



U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Evaluation Report

Oversight of North Carolina's Renewals of Thermal Variances

Report No. 11-P-0221

May 9, 2011

Report Contributors:

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Abbreviations

BIP	Balanced, indigenous population
CFR	Code of Federal Regulations
CWA	Clean Water Act
DWQ	Division of Water Quality
EPA	U.S. Environmental Protection Agency
MOA	Memorandum of agreement
NPDES	National Pollutant Discharge Elimination System
OIG	Office of Inspector General
OWM	Office of Wastewater Management

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At a Glance

Catalyst for Improving the Environment

Why We Did This Review

The Office of Inspector General received a Hotline complaint alleging that the State of North Carolina's National Pollutant Discharge Elimination System (NPDES) permits do not protect waters from harmful environmental effects caused by thermal discharges. We evaluated North Carolina's and Region 4's compliance with Clean Water Act (CWA) requirements for protecting surface waters from thermal discharges.

Background

Power and industrial facilities draw water from rivers and lakes to cool equipment and then discharge those cooling waters at a higher temperature back into those waterbodies. Either a state or the U.S. Environmental Protection Agency (EPA) may issue a variance under CWA Section 316(a) to allow facilities to discharge cooling waters at an alternative thermal effluent limit that is still protective of aquatic life.

For further information, contact our Office of Congressional, Public Affairs and Management at (202) 566-2391.

The full report is at:
www.epa.gov/oig/reports/2011/20110509-11-P-0221.pdf

Oversight of North Carolina's Renewals of Thermal Variances

What We Found

Region 4 has not adequately implemented management controls contained in its memorandum of agreement with North Carolina. Properly implemented controls would assure EPA that NPDES permits would comply with the CWA and applicable federal regulations. In four of the six draft permits we reviewed, Region 4 did not agree with the North Carolina Division of Water Quality that there was sufficient information to support the draft permit limits for temperature. Region 4 requested that the state add conditions to the final permits so that information could be collected to determine whether the thermal limits harm aquatic life. The two other draft permits we reviewed either did not contain a thermal variance request, or the region never commented on the thermal variance. We also found that the state limited the public's opportunity to review information and comment on these variances by not following regulatory requirements for developing complete permit fact sheets and public notices.

Due to procedural lapses by the North Carolina Division of Water Quality and Region 4, it cannot be determined whether waters are protected from harmful environmental effects caused by thermal discharges. The state and Region 4 will not make further determinations on the thermal variances until these facilities request NPDES permit renewals. As a result, until 2015, these facilities will continue discharging heated waters as allowed under their current permits and thermal variances.

What We Recommend

We recommend that the EPA Regional Administrator, Region 4, enforce the management controls of the NPDES memorandum of agreement; verify that thermal variances are protective of a balanced, indigenous population; and verify that permit fact sheets and public notices comply with federal regulations. The region agreed with our recommendations. We agree that their actions meet the intent of the recommendations.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

May 9, 2011

MEMORANDUM

SUBJECT: Oversight of North Carolina's Renewals of Thermal Variances
Report No. 11-P-0221

FROM: Arthur A. Elkins, Jr.
Inspector General

A handwritten signature in black ink, appearing to read "Arthur A. Elkins, Jr.", is placed to the right of the "FROM:" line.

TO: Gwendolyn Keyes Fleming
Regional Administrator, Region 4

This is our report on the subject evaluation conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

The estimated direct labor and travel costs for this report are \$245,398.

Action Required

In accordance with EPA Manual 2750, you are required to provide a written response to this report within 90 calendar days. You should include a corrective actions plan for agreed-upon actions, including milestone dates. Your response will be posted on the OIG's public website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of Section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal. We have no objections to the further release of this report to the public. We will post this report to our website at <http://www.epa.gov/oig>.

If you or your staff have any questions regarding this report, please contact Wade Najjum at 202-566-0832 or najjum.wade@epa.gov, or Dan Engelberg at 202-566-0830 or engelberg.dan@epa.gov.

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Purpose

In August 2010, the Office of Inspector General received a Hotline complaint alleging that the State of North Carolina's National Pollutant Discharge Elimination System (NPDES) permits do not protect waters from harmful environmental effects caused by thermal discharges into lakes. The U.S. Environmental Protection Agency (EPA), Office of Inspector General, evaluated North Carolina's and Region 4's compliance with Clean Water Act (CWA) requirements for protecting surface waters from thermal discharges at selected facilities.

