This document gives pertinent information concerning the reissuance of VPDES Permit listed below. This permit is being processed as a Major, Municipal permit. The discharge results from the operation of a 67 MGD wastewater treatment plant. This permit action consists of updating the Water Quality Standards and boilerplates. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-05 et seq.

1. Facility Name and Address: Noman M. Cole Pollution Control Plant, P.O. Box 268, Lorton, VA 22079 — SIC Code: 4952

   Facility Location: 9399 Richmond Highway, Lorton, VA 22079 — County: Fairfax

2. Permit No.: VA0025364 — Expiration Date: April 13, 2008

   Other VPDES Permits associated with this facility: VAN010022 (General Permit for Nutrients), VAR530331 (General Permit for Stormwater)

   Other Permits associated with this facility: NVRO70714 (Title V, Air)

   E2/E3/E4 Status: E3

3. Owner Name: Fairfax County Board of Supervisors

   Owner Contact/Title: Mr. Kailash Gupta, P.E., DEE, Director, Wastewater Treatment Division

   Telephone Number: (703) 550-9740 Ext. 255

4. Application Complete Date: November 26, 2007

   Permit Drafted By: Joan C. Crowther — Date Drafted: July 10, 2008

   Draft Permit Reviewed By: Alison L. Thompson — Date Reviewed: July 16-17, 2008

   Public Comment Period : Start Date: August 15, 2008 — End Date: September 15, 2008

5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name:	Pohick Creek	River Mile:	1APOH4.79
Stream Basin:	Potomac River	Subbasin:	Potomac River
Section:	7	Stream Class:	III
Special Standards:	b	Waterbody ID:	VAN-A16R
7Q10 Low Flow:	0.44 MGD	7Q10 (Nov-Mar):	3.94 MGD
1Q10 Low Flow:	0.21 MGD	1Q10 (Nov-Mar):	3.23 MGD
Harmonic Mean Flow:	5.4 MGD	30Q5 Flow:	2.2 MGD
303(d) Listed:	Yes	30Q10 Flow (April – Oct):	1.3 MGD
30Q10 Flow (Nov-Mar)	6.3 MGD		
TMDL Approved:	Yes (PCBs)	Date TMDL Approved:	September 2007 – SWCB October 2007 - EPA

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

   ✓ State Water Control Law
   ✓ Clean Water Act
   ✓ VPDES Permit Regulation
   ✓ EPA NPDES Regulation
   ___ EPA Guidelines
   ✓ Water Quality Standards
   ✓ Policy for the Potomac River Embayments (PPRE) (9 VAC 25-415-10 *et seq.*)

7. Licensed Operator Requirements: Class I

8. Reliability Class: Class I

9. Permit Characterization:

____ Private	____ Effluent Limited	✓ Possible Interstate Effect (Maryland)
____ Federal	✓ Water Quality Limited	____ Compliance Schedule Required
____ State	✓ Toxics Monitoring Program Required	____ Interim Limits in Permit
✓ POTW	✓ Pretreatment Program Required	____ Interim Limits in Other Document
✓ TMDL		

10. Wastewater Treatment Description:

This facility is a publicly owned advanced wastewater treatment facility that includes mechanical screening, primary sedimentation, aeration (activated sludge), clarification, equalization, chemical clarification with ferric chloride for phosphorus removal, filtration, chlorination, dechlorination, and defoaming. Flow is equalized at a couple of points in the process.

On July 13, 2005 a Certificate to Operate was issued for the 67-MGD facility. Wastewater treatment for the 67 MGD design flow is extensively discussed in a document entitled *Engineering Study for the Expansion of the Lower Potomac Pollution Control Plant Beyond 54 MGD*, Volume II, Book 2, August 1993. The advanced treatment process of Noman M. Cole PCP consistently yields effluent $cBOD_5$ and TSS results below 5 mg/L, which indicates treatment efficiencies greater than 85%. On July 30, 2008, a Certificate to Operate was issued for the methanol feed system.

The facility has 6 stormwater outfalls that discharge to Pohick Creek or unnamed tributaries of Pohick Creek. These outfalls are permitted under a General Stormwater Industrial Permit (VAR530331).

See Attachment 2 for a flow diagram of the treatment works.

TABLE No. 1 - Outfall Description

OUTFALL NUMBER	DISCHARGE SOURCES	TREATMENT	FLOW	Outfall Location Latitude and Longitude*
001	Domestic and/or Commercial Wastewater	See Item 10 above.	67.0 MGD Design Flow	38° 41' 53" N 77° 12' 03" W

*The outfall location's longitude was revised in this permit reissuance process. The previous longitude was 77º 12' 13".
Attachment 3 is a copy of the U.S.G.S. Topographic map (Fort Belvoir Quad), (DEQ #193B) identifying the Outfall No. 001 location and the DEQ ambient water quality monitoring stations listed in Item 14 of the Fact Sheet.

11. Sludge Treatment and Disposal Methods:

Sludge from the primary sedimentation tanks is pumped into the 6 degritters. The grit is sent to the I-95 Landfill. The degritted sludge has polymer added and is processed through gravity thickeners. Secondary sludge is blended with polymer and thickened in on of 3 flotation thickeners. The primary and secondary sludges are commingled in the two sludge storage tanks. The mixed sludge has lime and polymer added, is then centrifuged for the final dewatering, and is incinerated in the on-site multiple hearth incinerators. The dry ash from the 4 incinerators is hauled to the sanitary landfill for disposal.

The back-up method for sludge disposal is incineration at Covanta Fairfax, Inc. (I-95 incinerator).

See Attachment 2 for a flow diagram of the sludge treatment.

12. Material Storage:

See Attachment 4 for a summary of all materials and the volumes stored onsite.

13. Site Inspection:

The site inspection report conducted on March 15, 2007 by Terry Nelson can be found in the 2008 Permit Reissuance File.

14. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge (See Attachment 3 for map locations)

Table No. 2 Summary of DEQ's Ambient Water Quality Monitoring Stations on Pohick Creek

DEQ Station Rivermile	DEQ Ambient Water Quality Monitoring Station Description
River Mile 5.66 on Pohick Creek	1APOH005.66 at the Route 642 bridge – upstream from the Noman Cole PCP Outfall No. 001. (Prior to 2006, this station was mislabeled as 1APOH007.65)
River Mile 5.36 on Pohick Creek	1APOH005.36 at the U.S. Route 1 bridge upstream from the Noman Cole PCP Outfall No. 001. (approximately 0.57 rivermiles upstream of the facility's outfall location)
River Mile 4.79 on Pohick Creek	1APOH004.70 at the Route 611 bridge just upstream from the Noman Cole PCP Outfall No. 001.
River Mile 2.32 in Pohick Bay	1APOH002.32 at Pohick Bay across from the red brick house.

There are no other significant dischargers or water supply intakes near the Noman M. Cole PCP Outfall.

15. Receiving Stream Water Quality and Water Quality Standards:

a) Ambient Water Quality Data

The Noman M. Cole PCP discharges into the free-flowing portion of Pohick Creek. The three upstream ambient water quality monitoring stations from Outfall 001 are 1APOH005.66, 1APOH005.36 and 1APOH 4.79 and have been monitored: between 1990 and 2001; since 1972; and between 1972 and 2006, respectively. All monitoring data is on file at DEQ-NRO. AWQM Station 1APOH00.5.36 was used to determine the receiving stream's data.

In 1996, DEQ fish tissue/sediment was sampled at 1APOH004.79. The fish consumption impairment remains, even though the data is from outside the 2006 assessment period. The fish consumption impairment is due to exceedances of the water quality criterion based tissue value (TV) of 54 parts per billion (ppb) for polychlorinated biphenyls (PCBs) and 15 ppb for benzo(k)fluoranthene in fish tissue. Exceedance of the TV for PCB's was recorded in two species (bullhead catfish, white perch) in 1996. Exceedance of the TV for benzo(k)fluoranthene was exceeded in three species (bullhead catfish, white perch, and sunfish). Additionally, chrysene exceeded the TV of 15 ppb in bullhead catfish, and benzo(b)fluoranthene exceeded the TV of 15 ppb for white perch in the 1996 fish tissue sampling, noted by observed effects.

Sufficient exceedances of the instantaneous *E.coli* bacteria criterion (3 of 12 samples - 25.0%) were recorded at DEQ's ambient water quality monitoring station (1APOH005.36) at the Route 1 Bridge to assess this stream segment as not supporting of the recreation use goal for the 2006 water quality assessment. The fish consumption use is classified as impaired, as described above. The aquatic life and wildlife uses are considered fully supporting.

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The advisory, dated 4/19/99 and modified 12/13/04, limits

consumption of American eel, bullhead catfish, channel catfish less than eighteen inches long, largemouth bass, anadromous (coastal) striped bass, sunfish species, smallmouth bass, white catfish, white perch, gizzard shad, and yellow perch consumption to no more than two meals per month. The advisory also restricts the consumption of carp and channel catfish greater than eighteen inches long. The affected area includes the tidal portions of the following tributaries and embayments from the I-395 bridge (above the Woodrow Wilson Bridge) to the Potomac River Bridge at Route 301: Fourmile Run, Hunting Creek, Little Hunting Creek, Pohick Creek, Accotink Creek, Occoquan River, Neabsco Creek, Powell Creek, Quantico Creek, Chopawamsic Creek, Aquia Creek, and Potomac Creek. Additionally, exceedances of the water quality criterion based tissue value (TV) of 54 parts per billion (ppb) for polychlorinated biphenyls (PCBs) in fish tissue were recorded in three species in 2000 (largemouth bass, carp, channel catfish).

The closest downstream DEQ's ambient water quality monitoring station is 1APOH002.32 which is approximately 2.47 rivermiles downstream of the discharge is tidally influenced and is not representative of the water quality at the outfall location. This ambient water quality monitoring station has been monitored since 1979. This assessment segment includes the tidal waters of Pohick Creek from the head of the tide and extends until rivermile 1.31 in Gunston Cove. Please see the Planning memo dated November 26, 2007 (Attachment 5) for the assessment information on this segment.

