

FINAL

**NPDES PERMIT QUALITY REVIEW
NORTH CAROLINA**

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I. PQR BACKGROUND

National Pollutant Discharge Elimination System (NPDES) Permit Quality Reviews (PQRs) are an evaluation of a select set of NPDES permits to determine whether permits are developed in a manner consistent with applicable requirements established in the Clean Water Act (CWA) and NPDES regulations. Through this review mechanism, EPA promotes national consistency and identifies successes in implementation of the NPDES program and identifies opportunities for improvement in the development of NPDES permits.

EPA's review team, consisting of EPA regional and headquarters staff and contractor support, conducted a review of the North Carolina NPDES permitting program which included an on-site visit to the North Carolina Department of Environment and Natural Resources (DENR) in Raleigh, North Carolina on May 29-31, 2013.

The North Carolina PQR consisted of two components: permit reviews and topic reviews. The permit reviews focused on core permit quality and included a review of the permit application, permit, fact sheet, and any correspondence, reports or documents that provide the basis for the development of the permit conditions.

The core permit review involved the evaluation of selected permits and supporting materials using basic NPDES program criteria. Reviewers completed the core review by examining selected permits and supporting documentation, assessing these materials using standard PQR tools, and talking with permit writers regarding the permit development process. The core review focused on the Central Tenets of the NPDES Permitting program to evaluate the North Carolina NPDES program. In addition, discussions between EPA and state staff addressed a range of topics including program status, the permitting process, responsibilities, organization, and staffing. Core topic area permit reviews are conducted to evaluate similar issues or types of permits in all states. The national topics reviewed in the North Carolina NPDES program were: nutrients, pesticide general permit, pretreatment, and stormwater.

Regional topic area reviews target regionally-specific permit types or particular aspects of permits. EPA Region 4 selected whole effluent toxicity and water quality trading as regional topic areas. These reviews provide important information to North Carolina, EPA Region 4, EPA HQs and the public on specific program areas.

A total of eighteen (18) permits were reviewed as part of the PQR. Permits were selected based on issuance date and the review categories that they fulfilled.

II. STATE PROGRAM BACKGROUND

A. Program Structure

North Carolina Department of Environmental and Natural Resources (DENR) develops, issues and administers NPDES permits in North Carolina. Permitting for point sources is conducted within the Division of Water Quality. DENR's Central Office is located in Raleigh while the state maintains seven district offices in Washington, Wilmington, Raleigh, Fayetteville, Winston-Salem, Mooresville, and Asheville. The Central Office issues all NPDES permits and comprises two units: the complex permitting and expedited permitting units. The expedited permitting unit handles simple permit renewals, general permits, and complex enforcement cases. The complex permitting unit handles both major and minor individual permits, special technical issues, and policy implementation. The regional offices conduct inspections and are responsible for compliance, enforcement, and complaint responses. Two counties, Wake and Mecklenburg, conduct inspections of NPDES minor facilities within their jurisdictions.

Other groups within DENR support NPDES permitting: the basin planning unit, Total Maximum Daily Load (TMDL)/Modeling unit, classification/standards unit, environmental sciences section, and laboratory section. Prior to the basin kickoff meeting described below, permit workloads are divided by management between the complex and expedited sections. Individual assignments are made based on staff experience and current workloads.

DENR issues NPDES permits on a watershed basis. DENR uses a basin-wide information management system (BIMS). According to DENR, BIMS is a centralized, integrated database that comprises functional areas such as:

- Water Bodies – identifies and categorizes ocean, rivers, lakes, wetlands, and other water bodies in 17 water basins,
- Owners – stores and tracks 5,000 individuals that own facilities and other entities of environmental interest,
- Facilities – stores and monitors 20,000 facilities and other environmental interests that are permitted to discharge waste into water bodies, including surface waters, groundwater, animal farms, and wetlands,
- Permitting – contains 38,000 permits in various program areas which are initiated from applications, then stored and maintained in the BIMS,
- Monitoring – 16,800 discharge monitoring reports are keyed into BIMS annually from approximately 1,400 regulated facilities (individual NPDES permit holders) – also monitors non-discharge facilities,
- Inspections – standardizes and strengthens inspection processes in various program areas to support 160 inspectors across the state,
- Incidents – stores and tracks citizen complaints, accidental spills, wastewater treatment plant bypasses, sanitary sewer overflows, and other incidents requiring DWQ attention,
- Monitoring and reporting violations – tracks and automatically generates violations during nightly process based on monitoring, inspection, incident and other activities,
- Enforcement – supports and tracks DWQ enforcement actions against violators,

- Operator training and certification – supports required ongoing training activities and certification status of approximately 9,000 wastewater treatment plant and other facility operators across the state,
- Permitting and Enforcement Fees – tracks the various fees, dues and other financial information to support the continued DWQ business operations,
- EPA Reporting – transmits required permit, monitoring and enforcement data to EPA’s Permit Compliance System (PCS) weekly – this information feeds EPA’s Enforcement and Compliance History Online (ECHO) system and the Center for Regulatory Effectiveness (CRE) Watch List, and
- Reports - contains approximately 350 standard-format reports and dozens of ad hoc user extracts.

In addition to BIMS, DENR maintains an aquatic toxicity in-house data management system. Permitting tools include dissolved oxygen (DO) modeling, a reasonable potential analysis (RPA) spreadsheet, an ammonia/total residual chlorine spreadsheet, a spreadsheet for textile facilities, and nutrient allocation tables.

Prior to beginning work on permits, there is a kick-off meeting involving the permit writer, basin leads, coordinators, and TMDL staff, among others. For each basin, a nutrient permitting strategy and guidance document is developed. Active, individual NPDES permits are identified and grouped into those facilities with or without nutrient allocations. Goals for permit renewals are identified, permit template language for nutrient special conditions are provided along with the steps the permit writer should follow to ensure the correct conditions are included in each permit. A spreadsheet was developed that contains the following information:

- NPDES permit number and discharge information,
- Discharge type (municipal, industrial, etc.),
- Subbasin,
- Assigned permit writer,
- Total nitrogen and/or total phosphorus limits, averaging periods, etc.,
- Special conditions and/or allocations, and
- Flow category.

North Carolina does allow pollutant transfers within a basin. These typically involve nutrients and are handled as permit modifications. Site specific data and information is examined to determine localized affects as well as upstream and downstream potential impacts. Standardized permit and fact sheet templates have not been developed. The most recent electronic permit and fact sheet for the discharger are typically utilized as the starting point for permit development. Permit packages are peer reviewed and the use of checklists is being considered. There is an older version of permit writing procedures that was developed in 1999, DENR wants to develop its own permit writers’ guide.

DENR sends a letter to existing dischargers prior to the permit expiration date that provides links to applicable applications. DENR stated they use EPA application forms; however, during the visit, it was determined that the state uses a state-specific “short form” for some minor facilities. A permit writer reviews the permit application for completeness. If the application package is complete, an acknowledgment letter is sent to the applicant. For permit renewals, if the

application is not complete the permit writer will contact the permittee to request the missing information. For new permits or permit expansions, if the application does not contain all the required information and forms it will be returned to the permittee. After the application package is complete, a draft permit is developed. The appropriate Regional Office will review and comment on the draft permit.

An adjudication process is available for permittees upon written request within 30 days after receiving the permit. All individual draft permits for major and minor facilities issued for public comment are public noticed in a local newspaper. If no significant comments are received by DENR, the permit writer finalizes the permit and issues it 45 days after the public notice is published in the local newspaper.

If the public presents a strong opposition to the issuance of a permit during the 30 day comment period, a public hearing may be warranted. The public hearing process involves an additional 30 day public hearing notice and a 60 day period after the public hearing for the hearing officer to make a recommendation to the Director. The Director then has 30 days to evaluate the hearing officer recommendation and deny or issue the permit with modifications.

Permit files are maintained in both electronic and hard copy form, although the intention is to move toward a fully electronic format. The full administrative record is maintained at Central Files in Raleigh, and working files are maintained within the permits group.

B. Universe and Permit Issuance

Based on information provided prior to the PQR site visit, DENR reported that it administers permits for the following:

- 293 POTWs
 - (170 major and 123 minor; no CSOs)
- 928 non-municipal facilities
 - (63 major and 865 minor)
- 4 concentrated animal feeding operations (CAFO) facilities, 1 individual permit and 3 facilities covered under a General Permit
- Stormwater general permits covering:
 - 106 municipal permittees (municipal separate storm sewer systems (MS4s))
 - 3940 industrial permittees
 - 8,000 construction permittees.
- DENR also has 1732 facilities covered under non-stormwater general permits.

