendix B). For these reasons, MDE believes that the Millington air monitor serves as a reliable indicator of ambient concentrations of ozone in Kent and Queen Anne's Counties.

Part Two: Approved State Implementation Plan (SIP)

Given that Kent and Queen Anne's Counties were designated as marginal nonattainment areas on September 22, 2004, they must develop the following post-amendment requirements delineated under Section 182(a) for marginal areas and Section 184(b) for areas included in the ozone transport region:

- A base year inventory;
- Regulations designating any 50 ton per year VOC or 100 ton per year NOx stationary source as a major source;
- Regulations requiring stationary sources with potential to emit above the major source threshold to undergo new source review requirements including 1.15 to 1 offsets;
- Regulations requiring stationary sources that emit above 25 tons per year VOC or NOx to file a certified emissions statement annually;
- Regulations requiring RACT on VOC and NOx sources; and
- The inclusion of Queen Anne's County in the Enhanced Inspection and Maintenance (I/M) Program because it is part of a metropolitan statistical area greater than 200,000 population in the Ozone Transport Region.

The Department has met these requirements for Kent and Queen Anne's Counties through development and implementation of the following regulations and technical documents that have been submitted to EPA:

- Expansion of RACT rules statewide (COMAR 26.11.19.02G);
- Emissions certification requirements (COMAR 26.11.01.05-1);
- New source review requirements (COMAR 26.11.17);
- Enhanced I/M (COMAR 11.14.08- jointly adopted by MDE and the Motor Vehicle Administration);
- MDE is concurrently submitting the 2002 base year emission inventory as part of the Maintenance Plan required as part of this redesignation request. MDE will likely make slight revisions to this base year inventory between the date of the submission of this document and the date by which the final base year inventory is due (June 16, 2006).

The Department has supplied the following inventories to EPA through a combination of written and electronic documentation:

- The 1993 periodic inventory;
- The 1996 periodic inventory;
- The 1999 periodic inventory; and
- The 2002 periodic inventory.

Additionally, the State exercised its option to voluntarily require federal reformulated gasoline in all ozone nonattainment areas, including Kent and Queen Anne's Counties and the State has fully approved VOC and NOx RACT rules for sources in Kent and Queen Anne’s Counties.

The status of the above and other relevant SIP revisions is as follows:

Table 1: Status of Maryland SIP Submittals

SIP Revision	Date Submitted	Date Approved
Reformulated Gasoline Opt-in	1/17/92	4/1/92
Statewide RACT Rules-VOC	6/8/93	3/1/96
Statewide RACT Rules- NOx	6/8/93	2/8/01
Emissions Certification Rule	11/13/92	10/12/94
New Source Review Rule	6/8/92	2/12/01
1990 Base Year Inventory	3/24/94	9/27/96
Enhanced I/M Rule (QA's)	7/12/95	10/29/99
1993 Periodic Inventory*	1995	NA
Stage II Vapor Recovery comparability plan for marginal and attainment areas (includes Kent and QA's)	11/5/97	12/9/98
1996 Periodic Inventory*	1998/99	NA
Plan to improve air quality in the Washington, DC-MD-VA Region: State implementation Plan Severe Area SIP	2/24/04	11/16/05
NOx Reduction and Trading	4/27/00	1/10/01
New Source Review Rule	9/25/00	2/12/01
Modification of Phase II Attainment Plan- Baltimore region, Adding Tier 2 Standards	12/28/00	7/16/01
1999 Periodic Inventory*	2001	NA
2002 Periodic Inventory*	6/1/04	NA- electronic submittal
Formal Request to Redesignate Kent & Queen Anne's Counties as being in attainment of the 1-hour ozone standard	2/9/04	10/21/04

* Only the 1990 base year inventory was submitted as a full SIP revision. Periodic Emissions Inventory submittals are data submittal only.

Part Three: Permanent and Enforceable Reductions

A number of permanent and enforceable measures have caused emission reductions and lowered ozone concentrations in Kent and Queen Anne's Counties. These reductions are from all source sectors.

