

FINAL

**REGION 4 NPDES PERMIT QUALITY
REVIEW
TENNESSEE**

December 2-5, 2015

Region 4
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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, 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 one staff person from EPA Headquarters, two from EPA Region 4 and one support contractor, conducted a review of the Tennessee NPDES permitting program that included an on-site visit to the Tennessee Department of Environment and Conservation (TDEC), Division of Water Resources, in Nashville, Tennessee on December 2-5, 2015. The Tennessee PQR consisted of a core permit review as well as a review of national and regional topic areas.

The core permit review involved the evaluation of selected NPDES permits and supporting materials (permit applications, rationales, correspondence, reports, etc.) 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 Tennessee NPDES program. In addition, discussions between the PQR review team and the TDEC staff addressed a range of topics including program status, the permitting process, responsibilities, organization, and staffing.

National topic area permit reviews are conducted to evaluate similar issues or types of permits in all states. The national topics reviewed for the Tennessee NPDES program were: the pesticide general permit, and nutrient, pretreatment, and stormwater permitting.

Regional topic area reviews target specific permit types or particular aspects of permits that are of specific importance to the relevant EPA region. The regional topic areas selected by EPA Region 4 were implementation of Total Maximum Daily Loads (TMDLs) into NPDES permits and permitting of Combined Sewer Systems. These reviews provide important information to Tennessee, EPA Region 4, EPA Headquarters, and the public on specific program areas.

Eleven permits were reviewed as part of the Tennessee PQR. All 11 permits were reviewed for the core topic areas, 10 of the permits addressed national topics, and seven of the permits address the regional topics. Some permits were reviewed for more than one aspect of the PQR assessment. Permits were selected based on issue date and the review categories that they fulfill.

The information in Section II.A and B reflects information provided by TDEC in response to interview questionnaires and the on-site interview.

II. STATE PROGRAM BACKGROUND

A. Program Structure

Within TDEC, the Division of Water Resources (DWR) administers the NPDES permitting program. Within the DWR, the Water Quality Branch includes the following units: Drinking Water, Land-Based Systems, Water-Based Systems, Natural Resources, Planning and Standards, Watershed Management and Compliance & Enforcement. NPDES permits are developed in the Water-Based Systems Unit and the Mining Section (see below). TDEC has eight field offices located throughout the State and a Mining Section with oversight for mineral resource extraction operations and corresponding NPDES permits which is located in the Knoxville Field Office. The field offices are responsible for inspections, complaint tracking, ambient monitoring, processing construction permit Notice of Intent (NOI) applications and pretreatment inspections.

TDEC has 7 NPDES permit writers and 1 secretarial person that support the NPDES permit development process. The Watershed Management Unit assists with numerical modeling, TMDL development, and other planning and monitoring needs associated with permit development.

The State of Tennessee manages the day-to-day permit issuance and management activities of the permitting units through the use of an Internet friendly, Oracle database called WaterLog, which stores permitting and compliance information and facility records and includes a reporting tool. TDEC uses both EPA's Integrated Compliance Information System (ICIS) and WaterLog to store permitting data. Some, but not all, data flows from WaterLog to ICIS.

TDEC staff uses a range of tools to support permit development and implementation, including permit and rationale templates, analytical and limit development spreadsheets, water quality models and procedures/guidance. TDEC staff rely on previous issued permits or those issued for similar industries when writing a permit for a new discharger. An Excel spreadsheet is available to staff to calculate Reasonable Potential (RP) for whether a discharge may cause or contribute to an exceedance of water quality criteria for metals and nonmetals based on chronic and acute water quality criteria. The RP spreadsheet allows for the input of reported data for comparison with the water quality criteria. It includes embedded calculations that determine the effluent limitations. With regard to water quality modeling, permittees may propose mixing zones using CORMIX or similar models, but TDEC does not establish mixing zones absent such data. TDEC has numerous written procedures and guidance documents that are available to support NPDES permitting, covering topics such as RP procedures, antidegradation analysis guidelines, public notice procedures, Tennessee's strategy for addressing nutrients in NPDES permitting, and whole effluent toxicity.

With regard to permit QA/QC, draft permit packages for reissuance are reviewed by a supervisor and field office staff prior to public notice. All permits, regardless of whether the permit is for a new or expanded discharger in the watershed or the permit is a reissuance, go through the same QA/QC process prior to public comment. TDEC does not routinely use QA/QC checklists.

TDEC is rapidly moving to electronic storage of the official NPDES permit files and paper files are being converted to electronic format. TDEC uses an Oracle database and state file server that is maintained in the main TDEC office building. TDEC's Compliance Unit is responsible for maintaining all compliance records associated with permits.

B. Universe and Permit Issuance

TDEC estimates its non-mining NPDES permit universe includes about 907 permits as of December 2, 2015. This includes NPDES permits for 411 POTWs (188 major permits and 293 non-major permits) and 496 non-POTW facilities (44 major permits, 441 non-major permits and 11 CAFO permits).

TDEC also administers seven non-stormwater NPDES general permits, and three stormwater general permits, including five municipal separate storm sewer system (MS4) permits (Phase I and II Municipal), and a multisector general NPDES permit for industrial activities. Non-stormwater general permits include the following:

- Dischargers from the Application of Pesticides
- Concentrated Animal Feeding Operations
- Hydrostatic Test Water
- Treated Groundwater Associated with Underground Storage Tank Remediation
- Municipal Separate Stormwater Sewer System (MS4)
- Filter Backwash and Sedimentation Basin Washwater from Water Treatment Plants
- Stormwater Runoff and Process Waste Water Associated with Ready Mixed Concrete Facilities
- Multi-Sector General NPDES Permit for Industrial Activities
- Storm Water Discharges Associated with Construction Activity

TDEC estimates that as of December 2, 2015 there are 563 permittees covered under non-stormwater general permits.

Significant industries within Tennessee include: transportation, pulp and paper, chlorine, organic chemicals, metal finishing, energy, explosives, and automotive. Notices of Intent (NOIs) for NPDES coverage are tracked electronically in the state database, WaterLog.

For major individual NPDES permits, approximately 83% are current and 17% (27 permits) are administratively continued. For non-major permits, approximately 92% are current and 8% (39 permits) are administratively continued. EPA policy sets a goal that 90% or more of NPDES permits should be current for effective program administration. With regard to the permit development process, Tennessee uses EPA's NPDES permit application forms. Permits for reissuance are assigned to permit writers based on workload conditions several months in

advance. The permit writers check the applications to ensure completeness and may send either a completeness or incompleteness notification by email or call the permittee as warranted. TDEC uses a variety of tools to ensure permittees submit applications in a timely manner. These tools include email reminders, telephone calls, sending courtesy letters, and enforcement discretion, when appropriate. TDEC indicated these friendlier approaches have been an effective process for reducing the number of late permit applications.

Permit writers use the information in each permit application to develop the permit conditions and Rationale. Current and/or previously issued permits are also utilized to complete the reissuance process. Information is shared with the Watershed Management Unit for water quality modelling purposes, which develops wasteload allocation-based limits for oxygen-demanding pollutants and rationales for these limits. Wasteload allocations are based on state-wide water quality data and waters considered “available or unavailable” based on their 303(d)-listed waters, TMDLs, modelling, and nutrients. TDEC works to re-issue NPDES permits within 180 days from receipt of a complete application, and issue new permits within 365 days from receipt of a complete application.