Significant industries within the state include power plants, textiles, seafood processing, and bulk fuel storage. DENR estimates 20.6 percent of NPDES major permits and 14 percent of NPDES minor permits are expired and administratively continued (backlogged).

For new and expanding discharges, the permit development process includes a bi-weekly Engineering Alternatives Analysis (EAA) group review meeting to review alternatives/flow justifications to ensure programmatic consistency.

Technology-based effluent limits (TBELs) in NPDES permits are determined by using one or more of the following: (1) national standards for municipal dischargers or effluent guideline regulations (BPT, BCT, BAT, and NSPS) established by EPA for various industrial categories; or (2) case-by case analyses based on best professional judgment (BPJ).

Case-by-case BPJ limits are determined using: (1) permit file information (e.g., current and previous NPDES application forms and correspondence files; previous NPDES permit and fact sheet; statistical evaluation of effluent performance data from discharge monitoring reports (DMRs); compliance inspection reports); (2) information from existing facilities and permits (e.g., NPDES Individual and general permits for other NPDES permits issued to facilities in the same region or state, or that include case-by-case limitations for the same pollutants; toxicity reduction evaluations (TREs) for selected industries; ICIS-NPDES data; literature (e.g., technical journals and books); treatability manuals, state guidance documents); and (3) effluent guidelines development and planning information (industry experts within EPA headquarters, EPA Regions, and states; ELG Technical Development Documents, CWA section 308 questionnaires, proposed and final regulations, and EPA guidance manuals; EPA's Technical Support Documents (TSDs)).

Water quality-based effluent limits (WQBELs) are included in permits consistent with North Carolina Water Quality Standards (WQS) and criteria in Title 15A of the North Carolina Administrative Code, pursuant to 40 CFR 122.44(d). Parameters of concern are evaluated for consistency with the available aquatic life criteria (chronic) and human health criteria, considering mixing zones where appropriate. North Carolina has been allowed to use an action level approach, specifically for copper and zinc. In addition, there are no statewide numeric criteria for ammonia. EPA has recommended that action levels be removed and that the State should adopt EPA's recommended criteria for metals.

Monitoring frequencies for specific types of dischargers are found in 15A NCAC 02B.0508 and are based on the facility (SIC code) and classification. Once the public notice, draft permit, and fact sheet are finalized, the signed public notice is sent to the local newspaper for publication, and there is a 30-day period for public review and comment. Any comments are reviewed by DENR staff, who develop written responses that are included in the administrative record. All final administrative records are maintained in the central files located in Raleigh.

C. State-Specific Challenges

DENR's backlog numbers for expired permits have increased over the past few years. Hiring freezes and departed staff have forced the prioritization of work. In addition, litigation over coal ash, cooling water intake structures, and the Blue Ridge Paper Products NPDES permit (now known as Evergreen permit), as well as more recently the permits associated with closure of the Duke Power's facilities have diverted staff time. The EPA has offered permit writing training to DENR staff and has offered to provide guidance to improve permit quality.

D. Current State Initiatives

The EPA commends North Carolina for taking leadership in encouraging the formation of Water Quality Trading (WQT) Association for its innovative nutrient trading program between point and nonpoint sources of pollution in Tar-Pamlico River Basin. The Association formed an agreement with over 98% of the waste water dischargers in the basin to find more cost-effective ways to collectively meet their nutrient loading cap. To date, because the Tar-Pamlico Association has been successful at meeting their nutrient caps, the point-to-non-point source nutrient trading provisions provided under the Tar-Pam Nutrient Strategy have not been needed.

Since the completion of the PQR process in 2013, DENR has made a commitment to reduce permit backlog, collaborate more openly and early on key permit renewals, and address newly adopted WQS for metals in permits, once the WQS have been approved by EPA. Over the last two years, DNR has spent considerable time collaborating with the Region on the renewal of the Evergreen Permit, as well as the permits associated with closure of the Duke Power coal ash facilities.

III. CORE REVIEW FINDINGS

A. Basic Facility Information and Permit Application

1. Facility Information

Basic facility information is necessary to properly establish permit conditions. For example, information regarding facility type, location, processes and other factors is required by NPDES permit application regulations (40 CFR 122.21). This information is essential for developing technically sound, complete, clear and enforceable permits. Similarly, fact sheets must include a description of the type of facility or activity subject to a draft permit.

The 18 permits and fact sheets reviewed during the core review include permit issuance, effective and expiration dates, authorized signatures, and contain specific authorization-to-discharge information. These permits and fact sheets identify the location of the facility, identify the receiving waterbody by name and basin, and include very basic information describing the types of activities and treatment and identifying outfalls. The fact sheets provide some basic information regarding the designated uses of the receiving waterbodies and the impairment status of the receiving water.

2. Permit Application Requirements

Federal regulations at 40 CFR 122.21 and 122.22 specify application requirements for permittees seeking NPDES permits. Although federal forms are available, authorized states are also permitted to use their own forms provided they include all information required by the federal regulations. This portion of the review assesses whether appropriate, complete, and timely application information was received by the state and used in permit development.

For the 18 permits that were reviewed, applications reviewed were generally submitted on-time. Data provided in application forms lacked detailed information regarding method detection

limits; applications that contained “Non-Detect” in the field (versus an indication of method detection limit) were deemed complete. An indication of Non-Detect is insufficient to determine if sufficiently-sensitive analytical methods were employed and thus, quantifying the pollutant with respect to applicable water quality standards.

North Carolina uses their own application Form A for minor facilities. Their forms are not developed by the EPA and do not appear to require the same level of information as the EPA forms. For example, some of the information that is missing from North Carolina’s Form A that EPA’s Form 2 requires includes toxicity testing data, information on the disposal method (e.g., land application), geographic coordinates of the outfall(s), and a flow schematic drawing of the facility.

B. Technology-based Effluent Limitations

NPDES regulations at 40 CFR 125.3(a) require that permitting authorities develop technology-based requirements where applicable. Permits, fact sheets and other supporting documentation for publicly owned treatment works (POTWs) and non-POTWs were reviewed to assess whether technology based effluent limitations (TBELs) represent the minimum level of control that must be imposed in a permit.

1. TBELs for POTWs:

POTWs must meet secondary or equivalent to secondary standards (including limits for BOD, TSS, pH, and percent pollutant removal), and must contain numeric limits for all of these parameters (or authorized alternatives) in accordance with the secondary treatment regulations at 40 CFR Part 133. Eight POTW permits were reviewed as part of the PQR: Burnsville (NC0020290); Pinetops (NC0020435); Spruce Hill (NC0021423); Chadbourn (NC0021865); Littlejohn (NC0025691); Parkton (NC0026921); and Newton Clark (NC0036196).

The permits reviewed included an effluent limitations and monitoring requirements table that incorporated BOD and TSS limitations, expressed as both weekly and monthly averages, pH limitations expressed as a range, and percent removal requirements for BOD and TSS. There were instances where BOD limitations were more restrictive than those specified in 40 CFR Part 133. DENR personnel stated this was common due to wasteload allocations developed using DO modeling and through the basin wide permitting approach.

2. TBELs for Non-POTW Dischargers:

Permits issued to non-POTWs must require compliance with a level of treatment performance equivalent to Best Practicable Control Technology Currently Available (BPT), Best Available Technology Economically Achievable (BAT), or Best Conventional Pollutant Control Technology (BCT) for existing sources, and consistent with New Source Performance Standards (NSPS) for new sources. Where federal effluent limitations guidelines (ELGs) have been developed for a category of dischargers, the TBELs in a permit must be based on the application of these guidelines. If ELGs are not available, a permit must include requirements at least as stringent as BPT/BAT/BCT developed on a case-by-case using best professional judgment (BPJ) in accordance with the criteria outlined at 40 CFR 125.3(d).

The non-municipal permits chosen for review cover a variety of industries, including textiles, power plants, phosphate mining and manufacturing, and meat and poultry products. The ELGs generally appear to be properly applied and expressed; however, the fact sheets and administrative records provide little detail regarding how the facility categorization was conducted, whether the facilities were existing or new sources, and (where applicable) how production levels were used to calculate effluent limits were established. The 10 non-municipal permits reviewed as part of the PQR include: Invista S.A.R.L. (NC0001112); Coats American (NC0004243); Pharr Yarns (NC0004812); Tyson Foods, Inc. (NC0005126); Captain Stevens Seafood (NC00059218); Smithfield Packaging (NC0078344); PCS Phosphate (NC0003255); Columbus County (NC0087947); Duke Energy (NC0004961); and West Point Homes (NC0005762).