Background

Clean Water Act Section 316(a) Variances

Power and industrial facilities draw water from lakes and rivers to cool equipment. These cooling waters, known as thermal effluents after they are heated, are discharged from point sources (such as pipes) back into those waterbodies. Thermal effluents are regulated because heat is identified as a pollutant under 40 Code of Federal Regulations (CFR) §122.2. A facility may be authorized to discharge pollutants into waters of the United States by obtaining an NPDES permit.

A permitting authority (either a state or EPA) issues NPDES permits, which may contain a variance to a thermal effluent limit under 40 CFR, subpart H. This variance allows facilities to discharge cooling waters at an alternative thermal effluent limit that is still protective of aquatic life. To obtain a CWA 316(a) thermal variance, the operator of a facility must demonstrate to the permitting authority that an alternative thermal discharge limit will be protective of the indigenous aquatic community. This demonstration can be a detailed study from the permitted facility with supporting data showing that the alternate effluent limitation assures the "protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife" as defined in 40 CFR §125.71(c). This alternative effluent limit, or variance, is only in effect for the duration of the current permit. To obtain a CWA 316(a) thermal variance, a facility must include a request for the variance as part of the permit application. The applicant's request to continue a thermal variance must also include a demonstration that the alternative effluent limit continues to assure the protection and propagation of the balanced, indigenous population (BIP).

North Carolina's and EPA's Responsibilities for Implementing CWA 316(a) Thermal Variances

In 1975, EPA granted the State of North Carolina authority to issue NPDES permits. In 1983, both parties signed a memorandum of agreement (MOA) establishing policies, responsibilities, and procedures for administering the NPDES program. Today, the North Carolina Department of Environment and

Natural Resources, Division of Water Quality (DWQ), is responsible for surface water and ground water protection in the state. DWQ's Environmental Services Section and the Surface Water Protection Section, NPDES Permit Unit, share in the review of NPDES permit applications and renewals.

In North Carolina, the process for requesting an NPDES permit with a thermal variance begins with the submission of a facility's signed application to DWQ. For permit requests that include a CWA 316(a) thermal variance, the Environmental Services Section described its internal review process. The staff members review BIP reports for biological and physical/chemical data provided by the facility. The Environmental Services Section then submits its determination as to whether there is a BIP to the Permitting Unit, which prepares a draft NPDES permit. The Permitting Unit makes the final determination about a permittee's request for continuance of a CWA 316(a) variance. The NPDES Permit Unit makes the draft permit available for public review and comment through a public notice. EPA Region 4 should also receive a copy of the draft permit and any additional information requested for its review.

In 2007, the State of North Carolina and EPA Region 4 updated their MOA. According to the 2007 MOA, Region 4 will oversee the state's NPDES program for consistency with the CWA, state legal authorities, the MOA, the state's CWA Section 106 workplan, and all applicable federal regulations. Under the 2007 MOA, the region may provide comments, recommendations, or objections to a draft NPDES permit. Under 40 CFR §123.44(c)(5), the Regional Administrator may object to a draft permit if the Regional Administrator determines that provisions of the permit relating to the maintenance of records, reporting, monitoring, sampling, or the provision of any other information by the permittee, are inadequate to assure compliance with permit conditions. The period of review may be up to 90 days from receipt of the proposed permit. If the region chooses to object to the draft permit and the state fails to make the changes detailed in the objection, the region assumes authority for issuing the NPDES permit under the MOA.

Under the MOA, DWQ sends a copy of the draft permit package to EPA Region 4. This package includes a copy of the public notice, the draft permit, the application, the fact sheet or statement of basis associated with the permit, and notices of public hearings. According to 40 CFR §124.8, the fact sheet shall contain, when applicable, a brief summary of the basis for the draft permit conditions. The September 2010 *Permit Writers' Manual* suggests that the fact sheet should include detailed discussions of the development of the permit limitations for each pollutant. It must also contain, when applicable, a justification for continuing a thermal variance. Under 40 CFR §124.8(a), DWQ must send the fact sheet to the permit applicant and to any others requesting a copy.

To assess the quality of NPDES permits, the EPA Office of Water, Office of Wastewater Management (OWM), began conducting permit quality reviews in

2007. OWM shared its findings for reviews conducted in Regions 4, 7, and 9. According to OWM, the permit files containing CWA 316(a) thermal variances generally did not contain documentation supporting the variances.

To remind states and regions about responsibilities concerning CWA 316(a) variances, OWM issued a 2008 memorandum clarifying the requirements for issuing or renewing a CWA 316(a) thermal variance. The memorandum states, “It is essential that permitting authorities require applicants to provide as much information described in 40 CFR §125.72(a) and (b) as necessary to demonstrate the alternative effluent limit assures the protection and propagation of the BIP.” In addition to this memorandum, Region 4 sent comment letters about draft permits to DWQ. These letters requested that the final permits contain a condition that permittees perform additional studies to determine whether the thermal variances allow for a BIP. The final permits contained requests for permittees to conduct additional studies.

