



North Carolina Department of Environment and Natural Resources  
Division of Air Quality

Michael F. Easley, Governor

William G. Ross, Jr., Secretary  
B. Keith Overcash, P.E., Director

April 29, 2004

MEMORANDUM

FROM: Michael Y. Aldridge

TO: Keith Overcash  
Brock Nicholson  
Lee Daniel  
Laura Butler  
Sheila Holman

SUBJECT: NOx Budget Program (NOx SIP Call) Emission Monitoring Certification and Allowance Accounting

**Purpose:**

The purpose of this memorandum is to provide an overview of:

- The **NOx Budget Program**,
- The process for approval of **Initial Monitoring System Certification Applications**,
- The process for **NOx Emission Reporting** and **On-going Quality Assurance Requirements**,
- The process for **Compliance Certification** and **Allowance Reconciliation**, and
- The process for **Allocating Allowances to New Units**.

**Overview of the NOx Budget Program:**

On October 27, 1998, EPA finalized the so called **NOx SIP call** rule under 40 CFR, Part 96, “NOx Budget Trading Program for State Implementation Plans” and required 22 States and the District of Columbia<sup>1</sup> to submit State Implementation Plans (**SIP**) to address the regional transport of ground-level ozone. By improving air quality and reducing emissions of nitrogen oxides (NOx),<sup>2</sup> the actions directed by these plans will decrease the transport of ozone across State boundaries in the eastern half of the United States. The EPA, in conjunction with the States and the District of Columbia, established the maximum amount of NOx that can be emitted from each of the sources identified in various SIPs. EPA also established that compliance with the emission reductions required by the SIP call could be achieved by a “Cap and Trade” program. EPA promulgated the regulatory mechanism for the “Cap and Trade” program in Part 96.

<sup>1</sup> AL, CT, DE, DC, GA, IL, IN, KY, MD, MA, MI, MO, NJ, NY, NC, OH, PA, RI, SC, TN, VA, WV and WI

<sup>2</sup> NOx: a precursor to ozone formation

The NOx Budget Program requires that affected sources (**budget sources**) collectively meet a regional emission budget (total NOx mass emissions) each ozone season (May through September). The budget is established in an effort to achieve reductions from the 1996 baseline year. Under the program's cap and trade provisions, each State allocates emission allowances to their budget sources in accordance with that State's portion of the regional budget. Each allowance permits a source to emit one ton of NOx during the ozone season. To remain in compliance, budget sources must demonstrate that their actual ozone season emissions do not exceed the amount of allowances allocated for that period. Unused allowances may be sold or saved ("**banked**") for use in a subsequent ozone season. Regardless of the number of allowances a source holds, it cannot emit at levels that would violate other emission limit requirements. Budget sources can devise their own strategies to comply with NOx emission restrictions.

The State of North Carolina implemented its NOx SIP call through 15A NCAC 2D .1400, "Nitrogen Oxides." Rules .1416, and .1417 establish seasonal emission **caps**<sup>3</sup> for fossil fuel fired electric generators and combustion sources with heat inputs greater than 250 mm Btu per hour. Rule .1419 requires those sources to establish accounts under EPA's NOx trading program in accordance with Part 96. Sources have the option of either meeting the caps or buying allowances from other sources under the trading program. Sources that do not use all their allowances may sell them or bank them to be used in a later season. As mandated in Part 96, EPA, in collaboration with the States, administers the program to ensure accurate monitoring and timely reporting of emissions. More specifically, EPA administers the database systems used to manage the program and provides services such as tracking allowances, maintaining unit and account information, assisting with monitoring issues, and preparing end-of-season compliance reports. Although EPA administers the cap and trade program under 40 CFR 96.71(b)(3)(iv), the DAQ is responsible for approval of certification applications for monitoring systems installed at North Carolina facilities.

North Carolina has approximately 37 facilities with 122 budget units. These units must certify their NOx **Continuous Emissions Monitoring System (CEMS)** and meet other requirements of 40 CFR Part 75, Subpart H<sup>4</sup> by **May 1, 2004**.

### **Approval Process for the Initial Monitoring System Certification Application:**

The approval process for the Initial Monitoring System Certification Application will consist of the following procedures:

**Monitoring plan, test notice, protocol submittal, and review** – Each affected source must submit an electronic copy of a monitoring plan to the **EPA Clean Air Market Division (CAMD)** and a hardcopy to the State and EPA Regional offices no later than 45 days prior to the initial certification test date. The monitoring plan must include information referenced in 40 CFR Part 75, Subpart H, section 75.73(c). The primary purpose of the monitoring plan is to identify:

- source / unit information,
- monitor location,
- monitoring components to be certified,
- methodologies used to monitor and report NOx emissions, and
- the reporting schedule for each emissions unit.