C. Water Quality-Based Effluent Limitations

The NPDES regulations at 40 CFR 122.44(d) require permits to include any requirements in addition to or more stringent than technology-based requirements where necessary to achieve state water quality standards, including narrative criteria for water quality. To establish such “water quality-based effluent limits” (WQBELs), the permitting authority must evaluate the proposed discharge and determine whether technology-based requirements are sufficiently stringent, and whether any pollutants or pollutant parameters could cause or contribute to an excursion above any applicable water quality standard.

The North Carolina PQR assessed how permit writers implement these requirements. Specifically, the PQR reviewed applications, permits, fact sheets, reasonable potential analysis (RPA) worksheets, and other documents in the administrative record to evaluate how permit writers and water quality modelers:

- determined the appropriate water quality standards applicable to receiving waters,
- evaluated and characterized the effluent and receiving water including identifying pollutants of concern,
- determined critical conditions,
- incorporated information on ambient pollutant concentrations,
- assessed any dilution considerations, and
- determined whether limits were necessary for pollutants of concern and, where necessary, calculate such limits or other permit conditions.

For impaired waters, the PQR also assessed whether and how permit writers consulted and developed limits consistent with the assumptions of applicable EPA-approved total maximum daily loads (TMDLs).

Based on permit and file reviews and discussions with state staff, the following issues were noted with respect to the state’s approach to conducting reasonable potential analyses (RPA) and calculating WQBELs:

- There was little information in the fact sheet or administrative record documenting how DENR selected “pollutants of concern” to assess impacts on water quality.

- DENR employs a standardized spreadsheet to calculate instream pollutant concentrations necessary to assess reasonable potential. The spreadsheets were found in some but not all files reviewed.
- In general, North Carolina's water quality criteria for protection of aquatic life are expressed as a single "not to be exceeded" value. The water quality criteria do not appear to incorporate duration or frequency components. DENR reported that these criteria are implemented as chronic values, and are based on EPA's chronic criteria recommendations.
- Although the state WQS do not appear to include aquatic life criteria for protection of acute toxic effects, DENR reported that it uses EPA's acute criteria recommendations in its reasonable potential determinations. DENR's spreadsheet reflects the use of these acute values.
- The state has not adopted a numeric criterion for ammonia. In lieu of a numeric criterion, the state has established an ammonia implementation policy (15A NCAC 02B.0208) that calls for effluent limits for new and existing dischargers under various scenarios. It appears that the effluent limits established in the policy for certain categories of dischargers are based on technical performance of treatment plants; thus, it is unclear how the limits are protective of water quality. Administrative records and the fact sheets did not clearly document limit calculations as outlined in the Ammonia Toxicity Policy, and it was not clear if the policy was consistently applied.
- North Carolina's WQ criteria regulations establish "action levels" (AL) rather than enforceable numeric criteria for copper, zinc, chloride, iron, and silver. In the RPA process, if there is a determination that a pollutant will cause, have the reasonable potential to cause, or contribute to an excursion above an "Action Level," an effluent limit will not be established unless the pollutant is determined to be a "significant causative factor in whole effluent toxicity." If there is no observed toxicity (i.e., failure of a WET test), then the permit will only contain a monitoring requirement for the Action Level pollutant. (See: Implementation of Action Levels for Copper and Zinc in NPDES Permits, October 25, 2000, North Carolina Division of Water Quality).
- North Carolina's lack of WQS has made it difficult for permit writers to develop NPDES permits that protect aquatic life and human health. Developing limits for parameters when sufficiently protective WQS have not been promulgated by the State have been problematic. In January, 2015, DENR adopted new WQS for metals. For metals that EPA approves for Clean Water Act purposes, the NPDES permits will contain more appropriate limits for those specific metals.
- North Carolina does not appear to be consistently including limitations for oil and grease. Limits were observed in some permits, although administrative records did not consistently include documentation on the basis for whether or not limits were included.
- For some pollutants, DENR uses its water quality criteria to assess reasonable potential and develop limits consistent with procedures in EPA's Technical Support Document (TSD).
- During the core permitting review, it was difficult to ascertain from the fact sheet and file information what assumptions (mixing conditions, ambient pollutant concentrations, etc.) were used for the RPA and WQBEL calculations. In discussions with DENR staff, it was determined that the state generally uses default mixing assumptions for the receiving water that provide the full critical stream flow for dilution, assume rapid and complete

mixing, and assume zero ambient pollutant concentrations. Using these default conditions effectively provides the full assimilative capacity of the receiving water for each discharger. Absent verification that the full assimilative capacity of the stream is actually available, the state's procedures could result in a finding of no reasonable potential, where in fact there is a potential concern, or could result in the development of effluent limits that may not be protective of the applicable water quality standards. It was also unclear if state was updating the receiving stream flow data or merely using the previous fact sheet information while renewing the NPDES permits.

- Review of the related administrative record and fact sheets revealed that in some cases no RPA was done, particularly for renewed permits. Of the 18 permits reviewed as part of the PQR, the administrative record for two of the permits lacked adequate documentation for RPA (e.g., Tyson Foods, Inc. (NC0005126) and Spruce Hill (NC0021423)). In cases where RPA was done, it was completed for all parameters.

North Carolina also utilizes a basin-wide planning approach to coordinate permitting and other water quality assessment and protection efforts. Under its basin-wide permitting approach, as the NPDES permits for each basin are developed for issuance/reissuance, there are coordination meetings with the permit writer, basin leads, and TMDL staff, among others. There is a written strategy for the basin as well as a spreadsheet listing each discharger within the basin along with allocations assigned each facility, nutrient limits and monitoring, special conditions, and mass loadings. Based on the information provided, DENR has a comprehensive approach to assessing cumulative impacts from dischargers in a specific basin. However, little or no information regarding the implementation of the basin plan was documented in the fact sheets for individual facilities or contained in the administrative record.

For the permits reviewed, there was an indication on the first page of the fact sheets as to whether the receiving water was listed as being impaired and on the 303(d) list; however, the fact sheet did not necessarily indicate the nature of the impairment, or what pollutants contributed to the impairment. There was little to no follow-up discussion in the fact sheets and it was difficult to determine based on information in the record if the effluent limits and conditions adequately complied with applicable wasteload allocations from TMDLs or addressed the pollutants and conditions contributing or causing the impairment.

1. Anti-degradation:

Each State is required to adopt an anti-degradation policy consistent with EPA's anti-degradation regulations at 40 CFR 131.12. North Carolina's regulations at section 15A NCAC 02B.0201 require all new or expanded surface water discharges to meet anti-degradation requirements. In general, these procedures require maintenance of existing uses, balancing of benefits and impacts, and options review. All elements of the anti-degradation analysis, including whether existing uses are being maintained and whether the degradation is necessary to accommodate important economic or social development in the area, should be documented in the fact sheet.

The administrative records of the reviewed permits generally did not indicate how DENR has complied with these requirements. The few anti-degradation analyses that DENR has done are limited to cost of wastewater discharge and treatment for the NPDES permit applicants. The alternatives to the direct discharge should be analyzed as required by 15A NCAC 2H.0105(c)(2).

The socio-economic benefit of the proposed or expanded discharges should be clearly shown with actual or projected benefits.

2. Anti-backsliding:

CWA 402(c), 303(d)(4), and 40 CFR 122(1) restrict the relaxation of final effluent limitations and the relaxation of standards or conditions contained in existing permits. Anti-backsliding review is triggered when a permit is renewed, revised, or reissued. The PQR found that anti-backsliding requirements have not been discussed in the draft permits or in the administrative records.

3. Mixing Zone and Dilution:

40 CFR 131.13 states that states may, at their discretion, include in their state water quality standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances. Such policies are subject to EPA review and approval. DENR's administrative records reviewed do not discuss the mixing zone, dilution and diffuser-assisted mixing as required by State regulations contained at 15A NCAC 02b.0203(b).

D. Monitoring and Reporting

40 CFR 122.41(j) requires permittees to periodically evaluate compliance with the effluent limitations established in their permits and provide the results to the permitting authority. Monitoring and reporting conditions require the permittee to conduct routine or episodic self-monitoring of permitted discharges and where applicable, internal processes, and report the analytical results to the permitting authority with information necessary to evaluate discharge characteristics and compliance status.