Stationary Point Sources

- Reasonably Available Control Technology (RACT) regulations
- New Source Review (NSR)
- Emissions certification requirements
- NOx SIP call
- NOx Reduction and Trading

Area Sources

- Automobile refinishing coatings

- Consumer products
- Degreasing
- Architectural and industrial maintenance coatings (AIM)
- Tank truck unloading
- Portable fuel containers

Highway Vehicles
- Federal Motor Vehicle Control Program (FMVCP) including onboard control of evaporative and refueling emissions
- Lower Reid Vapor Pressure (RVP) for gasoline
- Federal reformulated gasoline
- Enhanced Vehicle Emissions Inspection/Maintenance
- National Low Emission Vehicle (NLEV) program
- EPA's heavy-duty diesel engine standards (2004, and 2007 Programs)
- EPA's Tier 2/low sulfur gasoline program for light-duty vehicles

Nonroad Sources
- EPA rules for large and small compression-ignition engines
- EPA rules for smaller spark-ignition engines
- EPA rules for recreational spark-ignition marine engines

A major portion of the decrease in ozone precursors is due to the Federal Motor Vehicle Control Program (FMVCP). Over a period of time, older, poorer performing on-road vehicles have gradually been replaced with newer vehicles that must meet increasingly more stringent tailpipe standards. Additionally, the State has included both Kent and Queen Anne's Counties in the federal reformulated gasoline program.

There is very little industry in the two counties and thus point source emissions are very low. Growth in point sources will be controlled through the new source review program requirement for offsets. Any major sources that wish to locate in Kent or Queen Anne's Counties will need to procure emissions offsets at a ratio of 1.15 to 1 for NOx and VOCs. This will limit new point source emissions that would result from industry growth in these two counties in the future.

It is important to note that in addition to reductions caused by all of the measures outlined above, background concentrations of ozone in Kent and Queen Anne's Counties will decrease as a result of the many ozone precursor reduction strategies implemented in the Baltimore and Washington D.C. severe nonattainment areas and the long range transport will be reduced through the NOx SIP Call Rule.

<u>Future Year Inventories</u>

MDE's calculations of future emissions of VOCs and NOx from stationary and mobile sources demonstrate that future emissions will not exceed the level of the attainment inventory (see Tables below). Future emissions levels must continue to remain at or below attainment levels for a period of 10 years after EPA redesignates the nonattainment areas to attainment (stable and declining inventory methodology). MDE's planning horizon for the maintenance plan is 2018, which allows a reasonable time for EPA processing of the request by 2008.

Table 2: Base Year, Attainment Year, Interim Year, and Projected VOC Emissions Inventories for the Kent and Queen Anne's County Nonattainment Area

Source Category	2002 VOC Emissions (Tons per Day)	2005 VOC Emissions (Tons per Day)	2009 Projected VOC Emissions (Tons per Day)	2018 Projected VOC Emissions (Tons per Day)
On-road Mobile	4.18	3.15	2.45	1.55
Non-road Mobile	11.00	10.00	8.25	5.96
Area	5.12	5.31	5.54	5.17
Point	0.12	0.12	0.13	0.16
Total	**20.42**	**18.58**	**16.37**	**12.84**

Table 3: Base Year, Attainment Year, Interim Year, and Projected NOx Emissions Inventories for the Kent and Queen Anne's County Nonattainment Area

Source Category	2002 NOx Emissions (Tons per Day)	2005 NOx Emissions (Tons per Day)	2009 Projected NOx Emissions (Tons per Day)	2018 Projected NOx Emissions (Tons per Day)
On-road Mobile	7.96	6.57	4.82	2.14
Non-road Mobile	3.74	3.77	3.66	3.03
Area	0.23	0.25	0.26	0.28
Point	0.07	0.07	0.07	0.08
Total	**12.00**	**10.66**	**8.81**	**5.53**

2002 Emission estimates are from the 2002 Base Year Emission Inventory being submitted concurrently with the Maintenance Plan associated with this redesignation request. The 2005 inventory is partly projected (the point source data in particular) and partly actual as the 2005 inventory is currently in process of being developed. Additional inventory information can be found in Appendix C of this document.

Part Four: Section 110 and Part D Requirements

Section 110

Section 110, (a)(2) of the Act contains general requirements for nonattainment plans. The state of Maryland has fulfilled all pre-amendment Act requirements pertaining to Kent and Queen Anne's Counties and the two nonattainment areas of Baltimore and Washington. Kent and Queen Anne's Counties have also completed all 1-hr Ozone requirements.

Part D

Section 182 (a)(1) under Part D requires the development of a "comprehensive, accurate, and current inventory of actual emissions from all sources, and a permit program for new and modified major stationary sources." MDE submitted a 2002 emissions inventory electronically to EPA on June 1, 2004 and operates a permit program for major sources.