Technology-based effluent limitations (TBELs) are developed based on regulations or a case-by-case basis using best professional judgment (BPJ). Limits based on BPJ must consider federal criteria, similar industries and stakeholder input. When determining appropriate effluent limits, permitting staff will compare TBELs to water quality-based effluent limitations (WBBELs) and select the more stringent of the two criteria. TDEC staff indicated that current rationales document this process better now than in the past.

WQBELs are based on wasteload allocations as well as on an analysis of priority pollutant data provided as part of the permit application and other available data. When sampling data pollutant levels exceed an applicable detection limit, the permit writer analyzes the data for reasonable potential to cause or contribute to an exceedance of water quality criteria. If reasonable potential is indicated, the permit writer follows the TDEC guidance entitled *Tennessee Division of Water Resource Reasonable Potential Procedures, last Updated 12/8/2015* in determining permit requirements. Whole effluent toxicity data also are considered in establishing limits and monitoring requirements. TDEC staff indicated that relatively few permits include mixing zones, and that permittees need to justify any such mixing zone (i.e., provide modeling data).

When a new permit is being developed for a municipal facility the County Engineer normally asks for a wasteload allocation, an antidegradation assessment is prepared, environmental information is developed, and a Design Development Report is completed. An antidegradation assessment is also prepared for expanded discharges (an increase in pollution and not flow). TDEC has *Antidegradation Analysis Guidelines*. The Rationale normally describes the review and findings of these analyses.

Anti-backsliding restrictions are routinely considered in developing or revising permit limits. Rationales document consideration of anti-backsliding by indicating that limits remain the same or by explaining the basis for any limits that were eliminated or made less stringent.

When a facility discharges to an impaired water (in TN, referred to as waters with unavailable parameters) the permit writer reviews the CWA section 303(d) list and the current assessment information available in the WaterLog database, the rationale discusses any relevant impairment, and permit limits are established to ensure the discharge meets water quality standards. If the receiving waterbody is subject to a TMDL, the permit writer considers whether and how the TMDL affects the facility's discharge and ensures that permit conditions are consistent with applicable portions of the TMDL. TMDLs are listed on TDEC's website (TDEC has access to web-based mapping and tabulated information for impaired waters and TMDLs).

Permits include monitoring requirements for parameters subject to discharge limits and also typically monitor for priority pollutants identified above detection levels to implement TDEC's reasonable potential policy. Nutrients are often monitored to obtain data for modeling and to support water quality criteria development. TDEC has developed monitoring frequency guidance for POTW permits. Reporting requirements correspond with monitoring provisions and relevant permit conditions, including some standard conditions. With regard to sampling and analysis methods, permits include standard language requiring the use of methods that are consistent with federal requirements (i.e., 40 CFR Part 136) and capable of measuring compliance with permit limits.

Municipal and industrial permits include the standard conditions expressed at 40 CFR §§122.41 and 122.42. Special conditions for POTW permits include pretreatment and biosolids provisions as well as spill reporting requirements. Permits also require notification to TDEC and affected third parties of any significant change in a discharge. Industrial permits also include specific requirements consistent with federal regulation (e.g., mining BMPs).

State regulations address the process for public comment on NPDES permits. Public notice of draft permits must be published, and the public is provided with an opportunity to comment on the draft permit and rationale. Comments are submitted by letter or email (through the use of an electronic comment box). TDEC provides public notice of NPDES general permits. Comments are included in the NPDES permit file and TDEC responses to those comments are discussed in the relevant notice of determination or the addendum to the rationale if changes are made based on public comment.

All permits are subject to objections and appeals per Federal and State regulations. TDEC staff indicated they currently have three active mining permit appeals and nine active NPDES permit appeals. Permit appeals are presented before an Administrative Law Judge.

C. State-Specific Challenges

Select achievements and challenges faced by the TDEC's NPDES program include the following:

- TDEC is losing a number of key NPDES staff and combined with normal turnover, TDEC is going to struggle with issuing permits in a timely manner. This could increase the backlog rate, which is currently at less than 10%.

- TDEC is challenged by certain difficult permits; that is, ones that are complex, technically challenging, and/or politically charged. These include those that address Fundamentally Difference Factor variances from power plants, Combined Sewer Overflow permits and MS4 permits with post-construction stormwater requirements.
- Permit rationales have grown more robust and are clearer and as a result the EPA has not had to consistently request 60-day extensions to complete permit reviews.

D. Current State Initiatives

State initiatives that strengthen the NPDES program include the following:

- TDEC recently updated its Reasonable Potential Analysis procedures and was the first Region 4 state to do this. In the absence of water quality data to characterize background concentrations of pollutants in the receiving stream, TDEC assumes a background concentration equal to one-half the water quality standard. This is a significant improvement in how TDEC performs their reasonable potential analysis rather than assuming a background concentration of zero, like the practice in other Region 4 states.
- Nutrients –
 - Tennessee, in collaboration with the U.S. Geological Survey, uses the SPARROW model to estimate nutrient loadings for Total Nitrogen (TN) and Total Phosphorus (TP) at the HUC-10 watershed scale for nutrient criteria development;
 - Tennessee developed a Nutrient Reduction Framework that uses an adaptive management approach to nutrient controls;
 - Treatment plant optimization is the first step in nutrient controls and waste water treatment plant (WWTP) permittees are required to develop a Nutrient Optimization Plan within 6-24 months (depending of the situation) of permit reissuance to specify operational methods using existing equipment for optimizing nutrient removal;
 - TDEC has observed improvements in nutrient levels in the receiving waters downstream of WWTPs as result of plants that have incorporated optimization techniques.
- The recent pesticide general permit mirrors much of the federal permit, although the scope is slightly different.
- TDEC is beginning to work with its non-MS4 communities to educate them on stormwater impacts to water quality and how to design stormwater management programs.
- TDEC's Mining Section estimates a total NPDES universe of approximately 585 NPDES permits. This includes approximately 485 individual NPDES permits, of which seven are considered major facilities, and approximately 100 NPDES stormwater permits with coverage under the Rock Harvesting Rules and/or Sector J of the Tennessee Multi-Sector Permit. The Mining Section is also responsible for permitting and assurance of adherence with the Tennessee Surface Mining Law of 1972. One permit writer is on staff to process and issue the 63 permits on file in the State.

The Mining Section is staffed with a total of 7 NPDES permit writers with duties split proportionately between the coal and non-coal programs. The Mining Section issued 125 mining individual NPDES permits in 2015; 105 of those being non-primary industry permits (non-coal) and 21 being primary industry permits (coal). All of the final permits for primary industries contained appropriate reasonable potential analyses and corresponding limits, especially for metal contaminants of special concern during mining practices.

TDEC consistently communicates with EPA with regard to big issues, including new hard rock mining legislation (amendments to the Rock Harvesting Rules found in Chapter 0400-40-18 used in conjunction with permitting with Sector J rules) clarifying permitting concerns at dimension stone and rock harvesting facilities. Also, TDEC has recently issued a general Aquatic Resources Alteration Permit for Recreational Prospecting with protection for High Quality waters and waters on the 303d list for impairments for Total Suspended Solids (TSS).