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<sup>3</sup> <http://daq.state.nc.us/monitor/>

<sup>4</sup> 40 CFR 96 references 40 CFR 75, Subpart H.

The monitoring plan is not approved or disapproved. EPA reviews the monitoring plan and notifies the source of any deficiencies. Once the source corrects these deficiencies, the corrected monitoring plan becomes part of a **certification application** submittal as noted below.

**Test protocol** - A test protocol is also submitted to the State along with the hard copy of the monitoring plan. The test protocol includes the following elements:

- a listing of the appropriate reference test methods,
- a description of how the source will be operated during the test,
- an explanation of how the reference test data and CEM data will be reduced,
- the reporting format,
- the test schedule, and
- identification of individuals responsible for conducting each test.

The test protocol is not approved or disapproved. However, if the facility wishes to propose test methods that are different from the reference methods specified in the applicable subpart, the facility operator must seek approval from the State and EPA prior to conducting the certification testing.

**Test observation** – In general, test observation is not required but encouraged. A test observation is conducted to ensure that the stack test equipment setup and test procedure match that required by the reference method. Furthermore, it provides an independent confirmation that the CEMS method and setup match that specified in the monitoring plan. The notification of initial certification testing must be submitted to the State no later than 21 days prior to testing.<sup>5</sup> The certification tests include:

- **Relative Accuracy Test Audit (RATA),**
- **bias test,**
- **linearity,**
- **7-day calibration error,**
- **cycle time, and**
- **Data Acquisition and Handling System (DAHS) verification.**

Only the RATA is observed. Depending on how the NOx mass emissions are to be calculated, a RATA may be required for the NOx CEM, CO2/O2 CEM, and flow CEM. Each RATA requires 9 test runs with each run taking about 21 to 30 minutes for gas and 15 minutes for flow.

**Certification application submittal, review and approval** – The regulations at 40 CFR 75.20 require the owner or operator of each source to submit an electronic copy of a **certification application** to CAMD and hardcopies to State and EPA Regional offices for all monitoring systems used under the NOx Budget Program. *EPA maintains that the facility has 45 days after completing the certification test to submit the electronic copy of the certification. However, the North Carolina rule (15 NCAC 2D .1403(d)(3)) requires monitoring, recordkeeping, reporting and all associated submittals to be accomplished by May 1, 2004.* CAMD reviews the electronic copy of the certification application using **Monitor Data Checking (MDC)** software and sends their review findings to the source, the State, and the EPA Region. The State reviews the hardcopy of the test report along with the findings from CAMD. Any deficiencies discovered during this review are communicated to the facility and resolved. **The State makes the final approval decision as required by 40 CFR 96.71(b)(3)(iv) and notifies CAMD and the EPA Region.**<sup>6</sup>

## **NOx Emission Reporting and On-going Quality Assurance Requirements:**

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<sup>5</sup> In certain situations 7 days notice is allowed (see 40 CFR 75.61(a)(i) and (ii)).

<sup>6</sup> The DAQ procedure checklist for the review of the Certification Application is attached.

Sources affected by the NOx Budget Program must submit **electronic data reports (EDR)** for their affected units directly to EPA's mainframe **Emission Tracking System (ETS)**.<sup>7</sup> Each report must be signed by the **Authorized Account Representative (AAR)**.<sup>8</sup> Reports are submitted to EPA and hard copies to the State no later than 30 days following the end of each calendar quarter of the ozone season (deadlines are July 30 and October 30).<sup>9</sup>

CAMD uses the ETS to perform automated data processing. An initial **data review** includes a search for certain **rejection criteria, critical errors, and informational errors**. The results of this search may trigger a requirement for a **data resubmission** in order to correct discrepancies. Data are maintained in a central database within ETS. This database is updated when electronic data report resubmissions are received and reviewed. The EPA extracts data from ETS for **data dissemination**. Data dissemination Includes:

- distribution of data to the public,
- ozone season allowance reconciliation, and
- compliance determination.

According to EPA, final ozone season emission data will be available for dissemination approximately five months after the end of each ozone season.

While ETS performs a certain amount of data review, it is primarily a processing and tracking tool. For a more detailed review of the data and to provide the capability for examining the **Quality Assurance / Quality Control QA/QC** portion of the data, CAMD uses the MDC software. MDC is used to search for any deficiencies in the electronic submittal of the monitoring plan or quality assurance test data and to target sources for field audits. Facilities are encouraged to run MDC before submitting quarterly reports in order to reduce data errors.<sup>10</sup>

Field audits, conducted by State agencies and EPA regions, provide in-depth verification of data quality. The field audit activities may include a review of on-site records, CEMS inspections, and quality assurance test observations.