Conclusion

Maryland's air quality monitoring network has shown Kent and Queen Anne's Counties to be in compliance with the 8-hour NAAQS for ozone. With this document and the associated Maintenance Plan, MDE has met the requirements of Section 107(d)(3) of the Clean Air Act, which outlines how nonattainment areas can be redesignated to attainment, and is confident that these counties will remain in attainment through the maintenance period.

Appendix A: Design Values

A design value is a way to determine if there have been violations of the NAAQS. Ozone attainment requires that not more than one 8-hour average per year exceed the standard of 0.085 ppm. Attainment is evaluated over a three-year period. The design value is calculated for ozone by taking the fourth highest value over a three-year period. The 8-hour ozone standard is found by averaging three years of the fourth highest maximum 8-hour ozone levels values in an area. This number, called the design value, must be lower than 85 parts per billion (ppb) to meet the standard. Currently, the Kent and Queen Anne's County design value (averaging 2003, 2004, and 2005) is 82 ppb. Data in the table below is from MDE's Air Monitoring Division.

Kent County				**Annual 8-Hour Ozone Design Values**				**(Units=ppm)**		
County	**Site**	**1995-1997**	**1996-1998**	**1997-1999**	**1998-2000**	**1999-2001**	**2000-2002**	**2001-2003**	**2002-2004**	**2003-2005**
Kent										
	Millington	**0.096**	**0.096**	**0.100**	**0.101**	**0.100**	**0.102**	**0.095**	**0.089**	**0.082**

Note: non-attainment exists where the three-year average of the 4th max 8-hour ozone average is greater or equal to 0.085ppm.

Bold indicates Design values by County/site.

Red indicates non-attainment of the standard.

2005 design values are preliminary and subject to change.

Appendix B: Verification of Monitoring Network

1993 Network Information

APPENDIX C: Verification of Monitoring Network

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

MAY 10 1993

Ms. Merrylin Zaw Mon, Director
Maryland Air and Radiation Administration
2500 Broening Highway
Baltimore, MD. 21224

MAY 12 1993

Dear Ms. Zaw Mon,

Attached is the final narrative report of the FY'93 Systems Audit of Maryland's Ambient Air Monitoring Program written by Dave O'Brien.

Your staff is doing an excellent job with the operation of Maryland's Ambient Air Monitoring Network and the submission of the AIRS AQS data. Please keep up the good work!

If you have any questions, please call me.

Sincerely,

Victor Guide, Chief
Philadelphia Operations Section

cc: Dave Arnold, O3/Mobile Source
Ed Carter, MD/Air Monitoring & Information Program
Ed Gluth, MD/QA Officer
Robert Kellam, OAQPS
Joe Kunz, Program Development
Dave Lutz, OAQPS, HQ NAMS
Dave O'Brien, POS, NAMS Coor.
Marcia Spink, Air Programs
Dick Wies, MD/DAM

2003 Network Information

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

December 2, 2003

SUBJECT: State of Maryland
Department of the Environment
Air and Radiation Management Administration
Systems Audit for CY 2000

FROM: Victor Guide
U.S. EPA Region 3
Air Protection Division

TO: David Krask, Chief
Division of Air Monitoring
Air and Radiation Management Administration
Maryland Department of the Environment

THRU: Walter Wilkie, Chief
Air Quality & Analysis Branch
Air Protection Division

A. Summary

The Maryland Department of the Environment , Air and Radiation Management Administration continues to operate and maintain and excellent ambient air monitoring program. All elements of the program from network design and siting, instruments/methods , laboratory operations/facilities, standards/traceability, data management and quality assurance combine to result in producing valid data of known quality , precision and accuracy. The data set is complete and submitted in a timely manner to the AIRS data base.

In addition, it should be noted that the MDE staff is of high technical quality and continues to provide quality support for the oversight, maintenance and quality assurance of the ambient air monitoring equipment utilized in the MDE network. MDE continues to provide support to a variety of Region 3 initiatives and to Region 3 state/local agencies : TO14/15 for air toxics at Chester/Marcus Hook, for PADEP; support to Region 3 Air Toxics projects.