Specifically, 40 CFR 122.44(i) requires NPDES permits to establish, at a minimum, annual monitoring for all limited parameters sufficient to assure compliance with permit limitations, including specific requirements for the types of information to be provided and the methods for the collection and analysis of such samples. In addition, 40 CFR 122.48, requires that permits specify the type, intervals, and frequency of monitoring sufficient to yield data which are representative of the monitored activity. The regulations at 40 CFR 122.44(i) also require reporting of monitoring results with a frequency dependent on the nature and effect of the discharge.

The permits reviewed generally included appropriate monitoring requirements based on the facility type, type of discharge and corresponding limit basis. Their requirements appear to be consistent with the state's monitoring frequencies for specific types of dischargers found in State regulations 15A NCAC 02B.0508.

1. Sufficiently Sensitive Methods:

40 CFR 122.44(I)(iv) requires testing to be conducted with sufficiently sensitive methods. EPA recommends that all permittees use methods that enable pollutants to be detected at levels to demonstrate compliance with permit limits or WQS. Where no approved sufficiently sensitive method can detect a pollutant at the water quality-based standards level, the most sensitive EPA approved method should be used. If the permittee believes that an alternative method should be

used (e.g., due to matrix interference), the permittee should obtain prior approval. Additionally, standard conditions in both industrial and domestic wastewater permits DENR should require the use of sufficiently sensitive methods.

The permit quality review revealed that in some cases, administrative records and supporting documents did not show whether sufficiently sensitive analytical methods were used in analyzing influent and effluent concentration.

Mercury: North Carolina has a two prong approach for evaluating mercury impairment. First, North Carolina implements its 2012 mercury TMDL for protection of human health, which is based on a fish tissue target of 0.3 mg/kg, by requiring permittees with permitted flows exceeding 2 MGD and discharging significant quantities of mercury (i.e., greater than 1 ng/l of mercury in effluent) to submit mercury minimization plans (MMPs). Second, North Carolina conducts a modified reasonable potential analysis for permittees to exceed the North Carolina WQS of 12 ng/l, allowing for limited dilution based on the 7Q10 flow of the receiving water body, but capped at a TBEL equal to 47 ng/l. North Carolina has indicated they plan to evaluate their mercury WQS at the next Triennial Review. When developing WQBEL, the permitting authority must ensure that the level of water quality to be achieved by such limits derives from and complies with all applicable State water quality standards as per 40 CFR 122.44(d)(1)(vii).

The administrative records and the fact sheets do not consistently show that the State has applied its mercury standards of 12 ng/L uniformly. In some permits the State has correctly applied this standard with a mercury limit of 12 ng/L to ensure the discharge will not contribute to those existing mercury exceedances. In some permits the State has only applied a limit of 47ng/L to implement a methyl mercury TMDL. The EPA sent a letter to DENR dated September 6, 2012, regarding permit recommendations to address statewide mercury impairments, a less stringent permit limit, such as the 47 ng/L, would only be justified once DENR demonstrates that site-specific data show that the facility is not causing or contributing to the existing mercury impairment. For the permits reviewed, insufficient information was available in the administrative records to support the higher limit for mercury.

E. Standard and Special Conditions

Federal regulations at 40 CFR 122.41 require that all NPDES permits, including NPDES general permits, contain an enumerated list of “standard” permit conditions. Further, the regulations at 40 CFR 122.42 require that NPDES permits for certain categories of dischargers must contain additional standard conditions. Permitting authorities must include these conditions in NPDES permits and may not alter or omit any standard condition, unless such alteration or omission results in a requirement more stringent than required by the federal regulations. In addition to standard permit conditions, permits may also contain additional requirements that are unique to a particular permittee or discharger. These case-specific requirements are generally referred to as “special conditions.” Special conditions might include requirements such as: additional monitoring or special studies such as pollutant management plan or a mercury minimization plan; best management practices [40 CFR 122.44(k)], or permit compliance schedules [40 CFR 122.47]. Where a permit contains special conditions, such conditions must be consistent with applicable regulations.

DENR has recently updated their standard conditions boilerplate (Parts II and III) that corresponds to the requirements found in 40 CFR 122.41 and 122.42. The updated boilerplate standard conditions were reviewed; earlier versions did not necessarily contain all the Federal requirements. In addition, Part IV of the boilerplate contains pretreatment requirements. This updated attachment was not found in the permit files for all the permits reviewed. Many of the permits reviewed for North Carolina contained additional narrative requirements (special conditions) addressing management practices and/or special studies or reports. These special conditions appeared appropriate for the types of dischargers and permits reviewed.

F. Administrative Process

The administrative process includes documenting the basis of all permit decisions (40 CFR 124.5 and 40 CFR 124.6); coordinating EPA and state review of the draft (or proposed) permit (40 CFR 123.44); providing public notice (40 CFR 124.10); conducting hearings if appropriate (40 CFR 124.11 and 40 CFR 124.12); responding to public comments (40 CFR 124.17); and, modifying a permit (if necessary) after issuance (40 CFR 124.5). EPA discussed each element of the administrative process with DENR and reviewed materials from the administrative process as they related to the core permit review.

DENR staff stated that all public notices are required by law to be published in a local newspaper. When permits for a particular basin are being developed, DENR contacts the appropriate environmental groups and other interested parties. North Carolina also maintains a list of interested parties, stakeholders and environmental groups and sends notices to members of this list as applicable.

The permit files reviewed contained comments received during the public notice period, and responses to those comments. Based on the permits reviewed, no significant changes were made between draft and final permits. However, it is not clear from a review of DENR's administrative records that significant comments or recommendations were incorporated in their final NPDES permits.

G. Administrative Record

The administrative record is the foundation that supports the NPDES permit. If EPA issues the permit, 40 CFR 124.9 identifies the required content of the administrative record for a draft permit and 40 CFR 124.18 identifies the requirements for a final permit. Authorized state programs should have equivalent documentation. The record should contain the necessary documentation to justify permit conditions. At a minimum, the administrative record for a permit should contain the permit application and supporting data; draft permit; fact sheet or statement of basis; all items cited in the statement of basis or fact sheet including calculations used to derive the permit limitations; meeting reports; correspondence between the applicant and regulatory personnel; all other items supporting the file; final response to comments; and, for new sources where EPA issues the permit, any environmental assessment, environmental impact statement, or finding of no significant impact.

Current regulations require that fact sheets include information regarding the type of facility or activity permitted, the type and quantity of pollutants discharged, the technical, statutory, and regulatory basis for permit conditions, the basis and calculations for effluent limits and conditions, the reasons for application of certain specific limits, rationales for variances or alternatives, contact information, and procedures for issuing the final permit. Generally, the administrative record includes the permit application, the draft permit, any fact sheet or statement of basis, documents cited in the fact sheet or statement of basis, and other documents contained in the supporting file for the permit.

Based on the review of the administrative records, the following were not transparent:

- What data were used to assess WQ impacts or to calculate Reasonable Potential Analysis (RPA) and limit calculations,
- How pollutants of concern are identified,
- What assumptions like dilution, mixing, background concentrations, etc. were made to calculate WQ calculations,
- How TBELs and WQBELs are compared,
- No discussion of RPA or limits to address state narrative water quality criteria,
- Little or no discussion of anti-backsliding or anti-degradation assessments, and
- Little discussion of WQ impairment and whether the discharge contributes to the impairment.

1. Documentation of Effluent Limitations:

Permit records for POTWs and industrial facilities should contain comprehensive documentation of the development of all effluent limitations. Technology-based effluent limits should include assessment of applicable standards, data used in developing effluent limitations, and actual calculations used to develop effluent limitations. The procedures implemented for determining the need for water quality-based effluent limitations as well as the procedures explaining the basis for establishing, or for not establishing, water quality-based effluent limitations should be clear and straight forward. The permit writer should adequately document changes from the previous permit, ensure draft and final limitations match (unless the basis for a change is documented), and include all supporting documentation in the permit file.

DENR drafts fact sheets for major NPDES permits, and for some minor NPDES permits. Adequate fact sheets are not drafted for all facilities, particularly when the permits are renewed. DENR has no apparent standardized process for developing factsheets.

H. National Topic Areas

Core topic areas are specific aspects of the NPDES permit program that warrant review based on the specific requirements applicable to the selected topic areas. These topic areas have been determined to be important on a national level. Core topic areas are reviewed for all state PQRs and include nutrients, pesticides, pretreatment and stormwater.