Scope and Methodology

We reviewed permit application materials for seven facilities (appendix A). We restricted our analysis to DWQ’s compliance with requirements for permits with a CWA 316(a) thermal variance, and Region 4’s review of these draft permits. We discussed with OWM, Region 4, and the North Carolina Department of Environment and Natural Resources the requirements to support a CWA 316(a) variance renewal. We also obtained and reviewed the public law, federal regulations, and Agency guidance pertaining to CWA 316(a) variances in NPDES permit renewals.

We conducted our review from November 2010 to March 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform our review to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our objectives.

Results of Review

Region 4 has not adequately implemented management controls contained in its MOA with North Carolina. Properly implemented controls would assure EPA that NPDES permits comply with the CWA and applicable federal regulations. In four of the six draft permits we reviewed, Region 4 did not agree with DWQ that there was sufficient information to support the draft permit limits for temperature. This information was needed so that Region 4 could determine whether proposed thermal variances would harm aquatic life. Region 4 requested that the state add conditions to the final permits so that information could be collected to determine whether the thermal limits harm aquatic life. According to the documents we obtained from DWQ, these facilities have been operating with a CWA 316(a)

thermal variance or collecting water temperature data since the mid-1970s through the early 1990s. Two other draft permits we reviewed either did not contain a thermal variance request or the region never commented on the thermal variance. As of January 2011, DWQ reported that the draft permit had not yet been developed for one other facility in our sample. We also found that the state limited the public's opportunity to review information and comment on these variances by not following regulatory requirements for developing complete permit fact sheets and public notices.

Due to procedural lapses by North Carolina and Region 4, it cannot be determined whether waters are protected from harmful environmental effects caused by thermal discharges. The state and Region 4 will not make further determinations on the thermal variances until these facilities request NPDES permit renewals. Region 4 and the public will not be able to assess whether these discharges are harming the BIP of the waterbodies until the permits expire in 2015.

Variance Renewals Lack Adequate Support

In four of the six draft permits we reviewed, Region 4 did not find sufficient support to agree with DWQ's decision to continue the CWA 316(a) thermal variances. To continue a thermal variance, federal regulations allow a permit applicant to demonstrate that a BIP does not exhibit any appreciable harm from the prior normal operating discharges. For three of these permits, Region 4 sent comment letters to DWQ. The region objected to the fourth because it did not have sufficient support for the thermal variance. In followup correspondence, Region 4 determined that that DWQ satisfied the conditions of the objections.

During 2010, Region 4 reviewed the draft permits for three facilities and, in each case, provided comments to DWQ regarding support for approving the permittee's request to continue with the thermal variance. For each of these draft permits, Region 4 stated in its comments that the "report lacks detail and did not generate information sufficient to support a Section 316(a) variance determination for the next permit cycle." For these three permits, the region developed a list of items to address in the future study plan for the next permit cycle.

In response to the region's comments, DWQ inserted a condition into the renewed permits requiring facilities to provide their study plans to Region 4. These permits do not expire until 2015.

Region 4 objected to one draft permit because it was concerned with the allowed monthly average temperature difference of 13.9 degrees Celsius as compared with the receiving waters. DWQ adjusted the permit limit to allow a temperature change of 8.5 degrees Celsius, resolving Region 4's concerns. DWQ issued the modified permit on May 26, 2010.

Region 4 also reviewed draft permits for two of the three other facilities in our sample. In one case, the region did not comment on the thermal variance in the

draft permit. In another one, Region 4 has not yet reviewed the draft permit because the state is currently developing it. In the final draft permit we reviewed, there is no thermal variance. DWQ told us the receiving water is classified as a cooling pond and is not considered a “water of the State”; therefore, the facility can discharge at a higher temperature. The permit states that in no case should the ambient temperature exceed 32 degrees Celsius as a result of operations. One of the two water-sampling locations in the permit is at the discharge point from the dam, which we estimate to be approximately 2 miles downstream from the facility.

We discussed this distance with the Region 4 permit reviewer and were told that the dam discharge sampling point may not be appropriate, and that this matter will be discussed with the state during the next permit renewal. The permit reviewer agreed that without a variance, the discharge must meet the water quality standards at all points in the lake.