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, design flow, 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, rationales must include a description of the type of facility or activity subject to a permit, and explain the reasoning for including or, not, pollutant limitations and monitoring parameters based on the information provided and known about the facility or processes.

The core permits reviewed specifically authorize the discharge subject to specified permit conditions, identify the permit issuance, effective and expiration dates, and allow for a term of five years or less. Several of the permits reviewed during the PQR had short effective dates and TDEC staff explained this was due to the watershed/permitting schedules. The rationales for these permits indicate for each permit the type of facility, the facility address, the wastewater being discharged, the treatment process, the outfall location, and the name of receiving water. In all the permits, the permit writers provided a good description of the receiving waters and permitted activities. In three permits (TN0058238, TN0024210 and TN0020117) the physical address and geographic coordinates of the facility were not in the permit or rationales. The information was available on the permit application in the record, but other permits reviewed contained this information in the permit and rationale. In two permits (TN0002461 and TN0024210) the specific location of the outfalls (i.e., latitude and longitude) is not included in

the permit. Locating the “end-of-pipe” for discharges to waters of the State is essential to ensure that appropriate and effective permit limitations are developed.

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.

TDEC uses the federal NPDES permit application forms for POTW and non-POTW NPDES permits. State developed application forms for NOIs for general permit coverage are used with permit issuance validated by a Notice of Coverage (NOC) one page document. Application forms were identified for the core permits reviewed in each of the respective permit files. All of the required application forms were present for the non-POTW permits and Form 2A (Municipal Facilities) was present for all of the POTW permits reviewed.

Complete applications for all permits appeared to be submitted in a timely manner. In general, the permit applications reviewed include all of the required analytical data with a few exceptions. In one POTW permit (TN0024210), the permit application was missing two pollutant scans as existing POTW dischargers are required to perform three pollutant scans within the existing permit cycle and this permittee only provide the results of one scan on the application. In two permits (TN0075078 and TN0020656) the applications did not include the required results of at least four quarters of Whole Effluent Toxicity (WET) test results. Two permit applications (TN0060151 and TN0058238) did not include flow diagrams, maps and water budgets and none were found in the permit file. In one permit application (TN0002941) the analytical methods were not identified and it was not possible to determine if sufficiently sensitive methods were used to assess compliance with applicable water quality standards. In another permit application (TN0058238), the method detection limits did not match what was stipulated in the rationale, and for select parameters, multiple methods reported were not sufficiently sensitive.

B. Technology-based Effluent Limitations

NPDES regulations at 40 CFR § 125.3(a) require that permitting authorities develop technology-based requirements where applicable. Permits, rationales and other supporting documentation for POTWs and non-POTWs were reviewed to assess whether 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 treatment standards (including limits for Biochemical Oxygen Demand (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. Five POTW permits were reviewed as part of this PQR.

The rationales for the POTW core permits reviewed include basic descriptions of the respective facilities and good descriptions of the treatment processes employed. The rationales consistently discuss the basis for the effluent limits in these permits, although this discussion does not focus on secondary treatment. Rather, the basis for the limits in the core POTW permits includes a wasteload allocation (focused on oxygen demanding pollutants), and, depending on the permit, may also include evaluation of priority pollutant data submitted with the permit application, discharge monitoring report data and Whole Effluent Toxicity (WET) test data. As a result, the POTW permit limits are largely water quality-based. In nearly all cases the POTW permit limits for BOD, TSS and pH are more stringent than required by secondary treatment standards; however, in one permit (TN0075078) the limits were not as stringent as secondary treatment standards as this permit has a lagoon as part of the waste treatment system. This permit also did not require 85 percent removal for BOD₅ and TSS because of the lagoon system, but this is consistent with 40 CFR §133.103. In another permit (TN0024210), the 85 percent removal requirement was not included as the Special Considerations in 40 CFR § 133.103 give exclusions from meeting these requirements for combined sewer systems. The Rationale for this permit indicated that alternate requirements are needed to encourage municipalities to correct excessive inflow and infiltration (I/I) problems in the sanitary sewer system as a means to prevent [intentional] dilution of the influent wastewater as a means of meeting permit limits.

2. TBELs for Non-POTW Dischargers

Permits issued to non-POTWs must require compliance with a level of treatment performance equivalent to 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 BAT/BCT developed on a case-by-case basis using Best Professional Judgment (BPJ) in accordance with the criteria outlined at 40 CFR § 125.3(d).

Six non-POTW permits were reviewed during the PQR. The rationales for these permits include waste stream characterization information and also identify the applicable discharge standards. In addition, the rationales include a table that indicates the basis for each limit, which is informative. Two of the six permits (TN0026450 and TN0002461) are subject to ELGs and have applicable effluent guidelines and include basic facility categorizations.

The technology-based limits for the six non-POTW permits are based on several factors including consideration of ELGs, BPJ, demonstrated performance, and anti-backsliding requirements. The limits in these permits are expressed in appropriate units and forms; however, in one permit (TN0064955) it wasn't clear from the record if permit limits were based on a "reasonable measure of actual production" as recommended in EPA's *Technical Support Document for Water Quality-based Toxics Control (EPA - 505/2-90-001)*. In one permit

(TN0064955) it was not clear from the permit or Rationale whether the TBELs for all pollutants were based on BPJ since this facility was not subject to an ELG.

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 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 PQR assessed the processes employed by permit writers and water quality modelers to implement these requirements. Specifically, the PQR assessed permits, rationales, 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,
- determined whether limits were necessary for pollutants of concern and, where necessary,
- calculated 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 TMDLs.

Overall, the core permits reviewed include WQBELs that are consistent with the documentation in the permit record. The rationales for the core permits reviewed identify the receiving water for each facility and discuss the impairment status of each waterbody, including TMDLs when relevant, and how the permit limits reflect any impairment or TMDL. TDEC doesn't refer to 303(d) status in the rationales, rather they refer to the whether or not a stream segment is "available" or "unavailable" for discharging certain pollutants. To improve transparency with the public, TDEC is encouraged to state the 303(d) status of the stream and also note whether the information on the 303(d) list is outdated and whether new assessment data is overriding the information contained on the 303(d) list. Officially, a stream segment is not removed from the 303(d) list until the delisting is approved by the EPA.

The rationales also include information that characterizes the respective discharge and also discuss the basis for each permit's discharge limits. The rationales document consideration of anti-backsliding and discuss antidegradation when relevant. In one permit (TN0064955) it was

unclear how the pollutants of concern were selected for determining WQBELs. In three of the permits (TN0075078, TN0026450 and TN0081566) the rationales did not contain a description of the impairment status of the receiving waters. One permit (TN0026450) did not describe the designated uses of the receiving water. The record for one permit (TN0058238) did not include calculations for how the limits for ammonia were developed nor did the permit provide short term (e.g., maximum daily, instantaneous) effluent limits for ammonia.

Most of the core permit files retained the results of the wasteload allocation and reasonable potential analyses (RPA), and reflect that these analyses are based on effluent characterization, any mixing, and applicable water quality standards. The RPA was missing from the record for two permits (TN0064955 and TN0060151) and an explanation was not provided in either the permit or rationale on how RP was considered for all parameters of concern. Two permits (TN0020656 and TN0002461) did not discuss RP for WET despite being required since the discharge exceeds 1 MGD.