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal, and the 2006 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment.

In response, the Virginia General Assembly amended the State Water Control Law in 2005 to include the *Chesapeake Bay Watershed Nutrient Credit Exchange Program*. This statute set forth total nitrogen and total phosphorus discharge restrictions within the bay watershed. Concurrently, the State Water Control Board adopted new water quality criteria for the Chesapeake Bay and its tidal tributaries. These actions necessitate the evaluation and the inclusion of nitrogen and phosphorus limits on discharges within the bay watershed.

b) Receiving Stream Water Quality Criteria

Part IX of 9 VAC 25-260 (360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Pohick Creek, is located within Section 7 of the Potomac River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 6 details other water quality criteria applicable to the receiving stream separated by the following seasons: November – March and April – October. These seasons are based on the seasonality of the Policy of the Potomac River Embayments.

Ammonia – The freshwater, aquatic life Water Quality Criteria for Ammonia are dependent on the instream temperature and pH. The 90th percentile temperature and pH values are used because they best represent the critical design conditions of the receiving stream. Because the facility recently upgraded its treatment works for biological nutrient removal, the ammonia waste load allocations (WLA's) and water quality criteria were re-evaluated for the current reissuance. For this permit, effluent temperature and pH data from January 2003 to March 2008 and Pohick Creek temperature and pH data from September 2001 to March 2008 were used to calculate the acute and chronic Ammonia criteria (Attachment 7). The temperature, pH and Ammonia results for both the PPRE months (April – October) and non-PPRE months (November – March) are summarized below.

TABLE No. 3 Summary of 2008 Permit Reissuance Ammonia Evaluation						
Season	**90th Percentile Effluent pH (S.U.)**	**90th Percentile Stream pH (S.U.)**	**90th Percentile Effluent Temperature (ºC)**	**90th Percentile Stream Temperature (ºC)**	**Acute Ammonia as N (mg/L)**	**Chronic Ammonia as N (mg/L)**
November – March	7.1	8.01	21	16.9	34	3.8
April – October	7.3	7.41	26	23.77	26	5.5

The acute and chronic ammonia as nitrogen freshwater Water Quality Criteria calculations for 2008, 2003 and 1998 are found in Attachment 8.

For the April 2003 reissuance, the following acute and chronic Ammonia criteria were developed by using the effluent temperature data from November 1999 to October 2002 to characterize the downstream mix of effluent and stream since it was determined that the instream waste concentration was >99% during the critical stream flow conditions. The historical pH data was not used to determine the ammonia criteria since the old treatment works were not designed to nitrify. It was the staff's best professional opinion that a default pH value of 7.5 SU be used to calculate the water quality criteria for ammonia.

TABLE No. 4 Summary of 2003 Permit Reissuance Ammonia Evaluation				
Season	**90th Percentile pH (SU)**	**90th Percentile Temperature (ºC)**	**Acute Ammonia as N (mg/L)**	**Chronic Ammonia as N (mg/L)**
November – March	7.5	22	11.97	2.06
April – October	7.5	26	11.93	2.05

The results for the 1998 reissuance are presented in the following table:

TABLE No. 5 Summary of 1998 Permit Reissuance Ammonia Evaluation			
Season	**90th percentile pH (S.U.)**	**90th percentile temperature (°C)**	**Chronic Ammonia as N (mg/L)**
November -March	7.4	21	2.06
April – October	7.4	26	2.04

During this 2008 reissuance process, the receiving stream's characteristics (flow, temperature and pH) were used to calculate the Ammonia criteria for the November through March timeframe. The resulting chronic Ammonia criteria were significantly different from what was calculated and used during the prior two permit reissuances. The resulting November through March Ammonia effluent limitations were 3.8 mg/L monthly average and 4.6 mg/L weekly maximum. However, since the facility has demonstrated that it is capable of consistently meeting the stricter existing November through March Ammonia effluent limitations of 2.2 mg/L monthly average and 2.7 mg/L weekly maximum, these limits will be carried forward in this reissuance.

Metals Criteria: The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/l calcium carbonate). The receiving stream's hardness data (13 data points) was reviewed and evaluated for the period of May 1985 –December 1985, September 2001 – December 2001, February 2002 – June 2002, March 2003 and March 2005. Using this hardness data, the receiving stream's hardness averages were determined for the November – March timeframe to be 42 mg/L and April through October to be 38 mg/l. The plant's effluent hardness average for these same time period were determined by effluent samples (15 data points) collected for the following timeframes: May 2002 through September 2002; July 2003; December 2006; and May through September 2007. Using this hardness data, the effluent hardness averages were determined for the November – March timeframe to be 87 mg/L and April through October to be 123 mg/L.

TABLE No. 6 Summary of Stream and Effluent Hardness Data Used for Metals Evaluation		
Season	**Stream Hardness Average (mg/L)**	**Effluent Hardness Average (mg/L)**
November -March	42	87
April – October	38	123

These stream and hardness values were used to the metals criteria. The hardness-dependent metals criteria are found in Attachment 9.

Bacteria Criteria: The Virginia Water Quality Standards (9 VAC 25-260-170 B.) states sewage discharges shall be disinfected to achieve the following criteria:

E. coli bacteria per 100 ml of water shall not exceed a geometric mean[1] of 126 or a single sample maximum of 235.

[1]For two or more samples taken during any calendar month

c) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9 VAC 25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Pohick Creek, is located within Section 7 of the Potomac Basin. This section has been designated a Class III water with a special standard of b.

Special Standard "b" (Policy for the Potomac Embayments) established effluent standards for all sewage plants discharging into Potomac River embayments and for expansions of existing plants discharging into non-tidal tributaries of these embayments. 9 VAC 25-415, Policy for the Potomac Embayments controls point source discharges of conventional pollutants into the Virginia embayment waters of the Potomac River, and their tributaries, from the fall line at Chain Bridge in Arlington County to the Route 301 Bridge in King George County. The regulation sets effluent limits for $cBOD_5$, total suspended solids, phosphorus, and ammonia (April – October), to protect the water quality of these high profile waterbodies.

d) Adjacent State's Water Quality Standards

Noman M. Cole PCP discharges to Pohick Creek, which is a tributary to the Potomac River. The discharge is approximately 5 miles from the Maryland State line. Staff reviewed the State of Maryland's Water Quality Standards (26.08.02.03-2 – Numerical Criteria for Toxic Substances in Surface Waters) and believes that the effluent limitations established in this permit will comply with Maryland's water quality standards at the point Pohick Creek enters the Potomac River. The State of Maryland was sent a copy of the draft permit on August 5, 2008 for their review and comments. As of September 24, 2008, no comments have been received.

e) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on March 10, 2008 for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: *Glyptemys insculpta* (wood turtle) and *Haliaeetus leucocpehalus* (bald eagle). The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and therefore, protect the threatened and endangered species found near the discharge.

The stream (Pohick Creek) that the facility discharges into is within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

(See Attachment 10)

16. Antidegradation:

The State Water Control Board's Water Quality Standards adopted in 1992 included an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

During the 2003 permit reissuance, the receiving stream was classified as Tier 1 based on the fact that this is an urban stream and it was on the 1998 303(d) listing for ammonia. Another factor influencing the Tier 1 determination is that the discharge volume is much greater than the flow in the stream. It is staff's best professional opinion that the instream waste concentration is essentially 100% during critical stream flows, and the water quality of the stream will mirror the quality of the effluent. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development :

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data must represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:

Effluent data obtained from the permit application (Water Quality Criteria Monitoring) and the Attachment A (of the permit) data has been reviewed and determined to be suitable for evaluation. The data are presented in Attachment 11.

The following pollutants require a wasteload allocation analysis since they are present at quantifiable levels: cadmium and selenium.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:

WLA	=	Wasteload allocation
C_o	=	In-stream water quality criteria
Q_e	=	Design flow
Q_s	=	Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
f	=	Decimal fraction of critical flow
C_s	=	Mean background concentration of parameter in the receiving

stream.

The water segment receiving the discharge via Outfall 001 has a 7Q10 flow (April – October) of 0.44 MGD, but since the design flow of the facility is 67.0 MGD, the instream waste concentration is >99%. It is staff's best professional opinion that mixing is instantaneous, and as such, there is no mixing zone and the WLA is equal to the Water Quality Criteria.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent discharged (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, ammonia as N is likely present being that this is a WWTP treating sewage, total residual chlorine may be present since chlorine is used for disinfection, and water quality criteria monitoring indicates cadmium and selenium are present in the discharge. As such, Attachment 6 details the WLA derivations for these pollutants.

c) Effluent Limitations from the Policy for the Potomac River Embayment (PPRE)(9VAC25-415), Outfall 001

The PPRE included monthly average effluent limits that apply to all sewage treatment plants:

Parameter	Monthly Average (mg/L)
$cBOD_5$	5
Total Suspended Solids	6
Total Phosphorus	0.18
NH_3 (Apr 1 – Oct 31)	1

The PPRE states that the "above limitations shall not replace or exclude the discharge from meeting the requirements of the State's Water Quality Standards (9 VAC 25-260-10 et seq.)."

d) Effluent Limitations Toxic Pollutants, Outfall 001

9 VAC 25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9 VAC 25-31-230.D. requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N:

Ammonia as N (April through October)
The following table summarizes the ammonia limits evaluated during this reissuance:

Table No. 7 Ammonia (April through October)

Source of the Monthly Average Limit	Monthly Average Limit
Policy for the Potomac River Embayments (PPRE)	1.0 mg/L
Wasteload Allocation Evaluation	2.1 mg/L

Since the PPRE is more stringent than the current Water Quality Criteria, the April through October monthly average limit will be 1.0 mg/L. The weekly average limit will be 1.5 mg/L based on the PPRE monthly average limit of 1.0 mg/L multiplied by a 1.5 multiplier.