In the four draft permits we reviewed that contain a thermal variance, Region 4 concluded that there were insufficient data to support the state’s determination that thermal variances will result in no appreciable harm to the waterbodies’ BIP. These were all permit renewals rather than new permits; therefore, Region 4 had previous opportunities to request that more data be collected to determine the effects of these variances. Had the region more closely monitored these draft permits as required under the current and previous MOAs, it would be in a position to determine whether renewing the thermal variances was appropriate. Without this support, we cannot determine whether these waterbodies are protected from harmful environmental effects caused by thermal discharges at the facilities we reviewed.

Permit Fact Sheets Were Missing Critical Information

Most of the draft permits we reviewed were missing critical information needed to allow EPA and the public an opportunity for review and comment as required by federal regulations. Five fact sheets we reviewed contained insufficient information to explain the basis for approving the thermal variance and the associated permit limits. As of January 2011, a DWQ permit writer reported that one permit is under review and the state has not developed the fact sheet. The other draft permit we reviewed did not contain a CWA 316(a) thermal variance, so reference to it in the fact sheet was not necessary. Without a complete summary of the state’s CWA 316(a) variance decision in the fact sheet, neither EPA nor the public has the needed information to understand the state’s rationale for approving these thermal variances.

According to 40 CFR §124.8, every draft NPDES permit that incorporates a variance must include a fact sheet. The fact sheet establishes the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit, as well as the basis for the permit limits, including

references to applicable statutory or regulatory provisions. A fact sheet provides a critical internal control mechanism because it is a source of information that explains a state's decision to both the region and the public. OWM's 2008 memorandum reiterated the importance of facts sheets. The memorandum stated that not only is a fact sheet required as part of an NPDES permit containing a CWA 316(a) thermal variance, but it must explain why the permitting authority believes the variance is justified. The fact sheet should also explain the thermal variance history (if it is a renewal) as well as the basis for continuing the variance.

For the five fact sheets with insufficient information, details about CWA 316(a) thermal variances ranged from general information to no information whatsoever. In compliance with 40 CFR §124.8(b)(5), DWQ stated why the variance appears justified in four of the five fact sheets. DWQ concluded that the waterbody receiving thermal waters has a balanced indigenous macroinvertebrate and fish community. One fact sheet did not contain this statement. These five fact sheets also did not contain a brief summary of the basis for the permit conditions (i.e., thermal variances), as required by 40 CFR §124.8(b)(4). Region 4 did not comment on the contents of these fact sheets when it reviewed the draft NPDES permit packages sent by DWQ. Without complete information in fact sheets, the public may not fully know the permit conditions pertaining to the CWA 316(a) thermal variance.

Public Notices Were Missing Required Elements

The public notices for five of six draft permits did not contain the required statements describing the proposed thermal variance. Because one facility does not have a thermal variance, the public notice did not need information about thermal variances. A final permit request was not under review by DWQ, and a public notice had not been issued. Statements about thermal variances alert the reader that one is being proposed for the facility. It provides a comparison of the water-quality-based limit and the less-stringent proposed limit allowed under the variance. The regulations require that a public notice for a draft permit with a thermal variance contain statements that address the following:

1. The thermal component of the discharge is subject to effluent limitations under CWA Section 301 or 306 and a brief description, including a quantitative statement, of the thermal effluent limitations proposed under Section 301 or 306.
2. A Section 316(a) request has been filed and that alternative, less-stringent effluent limitations may be imposed on the thermal component of the discharge under Section 316(a), and a brief description, including a quantitative statement, of the alternative effluent limitations, if any, included in the request.

According to the regional staff person who reviews the state's draft permits, the public notice should discuss the thermal variance. The permit reviewer said the

state may not send a copy of the public notice with the draft permit, but it is sometimes attached to the fact sheet. She was not aware that the public notices we reviewed did not meet the regulatory requirements. Failing to include this information in the public notice significantly reduces the public's awareness of the state's decision to allow a thermal variance in the permit.

Conclusion

We cannot determine whether North Carolina's approval of permits with CWA 316(a) thermal variances protects aquatic populations. The region determined that the thermal limits for four of the six facilities we reviewed were renewed based on insufficient documentation of proposed thermal variances. The process for issuing six of the seven facilities' permits did not follow important process safeguards. North Carolina and Region 4 have not followed a number of requirements contained in federal regulations, leading to incomplete documentation of the state's decision to approve these variances. After Region 4 determined that North Carolina had not gathered the information needed to determine whether variances were warranted, it developed a list of items to address in future study plans for the next permit cycle. In our opinion, the region should have noted the deficiencies in North Carolina's fact sheets and public notices in previous permit renewal packages. Incomplete fact sheets and public notices limit the public's ability to make informed judgments about, comment on, or dispute these decisions by North Carolina. These facilities will continue discharging heated waters as allowed under their current permits and thermal variances for the next 4 years. Consequently, Region 4 and the public will not know whether these discharges are harming the BIP of the waterbodies until the permits come up again for renewal.