D. Monitoring and Reporting

NPDES regulations at 40 CFR § 122.41(j) require 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 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 core permits reviewed require monitoring for all of the parameters subject to permit limits and specify the frequency and location of such monitoring. The monitoring requirements appeared sufficient in all the permits reviewed to assess compliance with effluent limitations. The major POTW and non-POTW permits included acute and/or chronic WET monitoring as warranted with the exception of four non-POTW permits which did not have WET testing requirements. All the POTW permits reviewed included influent monitoring for BOD and TSS.

All but two of the core permits reviewed require sampling and analysis methods consistent with 40 CFR Part 136 and state that such methods be sufficiently sensitive. In these two permits (TN0081566 and TN0020656) it wasn't clear in the permit or rationale whether sufficiently sensitive methods were used and in one of the permits (TN0020656) the permit writer states that EPA recommended methods are used but some of these aren't the most sensitive methods

available. All the permits reviewed require monitoring information be reported on a Discharge Monitoring Report (for POTW) or Operation Monitoring Report (for non-POTW) forms and specified the method, frequency and timing of submission of these reports.

E. Special and Standard 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 [see 40 CFR § 122.44(k)], or permit compliance schedules [see 40 CFR § 122.47]. Where a permit contains special conditions, such conditions must be consistent with applicable regulations.

In general, the core permits reviewed include the standard permit conditions specified in 40 CFR § 122.41 although it wasn’t always possible to discern whether all the standard conditions were present because some are referred to differently. To improve transparency, TDEC should review their standard conditions language to ensure that they are as stringent as the federal standard conditions and worded in a similar manner as in the federal conditions. The following provisions were not readily identified in several of the permits:

- Reporting Requirement – Compliance Schedule (status report within 14 days) and anticipated non-compliance (40 CFR § 122.41(1)(5)).
- Duty to mitigate
- Duty to Comply
- Signatory requirement

The core permits reviewed also include certain special conditions. All but one of the POTW permits included additional standard conditions for notification of new introduction of pollutants and new industrial users. All of the non-POTW permits reviewed included additional standard condition language regarding notification levels. TDEC’s 24-hour reporting requirement is not as detailed as 40 CFR § 122.41(1)(6)(ii), as Tennessee requires written notification within 10 days and Federal regulations require notifications within 5 days.

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 TDEC staff and reviewed materials from the administrative process as they related to the core permit review.

All but four of the core permit files reviewed include a public notice for the respective draft permit that includes information required by 40 CFR § 124.10. In these four permits (TN0064955, TN0020656, TN0075078 and TN0058238) the record did not include documentation of public notice; however, one of these permits (TN0075078) did include the public notice website and all the necessary information but there was no evidence that the notice was published in a newspaper. The record for one permit (TN0075078) indicates a public hearing was held but the record does not include a hearing transcript. In another permit (TN0020656), the record included public comments received but a written response to all significant comments was not in the file nor was it evident that an Addendum was included in the final permit Rationale.

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; rationale or statement of basis; all items cited in the statement of basis or rationale including calculations used to derive the permit limitations; meeting reports; correspondence between the applicant and regulatory personnel; all other items supporting the permit; 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 rationales 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.

The core permit files were reviewed for the following information: permit application and associated data, draft permit, rationale or fact sheet, public notice, select correspondence, and public comments and TDEC responses in cases where comments were submitted. Overall, the

files were well organized and generally complete. Critical findings identified during the review of the administrative records for the core permits were noted in previous sections.

H. National Topic Areas

National topic areas are 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 scale. National topic areas are reviewed for all state PQRs. The current national topics areas are: nutrients, pesticides, pretreatment and stormwater.

1. Nutrients

Background:

For more than a decade, nitrogen and phosphorus pollution has consistently ranked as one of the top causes of degradation of surface waters in the U.S. Since 1998, the EPA has worked at reducing the levels and impacts of nutrient pollution and, as a key part in this effort, has provided support to 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*, the Agency 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 Tennessee NPDES program, five permits (TN0058238, TN0075078, TN0020117, TN0020656 and TN0060151) were reviewed during the PQR, as well as the documents *Tennessee's Plan for Nutrient Criteria Development, Revised September 2007* and *Tennessee Nutrient Reduction Framework, January 2015 (draft)*.

Tennessee has been working on nutrient criteria development since 1995 and has made considerable progress incorporating nutrient and biological criteria into its Water Quality Standards (WQS). Tennessee's nutrient criteria development process for all waterbodies focuses on both cause and response variables. Causative factors are the pollutants such as nitrogen and phosphorus that stimulate excessive biomass. Response factors are measurements of the effects of the excess nutrients, such as elevated chlorophyll *a* levels, reduced water clarity or an adverse alteration in the benthic community composition. Tennessee's Nutrient Reduction Framework (NRF) encompasses nutrient reduction strategies for both point and nonpoint sources for each HUC-10 watershed within the state. The NRF methodology for point sources uses the concept of enrichment factor (EF), which is the ratio of the existing pollutant load to the "natural" background or baseline condition. The EF is used to determine the appropriate level of nutrient reductions for point sources in an impaired watershed. The NRF approach to nutrient reduction is intended to utilize adaptive management.

Tennessee's approach to nutrient reduction relies on the U.S. Geological Survey (USGS) modeling tool, SPARROW (Spatially Referenced Regression On Watershed attributes), to estimate the nutrient loading in each HUC 10 watershed from all sources that flow off the land

into the river and its tributaries. The SPARROW model relates in-stream water quality measurements to spatially referenced characteristics of watersheds, including constituent sources and factors influencing terrestrial and aquatic transport to derive annual nutrient loads. The USGS developed separate regional models for TN and TP. For each HUC-10 watershed, TDEC developed a spreadsheet to calculate a post-reduction annual nutrient load for the watershed after incorporating expected load reductions of point and nonpoint sources. This post-reduction annual nutrient load is referred to as the Protective Annual Watershed Load (PAWL) and when achieved the instream nutrient concentrations in the watershed are expected to be similar to those of an unimpaired watershed in the same ecoregion with healthy and productive ecosystem for fish and aquatic life. TDEC plans to implement the NRF into permits for WWTPs as they are reissued according to the Watershed Management Cycle. Adaptive management language was added to the City of Gatlinburg WWTP permit (TN0020117) as the downstream water is listed as impaired for TP. The permit requires the permittee to optimize treatment operations as a first step in implementing the NRF before nutrient limits are included in the permit.

In 2006, TDEC adopted nutrient criteria for Pickwick Reservoir, a reservoir shared with Alabama. The reservoir has a surface area of 43,100 acres at full pool, 9,400 acres of which are within Tennessee. Nutrient criteria for this reservoir states that the mean of the photic-zone composite Chlorophyll *a* samples collected monthly April through September shall not exceed 18 µg/L, as measured over the deepest point, main channel, dam, or forebay. Nutrient criteria established for Pickwick Reservoir was an adoption of Alabama's criteria and does not necessarily reflect how criteria in other reservoirs in Tennessee will be developed.