Ammonia as N (November through March)
Staff evaluated the new effluent and stream data and has concluded that it is significantly different; however, the facility has demonstrated that it is capable of consistently meeting the existing Ammonia effluent limitations so the existing ammonia limitations of 2.2 mg/L monthly average and 2.7 mg/L weekly average are proposed to continue in the reissued permit. (Attachment 9)

2) Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. Staff calculated WLAs for TRC using current critical flows and the mixing allowance. In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. A monthly average of 0.008 mg/L and a weekly average limit of 0.010 mg/L are proposed for this discharge (Attachment 12).

3) Metals/Organics:

Effluent limitation evaluations are provided in Attachment 12 for cadmium and selenium. It was determined that no limits are necessary for these pollutants.

e) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

There are no changes to dissolved oxygen (D.O.), carbonaceous biochemical oxygen demand-5 day ($cBOD_5$), total suspended solids (TSS), ammonia (November – March), Total Phosphorus, and pH limitations proposed.

pH limitations are set at the water quality criteria.

Dissolved oxygen (D.O.) has a daily minimum concentration of 6.0 mg/L and is based on original modeling conducted (See Attachment 13) and is set to meet the water quality criteria for D.O. in the receiving stream.

The $cBOD_5$ monthly average concentration is 5 mg/L and is based on the PPRE. The weekly average concentration is 8 mg/L. Modeling has demonstrated that this level is protective of Water Quality Standards.

The TSS monthly average concentration is 6.0 mg/L and is based on the PPRE. The weekly average concentration is 9.0 mg/L.

The Total Phosphorus limitation of 0.18 mg/L is based on the PPRE. The weekly average concentration is 0.27 mg/L. Modeling has demonstrated that this level is protective of Water Quality Standards.

E. coli limitations are in accordance with the Water Quality Standards 9 VAC25-260-170.

Monitoring for TKN and Nitrates + Nitrites is included in this permit. Total Nitrogen has a concentration effluent limitation of 7 mg/L. This Total Nitrogen effluent limitation was derived from the document entitled "To 1 Task 5 Development of the Nutrient Reduction Program at the Noman Cole PCP – Preliminary Engineering Report" dated June 2006. This PER states that "Consistent with the original design, the current reliable treatment limit at the NCPCP, after the addition of the methanol facility, at the design flows is estimated to be 7.0 mg/L total nitrogen." The Certificate to Operate the methanol feed system was issued on July 30, 2008. Therefore, a concentration effluent limitation of 7 mg/L was established in this permit reissuance. The associated loading permit limitation is regulated by the *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia* (VAN020054). The monitoring is required to assist in the assessment of impact of point source discharges of nutrients on the Chesapeake Bay.

The weekly average concentrations for the PPRE parameters were calculated by using the monthly average concentration and multiplying by a 1.5 multiplier.

f) Effluent Limitations and Monitoring Summary - Other

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/l), with the flow values (in MGD) and a conversion factor of 3.785.

No loading limits are assigned to toxic parameters because the water quality criteria are concentration-based (DEQ Guidance Memorandum 00-2011).

An ammonia loading limit for the summer months is included in the permit because the basis for this limit is PPRE and not the toxic water quality criteria.

Monitoring frequencies are in conformance with Agency guidance with exception of $cBOD_5$. The monitoring frequency for $cBOD_5$ was reduced during to the 2003 permit reissuance to 5D/W based on the facility's outstanding performance. During this permit reissuance, the permittee requested that the $cBOD_5$'s frequency of analysis be reduced further. Due to the continual facility's outstanding performance and E3 rating, the $cBOD_5$'s frequency of analysis was reduced to 3D/W with the stipulation that if the $cBOD_5$'s effluent limitation was violation, the frequency of analysis would immediately be increase 5D/W and remain at this frequency for the term of the permit. Monitoring once per day for TSS, ammonia, and total phosphorus will adequately demonstrate plant operation and maintenance.

g) Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9 VAC 25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries.

The State Water Control Board adopted new Water Quality Criteria for the Chesapeake Bay in March 2005. In addition to the Water Quality Standards, there are three new regulations that necessitate nutrient limitations:

- 9 VAC 25-40 - *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* requires discharges with design flows of $\geq$0.04 mgd to treat for TN and TP to either BNR levels (TN = 8 mg/l; TP = 1.0 mg/l) or SOA levels (TN = 3.0 mg/l and TP = 0.3 mg/l).

- 9 VAC 25-720 – *Water Quality Management Plan Regulation* sets forth TN and TP maximum wasteload allocations for facilities with design flows of $\geq$0.5 mgd limiting the mass loading from these discharges.

- 9 VAC 25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia* was approved by the State Water Control Board on September 6, 2006 and became effective January 1, 2007. This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements, shall be authorized, monitored, limited, and otherwise regulated under the general permit and not this individual permit.

Monitoring for Nitrates + Nitrites and Total Kjeldahl Nitrogen are included in this permit. The monitoring is needed to protect the Water Quality Standards of the Chesapeake Bay. Monitoring frequencies are set at the frequencies set forth in 9 VAC 25-820.

Annual average effluent limitations, as well as monthly and year to date calculations for Total Nitrogen are included in this individual permit. Since the Total Phosphorus effluent limitations both for monthly and weekly averages concentrations and poundages established by the PPRE is more stringent than what is

required under 9 VAC 25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*, it is the staff's best professional judgment to eliminate the need for requiring the permittee to provide the calculated "Year to Date" and "Calendar Year" values.

For the 67.0 MGD flow, concentration limits of 7.0 mg/l TN annual average and 0.3 mg/l TP annual average are needed based on 9VAC 25-40-70.A(4). As stated in Section 17c, the PPRE requires a TP concentration of 0.18 mg/l. The most stringent TP concentration was used to establish the TP effluent limitations. The limits are based in part on the WLA assigned to the facility in 9VAC25-720. Loading limits will be governed by the general permit mentioned above.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements:

Design flow of this facility is 67.0 MGD.
Effective Dates: During the period beginning with permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	N/A	67.0	N/A	N/A	NL	Continuous	TIRE
pH	3	N/A	N/A	6.0 S.U.	9.0 S.U.	1/D	Grab
$cBOD_5$	5, 6	5 mg/L 1268 kg/day	8 mg/L 2029 kg/day	N/A	N/A	3D/W	24 HC
Total Suspended Solids (TSS)	6	6.0 mg/L 1522 kg/day	9.0 mg/L 2282 kg/day	N/A	N/A	1/D	24 HC
Ammonia, as N (Apr-Oct)	6	1.0 mg/L 254 kg/day	1.5 mg/L 380 kg/day	N/A	N/A	1/D	24 HC
Ammonia, as N (Nov-March)	3	2.2 mg/L	2.7 mg/L	N/A	N/A	1/D	24 HC
Dissolved Oxygen	3, 5	N/A	N/A	6.0 mg/L	N/A	1/D	Grab
Total Residual Chlorine (after contact tank)	4	N/A	N/A	0.5 mg/L	N/A	12/D at 2H intervals	Grab
Total Residual Chlorine (after dechlorination)	3	0.008 mg/L	0.010 mg/L	N/A	N/A	1/D	Grab
E. Coli (Geometric Mean)	3	126 n/100 mls	N/A	N/A	N/A	5D/W	Grab
Total Nitrogen[a,b]- Monthly	1,3	NL	N/A	N/A	N/A	3D/W	Calculated
TKN (mg/L)	1,3	NL	N/A	N/A	N/A	3D/W	24 HC
Nitrate + Nitrite, as N	1,3	NL	N/A	N/A	N/A	3D/W	24 HC
Total Nitrogen – Calendar Year[b]	1,3	7.0 mg/L	N/A	N/A	N/A	1/YR	Calculated
Total Nitrogen – Year to Date[b] (mg/L)	1,3	NL	N/A	N/A	N/A	1/M	Calculated
Total Phosphorus	5, 6	0.18 mg/L 101 lbs/d	0.27 mg/L 151 lbs/d	N/A	N/A	1/D	24 HC
Chronic 3-Brood Static Renewal –*C. dubua* (TU_c)		N/A	N/A	N/A	NL	1/YR	24 HC
Chronic 7-Day Static Renewal – *P. promelas* (TU_c)		N/A	N/A	N/A	NL	1/YR	24 HC

The basis for the limitations codes are:
1. 9 VAC 25-40 (Nutrient Regulation)
2. Best Professional Judgement
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model- Attachment 13
6. 9 VAC 25-415 (Policy for the Potomac River Embayment)

MGD = Million gallons per day.
N/A = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.

12D = Twelve times per day
1/D = Once every day.
3D/W = Three days a week.
5D/W = Five days a week.
1/W = Once every week.
1/M = Once every month.
1/YR = Once every year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the Monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum of twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected. Where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by ≥10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

[a] = Total Nitrogen = Sum TKN plus Nitrate + Nitrite

[b] = See Section 21.a. for the Nutrient Calculations.

20. Sludge Monitoring and Limitations

A. Regulations:

The VPDES Permit Regulation (VAC 25-31-10 et seq.), has incorporated technical standards for the use or disposal of sewage sludge, specifically land application and surface disposal, promulgated under 40 CFR Part 503.

The Permit Regulation (9 VAC 25-31-420) establishes the standards for the use or disposal of sewage sludge. This part establishes standards, which consist of general requirements, pollutant limits, management practices, and operational standards, for the final use or disposal of sewage sludge generated during the treatment of domestic sewage in the treatment works.

B. Evaluations:

Sludge Classification:

The Noman M. Cole PCP is considered as Class I sludge management facility. The permit regulation (9 VAC 25-31-500) defines a Class I sludge management facility as any POTW which is required to have an approved pretreatment program defined under Part VII of the VPDES Permit Regulation (9 VAC 25-31-730 to 900) and/or any treatment works treating domestic sewage sludge that has been classified as a Class I facility by the Board because of the potential for its sewage sludge use or disposal practice to adversely affect public health and the environment. The Noman M. Cole PCP incinerates the sludge generated from the wastewater treatment process. Incineration is governed by the regulations of the Air Pollution Control Board. The ash generated from the incinerators is disposed in a landfill.