1. Nutrients

Background:

For more than a decade, both nitrogen and phosphorus pollutions have consistently ranked as one of the top causes of degradation of surface waters in the U.S. Since 1998, EPA has worked at reducing the levels and impacts of nutrient pollution. A key part in this effort has been the support EPA has provided to the States to encourage the development, adoption and implementation of numeric nutrient criteria as part of their water quality standards (see the EPA's *National Strategy for the Development of Regional Nutrient Criteria*). In a 2011 memo to the EPA regions titled *Working in Partnerships with States to Address Nitrogen and Phosphorus Pollution through use of a Framework for State Nutrient Reductions*, EPA announced a framework for managing nitrogen and phosphorus pollution that, in part, relies on the use of NPDES permits to reduce nutrient loading in targeted or priority watersheds. To assess how nutrients are addressed in the North Carolina NPDES program, EPA reviewed 15 permits with nutrients requirements as well as water quality trading program, and supporting administrative documents.

Program Strengths:

North Carolina has numeric criteria for chlorophyll a. The State has established nutrient standards for water bodies identified as Nutrient Sensitive Waters (NSW) and High Quality Waters {(15A NCAC 02B.0223 and 15A NCAC 02B.0224)}. Session Law 1997-458 adopted limits for nitrogen and phosphorus. Furthermore, North Carolina has conducted studies to set phosphorus limits for NSW.

Critical Findings:

North Carolina has chlorophyll a value of 40 µg/L for fresh and saltwater aquatic life; and 15 µg/L for trout waters. Based on responses to the PQR interview questions and a review of information collected on the nutrient PQR checklist, its apparent chlorophyll-a limits are not consistently applied in permits. The State's policy for implementing nutrient limits in permits is unclear based on EPA's review of the State's administrative records for the permits reviewed during the PQR. This is true particularly for water quality trading partners who discharge to NSW, and municipal and industrial wastewater treatment facilities that contribute significant nitrogen and phosphorus loadings, and urban stormwater sources that discharge into nitrogen and phosphorus-impaired waters.

2. Pesticides

Background:

On January 7, 2009, the Sixth Circuit vacated the EPA's 2006 NPDES Pesticides Rule on Aquatic Pesticides (71 Fed. Reg. 68483, November 27, 2006) and found that point source discharges of biological pesticides and chemical pesticides that leave a residue, into waters of the U.S. were pollutants under the CWA. *National Cotton Council of America v. EPA*, 553 F.3d 927 (6th Circuit, 2009). As a result of the Court's decision to vacate the 2006 NPDES Pesticides Rule, NPDES permits are required for discharges of biological pesticides and of chemical pesticides that leave a residue, to waters of the United States. In response to this decision, on April 9, 2009, the EPA requested a two-year stay of the mandate to provide the EPA time to develop general permits, to

assist NPDES-authorized states to develop their NPDES permits, and to provide outreach and education to the regulated community. On June 8, 2009, the Sixth Circuit granted the EPA the two-year stay of the mandate. On March 28, 2011, the U.S. Court of Appeals for the Sixth Circuit granted the EPA's request for an extension to allow more time for pesticide operators to obtain permits for pesticide discharges into U.S. waters. The court's decision extended the deadline for when permits would be required from April 9, 2011 to October 31, 2011.

EPA proposed a draft pesticide general permit on June 4, 2010, to cover certain discharges resulting from pesticide applications in unauthorized states, tribes and territories. The EPA Regional offices and State NPDES authorities may issue additional general permits or individual permits, if needed. On October 31, 2011, the EPA issued the final NPDES Pesticide General Permit (PGP) for Discharges from the Application of Pesticides. The federal PGP applies where the EPA is the permitting authority. All delegated state NPDES authorities have issued state pesticide general permits as of April, 2013.

Program Strengths:

Existing North Carolina's state law provides the authority to issue NPDES permits for discharges from the application of pesticides. DENR issued its pesticide general permit, NCG560000, in January, 2012.

Critical Findings:

Region 4 reviewed DENR's pesticide general permit with a focus on verifying its consistency with NPDES program requirements. It was found that this permit meets the requirements to obtain coverage for all discharges from the application of pesticides including all pesticide use patterns described in the EPA pesticide permit, all operators of discharges, including decision-makers and applicators. The review found the permit consistent with CWA requirements.

3. Pretreatment

Background:

The EPA Region 4 industrial pretreatment program routinely performs comprehensive audits of the state's permitting, compliance, and enforcement activities to assure consistency with the Clean Water Act, state law, the MOA, the state grant workplan, and all applicable federal regulations. As part of this PQR, select POTW permits with and without an approved pretreatment program were reviewed using the PQR checklist for the necessary pretreatment elements. The EPA did not review any industrial permits with respect to pretreatment language as the State does not issue NPDES permits to indirect dischargers, rather, local governments are responsible for issuing these permits. The EPA found some discrepancies pertaining to the pretreatment language required in 40 CFR 122.42(b) and these are outlined in the Critical Findings Section. It is noted that this section of the PQR report is not typical of what is seen in other pretreatment program in other EPA Regions. Region 4's comprehensive audit of the State's pretreatment program is unique in that the audit reviews a larger universe of permits.

The Comprehensive State Pretreatment Program Audits (CSPPA) include: (1) on-site visits to all appropriate state offices, including central and field offices; (2) compliance oversight visits to a statistically significant percentage of publically owned treatment works (POTW) pretreatment

programs and state industrial users; and (3) a desk audit of the legal authorities, formal procedures, and resources available to the state's industrial pretreatment program.

To date, the CSPPA for NC has not been scheduled. Since the CSPPA takes a more comprehensive look at the pretreatment program, the EPA's evaluation of the state's pretreatment permitting activities will be included in that report and provided separately to the state Director.

Program Strengths:

Based on the limited number of permits reviewed during the PQR, it's apparent that most of the federal requirements are contained in the State's boilerplate language. A more complete review of the State's pretreatment program will be determined once the CSPPA is completed.

Critical Findings:

The PQR assessed permit language for four selected permits, all with approved pretreatment programs, to determine if boilerplate language for the selected permits was included in the permits having pretreatment programs. The review concluded that boilerplate language was included for permits requiring pretreatment programs. However, the appropriateness and completeness of the boilerplate language will be reviewed as part of the previously mentioned pretreatment audit. The review of these four permits concluded that two notification requirements were not included in the permit language and pertain to: (1) introduction of pollutants to a POTW (40 CFR 122.42(b)(1)); and (2) any substantial change in volume or character of pollutants (40 CFR 122.42(b)(2)). However, other specific pretreatment language was included in the permit and this includes: (1) the requirements of 40 CFR 122.44(j)(2)(i) to develop and submit a local program if in the case pretreatment becomes necessary at a later date or, alternatively, a reopener clause specifically for pretreatment; (2) the requirements to identify in terms of character and volume of pollutants any Significant Industrial Users discharging into the POTW (40 CFR 122.44(j)(1)); and (3) permit contains notification requirements for quantity and quality of effluent to POTW and anticipated impact of the change in effluent to POTW (40 CFR 122.42(b)(3)).

4. Stormwater

Background:

The NPDES program requires stormwater discharges from certain municipal separate storm sewer systems (MS4s), industrial activities, and construction sites to be permitted. Generally, EPA and NPDES-authorized states issue individual permits for medium and large MS4s and general permits for smaller MS4s, industrial activities, and construction activities.

As part of the PQR, EPA reviewed the City of Charlotte's Phase 1 MS4 permit, NPDES No, NCS000240. There are numerous Phase II MS4 permittees in NC, and for the PQR the general stormwater permit applicable to all Phase II municipalities, NCG230000, was reviewed. For construction stormwater permits, EPA reviewed the general permit, NCG010000, issued to these entities and did not review any information pertaining to an individual coverage request. NC also issues a general permit for stormwater from industrial facilities, and for the PQR General Permit NCG090000 issued to Manufacturing Paints, Varnishes, Lacquers, Enamels, and Allied Products was reviewed.

Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s)

Phase I MS4s: There are 11 Phase I MS4s within the State of North Carolina. NPDES Permit NCS000240 for the City of Charlotte was reviewed for the PQR. The Charlotte-Mecklenburg Storm Water Services (CMSWS) is the primary agency responsible for managing the City's NPDES stormwater permit, its MS4 and the Storm Water Management Plan (SWMP).