In all of the permits reviewed for nutrients, only monitoring requirements were required for TN and TP. This is appropriate when the upstream waterbody is not on the 303(d) list as impaired for nutrient. One permit (TN0020117) adopted the NRF strategy and incorporates an adaptive management approach to nutrient controls. The first step in the adaptive management approach requires the permittee to prepare a Nutrient Optimization Plan within 6 months of date of permit issuance. The purpose of the Nutrient Optimization Plan is to identify specific methods for optimizing nutrient removal practices using existing equipment for optimizing nutrient removal. Beginning August 1, 2018, the permittee is required to meet the annual average TP load limit of 5,479 lb/yr as derived from the HUC-10 Subwatershed and an effluent concentration of 0.3 mg/L. Implementation of the NRF also requires ambient monitoring by the permittee to demonstrate the effectiveness of the installed pollutant controls to achieve WQS. Ambient water quality monitoring required in the permit includes collecting nitrate-nitrite, Total Kjeldahl Nitrogen (TKN), Ortho-Phosphorus and TP at locations upstream and downstream of the discharge as well as effluent samples. The permit also requires the permittee to perform ambient bioassessments to evaluate the impact of the discharge on biotic response.

Program Strengths:

Tennessee has two major strategies to remove nutrients from wastewater treatment plant (WWTP) discharges. One is through design and construction for nutrient removal. Another is

optimization of existing treatment. The modification of daily operations at the WWTP has the potential to reduce the WWTP's nitrogen discharge up to 66% and phosphorus discharge up to 75%; however, actual optimization-induced reductions will vary by site-specific plant conditions. As part of the adaptive management strategy, TDEC supports the use of operational methods to reduce nutrient discharges from WWTPs as a first step.

TDEC evaluates nutrient impact levels in each HUC-10 watershed as high, medium, or low based on a combined analysis of EF and percentage of WWTP contribution. In each HUC-10 watershed, the resulting nutrient impact level determines the appropriate level of nutrient reduction for WWTPs to achieve the PAWL. In HUC-10s with medium impact, nutrient effluent target limits incorporated into NPDES permits correspond to conventional biological nitrogen and phosphorus removal and tertiary treatment (i.e., 8 mg/L TN and 1 mg/L TP). Effluent limits assigned to HUC-10s with high impact (i.e., 5 mg/L TN and 0.3 mg/L TP) represent results of additional chemical treatment for phosphorus removal and more stringent nitrogen removal.

Critical Findings:

Because TDEC has listed moving waters as impaired due to nutrient enrichment based on published eco-region reference values, there may be an expectation that such values should represent in-stream targets and that wasteload allocations should be designed to meet such targets based on the results of reasonable potential analyses conducted during permit reissuance. TDEC is taking an intermediary step towards nutrient reduction while requiring the discharger to collect additional data to evaluate effectiveness of planned controls on instream water quality. This approach will require strong coordination between TDEC's listing and assessment program and its NPDES implementation programs. While TDEC's adaptive management approach is moving the state in the right direction towards nutrient criteria development, there is concern that the approach may not get them to developing WQBELs. In addition, it appears based on the permits reviewed, TDEC only conducts a RPA for nutrients when there is an impairment in the receiving stream. Since all WWTPs discharge nutrients it is recommended that TDEC modify their practices and conduct a RPA for nutrients in all POTW permits. For those facilities where RP exists for nutrients, TDEC should establish a plan for assigning WQBELs in the permits within a certain timeframe (e.g., two permit cycles).

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 Cir. 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 Agency 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. 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. Tennessee issued a PGP, TNP100000, on March 31, 2012 and it expires on March 30, 2017. Tennessee adopted the EPA's PGP in its entirety with minor modification where the EPA permit was not applicable in Tennessee. There are no facilities in Tennessee covered under an individual pesticides permit.

Program Strengths:

The Tennessee PGP, like the EPA permit, covers operators that apply pesticides that result in discharges from the following pesticide use patterns: 1) mosquito and other flying insect pest control; 2) weed and algae control; 3) animal pest control; and 4) forest canopy pest control. Region 4 reviewed Tennessee's PGP 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. The review found that the permit was consistent with CWA requirements.

Critical Findings: None

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 Memorandum of Agreement (MOA), the state grant workplan and all applicable federal regulations.

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 public utility (i.e., POTW) pretreatment programs and, if appropriate, state-controlled significant industrial users; and (3) a desk audit of the legal authorities, formal procedures, and resources available to the state's industrial pretreatment program. 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 the CSPPA report provided separately to the state Director. The EPA began the field activity for the CSPPA of Tennessee in mid-FY15, and is presently performing analysis of the collected data.

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, the EPA and NPDES-authorized states issue individual permits for medium and large MS4s and general permits for smaller MS4s, industrial activities, and construction activities. The EPA Region 4 staff reviews all draft MS4 and construction permits as per the MOA with the State of Tennessee. The Region makes its official comments and recommendations about permit quality during these reviews.

As part of the PQR, EPA reviewed the City of Nashville/Davidson County's Phase I MS4 permit (TNS068047). At the time of review, Tennessee's Phase II general permit was expired, and TDEC had drafted preliminary versions of a revised permit. Given that the PQR process coincided with the transition period of the Phase II MS4 general permit, it was not included as part of the PQR. For construction stormwater activities, EPA reviewed Tennessee's general permit (TNR100000), issued to construction activity entities and did not review any information pertaining to an individual coverage request. TDEC also issues general and individual permits for stormwater from industrial facilities, and four of the industrial permits (TN0002941, TN0026450, TN0002461 and TN0064955) the EPA reviewed addressed stormwater discharges.

Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s)

There are five Phase I MS4s within the State of Tennessee. These include Chattanooga, Knoxville, Memphis, Nashville, and the Tennessee Department of Transportation (TDOT). At the time of the PQR, the City of Nashville/Davidson County permit was the only current MS4 permit; all other Phase I permits and the Phase II general permit were expired at this time.

TDEC issued the permit to the Nashville/Davidson County MS4 on January 1, 2012, effective February 1, 2012. The Metropolitan Government of Nashville is the primary agency responsible for managing the City's NPDES stormwater permit, its MS4, Stormwater Management Program, and Stormwater Management Plan. The City of Nashville/Davidson County's MS4 permit contains all the required elements of an effective program including the development of a Stormwater Management Program (SWMP). The SWMP, which is routinely reviewed and updated, contains various elements and directives that must be reported on in an annual report. The City's permit contains all the specifics and details about each core element required of the Phase I program.

It is appropriate to note that TDEC's MS4 stormwater post-construction permit requirements have been the focus of a lot of attention in Tennessee in recent years. Specifically, TDEC's runoff reduction requirement for the onsite management of site runoff from the first inch of every rainfall event preceded by 72 hours of no measurable precipitation has been heavily scrutinized by various stakeholders. Some of the concerns that haven't been raised are related to whether EPA and TDEC have the authority to require runoff reduction requirements, among other related issues. As such, TDEC has been working to revise the permit language and

requirements after considering these comments. Once the post-construction requirements are finalized, EPA has reason to believe that they will be replicated in future MS4 permits.