21. Other Permit Requirements:

a) Part 1.B. of the permit contains additional chlorine monitoring requirements, quantification levels and compliance reporting instructions.

In accordance with VDH's Disinfection Guidelines and Requirements, a minimum chlorine residual must be maintained at the exit of the chlorine contact tank. As stated in VA-VDH's January 6, 1997 Working Memo from C.M.Sawyer, P.E., no more that 10% of the monthly test results for TRC at the exit of the chlorine contact tank shall be <1.0 mg/L with any TRC <0.6 mg/L considered a system failure. Variance from these requirements are allowed where the discharger provides adequate indicator microorganism test results for the effluent that verify disinfection standards were met during the TRC violations. *E. coli* limits are defined in this section as well as monitoring requirements to take effect should an alternate means of disinfection be used. Noman M. Cole PCP has been allowed a minimum chlorine contact value of 0.5 mg/L since the fecal coliform values have demonstrated that disinfection standards were met.

9 VAC 25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9 VAC 25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

The calculations for the Nitrogen and Phosphorus parameters shall be in accordance with the calculations set forth in 9 VAC 25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*. §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9 VAC 25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

b) Permit Section Part I.D., details the requirements for Toxics Management Program.

The VPDES Permit Regulation at 9 VAC 25-31-210 requires monitoring and 9 VAC 25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A Toxics Management Program (TMP) is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC, and receiving stream characteristics.

Noman M. Cole PCP meets two of the above requirements, it is a POTW with a design rate >1.0 MGD and the facility has an approved pretreatment program. The TMP uses bioassay-testing methods for measuring the potential for the effluent to cause toxicity in the receiving stream.

During the current permit cycle the facility was required to monitor the effluent on a yearly for chronic toxicity utilizing two test species. Toxicity testing for 2003, 2004, 2006 and 2007 were found valid and the test results acceptable. For all these tests, the effluent from Outfall 001 exhibited no toxicity to the test organisms. The individual review reports for the toxicity tests are on file in the 2008 permit reissuance file. The 2005 toxicity review report was not found but the results were noted on the following years review and indicated that the effluent from Outfall 001 exhibited not toxicity to the test organisms. (See Attachment 14)

The proposed permit includes TMP language that continues to require Noman M. Cole PCP to perform annual chronic toxicity testing for the duration of the permit. Results will be reported annually on the DMR.

c) Permit Section Part I.C., details the requirements of a Pretreatment Program.

The VPDES Permit Regulation at 9 VAC 25-31-210 requires monitoring and reporting. The VPDES Permit Regulation at 9 VAC 25-31-730. through 900., and 40 CFR Part 403 requires POTWs with a design flow of >5 MGD and receiving from Industrial Users (IUs) pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards to develop a pretreatment program.

This treatment works is a POTW with a design capacity of 67 MGD. The Pretreatment Program was originally approved April 11, 1985 and was modified effective March 15, 1994 (legal authority, permit boilerplate, local limits, and Enforcement Response Plan). Fairfax County has four (4) Significant Industrial Users (SIUs) regulated through this program. Two of the SIUs are Categorical Industrial Users (CIUs): Alexandria Coatings (d.b.a. Alexandria Metal Finishers, Inc.) and TekAm Corporation. Both of these CIUs are metal finishers and are subject to categorical pretreatment standards and local limits. The two other SIUs are non-categorical and include Covanta Fairfax, Inc. (formerly Ogden Martin Systems/I-95 Resource Recovery Facility), and Shenandoah's Pride Dairy. The permittee states in the application that none of the listed SIUs have contributed to or caused any problems with the treatment works in the past three years. Canada Dry Potomac Corporation was not listed as non-categorical SIU for this 2008 permit reissuance.

The pretreatment program conditions will include: implementation of the approved pretreatment program that complies with the Clean Water Act, Water Control Law, State regulations and the approved program; submission to the Northern Regional Office of an annual report, by January 31st of each year, that describes the permittee's program activities over the previous year; submission of a survey of all the Industrial Users discharging to the POTW within 180 days of the permit's effective date; submission of any program changes prior to implementation; issuance and reissuance of all SIU permits in a timely manner, inspection and sampling

of all SIUs annually, implementation of the reporting requirement of Part VII of the VPDES Permit Regulation; review of the Enforcement Response Plan; reevaluation of the local limits within one year of the permit's effective date; maintenance of adequate resources to implement the approved program; and meet all public participation and public notice requirements. The permit also contains a reopener clause.

22. Other Special Conditions (Part I.E.):

a) 95% Capacity Reopener. The VPDES Permit Regulation at 9 VAC 25-31-200.B.2. requires all POTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b) Indirect Dischargers. Required by VPDES Permit Regulation, 9 VAC 25-31-280 B.9 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works. The terms of this condition are met through the implementation of the Pretreatment Program (See Section 21.c.).

c) O&M Manual Requirement: Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190.E. Within 90 days of the effective date of this permit, the permittee shall submit for approval a statement confirming the accuracy and completeness of the current O&M Manual to the Department of Environmental Quality, Northern Regional Office (DEQ-NVRO). Future changes to the facility must be addressed by the submittal of a revised O&M Manual within 90 days of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d) Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9 VAC 25-31-200 D, and Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.) requires licensure of operators. This facility requires a Class I operator.

e) Reliability Class. The Sewage Collection and Treatment Regulation at 9 VAC 25-790 requires sewerage works achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. The facility is required to meet a reliability Class of I.

f) Nutrient Reopener. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

g) CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

h) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9 VAC 25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

i) Sludge Reopener. The VPDES Permit Regulation at 9 VAC 25-31-200.C.4. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

j) Sludge Use and Disposal. The VPDES Permit Regulation at 9 VAC 25-31-100.J., 220.B.2., and 420-720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

k) E3/E4. 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate

compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

l) Final Effluent Monitoring Alternative. 9 VAC 25-31-30 Federal Effluent Guidelines incorporates by reference Secondary Treatment 40 CFR Part 133 (1999). 40 CFR Part 133.104 permits the substitution of chemical oxygen demand (COD) or total organic carbon (TOC) for BOD_5 when a long-term BOD_5: COD or BOD_5: TOC correlation has been demonstrated. This special condition allows the permittee to develop a facility specific correlation between $cBOD_5$ and COD for final effluent compliance monitoring.

The permittee may submit to DEQ for review and approval a plan of study prior to the start of the study. The plan shall include: method of analysis for COD, QA/QC procedures for the method, time frame for study, number of samples to be analyzed to establish the correlation, the statistical methods for determining the correlation, and the method of validating the established correlation.

Once the study is completed and a correlation is established the data, QA/QC information, and correlation calculations are to be submitted to DEQ for review and approval. Upon DEQ's approval of the results, the correlation shall be used to calculate monthly average and weekly average COD effluent limits and monitoring for COD will be once per day and sampling will be 24 hour composites. Monitoring for $cBOD_5$ shall be reduced to once per week for the remaining term of the permit. COD results shall be reported in accordance with Part II.C.

Validation of the correlation: The facility shall be required to validate the established correlation, as outlined in the plan of study, and report the validation with the monthly DMR. A summary of the validation data shall also be submitted with the permit application. If the facility fails to submit the summary validation data, the permittee will have to complete a new study for review and approval by DEQ and also return to $cBOD_5$ final effluent monitoring at the frequency required by the permit prior to beginning COD monitoring.

This special condition also allows the facility to opt out of COD final effluent monitoring and revert back to regular $cBOD_5$ monitoring at any time upon notification to DEQ in writing. $cBOD_5$ final effluent monitoring will then become effective the first day of the next full month following the written request.

m) TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may to developed and approved for the receiving stream. See Fact Sheet No. 26 for additional information regarding the pertinent TMDLs.

n) PCB Monitoring. This special condition shall require the permittee to monitor and report PCB concentrations in dry weather and wet weather effluent samples. The results from this monitoring shall be used to implement the PCB TMDL that was developed for the Potomac River and approved by EPA in October 2007. This facility was given a WLA in the TMDL.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a) Special Conditions:
1) Updated the TRC limitations and monitoring requirements to be consistent with current guidance.
2) Included the Nutrient Reporting Calculation explanation.
3) Included the E3/E4 and PCB special conditions.
4) Replaced the "Nutrient Enriched Waters Reopener" with the "Nutrient Reopenter".
5) The Toxics Management Program and Pretreatment languages were updated to comply with current guidance.

6) Deleted Water Quality Criteria Monitoring Special Condition (Attachment A) since is currently required at permit reissuance on Form 2A.

b) Monitoring and Effluent Limitations:
1) Removed the Effluent Limitation and Monitoring Requirements for the 54 MGD facility.
2) Deleted the temperature monitoring requirement.
3) Incorporated a TN (Calendar Year) monthly concentration effluent limitation.
4) Decreased $cBOD_5$ frequency of analysis from 5D/W to 3D/W.

24. Variances/Alternate Limits or Conditions:

1) The Noman M. Cole PCP has a variance from EPA for the analysis of Total Phosphorus. The on-site laboratory utilizes the stannous chloride method (Standard Methods, 14th edition, Method 425E). (Attachment 15)

25. Public Notice Information:

First Public Notice Date: August 15, 2008 Second Public Notice Date: August 22, 2008

Public Notice Information is required by 9 VAC 25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: Northern DEQ Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (540) 899-4506, jccrowther@deq.virginia.gov. See Attachment 16 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

26. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):

This facility discharges directly to Pohick Creek. The receiving stream portion of Pohick Creek is impaired for benzo(k) fluoranthene and PCBs, both in fish issue. Additional, there is an *E. coli* bacteria impairment. The *E. coli* impairment has a TMDL due date of 2018, while the benzo(k) fluoranthene and PCB (free-flowing portion) in fish tissue have a TMDL due date of 2014. NRO has requested that the fish tissue and sediment monitoring staff (based in Central Office) conduct follow-up monitoring in the free-flowing portion of Pohick Creek. There is a PCB in fish tissue impairment for the tidal portion of Pohick Creek. This has been addressed through the approved TMDL. The Draft 2008 TMDL Fact Sheets are provided in Attachment 17.