In all MS4 jurisdictions, maintenance and improvements to the MS4 system are funded by stormwater utility fees. Maintenance activities include cleaning inlets of debris and sediment, maintaining channels to reduce erosion and maximize pollution reduction capabilities, and the removal of blockages. Improvements to the MS4 system include solving watershed scale infrastructure problems, channel stabilization, safety improvements, stream habitat enhancement, water quality enhancement, and resolving flooding problems associated with stormwater generated from public streets.

The Phase I MS4 permit for the City of Charlotte contains all the required elements of an effective program including the development of the SWMP, which is routinely updated, typically calling for completion of development of new SWMP directives within one (1) year and implementation completed within five (5) years from the effective date of the currently issued permit renewal. As indicative of large and medium MS4s within the State of North Carolina, the City's SWMP as required by the permit includes all of the core elements required of the Phase I permit program.

Program Strengths:

The Region 4 staff reviewed the permit for adherence to the federal MS4 requirements. As typical of Phase I MS4 programs within the State, North Carolina's overall administration of the NPDES stormwater program and its permits, continue to meet the EPA's expectations. DENR staff are proactive in keeping MS4s up to date on State and federal initiatives/policies, and meet with the MS4s on a scheduled basis. Plans and Annual reports are reviewed and updated as necessary.

Critical Findings: None

Phase II MS4s: The general permit authorize existing and new point source discharges of stormwater runoff from the Permittee's MS4 in accordance with the permit conditions which include the Permittee's approved Stormwater Management Plan. The Stormwater Management Plan is incorporated by reference, and is an enforceable part of the stormwater NPDES permit. In the State, there are approximately 109 small MS4s.

Program Strengths:

As with the Phase I program, Region 4 staff reviewed the general permit for Phase II MS4s for adherence to the federal MS4 requirements. North Carolina's overall administration of the Phase II NPDES stormwater program and the permits issued continues to meet the EPA's expectations. DENR staff are aggressive in routinely keeping MS4s up to date on state and federal

initiatives/policies, and meet with the MS4s on a scheduled basis. Plans and annual reports are reviewed and updated as necessary.

Critical Findings: None

General Permit for Stormwater Discharges from Construction Activity (NCG010000)

In developing the State's Construction General Permit (CGP), DENR determined that it needed a mechanism to involve the various stakeholders than it had traditionally used in the past for this permit. Therefore, the State established a Construction General Permit Technical Advisory Group (CTAG) to work with DENR staff in discussing various options for construction. The CTAG was made up of 14 members representing regulatory, environmental, and development interests. The entire group or a subgroup met approximately 14 times during the development of the permit. The meetings were also open to the public, and many citizens attended. Notes from all meetings were documented and provided both to the participants and to those on an extended mailing list. CTAG did not vote on the final recommended draft permit, but the Group did discuss all significant issues prior to the State's preparation of the draft permit. The permit was issued on August 11, 2011, and will expire on July 31, 2016. There are approximately 7800 facilities covered by this permit.

Program Strengths:

The State has done an exemplary job in the implementation of its construction program, particularly in its delegation of authority to local municipalities. In addition, the Division of Land Resources ensures that under its delegation, all construction sites are inspected routinely and tier enforcement mechanisms are in place to ensure compliance. Contained within the general permit are several key pollution prevention requirements and conditions that are critical to compliance. Some of these are the following:

- Construction activities disturbing one or more acres of land will need a local or state sediment and erosion control plan and coverage under the NPDES General Permit for stormwater point source discharges,
- Local or state sediment/erosion control plans must be approved before disturbance occurs,
- Must implement the state or local plan (deviations are a violation of the permit),
- Corrective action shall be taken immediately to control discharge of any sediments off site or into waters of the state,
- At least once per week, each control measure shall be inspected to ensure that it is operating correctly and records maintained,
- Control measure inspections should also be made within 24 hours of rain events greater than 0.50 inches, and
- The quality of all stormwater discharges shall be observed and recorded.

There are some notable enhancements in the current permit over the previous CGP. For example, ground cover is now required within seven (7) days of temporary or permanent stopping of work for all perimeter dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3:1. For all other areas, ground cover would be required within 14 days. The permit also requires added protections for projects draining to all High Quality Waters. Included in the permit is improved

language on regarding the installation, implementation, and maintenance BMPs. The permit also requires a 50 foot setback requirement for stock piles, and storage of land clearing, demolition debris, construction and domestic waste, and hazardous or toxic waste on construction sites. In addition, some key definitions had been added, along with clarifying language to other Sections of the permit.

Thirty five local governments rely on North Carolina's Division of Land Resources Erosion and Sediment Control Program, 43 local governments rely on a county delegated Soil and Erosion Control (S&EC) program and 10 are delegated by DENR's Division of Land Resources to implement a the S&EC program. The Erosion and Sediment Control Program whether implemented by the state or a state delegated program effectively meets the requirements of the Construction Site Runoff Controls by permitting and controlling development activities disturbing one or more acres of land surface and those activities less than one acre that are part of a larger common plan of development. This program is authorized under the Sediment pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code. This program includes procedures for public input, sanctions to ensure compliance, requirements for construction site operators to implement appropriate erosion and sediment control practices, review of site plans which incorporates consideration of potential water quality impacts, and procedures for site inspection and enforcement of control measures.

Critical Findings:

The permits reviewed appear to include effluent limits within the requirements to develop a Stormwater Pollution Prevention Plan (SWPPP). It is important to distinguish between the effluent limits in the permit, which DENR is responsible for developing, and the discharger's SWPPP, which is the documentation the permittee uses to demonstrate compliance with effluent limits in the permit. For enhanced transparency, the EPA recommends that effluent limits be included in a separate section of the permit from the SWPPP requirements.

In addition, the permits reviewed appear to be missing many of the non-numeric effluent limit requirements promulgated in 2009 in the Construction & Development Effluent Limitation Guidelines (C&D Rule) at 40 CFR 450.21. It is unclear whether the permit is relying on the State's Erosion and Sediment Control Planning and Design Manual. In the next permit cycle, the EPA recommends that the permit include requirements from the C&D Rule as enforceable limits.

Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity

DENR issues sector by sector industrial stormwater general permits depending upon the industrial categories in each sector. One such sector permit, Manufacturing Paints, Varnishes, Lacquers, Enamels, and Allied Products, NCG090000, was selected by EPA for this PQR. The permit was issued on October 25, 2012 with an effective date of November 1, 2012. The permit expires on October 31, 2017.

This permit requires coverage for discharges associated with the following activities: (1) establishments primarily engaged in the manufacture of paints, varnishes, lacquers, enamels, and allied products [standard industrial classification (SIC) 2851]; and (2) Stormwater point source

discharges from industrial activities deemed by the Division of Water Quality to be similar to these operations in the process, or the discharges, or the exposure of raw materials, intermediate products, by-products, products, or waste products.

Program Strengths:

Region 4 reviewed DENR's NCG090000 with a focus on verifying its consistency with NPDES program requirements. The review found that this permit meets the federal requirements to obtain coverage for all stormwater related discharges associated with manufacturing paints, varnishes, lacquers, enamels, and allied products.

Critical Findings: none

IV. REGIONAL TOPIC AREA FINDINGS

A. Whole Effluent Toxicity

Background:

Regulations at 40 CFR 122.44(d) require several factors to be considered when determining whole effluent toxicity (WET) reasonable potential (RP). Among these factors, WET monitoring data used should be representative of the effluent discharge and consideration of species sensitivity, including ensuring that effluent variability is considered and addressed. Permit writers are supposed to monitor WET with three species (plant, invertebrate and vertebrate) or at least two if no plant test is available (i.e., invertebrate, vertebrate) to determine the most sensitive species. 40 CFR 122.48(b) requires permits to establish monitoring requirements to yield data representative of the monitored activity, and 40 CFR 122.44(i)(1) requires that monitoring requirements ensure compliance with permit limitations. Monitoring frequencies are based on the nature of the facility, similar facilities and, if applicable, existing and/or previous permit's monitoring results or compliance history.

As part of the PQR, EPA reviewed 18 permits and fact sheets to see if the permit requirements adequately and correctly implemented the WET permit requirements of the water quality standards. North Carolina has identified biological integrity as the cause of impairment in its lakes in its 2012 CWA 305(b) report. The review demonstrated that the majority of the permits have either acute or chronic toxicity monitoring requirements.

North Carolina continues to use only control plus one effluent concentration when conducting their WET tests and requires follow-up testing using multiple concentrations upon a test failure. This approach is inconsistent with WET testing methods contained in 40 CFR 136, which requires WET tests be conducted using five effluent concentrations plus a control. However, subsequent to the PQR, North Carolina submitted the appropriate documentation where the State received EPA's approval for the Alternate WET Test procedure. It is noted that North Carolina can statistically analyze the WET test results using the control plus one effluent concentration as long as they are using the statistical approach the EPA recommended in 2010.