All but one MS4 permit is expired at this time. Current challenges regarding the post-construction requirements have been a factor delaying the reissuance, but a couple of the permits have expired long before this issue came to light. Specifically, the EPA is urging TDEC to reissue the City of Memphis and City of Knoxville permits in a timely manner, as to date they have been expired for over 11 years. It is concerning that these MS4s are still operating under administratively continued permits that do not contain updated MEP-level requirements. Additionally, these permits are not as specific, measurable, or as enforceable as recent MS4 permits in Tennessee, and it is difficult for these permittees to measure compliance with the permit stormwater management program elements. This continued permit backlog has also affected potential inspection and enforcement activities.

Program Strengths:

The Region 4 staff reviewed the Phase I MS4 permit issued to the City of Nashville for adherence to the federal MS4 requirements. Overall, Tennessee's administration of the NPDES stormwater program and its permits continues to operate at or above the EPA's level of expectations. The EPA is pleased to see that minimum construction inspection frequencies are specified, and that the permit includes clear performance standards and maintenance requirements for post-construction. Another strength of the permit is the specification of BMP and monitoring requirements for discharges into waterbodies with EPA-approved or established TMDLs, as well as for discharges to impaired waters without a TMDL. The monitoring section is also very specific and has different types of monitoring components that comprise the overall stormwater monitoring program. For instance, the permit includes wet weather, instream ambient, and biological monitoring, watershed characterization requirements, field screening and sampling, and monitoring to assess various SWMP elements.

Critical Findings:

As a general matter, the EPA suggests that future iterations of the Nashville/Davidson County permit and other MS4 permits incorporate clearer, more specific, measurable, and enforceable requirements. The Nashville/Davidson County permit contains some language that is clear, specific, measurable, and enforceable; however, other areas of the permit are not as specific. For example, the permit contains language allowing the permittee to determine appropriate performance standards and these should be specified in the permit and not be left to the permittee to develop.

Over the past several years, the EPA has been taking a closer look at MS4 permits within Region 4 with an expectation that permit requirements are consistent with the statutory and regulatory maximum extent practicable requirement, and that the development of appropriate performance standards should be specified in the permit and not be left to the permittee. TDEC can refer to the EPA's MS4 Permit Improvement Guide for examples of permit provisions and rationales to see what level of detail and specificity the EPA is looking for during our permit reviews.

General Permit for Stormwater Discharges from Construction Activity

TDEC established a Qualified Local Program (QLP) to formally recognize MS4s that meet or exceed the provisions of the Tennessee construction general permit. EPA's stormwater regulations include provisions allowing for streamlining and coordination among programs at the state and local levels, and through the QLP program, a permittee responsible for a project within the jurisdiction of a recognized municipality would follow that municipality's requirements for stormwater management. The Tennessee QLP program was developed through a stakeholder-driven process, and funded through EPA's Innovation Grant Program. The incentives of the program include a set of streamlined QLP minimum requirements, a standardized cooperative enforcement protocol between TDEC and QLP participants, and recognition of QLP status as an alternative measurement of MS4 permit effectiveness. Obtaining QLP status is optional and currently there are five QLP participants in the state, including Bristol, Cookeville, Knox County, Knoxville, and Washington County.

TDEC issued the general permit for discharges of stormwater associated with construction activity on May 23, 2011, effective May 24, 2011. As part of the appendices, the permit includes a NOI form, a Notice of Termination (NOT) form, and a Twice-Weekly Inspection Report form. This construction stormwater inspection form includes questions about the functionality of several erosion prevention and sediment control best management practices, along with other items that the permittee must report.

Program Strengths:

The construction general permit routinely refers to the Tennessee Erosion and Sediment Control Handbook, which TDEC issued as a stormwater planning and design manual for construction activities. The Handbook includes standardized and comprehensive erosion prevention and sediment control BMPs, and it serves as the primary reference for the development and implementation of SWMPs in the state.

The construction general permit includes all the non-numeric effluent limitations that are required as part of the Construction and Development Rule. There are buffer zone requirements, as well as additional BMP requirements for discharges into impaired or exceptional state waters. The permit specifies that certain activities, such as site assessment and other requirements, involve personnel that meet minimum professional qualifications. Schedule of inspection is clearly defined. Also, there are specific erosion prevention and sediment control conditions that apply to linear construction projects.

Critical Findings: none

Stormwater Discharges Associated with Industrial Activity

TDEC issues a stormwater multi-sector general permit (TNR050000) authorizing all new and existing stormwater point sources within Tennessee to discharge stormwater associated with industrial activity, excluding construction, to waters of the State. This permit does not authorize discharges from Ready-Mix Concrete facilities as this sector has its own general permit.

Tennessee's stormwater multi-sector general permit (TMSP) is modeled after the EPA's Multi-Sector General NPDES Permit for industrial stormwater, issued September 29, 2008 (2008 MSGP) and many of the benchmark values and recommended procedures, practices, control measures and BMPs are based principally on the Federal 2008 MSGP. In addition to reviewing this permit, the EPA reviewed four individual permits issued to industrial facilities (TN0064955, TN0026450, TN0002461 and TN0002941) for consistency with stormwater regulations.

Of the four individual permits reviewed, only one permit was subject to an ELG (TN0026450) while the other three permits either were not subject to an ELG or the discharge contains only stormwater. The permits for the facilities not subject to an ELG included TBELs based on BPJ for all conventional, nonconventional and toxic pollutants in the discharge. The permittee subject to an ELG is a nuclear power generating facility and it maintains the highest level of monitoring and compliance possible. The U.S. Nuclear Regulatory Commission provides oversight of this facility and they require monitoring for radioactive pollutants not covered in any of the NPDES permits. One of the individual permits (TN0064955) authorizes a temporary process water stream, resulting from a sewer line repair, to discharge through the permitted outfall without any additional monitoring requirements during the repair. To ensure elevated *E.coli* is not discharged to the receiving stream, it is recommended that additional monitoring occur during the time of the repair. It should be noted that the receiving stream has a TMDL for bacteria.

Program Strengths:

Region 4 reviewed Tennessee's TMSP as well as four individual permits with a focus on verifying consistency with NPDES program requirements. The review found that these permits meet the federal requirements to obtain coverage for all stormwater related discharges associated with industrial activities. Some of the highlights of TDEC's permitting of industrial stormwater under both the TMSP and individual permits are as follows:

- The TMSP addresses 32 specific industrial sectors and the permit contains sector-specific requirements for monitoring and inspections including sector-specific monitoring locations and frequency;
- The TMSP and three of the individual permits reviewed require visual assessments of stormwater discharges;
- The TMSP and the individual permits define a measurable storm event as any event that produces greater than 0.1 inches of rainfall;
- The individual permits reviewed all contain language that when stormwater comes into contact with process wastewater it is subject to the same monitoring requirements as the industrial discharge;
- The TMSP and one of the three individual permits reviewed allow monitoring requirements to be waived for select sectors at "substantially identical outfalls"; and
- The TMSP and individual permits contain benchmark values that are not considered effluent limits and exceeding a benchmark is not a permit violation. If there is an exceedance of a benchmark value, the permits contain triggers requiring corrective action.