The permit contains a re-opener condition that may allow these limits to be modified, in compliance with section 303(d)(4) of the Act once a TMDL is approved.

27. Additional Comments:

1) Development of the Policy for the Potomac River Embayments (9 VAC 25-415-10):

The State Water Control Board adopted the Potomac Embayment Standards (PES) in 1971 to address serious nutrient enrichment problems evident in the Virginia embayments and Potomac River at the time. These standards applied to sewage treatment plants discharging into Potomac River embayments in Virginia and for expansions of existing plants discharging into the non-tidal tributaries of these embayments. The standards were actually effluent limitations for BOD_5, unoxidized nitrogen, total phosphorus, and total nitrogen:

Parameter	PES Standard (monthly average)
BOD_5	3 mg/L
Unoxidized Nitrogen	1 mg/L (April – October)
Total Phosphorus	0.2 mg/L
Total Nitrogen	1 mg/L (when technology is available)

Based upon these standards, several hundred million dollars were spent during the 1970s and 1980s upgrading major treatment plants in the City of Alexandria and the Counties of Arlington, Fairfax, Prince William, and Stafford. Today, these localities operate advanced wastewater treatment plants which have contributed a great deal to the dramatic improvement in the water quality of the upper Potomac estuary.

Before the planned upgrades at these facilities were completed, and the fact that water quality improved, questions arose over the high capital and operating costs that would result from meeting all of the requirements contained in the PES. Questions also arose due to the fact that the PES were blanket effluent limitations that applied equally to different bodies of water. Therefore, in 1978, the State Water Control Board committed to reevaluate the PES. In 1984, a major milestone was reached when the Virginia Institute of Marine Science (VIMS) completed state-of-the-art models for each of the embayments. The Board then selected the Northern Virginia Planning District Commission (NVPDC) to conduct wasteload allocation studies of the Virginia embayments using the VIMS models. In 1988, these studies were completed and effluent limits that would protect the embayments and the mainstem of the Potomac River were developed for each major facility (Attachment 13).

Since the PES had not been amended or repealed, VPDES permits had included the PES standards as effluent limits. Since the plants could not meet all of the requirements of the PES, the plant owners operated under consent orders or consent decrees with operating effluent limits for the treatment plants that were agreed upon by the owners and the Board.

In 1991 and 1992, several Northern Virginia jurisdictions with embayment treatment plants submitted a petition to the Board requesting that the Board address the results of the VIMS/NVPDC studies. Their petition requested revised effluent limitations and a defined modeling process for determining effluent limitations.

The recommendations in the petition were designed to protect the extra sensitive nature of the embayments along with the Potomac River which have become a popular recreational resource during recent years. The petition included requirements more stringent than would be applied using the results of the modeling/allocation work conducted in the 1980s. With the inherent uncertainty of modeling, the petitioners question whether the results of modeling would provide sufficient protection for the embayments. By this petition, the local governments asked for continued special protection for the embayments based upon a management approach that uses stringent effluent limits. They believe this approach has proven successful over the past two decades. In addition the petition included a modeling process that will be used to determine if more stringent limits are needed in the future due to increased wastewater discharges.

The State Water Control Board adopted the petition, with revisions, as a regulation on September 12, 1996. The regulation is entitled *Policy for the Potomac River Embayments* (9 VAC25-415-10). On the same date, the Board repealed the old PES. The new regulation became effective on April 3, 1997, and contains the following effluent limits:

Parameter	PPRE Standard (monthly average)
$cBOD_5$	5 mg/L
TSS	6 mg/L
Total Phosphorus	0.18 mg/L
Ammonia as Nitrogen	1 mg/L (April - October)

9 VAC 25-415-50 Water Quality Monitoring. The Policy says "that water quality models may be required to predict the effects of wastewater discharges on the water quality of the receiving waterbody, the embayment, and the Potomac River. The purpose of the modeling shall be to determine if more stringent limits than those required by 9 VAC 25-415-40 (the Policy's effluent limitations) are required to meet water quality standards."

Two models were run for the 67 MGD expansion of the Noman M. Cole PCP: the Virginia Institute of Marine Science Gunston Cove Model (VIMS) and the Potomac Eutrophication Model (PEM). The model printouts are part of a document entitled *Engineering Study for the Expansion of the Lower Potomac Pollution Control Plant Beyond 54 MGD: Modeling Printouts VIMS, PEM-1991, DEM CORMIX 2*, July 1992. Modeling predicts that the Policy's limits will protect water quality. See Attachment 13 for a summary of the modeling results and summary.

2) Previous Board Action(s): None.

3) Staff Comments: None.

4) Public Comment:

DEQ received two responses during the public comment period. Ms. Jennifer C. Chavez representing Earthjustice requested a copy of the Noman M. Cole PCP draft VPDES Permit, Fact Sheet and Application on August 27, 2008. The draft permit and fact sheet were emailed to her on August 27, 2008 and the application was mailed on August 28, 2008. No further response was received from Ms. Chavez.

On August 29, 2008, the draft VPDES permit and fact sheet were emailed to Mr. Mike Gerel, Chesapeake Bay Foundation, for his review and comments. Mr. Gerel submitted comments on September 15, 2008 pertaining to the Total Nitrogen (TN) annual average concentration required in the permit. The draft permit contained an 8 mg/L TN. Mr. Gerel was requesting that a 5 mg/L be required based on the nutrient removal equipment that had been recently installed at the facility (methanol feed system). However, in accordance with DEQ guidance, it was staff's decision to lower the TN effluent limitation to 7 mg/L based on the document titled "*To 1 Task 5 Development of the Nutrient Reduction Program at the Noman Cole PCP – Preliminary Engineering Report"* dated June 2006, that states, "Consistent with the original design, the current reliable treatment limit at the NCPCP, after the methanol facility, at design flows is estimated to be 7.0 mg/L total nitrogen. A letter dated September 29, 2008 was sent to Mr. Gerel explaining the staff's decision regarding his comment.

Comments were also received by Fairfax County, Noman M. Cole PCP. These comments and their responses can be found in the 2008 permit reissuance file in emails dated September 8th and 9th, 2008.

5) The EPA Checklist is found in Attachment 18.

Attachment 1	Paul E. Herman, Interoffice Memorandum dated December 31, 1996, regarding Flow Frequency Determination for Noman M. Cole PCP
Attachment 2	Treatment system schematic/flow diagram
Attachment 3	U.S.G.S. Topographic Map (Fort Belvoir, 193B)
Attachment 4	Material Storage Information dated 1/31/08
Attachment 5	Planning Statement dated November 26, 2007
Attachment 6	Water Quality Criteria (Source: OWP Guidance Memo 00-2011 (August 24, 2000)
Attachment 7	Effluent Temperature and pH data and Pohick Creek Temperature and pH data
Attachment 8	2003 and 2008 Acute and Chronic Ammonia Water Quality Criteria Calculations
Attachment 9	Effluent and Pohick Creek Hardness Data
Attachment 10	Virginia DGIF Fish and Wildlife Information System Database results dated March 10, 2008
Attachment 11	Water Quality Criteria Monitoring and Appendix A Data
Attachment 12	Statistical analysis for TRC, Cadmium, and Selenium
Attachment 13	Stream Modeling Results and Summary; 1987 NVPDC Wasteload Allocations Studies
Attachment 14	Toxicity Testing Results for 2003, 2004, 2006 and 2007
Attachment 15	Variance for the Total Phosphorus Method dated March 1, 1983
Attachment 16	Public Notice
Attachment 17	Total Maximum Daily Load and Impaired Segment Information
Attachment 18	EPA Checklist

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Water Quality Assessments and Planning
629 E. Main Street P.O. Box 10009 Richmond, Virginia 23240

SUBJECT: Flow Frequency Determination
Lower Potomac STP - VA#0025364

TO: April Young, NRO

FROM: Paul Herman, WQAP

DATE: December 31, 1996

COPIES: Ron Gregory, Charles Martin, File

RECEIVED
JAN 3 1997
Northern VA. Region
Dept. of Env. Quality

The Lower Potomac STP discharges to the Pohick Creek near Lorton, VA. Stream flow frequencies are required at this site for use by the permit ~~writer in~~ developing effluent limitations for the VPDES permit. The Policy for the Potomac Embayments (PES) apply to this facility thereby requiring special flow frequency analyses to determine the 1Q10 and 7Q10 during the winter months (November - March) defined by the Standard. The 1Q10 and 7Q10 flow frequencies for the summer months (April - October) are based on the analysis of data available for the period of record at the selected reference gaging station.

The seasonal, temperature based, flow frequencies have been determined for the reference gage used in this analysis; the Accotink Creek near Annandale, VA (#01654000) which has been operated by VDEQ and the USGS since 1947. The gage is located at the Route 620 bridge in Fairfax County, VA. The flow frequencies for the gage and the discharge point are presented below. The values at the discharge point were determined by drainage area proportions and do not address any withdrawals, discharges, or springs lying upstream.

Accotink Creek near Annandale, VA (#01654000):

Drainage Area = 23.5 mi^2

1Q10 = 0.24 cfs	PES 1Q10 = 2.5 cfs	HF 30Q10 = 7.2 cfs
7Q10 = 0.51 cfs	PES 7Q10 = 3.4 cfs	LF 30Q10 = 1.5 cfs
30Q5 = 2.5 cfs	HM = 6.1 cfs	

Pohick Creek at Lower Potomac STP discharge point:
cfs x 0.6463 = MGD

Drainage Area = 32 mi^2

1Q10 = 0.33 cfs = 0.21 MGD	PES 1Q10 = 3.4 cfs = 2.2 MGD
7Q10 = 0.69 cfs = 0.44 MGD	PES 7Q10 = 4.6 cfs = 3.0 MGD
30Q5 = 3.4 cfs = 2.2 MGD	HM = 8.3 cfs = 5.4 MGD

HF 30Q10 = 9.8 cfs = 6.3 mgd
LF 30Q10 = 2.0 cfs = 1.3 mgd

PC
7/21/08

Attachment 1

Be advised, the seasonal tiering defined in the Policy for Potomac Embayments is not based on stream flow. Rather, the tiers are temperature based. Procedures for establishing flows during the months included in a temperture tier are not addressed in Section III-A pages 12-17 of the "Virginia Water Control Board VPDES Technical Reference Manual".