Program Strengths:

North Carolina requires permittees to conduct acute toxicity tests on a quarterly basis using protocols defined in the North Carolina Procedure Document entitled “Pass/Fail Methodology for Determining Acute Toxicity in a Single Effluent Concentration”. North Carolina is commended for requiring an effluent concentration of 90 percent for evaluating acute mortality. In addition, the State is very prescriptive in the permits to require the permittee to perform the test using representative samples collected during the months of February, May, August and November. Should any single quarterly monitoring indicate a failure to meet specified limits, then monthly monitoring will begin immediately until such time that a single test is passed.

Critical Findings:

The permits reviewed required either acute or chronic WET testing but not both. The administrative record did not demonstrate why some facilities were given acute toxicity monitoring requirements and why other facilities were given chronic toxicity monitoring requirements. When no WET limits were required, the fact sheets or administrative records did not document the reasons for the absence of WET limits. The reasons for determination of frequency of monitoring toxicity were not clear. In addition, it was not apparent from the permits reviewed that North Carolina is meeting the minimum WET test methods requirements and this is a significant problem; however, after further consultation North Carolina was able to provide the necessary documentation where EPA approved the State’s Alternate WET Test procedure.

B. Water Quality Trading

Background:

A Water Quality Trading (WQT) policy was published by EPA on January 13, 2003. The purpose of this policy is to encourage states, interstate agencies and tribes to develop and implement water quality trading programs for nutrients, sediments and other pollutants where opportunities exist to achieve water quality improvements at reduced costs. More specifically, the policy is intended to encourage voluntary trading programs that facilitate implementation of TMDLs, reduce the costs of compliance with CWA regulations, establish incentives for voluntary reductions and promote watershed-based initiatives. As part of the PQR, the EPA reviewed the WQT for the Tar-Pamlico Basin.

EPA recognizes that nutrient trading can be a useful tool to allow for cost-effective pollution reduction measures while meeting water quality obligations. The WQT agreement in the Tar-Pamlico Basin allows the Tar-Pamlico Association’s dischargers to find more cost-effective ways to collectively meet their nutrient loading cap by allowing facilities that were better able to remove nutrients at a given time to complete the changes needed to make reductions toward the collective limit. The agreement also provides a more cost-effective nutrient reduction alternative if the Association is unable to meet its cap - payments for agricultural BMPs that are documented to be more cost effective than retrofits or treatment modifications during expansion. In the Tar-Pamlico Basin, the State currently provides for two different forms of trading to help meet pollutant reduction goals for the estuary.

First, the State, the Tar-Pamlico Basin Association, the Environmental Defense Fund and the Pamlico-Tar River Foundation signed an agreement in 1989 for an innovative nutrient trading

program between point and nonpoint sources of pollution. The agreement, which is currently in its third phase, calls for the Association that includes over 98% of the waste water dischargers in the basin to either reduce their nutrient loading to the estuary or, if they exceeded an annual collective loading cap, to fund agricultural Best Management Practices (BMPs) through the state's existing Agriculture Cost Share Program.

A second form of trading in the Tar-Pamlico occurs between nonpoint sources through the purchase of off-site nutrient offset credits by developers from third-party providers to achieve stormwater runoff loading requirements on their development projects. The option of purchasing these nutrient credits allows developers more flexibility in meeting the runoff requirements of their project while insuring that nutrient loads to the estuary do not increase.

Program Strengths:

To date, due to the success of the Tar-Pamlico Association at meeting their nutrient caps, the point-to-non-point source nutrient trading provisions provided under the Tar-Pam Nutrient Strategy have not been needed. They have, however, resulted in Association funding for BMP implementation and the provisions remain in place to allow for cost-effective nutrient reductions.

Critical Findings:

The reviewed permit and fact sheet did not show any calculation to explain how an individual allocation was to be determined as a share of the Tar-Pamlico Basin Association. As per 40 CFR 124.56(a), the fact sheet should include such information. This information is especially important because it appears that enforcement of the nutrient allocation is only through the Association's permit, not through permits for individual facilities. A reasonable potential analyses for nutrients and other parameters were not documented in the permit file. This is inconsistent with 40 CFR 122.44(d)(1).

V. ACTION ITEMS

This section provides a summary of the main findings of the review and provides proposed action items to improve DENR NPDES permit programs. This list of proposed action items will serve as the basis for ongoing discussions between EPA Region 4 and North Carolina as well as between EPA Region 4 and EPA HQ. These discussions should focus on eliminating program deficiencies to improve overall performance by enabling good quality, defensible permits issued in a timely fashion.

The proposed action items are divided into three categories to identify the priority that should be placed on each Item and facilitate discussions between Regions and states.

- **Critical Findings** (Category One) - Most Significant: Proposed action items will address a current deficiency or noncompliance with respect to a federal regulation.
- **Recommended Actions** (Category Two) - Recommended: Proposed action items will address a current deficiency with respect to EPA guidance or policy.
- **Suggested Practices** (Category Three) - Suggested: Proposed action items are listed as recommendations to increase the effectiveness of the state's NPDES permit program.

The critical findings and recommended actions proposed should be used to augment the existing list of “follow up actions” currently established as an indicator performance measure and tracked under EPA’s Strategic Plan Water Quality Goals or may serve as a roadmap for modifications to the Region’s program management.

A. Basic Facility Information and Permit Application

The DENR permits, fact sheets, and files that were reviewed do not provide an adequate level of facility information on which to base permit requirements. Permit applications for major dischargers meet requirements for timing and completeness. The application forms for minor facilities are not EPA forms, and do not contain all of the information required by regulations. Proposed Action Items to help DENR strengthen its NPDES permit program include the following:

- Ensure all application forms comply with 40 CFR 122 Subpart B. (Category 1)
- Use checklists or other QA/QC procedures to ensure permit files/records applications have all required elements, including complete fact sheets and administrative record components. (Category 3)
- Require use of sufficiently sensitive analytical methods and ensure method detection limits are documented in application forms. (Category 2)

B. Technology-based Effluent Limitations

For the most part, the DENR permits reviewed properly implement TBELs for municipal and non-municipal facilities. In many cases, BOD effluent limits are more stringent than those required by the secondary treatment standards. Proposed Action Items to help DENR strengthen its NPDES permit program include the following:

- A more complete discussion of applicable ELGs in the fact sheet would be helpful and would provide transparency to the public. While ELGs appeared to be correctly applied in most permits, additional discussion on the level of treatment like NSPS, BAT, BPT, or BCT should be contained in the fact sheet. In addition, for effluent limits established using production or flow, the basis for those values and associated calculations should be contained in the fact sheet. (Category 2)

C. Water Quality-Based Effluent Limitations

The fact sheets reviewed did not provide an adequate narrative of the process DENR uses to determine if WQBELs are required. Proposed Action Items to help DENR strengthen its NPDES permit program include the following:

- Review of the administrative record and fact sheets revealed that the RPA was not adequately done for many permits to show limits which would be protective of water quality. DENR should develop procedures to ensure that permit writers consistently follow to demonstrate how effluent limits are protective of WQS and comply with CWA § 301(b)(1)(C). (Category 1)
- Fact sheets should describe how pollutants of concern are determined (DMRs, application data, special studies, TBELs, TMDLs, etc.) (40 CFR 124.56). (Category 2)

- Any assumptions used in mixing zone calculations should be included in the fact sheet. In all cases, the critical conditions used in the RPA and limit calculations should represent actual conditions and actual updated flow; and must ensure that applicable water quality standards are achieved (40 CFR 124.56 and 122.44). (Category 1)
- The fact sheet should discuss any parameters limited by WQBELs in the previous permit for which no effluent limits are in place in the current permit. For these dropped effluent limitations, information should be included to demonstrate that anti-backsliding provisions are satisfied (40 CFR 124.46(a), 122.44). (Category 2)
- For those permits where an applicable TMDL has been developed, a more thorough discussion of how the TMDL requirements are, or are not, applicable and incorporated into the permit should take place (40 CFR 124.56(a), 122.44(d)(2)). (Category 2)

Anti-degradation Analyses:

- The administrative records for 7 of the 18 permits reviewed did not indicate that anti-degradation analyses were conducted. The administrative records for the permits lacking adequate anti-degradation analyses are: Coats America, Inc. (NC0004243), Spruce Pine WWTP (NC0021423), Invista, S.A.R.L. (NC0001112), Tyson Foods, Inc. (NC0005126), PCS Phosphate, Inc. (NC0003255), Littleton WWTP (NC0025691), and Pinetop WWT (NC0020435). The alternatives to the direct discharge should be analyzed as required by 15A NCAC 2H.0105(c)(2). DENR should develop procedures so that these requirements are met. (40 CFR 131.12). (Category 1)

Anti-backsliding:

- The administrative records should document the basis for anti-backsliding (40 CFR 124.56(a)). (Category 2)

D. Monitoring and Reporting

Monitoring and reporting requirements in the permits reviewed generally appeared to be consistent with program requirements. Proposed Action Items to help DENR strengthen its NPDES permit program include the following:

- Sufficiently sensitive EPA approved analytical methods should be used. (Category 2)
- The administrative records should document how the facilities comply with North Carolina's two-prong approach for evaluating mercury limits in permits. (Category 3)

E. Special and Standard Conditions

The standard conditions reviewed were consistent with federal requirements, and the special conditions appeared to be appropriate and reasonably documented. Proposed Action Items to help DENR strengthen its NPDES permit program include the following:

- Ensure that the recently updated NPDES Standard Conditions boilerplate is included as a part of all permits and in all administrative files. (40 CFR 122.41). (Category 1)

F. Administrative Process (including public notices)

The administrative processes were not consistent with federal requirements and for those draft permits that received public comments, incomplete responses were found in the central files indicating how, if any, permit conditions changed as a result of public comment. Proposed Action Items to help DENR strengthen its NPDES permit program include the following:

- Encourage DENR to provide clarity in the Administrative Record on how comments received during the public comment process was addressed in the Final permit or whether the comment was not considered significant to warrant a change. This demonstrates transparency in the permitting process. (Category 1)

G. Documentation (including fact sheet)

The fact sheets reviewed did not provide sufficient information to adequately determine if the necessary effluent limits are contained in the permit, how WQBELs and TBELs are calculated, and if the permit complies with TMDL requirements and basin strategies, among other items. Proposed Action Items to help DENR strengthen its NPDES permit program include the following:

- Develop a fact sheet template that includes all the requirements found in 40 CFR 124.8. (Category 1)
- Include in relevant fact sheets additional discussion of how the anti-backsliding requirements at 40 CFR 122.44(l) were satisfied. (Category 2)
- EPA recommends that DENR include in the fact sheet or permit file a comparison of previous effluent limits and new effluent limits as well as a discussion on the compliance history of the facility. (Category 3)
- Have a more thorough discussion in the fact sheet to ensure that facility categorization information clearly addresses whether a facility or discharge is a new or existing source where applicable. (Category 3)
- Explain what data was used to assess water quality impacts and in conducting the RPA and effluent limitations calculations. (Category 2)
- Clearly identify how pollutants of concern are determined. (Category 2)
- Provide a clear comparison of TBELs and WQBELs to ensure the more stringent limit is placed in the NPDES permit. (Category 2)
- There was little discussion in the fact sheet concerning the basin-wide strategy, load allocations, or discussions with other DENR groups in the development of the NPDES permits. (Category 3)
- Fact sheets should include more thorough discussions of reasonable potential or effluent limits to address state narrative criteria. (Category 2)
- EPA recommends a more comprehensive explanation of any applicable water quality impairments and if the discharge contributes to the impairment. (Category 2)

H. National Topic Areas

Proposed Action Items for core topic areas are provided below.

1. Nutrients

North Carolina has numeric criteria for chlorophyll a. The State has established nutrient standards for water bodies identified as Nutrient Sensitive Waters (NSW) and High Quality Waters. The State has adopted chlorophyll a value of 40 µg/L for fresh and saltwater aquatic life; and 15 µg/L for trout waters. Effluent monitoring for nitrogen-based or phosphorous-based is placed in permits for facilities that treat nutrient bearing wastewaters. Proposed Action Items to help North Carolina strengthen its NPDES permit program include the following:

- Require monitoring for both nitrogen and phosphorus and not just the limiting nutrient. (Category 3)
- Provide documentation in the Fact Sheet on how the chlorophyll a criteria are applied consistently in permits. (Category 2)

2. Pesticides

On October 31, 2011, the EPA issued the final NPDES Pesticide General Permit (PGP) for Discharges from the Application of Pesticides. The federal PGP applies where the EPA is the permitting authority. DENR issued its pesticide general permit and is effective since January 1, 2012. There are no obstacles in state law preventing the state NPDES permitting authority from fully implementing the pesticide permit requirements. The Pesticides General Permit appears to be consistent with program requirements. No action items are proposed based on this PQR.

3. Pretreatment

The EPA Region 4 will be conducting a Comprehensive State Pretreatment Program Audits in North Carolina within the next two years. This Audit will supplement the critical findings and action items determined during the PQR. Proposed Action Items to help North Carolina strengthen its NPDES permit program include the following:

- Inclusion in the permits the notification requirements for introduction of pollutants to a POTW (40 CFR 122.42(b)(1)) and any substantial change in volume or character of pollutants (40 CFR 122.42(b)(2)). (Category 1)

4. Stormwater

North Carolina's overall administration of the NPDES stormwater program and its permits, continue to operate at or above EPA's level of expectations. The EPA commends DENR for establishing stormwater permit language that is clear, specific, measureable and enforceable. DENR staff are proactive in keeping MS4s up to date on State and federal initiatives/policies, and meet with the MS4s on a scheduled basis. Plans and Annual reports are reviewed and updated as necessary. Proposed Action Items to help North Carolina strengthen its NPDES permit program include the following:

- DENR should separate effluent limits in permits from requirements to develop SWPPP. (Category 3)

- Permits appear to be missing many of the non-numeric effluent limit requirements promulgated in 2009 in the Construction & Development Effluent Limitation Guidelines (C&D Rule) at 40 CFR 450.21. It is unclear whether the permit is relying on the State's Erosion and Sediment Control Planning and Design Manual. In the next permit cycle, the EPA recommends that the permit include requirements from the C&D Rule as enforceable limits. (Category 2)

I. Regional Topic Areas

Proposed action items for special focus areas are provided below.

1. Whole Effluent Toxicity (WET) Testing

North Carolina requires permittees to conduct acute toxicity tests on a quarterly basis using protocols defined in the North Carolina Procedure Document entitled "Pass/Fail Methodology for Determining Acute Toxicity in a Single Effluent Concentration." Proposed action items to help North Carolina strengthen its NPDES permit program include the following:

- Clearly document in permit fact sheets why some facilities were given acute toxicity monitoring requirements and others were given chronic toxicity monitoring requirements and how this is representative of the permitted effluent discharge. (Category 1)
- When no WET limits are required, the fact sheets should document the reasons for the absence of WET limits. (Category 1)
- Clearly document that the most sensitive species was selected when determining reasonable potential and compliance with permit's WET limits. (Category 1)
- Conduct WET tests consistent with EPA WET test methods (2002) promulgated at 40 CFR Part 136 including all minimum test acceptability criteria (TAC) for a valid WET test (i.e., conduct WET tests with five effluent concentrations plus a control). It appears that North Carolina is only conducting WET tests with five effluent concentrations plus a control when testing at a single effluent concentration fails the WET test. (Category 1)

2. Water Quality Trading

EPA recognizes water quality trading as a useful tool for implementing cost-effective pollution reduction measures while meeting water quality obligations, especially for nutrients. The water quality trading agreement in the Tar-Pamlico Basin allows the Association's dischargers to find more cost-effective ways to collectively meet their nutrient loading cap by allowing facilities that were better able to remove nutrients at a given time to complete the changes needed to make reductions toward the collective limit. The agreement also provides a more cost-effective nutrient reduction alternative if the Association is unable to meet its cap - payments for agricultural BMPs that are documented to be more cost effective than retrofits or treatment modifications during expansion. Proposed action items to help North Carolina strengthen its NPDES permit program include the following:

- Provide calculations in the fact sheet to explain how an individual allocation was determined as a share of the Tar-Pamlico Basin Association. As per 40 CFR 124.56(a), the fact sheet should include such information and the permit for each facility should include enforceable individual limits as well as any group cap on loads. In addition, permit provisions should be included regarding the conditions under which an individual permit would be applicable. (Category 1)
- Provide documentation in the administrative record when concluding that no reasonable potential exists for nutrients and other parameters to cause or contribute to an impairment. (Category 2)