Recommendations

We recommend that the Regional Administrator, Region 4:

1. Enforce the management controls of the NPDES MOA.
2. Verify that thermal variances are protective of a balanced, indigenous population.
3. Verify that permit fact sheets and public notices comply with federal regulations.

Agency Response and OIG Comment

The region agreed with our recommendations. We agree that their actions meet the intent of the recommendations.

Status of Recommendations and Potential Monetary Benefits

RECOMMENDATIONS						POTENTIAL MONETARY BENEFITS (in \$000s)	
Rec. No.	Page No.	Subject	Status ¹	Action Official	Planned Completion Date	Claimed Amount	Agreed-To Amount
1	7	Enforce the management controls of the NPDES MOA.	O	Regional Administrator, Region 4			
2	7	Verify that thermal variances are protective of a balanced, indigenous population.	O	Regional Administrator, Region 4			
3	7	Verify that permit fact sheets and public notices comply with federal regulations.	O	Regional Administrator, Region 4			

¹ O = recommendation is open with agreed-to corrective actions pending
C = recommendation is closed with all agreed-to actions completed
U = recommendation is undecided with resolution efforts in progress

List of Reviewed Permits

Facility permit documentation reviewed as part of Hotline complaint:

1. Asheville Coal Power Plant (NC0000396)
2. Belews Creek Steam Station (NC0024406)
3. Blue Ridge Paper Products Canton Mill (NC0000272)
4. Buck Steam Station (NC0004774)
5. Cliffside Steam Station (NC0005088)
6. Marshall Steam Station (NC0004987)
7. McGuire Nuclear Power Plant (NC0024392)

Agency Comments

MEMORANDUM

SUBJECT: Draft Report:
Oversight of North Carolina's Renewals of Thermal Variances
OIG Project No. 2011-0003

FROM: Gwendolyn Keyes Fleming
Regional Administrator

TO: Wade Najjum
Assistant Inspector General for Program Evaluation

This is in response to your memorandum to me dated April 5, 2011, regarding an Office of Inspector General (OIG) draft report on several final National Pollutant Discharge Elimination System (NPDES) permits issued by the North Carolina Department of Natural Resources (NCDNR). The permits contain provisions for thermal variances to comply with requirements of Section 316(a) of the Clean Water Act (CWA).

Below are recommendations in the draft report with our responses:

1. **OIG Recommendation:** Enforce the management controls of the NPDES Memorandum of Agreement.

EPA Response: We concur. Section IV.B.3. of EPA Region 4's Memorandum of Agreement (MOA) with NCDNR states, "EPA may provide to the State written comments on, recommendations with respect to, or objections to the issuance of the draft permit." Regional review of a particular draft NPDES permit, or type of permit, is a discretionary oversight activity. It is also within the Region's discretion to object, comment, or choose not to comment to a draft NPDES permit. Based on information available at the time we reviewed the draft permits, we implemented the MOA by providing comments on and recommendations with respect to proposed 316(a) thermal variances. We recommended that during the next permit term facilities should collect targeted data that would assist the State in determining if the thermal component of the effluents was allowing maintenance of a balanced and indigenous population (BIP) of fish, shellfish and wildlife in the receiving water body near the discharge point. This data will be more detailed than the data previously used by the State in its determination of compliance with CWA Section 316(a).

2. **OIG Recommendation:** Verify that thermal variances are protective of a balanced, indigenous population.

EPA Response: We concur. By the end of each permit's term, as directed by EPA in our comment letters on the draft permits, the State will have specific data to determine if the receiving water body is able to maintain a BIP. EPA will review the data and verify that the thermal variances are protective of a balanced and indigenous population.

3. Verify that permit fact sheets and public notices comply with federal regulations.

EPA Response: We concur. In accordance with the MOA, EPA may review draft permits, or in the limited circumstances described in Section IV.B.6., proposed permits. In the future, EPA will review draft permits with CWA 316(a) variances to ensure that the permit fact sheets and public notices contain the necessary elements and language to adequately inform the public of thermal discharges in relationship demonstrating the maintenance of a BIP.

Thank you for the opportunity to comment on this draft report. Please contact Jim Giattina, Director of the Water Protection Division at Giattina.Jim@epa.gov or at (404) 562-9345, if you have any questions about our response.

Distribution

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