If you have any questions concerning this analysis, please let me know.

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Office of Water Resources Management

4900 Cox Road P. O. Box 11143 Richmond, Virginia 23230

SUBJECT: Flow Frequency Determination
Lower Potomac STP - VA#0025364

TO: Lyle Anne Collier, NRO

FROM: Paul Herman, OWRM-WQAP Paul

DATE: September 29, 1993

COPIES: Ron Gregory, Charles Martin, Dale Phillips, Curt Wells, Charlie Banks, File

The Lower Potomac STP discharges to Pohick Creek near Lorton, VA. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

The DEQ has operated a continuous record gage on Accotink Creek near Annandale, VA (#01654000) since 1948. The gage is approximately 7.0 miles north of the discharge point. The flow frequencies for the gage and the discharge point are presented below. The values at the discharge point were determined by drainage area proportions and do not address any withdrawals, discharges, or springs lying upstream.

Accotink Creek near Annandale, VA (#01654000):

Drainage Area	=	23.4	mi^2
1Q10	=	0.24	cfs
7Q10	=	0.51	cfs
High Flow 1Q10	=	3.7	cfs
High Flow 7Q10	=	4.5	cfs
30Q5	=	2.5	cfs
HM	=	6.1	cfs

Pohick Creek at Lower Potomac STP discharge point:
cfs x 0.6463 = MGD

Drainage Area	=	32	mi^2
1Q10	=	0.33	cfs = 0.21 MGD
7Q10	=	0.69	cfs = 0.44 MGD
High Flow 1Q10	=	5.0	cfs = 3.23 MGD December - May
High Flow 7Q10	=	6.1	cfs = 3.94 MGD December - May
30Q5	=	3.4	cfs = 2.2 MGD
HM	=	8.3	cfs = 5.4 MGD

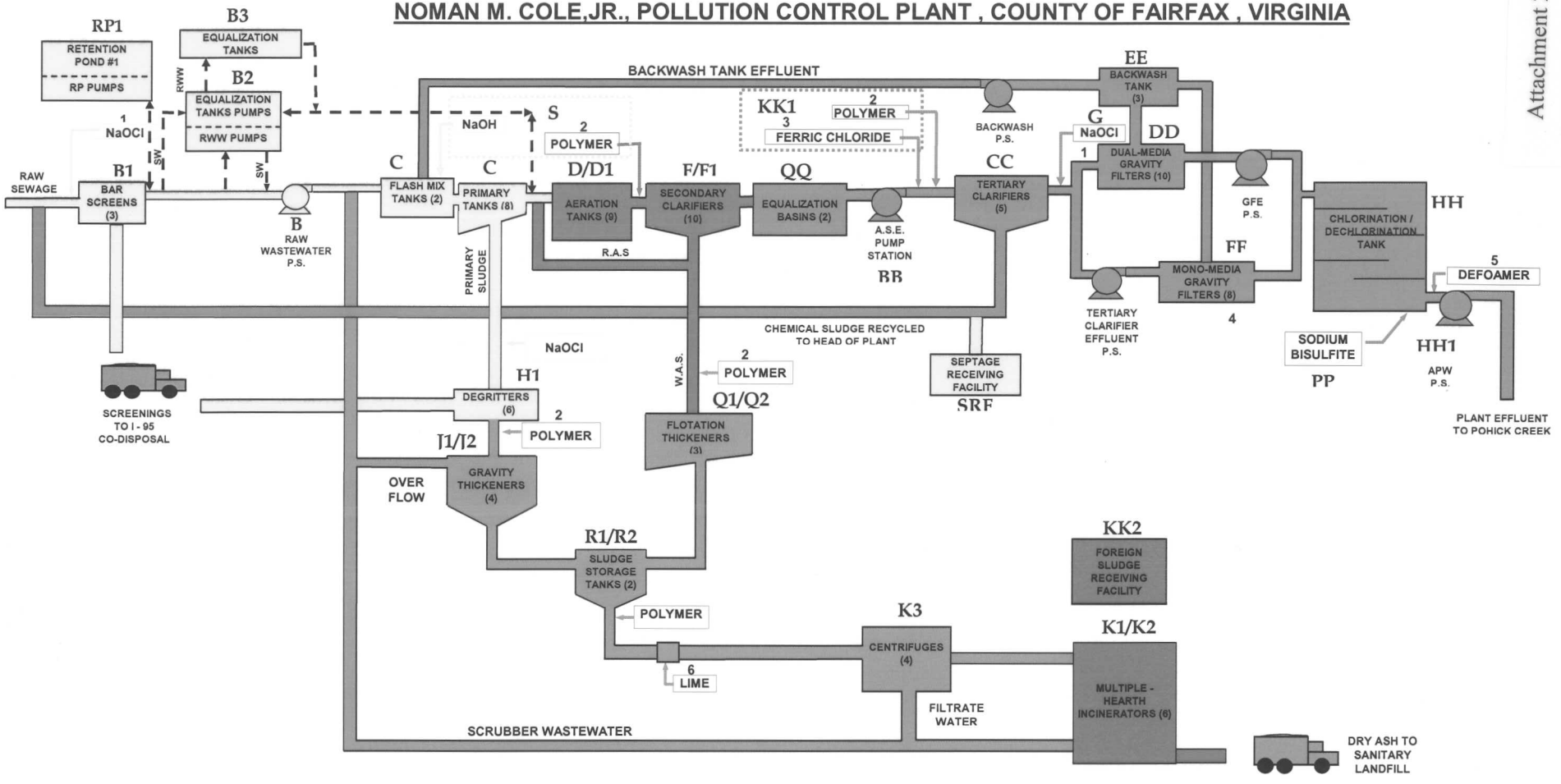
If you have any questions concerning this analysis, please let me know.