## **Compliance Certification and Allowance Reconciliation:**

By November 30 following each ozone season (**control period**), the AAR must submit a compliance certification report to EPA and the State. This report includes the identification of each budget unit, a certification of compliance,<sup>11</sup> and at the AAR's option, a designation of how allowances are to be reconciled (which allowances are to be deducted and from which accounts):

**Compliance certification** - The compliance certification attests that the unit was operated in compliance with the NOx budget emissions limitations; the monitor data was recorded in accordance with the requirements of 40 CFR 75, Subpart H; that the control equipment was operated during the reporting period in accordance with the monitoring plan; and that any substituted data did not systematically underestimate NOx emissions. The compliance certification also notes any changes to the monitoring system that would affect the certification of the monitor itself.

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<sup>7</sup> <http://www.epa.gov/airmarkets/reporting/process.html>

<sup>8</sup> For definition of Authorized Account Representative, see 40 CFR 96.2.

<sup>9</sup> See 2D .1404(g).

<sup>10</sup> <http://www.epa.gov/airmarkets/monitoring/mdc/index.html>

<sup>11</sup> This differs from the "Annual Compliance Certification" requirements of Part 70.

**Allowance Reconciliation** - Allowances are allocated and used as follows:

***Establishment of accounts:*** CAMD assigns accounts in the **NOx Allowance Tracking System (NATS)**<sup>12</sup> for facilities as follows: A facility that has only one emissions unit that is subject to the NOx budget rule is assigned a **compliance account** for that unit. A facility that has more than one subject unit is assigned a compliance account for each unit plus an **overdraft account**. Allocated allowances for each unit are normally credited to the compliance account. However, allowances may be transferred into the overdraft account. The overdraft account allows the facility greater flexibility in bubbling between units, managing banked allowances from previous years, managing transferred allowances from other sites, or managing allowances purchased from other NOx budget program participants.

***Allowance deductions:*** By November 30 following the end of each ozone season, actual NOx emissions are reconciled with eligible allowances. At this time, as noted above, the AAR may designate accounts to be used for making allowance deductions. Absent such designations, EPA compares emission quarterly reports to allowance allocations in the NATS and then deducts “used allowances” beginning with the compliance account. EPA uses a **First In First Out (FIFO)** principle in deducting allowances from this account. Allocated allowances are credited to a compliance account in the following order:

1. NOx allowances that were allocated to the unit for the current season (control period).
2. NOx allowances that were allocated for the control period to any other unit and transferred to the compliance account [This includes any purchased allowances.]
3. NOx allowances that were allocated to the unit for a prior control period (**banked allowances**).
4. NOx allowances that were allocated for a prior control period to any other unit and transferred to the compliance account (banked allowances).

Allowances are deducted from the compliance account in the same order as credited.

***Overdraft Accounts:*** If the compliance account for one or more units does not have enough allowances to offset actual emissions, EPA then turns to the overdraft account in order to satisfy the shortfall in the respective compliance accounts, beginning with the lowest numbered compliance account. Deductions from overdraft accounts are made according to the same FIFO protocol as noted above.

***Banked Allowances:*** Banked allowances may be used at a rate of one allowance for one ton of emissions as long as the total number of banked allowances for the region<sup>13</sup> does not exceed 10 percent of the regional NOx budget for the current control period. In cases where that percentage is exceeded, a mechanism called “**progressive flow control**” (PFC) is used. PFC is intended to limit the number of banked allowances used in a given control period. EPA establishes a **PFC factor** by:

- summing the NOx budget allowances for all states in the region,
- multiplying that sum by 0.10, and
- dividing that result by the total number of banked allowances for all states.

EPA applies the PFC factor to each account as follows:

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<sup>12</sup> <http://www.epa.gov/airmarkets/tracking/index.html>

<sup>13</sup> The region now includes the District of Columbia and the original 22 states, minus Wisconsin. See Federal Register Vol. 69, No. 77, April 21, 2004.

- The factor is multiplied by the number of banked allowances in each compliance account or overdraft account.
- The resulting product is the number of banked allowances that may be deducted on a 1 to 1 basis (1 allowance for 1 ton of actual emissions) from each respective account.
- Any banked allowances that are needed in excess of the resulting product must be deducted on a 2 to 1 basis (2 allowances for 1 ton of actual emissions).

**Excess Emissions:** Finally, if there are still not enough allowances in the compliance account or overdraft account to cover emissions, the unit is considered to be out of compliance with the NOx budget rules. In this case deductions are made from the appropriate compliance account or overdraft account from future control period allocations. Deductions made from future allocations are made on a 3 to 1 basis (3 allowances for 1 ton of actual emissions). This not only uses allocations at an accelerated rate, it depletes the allowances available for the following control period. In addition, the State or EPA may take other enforcement actions in response to the excess emissions.