Attachments

2003 Ozone Audit Cover Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

David Krask, Chief
Division of Air Monitoring
Air and Radiation Management Division
Maryland Department of the Environment

December 2, 2003

Dear David,

Attached please find copies of all the ozone audits conducted in the State of Maryland for the 2003 ozone season. I have also included copies of all ozone audits conducted by EPA Region 3 staff for the years 1997-2003 for your information. Special thanks to you and your staff for the continued cooperation and excellent work in all matters related to ambient air monitoring. All of the ozone instrumentation at the stations were found to be in good condition and the audits revealed no problems as related to instrument response to the Region 3 primary standard for ozone (TEI 49PS s/n 75758-30).

We are planning to continue this important audit oversight role for our state/local agencies in Region 3 in 2004. Performance audits for ozone, sulfur dioxide and carbon monoxide will be included in our work plans for next year and we will be in contact with you and your staff to plan out the schedule in the next few weeks.

Sincerely,

Walter Wilkie, Chief
Air Quality & Analysis Branch
Air Protection Division

Attachments

2001 Ozone Audit Results

Ozone Audit Form
(O_3)

Agency Maryland

Site Name Millington

Site Location Millington, MD

Airs No. _____ Date 5-23-2001

EPA Auditor(s) Victor Guide

Agency Representative Bob Judd

Analyzer (MFGR/Model/SN DASIBI 3913

Audit Equipment (MFGR/Model/SN TEI 4998 #67732

PPB Dial Setting	x ppm UV photometer	y ppm Inst.Response	% = (y-x)/x x 100	Regression Data
0000	0.000	0.000		m Slope 0.9851432
400	0.400	0.398	-	
300	0.300	0.301	2	b Intercept 0.00253530
200				
125	0.126	0.126	2	r Corr. Coeff. 0.99999
80	0.080	0.082	-	

Slope (m) <± 10%
Intercept (b) <± 0.015
Correlation Coefficient (r) > 0.995

%D ± 5% or less - Passed : Millington Station passed the audit 5-23-2001
± Greater than 5% but less than 10% - Passed, but marginally

± 10% or more - Failed audit

2002 Ozone Audit Results

Ozone Audit Form
(O_3)

Agency Maryland

Site Name Millington

Site Location Millington, MD

Airs No. _____ Date 6/20/02

EPA Auditor(s) Victor Guide

Agency Representative Steve Quarles

Analyzer (MFGR/Model/SN DASIBI #1012191

Audit Equipment (MFGR/Model/SN TRI 40C AMS #608

PPB dial setting	x ppm UV photometer	y ppm Inst. respon.	d = (y - x)/x x 100	Regression Data
0000	0.000	0.000		m slope
400	0.400	0.403	0.75	1.0058
300				b intercept
200	0.175	0.177	1.10	0.0008
125				r Corr.Coeff.
80	0.070	0.071	1.40	1.0000

Slope (m) <± 10%
Intercept (b) <± 0.015
Correlation Coefficient (r) > 0.995

%D ± 5% or less - Passed
± Greater than 5% but less than 10% - Passed, but marginal
± 10% or more - Failed audit

Millington Station passed the ozone audit conducted on 6/20/02.

2003 Ozone Audit Results

Ozone Audit Form
(O_3)

Agency Maryland

Site Name Millington

Site Location Millington, MD

Airs No. _____ Date 8-19-2003

EPA Auditor(s) Victor Guide

Agency Representative Tom Gronau

Analyzer (MFGR/Model/SN TEI #1010378

Audit Equipment (MFGR/Model/SN TEI 49PS #75758-30

PPB Dial Setting	x ppm UV photometer	y ppm Inst.Response	% = (y-x)/x x 100	Regression Data
0000	0.000	0.000		m Slope 0.995674409
400	0.402	0.392	2	
300	0.300	0.296	1	b Intercept 0.000213444
200				
125	0.126	0.124	-	r Corr. Coeff. 0.99999
70	0.071	0.070	-	

Slope (m) <± 10%
Intercept (b) <± 0.015
Correlation Coefficient (r) > 0.995

%D ± 5% or less - Passed : Millington Station passed the audit 8-19-03
± Greater than 5% but less than 10% - Passed, but marginal
± 10% or more - Failed audit

Appendix C: Supplemental Emission Inventory Information

- There were no significant changes between the MDE submitted 2002 Periodic Emission Inventory (PEI – CERR) and the referenced 2002 Base Year Inventory

- There are no Emission Reduction Credits (ERC's) in the 2002 Base Year Inventory for Kent and Queen Anne's Counties. To the extent possible 2002 emissions reported are actual emissions.

- MDE prepares all ozone inventories in tons per summer day or tons per ozone season day.