10/1/93 - Per Paul Herman, the high flow months are December - May. Lac

Attachment 2

PROCESS FLOW DIAGRAM

NOMAN M. COLE,JR., POLLUTION CONTROL PLANT , COUNTY OF FAIRFAX , VIRGINIA



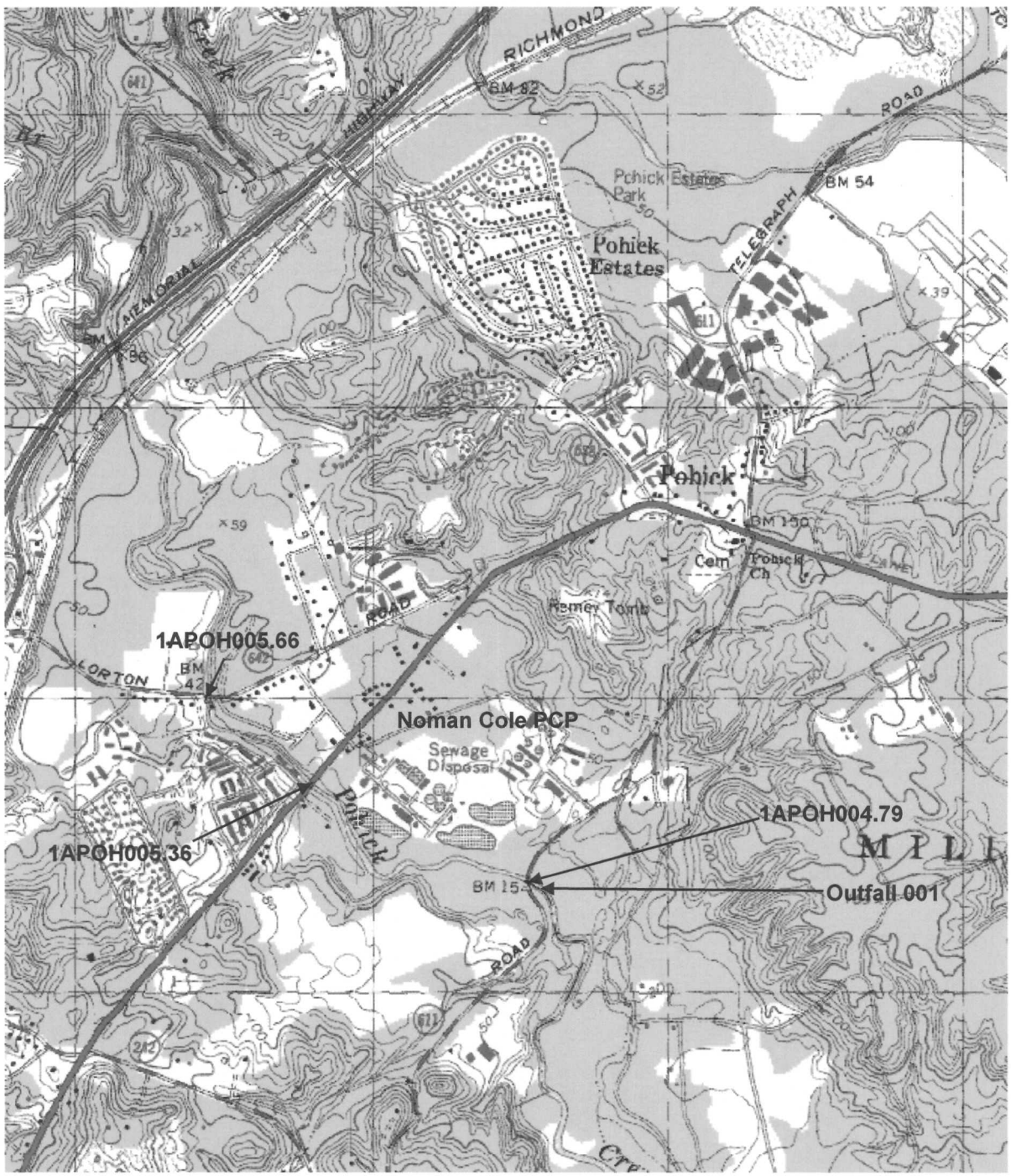
PROCESS LEGEND

- PRELIMINARY/PRIMARY TREATMENT
- BNR
- AWT
- SOLIDS HANDLING
- INCINERATION
- ODOR CONTROL
- SUPPORT & ANCILLARY

BUILDING NAMES

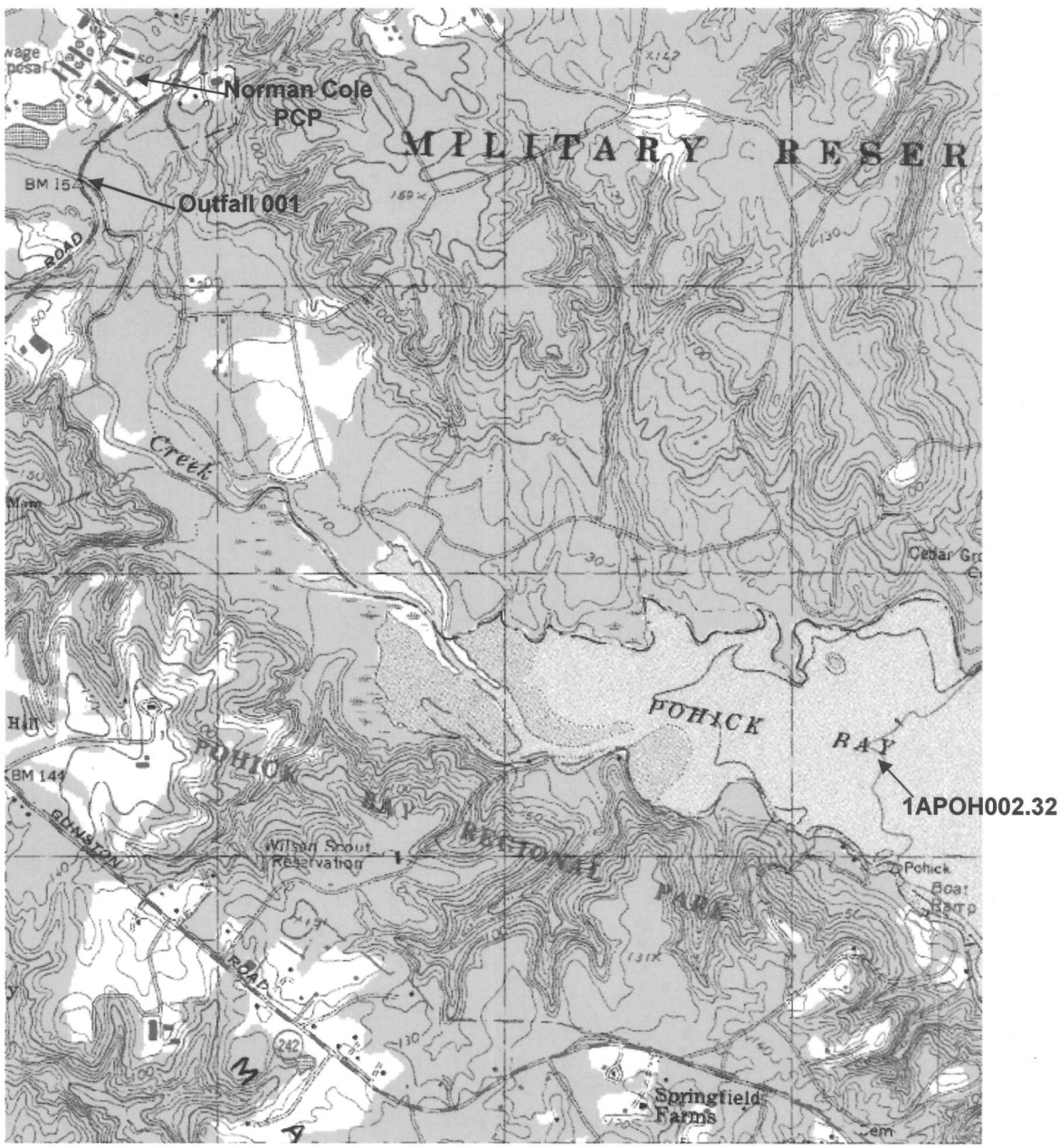
A	ADMINSTRATION BUILDING
B	RAW WASTEWATER PUMPING STATION
B1	BAR SCREEN BUILDING
B2	RAW WASTEWATER PUMPING STATION/DIVERSION
B3	EQUALIZATION TANKS
C	PRIMARY TANKS AND FLASH MIX TANKS
C2	ODOR CONTROL
D	AERATION TANKS
D1	ACTIVATED SLUDGE TANKS
E	BLOWER BUILDING
F	SECONDARY CLARIFIERS
F1	SECONDARY CLARIFIERS
G	CHLORINATION FACILITY
H1	DEGRITTING FACILITY
J1/J2	PRIMARY SLUDGE THICKENERS
K1	SLUDGE PROCESSING BUILDING (INC. NO. 1 / 2)
K2	SLUDGE PROCESSING BUILDING (INC. NO. 3 / 4)
K3	SLUDGE PROCESSING BUILDING (FILTER PRESS)
Q	FLOTATION THICKENERS
R1/R2	SLUDGE STORAGE TANKS
S	SECONDARY CHEMICAL FEED BUILDING
T	AWT MAINTENANCE BUILDING
U	BUILDINGS AND GROUNDS BUILDING
BB	ASE PUMPING STATION
CC	AWT CLARIFIERS (TERTIARY CLARIFIERS)
DD	GRAVITY FILTER BUILDING
EE	DUAL MEDIA FILTER BUILDING
FF	MONOMEDIA FILTER BUILDING
HH	AWT CHLORINATION AND DECHLORINATION BUILDING
HH1	APW PUMP STATION
IM	IN-LINE MIX BUILDING
JJ	AWT SLUDGE THICKENERS
KK1	FOREIGN SLUDGE HANDLING BUILDINGS
KK2	FOREIGN SLUDGE HANDLING BUILDINGS
PP	SODIUM BISULFITE BUILDING
QQ	EQUALIZATION BASINS
RR	BULK STORAGE
SRF	SEPTAGE RECEIVING FACILITY
TT	PLANT OUTFALL STRUCTURE

Noman Cole Pollution Control Plant Outfall Location and DEQ's Ambient Water Quality Monitoring Stations
2/22/08



Attachment 3

Noman Cole Pollution Control Plant Outfall Location and DEQ's Ambient Water Quality Monitoring Stations 2/22/08 (continued)



Noman M. Cole, Jr. Pollution Control Plant
On-Site Stored Material as of 1/31/08

Attachment 4

Material	Storage Volume	Location/Uses	Handling Practices
Ferric Chloride	2-9,000 gallon tanks 1-12,000 gallon tank 1-16,000 gallon tank	KK-1 Building KK-1 Building KK-1 Building	Pumped in liquid form from tank trucks to storage tanks. Tanks are surrounded by containment walls. All further transport of this material to the plant processes is done via underground piping and piping within buildings.
Fuel Oil for Incineration, Heat, and back-up Power	3-6,000 gallon tanks 2-12,000 gallon tanks 1-1,000 gallon tank	G-1, G-3, and G-4 Building (power generation) K-1 Building, K-2 Building Outside of U Building (oil recycle)	Pumped from tanks trucks to a storage tank then pumped via piping to process use within the building.
Screening from raw wastewater	10 yards hopper	Buckets are removed daily to the I-95 cogeneration incineration	These material are conveyed into dumpster buckets and hauled to the I-95 ERRF (i.e. codisposal with municipal refuse). The stormwater runoff form this ara is recycled back
Lime	5,800 cubic foot bin	K-3 storage bin	Lime in dry form is conveyed indoors for storage. All further transport of this material to the plant processes is done via underground piping within the building.
Grit removed from wastewater	10 yard hopper	Buckets are removed daily to the I-95 cogeneration incineration	This material is conveyed into dumpster buckets for routine removal and disposal at the I-95 ERRF (i.e., codisposal with municipal refuse). The stormwater runoff from this area is recycled back to the plant for treatment with raw wastewater.
Ash from incinerated sludge	10-12 ton dump truck	Trucks leave site daily to I-95 cogeneration incineration	This material is loaded into trucks in a covered area using a funnel-type sock to reduce wind removal of the material. It is then disposed of at a nearby sanitary landfill.
Dry Polymer	1-5,000 cubic foot silo 4-6 pallets (40-50 lb bags per pallet) 1 pallet from KK-1 Building 4-6 pallets (40-50 lb bags per pallet)	K-3 Building KK-1 Building J Building S Building	Dry polymer is conveyed indoors for storage. All further transport of this material to the plant processes is done via underground piping within the buildings.
Liquid Polymer	1-7,050 gallon tank	K-3 Building	Pumped in liquid form from tank trucks to storage tanks from where it is transferred for process use by piping and pumps within the building.