Critical Findings:

The EPA findings of TDEC's permitting of industrial stormwater are based on the review of the TMSP and four individual permits and are as follows:

- TDEC should not permit temporary process-water waste streams discharging through a permitted stormwater outfall without any additional monitoring requirements;
- TDEC should ensure that all individual industrial stormwater permits contain provisions requiring visual assessments of stormwater discharges for narrative criteria;
- The TMSP and individual industrial stormwater permits should specify how compliance with applicable water quality standards will be determined; and
- The TMSP has additional requirements for existing dischargers to all impaired waters identified on the Tennessee's 305(b)/303(d) list, including monitoring for appropriate parameters and corrective action if the discharge exceeds the benchmark value for the pollutant of concern, but this provision does not seem to apply to new dischargers. To improve transparency, the TMSP should require similar additional controls and monitoring requirements for new dischargers into impaired waters.

IV. REGIONAL TOPIC AREA FINDINGS

A. Implementation of TMDLs

Background:

A TMDL is a calculation of the maximum quantity of a pollutant that may be added to a waterbody from all sources, without exceeding its applicable WQS. State must establish TMDLs for all impairing pollutants – pollutants that prevent waters from attaining WQS after implementing applicable technology-based requirements. Where a TMDL has been established for a waterbody, WQBELs must be consistent with the assumptions and requirements of any wasteload allocation (WLA) for point source dischargers.

The focus of the TMDL review has been to verify that final TMDL requirements applicable to point sources are being implemented in NPDES permits. As part of the PQR, EPA reviewed the record for three municipal permits and three industrial permits (TN0024210, TN0075078, TN0020656, TN0064955, TN0026450 and TN0060151) to see if the permits adequately and correctly implemented TMDL wasteload allocations. While several of these permittees discharge to streams with multiple TMDLs, only those TMDLs where the facilities were discharging pollutants that caused or contributed to the impairment were considered in the PQR review. The TMDLs relevant to these permits address bacteria impairments and all but one of the permits (TN0026450) discharges pollutants that caused or contributed to the impairment. The review demonstrated that the permits included WQBELs consistent with the assumptions and requirements of the wasteload allocation in the TMDL.

Program Strengths:

TDEC prepares implementation plans for each TMDL and these are readily available on TDEC's website. The purpose of the implementation plan is to identify the actions that must be taken in the future to decrease the pollutants of concern from entering the stream with the goal of improving water quality and better enabling the waterbody to meet the state water quality standard. The TMDL Implementation Plans concentrate on educating the public about non-point sources of water pollution and encouraging the use of best management practices at the agriculture, forestry, and urban and residential levels to reduce non-point source pollution. The implementation plans document the public participation process used to define the issues and resolve any local concerns regarding specific sources of pollution contributing to the water quality impairment.

Critical Findings: none

B. Combined Sewer Overflows

Background:

Combined Sewer overflows (CSOs) present environmental and health problems because they discharge untreated wastewater that contain microbial pathogens, suspended solids, toxic chemicals, trash and other pollutants into waterways. CSO discharges are subject to CWA Section 402(q), which requires that any permit, enforcement order or decree for discharges from combined sewer systems shall conform to the EPA's 1994 CSO Control Policy (59 Fed. Reg. 18688, April 19, 1994, 33 U.S.C. 1342(q)). The CSO Control Policy allows the permittee two approaches to determining compliance with WQS: 1) presumptive approach; and 2) demonstrative approach. The presumptive approach assumes after implementation of the Long-Term CSO Control Plan (LTCP) and installation of BMPs, the effluent will not exceed WQS whereas in the demonstrative approach it is assumed that the levels of control required to meet WQS are known and can be explicitly designed for in the LTCP.

The CSO Control Policy identifies permit requirements for the development and implementation of CSO controls using a two-phase approach. Phase I includes permit requirements for the implementation of the nine minimum controls and development of a (LTCP). Phase II requirements included in permits pertain to implementation of the LTCP. As part of the PQR, the EPA selected two permits (TN0024210 and TN0020656) to review with the focus on the CSO requirements and whether the permits met the conditions of the EPA's 1994 CSO Control Policy. The City of Clarksville (TN0020656) plans to target full separation of its sanitary and storm sewer systems, and the EPA does not anticipate post-phase 2 compliance monitoring as a significant permit component in the future. In the City of Chattanooga permit, the City used the presumptive approach for compliance with the LTCP.

Program Strengths:

TDEC has made good progress in implementing the nine minimum control measures into a LTCP for the City of Chattanooga. Likewise the Clarksville POTW facility has planned for full separation and permit conditions will reflect as such. The Chattanooga permit requires monitoring for *E.coli* both upstream and downstream of the CSO outfalls.

Critical Findings:

The EPA findings of TDEC's permitting of CSOs are based on the review of the City of Chattanooga permit and are as follows:

- A topographic map or sketch showing the CSO discharge locations was missing.
- The permit did not identify the physical location of the outfalls.
- For post-construction compliance monitoring, the Chattanooga permit contains a compliance point for collection of ambient water quality data in the middle of the Tennessee River which presumes a large mixing zone. It is unclear whether TDEC's WQS allow for mixing zones for bacteria as a human health contaminant.
- The permit includes language stating if samples of CSO releases have *E.coli* in excess of the daily maximum WQS the State does not consider these permit violations but suggest contributions to possible water quality violations.

V. ACTION ITEMS

This section provides a summary of the main findings of the review and provides proposed Action Items to improve TDEC's NPDES permit programs. This list of proposed Action Items will serve as the basis for ongoing discussions between Region 4 and TDEC as well as between EPA Region 4 and EPA HQ. These discussions should focus on eliminating program deficiencies to improve 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 states or Region's NPDES permit program.

The critical findings and recommended action items 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 and/or may serve as a roadmap for modifications to the Region's program management. Anywhere a Category 1 finding is noted in the sections below the specific reference to the federal regulation that is not being followed is provided. The basis of all Category 2 findings is the EPA's NPDES Permit Writers' Course Manual (EPA 833-B-97-001).

A. Basic Facility Information and Permit Application

The core permits and rationales reviewed include the basic facility, permit, and receiving water information necessary for a well-structured permit. In all the permits, the permit writers provided a good description of the receiving waters and permitted activities. Proposed action items to help Tennessee strengthen its NPDES permit program include the following:

- Ensure complete applications are submitted by permittee and contain analytical results from three priority pollutant scans per 40 CFR §122.21. (Category 1)
- Permit applications should contain at least four quarters of WET testing results per 40 CFR §122.21. (Category 1)
- Permit applications should include flow diagrams, maps and water budgets per 40 CFR §122.21. (Category 1)
- Permit and Rationale should identify that sufficiently sensitive analytical methods were used per 40 CFR §136. (Category 1)
- Include the location of the discharge (e.g., physical address, latitude and longitude) in all permits and rationales. (Category 2)
- Method detection limits provided in the permit should match those in the rationale. (Category 3)

B. Technology-based Effluent Limitations

In nearly all the POTW permits reviewed, effluent limits for BOD, TSS and pH are generally more stringent than required by secondary treatment because in most cases these are based on wasteload allocations. For non-POTW facilities, the technology-based limits for the permits reviewed are based on several factors including consideration of ELGs, BPJ, demonstrated performance, and anti-backsliding requirements. Proposed action items to help Tennessee strengthen its NPDES permit program include the following:

- Document in the record if permit limits are based on a "reasonable measure of actual production". (Category 2)
- Document in the rationale or permit file the basis for effluent limits (e.g., BPJ, BCT, etc.). (Category 2)

C. Water Quality-Based Effluent Limitations

The core permits reviewed include WQBELs that are consistent with the documentation in the permit record. Permit Rationales include information characterizing the discharge and also discusses the basis for effluent limits, anti-backsliding and anti-degradation, when relevant. Proposed action items to help Tennessee strengthen its NPDES permit program include the following:

- All water quality-based limits should be expressed as both average monthly and maximum daily limitations, consistent with 40 CFR § 122.45(d). (Category 1)
- TDEC should document how reasonable potential was considered for all pollutants of concern including WET testing per 40 CFR §122.21(d)(i)(ii). (Category 1)
- Record should identify how the pollutants of concern were selected for determining WQBELs per 40 CFR §122.44(d). (Category 1)
- Record should include calculations for determining ammonia limits. (Category 2)
- Permit Rationales should identify the designated use as well as the impairment status of the receiving waters. (Category 2)
- TDEC is encouraged to state in the permit Rationale the 303(d) status of the stream and also note whether the information in the 303(d) list is outdated and new assessment data is overriding the information contained on the 303(d) list. (Category 3)
- To improve transparency with the public, TDEC is encouraged to update the permit rationales to link together impairment status, the official 303(d) listings, updates to assessments and TMDL status. (Category 3)

D. Monitoring and Reporting

The core permits reviewed require monitoring for all of the parameters subject to permit limits and in general the monitoring appeared sufficient to assess compliance with effluent limitations. Proposed action items to help Tennessee strengthen its NPDES permit program include the following:

- Record should clearly indicate that sufficiently sensitive analytical methods were used consistent with 40 CFR § 136. (Category 1)

E. Special and Standard Conditions

In general, the core permits reviewed include the standard permit conditions specified in 40 CFR § 122.41, although it wasn't always possible to discern whether all the standard conditions were present because some are referred to differently. Proposed action items to help Tennessee strengthen its NPDES permit program include the following:

- Review and update permit language to ensure that all standard conditions are as stringent as the federal standard conditions at 40 CFR § 122.41, including compliance schedule requirements, duty to mitigate, duty to comply and signatory requirement. (Category 1)
- TDEC should ensure that its 24-hour reporting requirement is as detailed as 40 CFR § 122.41(1)(6)(ii). (Category 1)

F. Administrative Process (including public notice)

Most of the core permit files reviewed include public notices for the draft permits and whether public hearings were held or not. Proposed action items to help Tennessee strengthen its NPDES permit program include the following:

- Record should include documentation of public notices per 40 CFR § 124.10. (Category 1)
- Record should contain a transcript of the public hearing, if one was held per 40 CFR § 124.11. (Category 1)
- Record should include a written response to all significant comments received on a draft permit during the comment period, consistent with 40 CFR § 124.17. (Category 1)
- Record should include a note stating that no comments were received or if no public hearing was requested. (Category 3)

G. Documentation (including rationale)

The files for the core permits reviewed were well organized and generally complete, containing the relevant permit application and data, draft permit, rationale or rationale, public notice, select correspondence, public comments and TDEC responses, and additional materials. However, some aspects of core permit files could be better documented. Proposed action items to help Tennessee strengthen its NPDES permit program were addressed in previous sections and are not repeated here.

H. National Topic Areas

Proposed Actions Items for national topic areas are provided below.

1. Nutrients

TDEC has two major strategies to remove nutrients from POTW discharges: 1) design and construction for nutrient removal; and 2) optimization of existing treatment operations. TDEC developed a Nutrient Reduction Framework that utilizes adaptive management strategies to obtain reductions from both point and nonpoint sources at the HUC-10 watershed level. TDEC plans to implement its nutrient reduction strategy into POTW permits as they are reissued according to the Watershed Management Cycle. Proposed Action Items to help TDEC strengthen its NPDES permit program include the following:

- TDEC should ensure that intermediary effluent limits for nutrients reflect TBELs and are not misconstrued as true water quality based effluent limits per 40 CFR § 124.56. (Category 1)
- TDEC should conduct an RPA for nutrients in all POTW permits regardless of the impairment status of the receiving stream per 40 CFR § 122.44(d)(i)(ii). (Category 1)

- TDEC should assign WQBELs to nutrients in POTW permits, where appropriate per 40 CFR § 122.44(d). (Category 1)

2. Pesticides

There are no proposed action items for this subject area.

3. Pretreatment

There are no proposed action items for this subject area.

4. Stormwater

The State of Tennessee's overall administration of the NPDES stormwater program and its permits continue to meet EPA's expectations. Proposed Action Items to help TDEC strengthen its NPDES permit program include the following:

- TDEC should not permit temporary stream of process water from discharging through a permitted stormwater outfall without any additional monitoring requirements per 40 CFR § 122.45(h). (Category 1)
- TDEC should ensure that all individual industrial stormwater permits contain provisions requiring visual assessments of stormwater discharges per 40 CFR § 122.41(i). (Category 1)
- MS4 permits should incorporate clear, specific, measurable, and enforceable permit requirements per 40 CFR § 122.26. (Category 1)
- The TMSP and individual industrial stormwater permits should specify how compliance with applicable water quality standards will be determined. (Category 2)
- The TMSP has additional requirements for existing dischargers to all impaired waters identified on the Tennessee's 305(b)/303(d) list, including monitoring for appropriate parameters and corrective action if the discharge exceeds the benchmark value for the pollutant of concern, but this provision doesn't seem to apply to new dischargers. To improve transparency, the TMSP should require similar additional controls and monitoring requirements for new dischargers into impaired waters. (Category 3)

I. Regional Topic Areas

Proposed Actions Items for regional focus areas are provided below.

1. Implementation of TMDLs

The focus of the TMDL review was to verify that final TMDL requirements applicable to point sources are being implemented in NPDES permits. EPA reviewed six permits and rationales to see if the permits adequately and correctly implemented TMDLs developed to address impairments and how wasteload allocations were incorporated into permit requirements. The

review demonstrated that the permits included WQBELs consistent with the assumptions and requirements of the wasteload allocation portion of the TMDL. There are no proposed action items for this subject area.

2. Combined Sewer Overflows

As part of the PQR, the EPA selected two permits to review with the focus on the CSO requirements and whether the permits met the conditions of the EPA's 1994 CSO Control Policy. One of these permits was issued to the City of Clarksville and they plan to fully separate the sanitary and storm sewer systems. Depending how quickly the separation happens, the City of Clarksville may not have to implement post-phase II monitoring into their permit, but the City has to comply with the CSO Policy and implement its provisions in their permit as long as they have the capacity to discharge from a combined sewer system. Proposed Action Items to help TDEC strengthen its NPDES permit program include the following:

- The record should include a topographic map or sketch identifying the locations of the CSO discharges as well as a description of the physical location of these outfalls per 40 CFR § 122.21. (Category 1)
- Language in the permit should state that CSO discharges that have *E.coli* concentrations in excess of the daily maximum WQS are water quality violations unless TDEC can demonstrate that its existing WQS allow for these excursions per 40 CFR § 122.41(a). (Category 1)