### **Allocating Allowances to New Units:**

The Section .1400 NOx budget rules include provisions for new growth.

Rule .1418 sets emission standards for new **electric generating units (EGU) , large boilers and large internal combustion (IC) engines.**<sup>14</sup>

Rule .1421 establishes allowance **pools** for new growth and establishes a mechanism for allocating those allowances to new EGUs and large boilers. Under .1421 allocations must be officially requested. **Preliminary allocations** are made at the beginning of the ozone season according to the amount of allocations requested. Or, as an alternative, if more allowances are requested than exist in the pool, preliminary allocations are made pro rata on the basis of heat input and operating hours.

**Final allocations** are established at the end of the ozone season as follows:

1. For each individual source, its allowable emission rate under Rule .1418 is multiplied by its heat input during the ozone season. This product is divided by 2000.
2. The lesser of the source's actual emissions of NOx, the value calculated under item 1 above, or the preliminary allocation made at the beginning of the ozone season, shall be the source's allocation from the "new growth" allocation pool.

New growth allocations are posted on the DAQ website,<sup>15</sup> and final allocations are reported to EPA for tracking in NATS.

New growth pools exist for 2004, 2005, 2006, and 2007. As Rule .1421 currently stands, beginning with 2008, there are no allowances for new growth. However, the rule includes provisions for the Commission to begin rulemaking by July 1, 2006 in order to establish new growth allocations for 2008 and later years. Allowances for new growth may also be made available by reallocating allowances from units that were retired subsequent to having been issued allowances. Allowances from retired units are not automatically available for reallocation. They remain in the account for the retired unit (unless purchased) until such time as reallocations are made for the entire State.

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<sup>14</sup> IC engines are only regulated through emission standards and not allowances. This is due to problems with monitoring these sources.

<sup>15</sup> <http://daq.state.nc.us/monitor/>

Memorandum – NOx Budget Program

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Attachment:

cc: Paul Muller  
Michael Landis  
Myron Whitley  
Ernie Fuller  
Steven Vozzo  
Robert Fisher  
Wayne Cook  
Donald van der Vaart  
Thom Allen  
Dennis Igboko  
Kimberly Garnett  
Richard Simpson  
Samir Parekh  
Robert Fulp  
Robert Camby  
Joan Liu

# Procedure for Reviewing The NOx Budget Certification Application Report.

## Step 1: Monitoring Plan and Test Protocol Reviews

Review Hardcopy portion of the Monitoring Plan along with the CAMD feedback of the electronic portion. Communicate and resolve any deficiencies with the source. Fill out monitoring plan checklist<sup>1</sup> [as applicable]. In particular, check the span calculations and schematic diagrams proposed for the data flow, monitor and sampling port locations. Ensure that they are consistent with the monitoring methodology in the rule and the reference test methods.

Before scheduling the test observation, review the test protocol and fill out checklist<sup>2</sup> and ensure that the proposed test methods are consistent with the test methods allowed in Part 75. Resolve any deficiencies with the source. Any deviations from the approved reference test methods must be approved by CAMD.

Initial monitoring plan and notification of initial certification testing required 45 days before start of certification testing (75.62 & 75.61)

## Step 2: Test Observation:

Observe the RATA test for the monitoring systems to be certified using the appropriate checklist forms<sup>3</sup>. Inspect the monitoring system(s) set up and confirm the model/serial numbers of the monitoring systems. Observations of the 7-day cal, linearity, cycle time and Data Acquisition Handling System (DAHS) verification tests is not required.

Notification of initial certification testing must be submitted to the State no later than 21 days prior to testing. 7 days is allowed in certain situations (75.61(a)(i) and (ii))

## Step 3: Certification Application Review

Review hardcopy of Certification Application Report along with the CAMD feedback of the electronic portion. Communicate and resolve any deficiencies with the source. Fill out the checklist form<sup>4</sup> and ensure that all aspects of the testings were completed. Ensure that all required testing for the systems were conducted and that all raw data and documentation were submitted including calibration gas certificates [Protocol 1 gas]. Draft approval/disapproval letter for Lee's signature.

Certification Application report is submitted no later than 30 days after testing and EPA/State Agency has 120 days after receipt of a complete certification to review the application. If no review is conducted, the monitoring system(s) is automatically certified after the end of 120 days.

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<sup>1</sup><http://www.epa.gov/airmarkets/monitoring/index.html#otc>

<sup>2</sup>Test protocol review checklist (attached)

<sup>3</sup><http://www.epa.gov/airmarkets/monitoring/auditmanual/index.html>

<sup>4</sup>[http://www.epa.gov/airmarkets/fednox/docs/cert\\_app\\_check.pdf](http://www.epa.gov/airmarkets/fednox/docs/cert_app_check.pdf)