Material	Storage Volume	Location/Uses	Handling Practices
Sodium Hypochlorite	1-200 gallon tank 1-910 gallon tank	K-3 Building (odor control) R1/R2 Odor Control	Pumped in liquid form from tank trucks to storage tanks from where it is transferred for process use by piping and pumps within the building.
Sodium Bisulfite	2-15,000 gallon tanks 1-1,000 gallon tank	PP Building, storage tanks HH Building, day tank	Pumped in liquid form from tank trucks to storage tanks from where it is transferred for process use by piping and pumps within the building.
Muriatic Acid	8,000 gallon tank (less than 1,000 gallons maintained)	K-3 Building	Pumped in liquid form from tank trucks to storage tanks from where it is transferred for process use by piping and pumps within the building.
Sodium Hydroxide	1-200 gallon tank 1-2,000 gallon tank	K-3 Building (odor control) R1/R2 Odor Control	Pumped in liquid form from tank trucks to storage tanks from where it is transferred for process use by piping and pumps within the building.
Hydrochloric Acid	1-400 gallon tank	C-2 (Primary odor control)	Pumped in liquid form from tank trucks to storage tank and then to process use by piping and pumps within the building.
Sulfuric Acid	1-400 gallon tank 1-200 gallon tank	R1/R2 Odor Control K-3 Building (odor control)	Pumped in liquid form from tank trucks to storage tank from where it is transferred for process use by piping and pumps within the building.
Methanol/Acetic Acid	3-9,400 gallon tanks	I Building	Pumped in liquid form from tank trucks to storage tank from where it is transferred for process use by piping and pumps within the building.
Defoamer	10-55 gallon drums	HH Building	Delivered and stored in 55-gallon drums from which it is transferred to a storage tank and is transferred for process use by piping and pumps within the building.
Round-up	20 gallons	U Building	Systemic herbicide applied as needed
Fertilizer	3 to 6 tons	U Building	Applied annually. Contains nitrogen and phosphorus
Lime	22 tons in 50 lbs bags	RR Building	This supply should last years and is back up for sludge dewatering and as fertilizer. Applied annually.
Bacteria larvicide	5-40 pound packages	U Building	Applied seasonally to control mosquito populations.

The main gate of the plant at US Route 1 is the only access route which can be taken by trucks carrying significant materials into and out of the plant.

The only area in which pesticides, herbicides, and fertilizers are routinely applied is on the grassed areas adjacent to the main gate at Route 1. Round-up, fertilizer, lime and bacteria larvicide are the various materials applied on the green area in front of the plant.

To: Rob Swanson
From: Joan C. Crowther

Date: November 26, 2007
Subject: Planning Statement for Noman M. Cole, Jr. Pollution Control Plant; VA0025364

Discharge Type:	Municipal
Discharge Flow:	67 MGD
Receiving Stream:	Pohick Creek
Latitude / Longitude:	38° 41' 53"/ 77° 12' 03"

Watershed: VAN-A16R and PL29

1. Is there monitoring data for the receiving stream? Yes.
   - If yes, please attach latest summary.
   A summary for assessment unit VAN-A16R_POH01A00, which begins at the confluence with South Run, approximately 0.25 rivermile upstream from I-95, and continues downstream until the end of the free-flowing portion of Pohick Creek, is noted below. Impairments have been highlighted and observed effects underlined.

Class III, Section 7, special stds. b.

DEQ ambient stations 1APOH005.36, at Route 1, and 1APOH005.66, at Route 642.

Note: In 2006, station 1APOH005.66 rivermile was corrected. Station was formerly misnamed 1APOH007.65.

Historical Note: **DEQ fish tissue/sediment station 1APOH004.79 was sampled in 1996. The fish consumption impairment remains, even though the data is from outside the assessment period. The fish consumption impairment is due to exceedances of the water quality criterion based tissue value (TV) of 54 parts per billion (ppb) for polychlorinated biphenyls (PCBs) and 15 ppb for benzo(k)fluoranthene in fish tissue. Exceedance of the TV for PCB's was recorded in two species (bullhead catfish, white perch) in 1996. Exceedance of the TV for benzo(k)fluoranthene was exceeded in three species (bullhead catfish, white perch, and sunfish).** Additionally, chrysene exceeded the TV of 15 ppb in bullhead catfish, and benzo(b)fluoranthene exceeded the TV of 15 ppb for in white perch in the 1996 fish tissue sampling, noted by observed effects.

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. Sufficient exceedances of the instantaneous E.coli bacteria criterion (3 of 12 samples - 25.0%) were recorded at DEQ's ambient water quality monitoring station (1APOH005.36) at the Route 1 bridge to assess this stream segment as not supporting of the recreation use goal for the 2006 water quality assessment. The fish consumption use is classified as impaired, as described above. The aquatic life and wildlife uses are considered fully supporting.

2004 TMDL ID for this segment was VAN-A16R-01.

   - If no, where is the nearest downstream monitoring station.
   The monitoring for this assessment unit is based on monitoring from station 1aPOH005.36, at the Route 1 crossing, which is approximately 0.57 rivermiles **upstream** from the facility outfall. The nearest downstream monitoring station is station 1aPOH002.32, which is

approximately 2.47 rivermiles downstream from the facility outfall. Station 1aPOH002.32 was used for assessment of assessment units VAN-A15E_POH02A00 and VAN-A16E_POH01A06, which includes tidal waters of Pohick Creek from the head of tide and extends until rivermile 1.31 in Gunston Cove. A summary of these assessment units is below. Impairments have been highlighted and observed effects underlined.

Class II, Section 6, special stds. b, y.

DEQ ambient and fish tissue/ sediment station 1APOH002.32. DEQ Coastal 2000, part of estuarine probabilistic monitoring, station 1APOH002.42. Sampling was conducted in 2002.

Note: Fish tissue/ sediment station incorrectly named 1APOH000.32 for sampling, however, coordinates place station at rivermile 2.32.

Historical Note: In 2006, the segment VAN-A15E_POH02A00 was split along the boundary separating subwatersheds A15 and A16.

Note: For the 2006 assessment, the ammonia parameter is shown to be supporting for the aquatic life and wildlife uses and should be removed from the 303(d) list of waters.

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The advisory, dated 4/19/99 and modified 12/13/04, limits consumption of American eel, bullhead catfish, channel catfish less than eighteen inches long, largemouth bass, anadromous (coastal) striped bass, sunfish species, smallmouth bass, white catfish, white perch, gizzard shad, and yellow perch consumption to no more than two meals per month. The advisory also restricts the consumption of carp and channel catfish greater than eighteen inches long. The affected area includes the tidal portions of the following tributaries and embayments from the I-395 bridge (above the Woodrow Wilson Bridge) to the Potomac River Bridge at Route 301: Fourmile Run, Hunting Creek, Little Hunting Creek, Pohick Creek, Accotink Creek, Occoquan River, Neabsco Creek, Powell Creek, Quantico Creek, Chopawamsic Creek, Aquia Creek, and Potomac Creek. **Additionally, exceedances of the water quality criterion based tissue value (TV) of 54 parts per billion (ppb) for polychlorinated biphenyls (PCBs) in fish tissue were recorded in three species in 2000 (largemouth bass, carp, channel catfish).**

There is insufficient information to determine if the open water aquatic life subuse is met; the thirty day mean is acceptable, however, the seven day mean and instantaneous levels have not been assessed. **Because submerged aquatic vegetation subuse of the aquatic life use was not met, the segment is considered impaired for the aquatic life use.** Two of 10 samples (20.0%) exceeded the chlorophyll-a screening value of 50 ug/L. Additionally, the ER-M sediment screening value (SV) of 6 ppb (dry weight) for chlordane was exceeded in sediment samples collected in 2000. Both were noted by observed effects for the aquatic life use.

Fecal coliform monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. Sufficient exceedances of the instantaneous fecal coliform bacteria criterion (3 of 22 samples - 13.6%) were recorded at DEQ's ambient water quality monitoring station (1APOH002.32) to assess this stream segment as not supporting of the recreation use goal for the 2006 water quality assessment. The wildlife use is considered fully supporting.

Trend analysis was performed on 1APOH002.32. While no applicable uses were shown to be threatened, the following statistically significant trends were observed; Nitrate plus Nitrite (increasing), Total Suspended Solids (decreasing), Total Nitrogen (decreasing), and Total Phosphorus (decreasing).

Coastal 2000 weight of evidence analysis, utilizing bulk chemical data, toxicity test data, and an evaluation of benthic community conditions, resulted in insufficient information to determine support of any designated uses. However, it was noted that some possibilities for benthic alteration could be a result of nutrient enrichment, habitat condition, habitat type, or a high energy environment. However, toxic contaminants are an unlikely cause of the stressed community.

2004 TMDL ID for this segment was VAN-A15E-01.

2. Is the receiving stream on the current 303(d) list? Yes.

   - If yes, what is the impairment?
   The receiving portion of Pohick Creek is impaired for benzo(k) fluoranthene and PCBs, both in fish tissue. Additionally, there is a bacteria impairment for *E. coli*.

   - Has the TMDL been prepared?
   The PCB in fish tissue TMDL for the **tidal** Potomac River was approved by the U.S. EPA on 10/31/2007.

   - If yes, what is the WLA for the discharge?
   The facility was given a WLA of **5.92 g/year as a PCB load**. Additionally, the facility was included in 9VAC25-720 (Water Quality Management Planning Regulation) and provided with allocations for total nitrogen and total phosphorus. These values are **612,158 lb/year (TN) and 36,729 lb/year (TP).**

   - If no, what is the schedule for the TMDL?
   The E. coli impairment has a TMDL due date of 2018, while the Benzo(k) fluoranthene and PCB (free-flowing portion) in fish tissue have TMDL due dates of 2014. NRO has requested that the fish tissue and sediment monitoring staff, based at Central Office, conduct follow-up monitoring in the free-flowing portion of Pohick Creek.

3. If the answer to (2) above is no, is there a downstream 303(d) listed impairment? Yes.

   - If yes, what is the impairment?
   There are downstream impairments for fecal coliform bacteria and insufficient acreage of submerged aquatic vegetation (SAV). However, if the draft 2008 assessment does not change, both of these are expected to be removed (delisted) with approval of the 2008 assessment. Finally, there is a PCB in fish tissue impairment for the tidal portion of Pohick Creek. This has been addressed through the approved TMDL.

   - Has a TMDL been prepared? NA

   - Will the TMDL include the receiving stream? NA

   - Is there a WLA for the discharge? NA

   - What is the schedule for the TMDL? NA

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?
   We request that the language being finalized by permitting staff regarding monitoring for PCBs (using low-level detection methods) be incorporated into the permit.

```
Mixing Zone Predictions for              Noman Cole (Low Flows)

Effluent Flow = 67 MGD                         July 22, 2008 JCC
Stream 7Q10   = 0.44 MGD
Stream 30Q10 = 1.3 MGD
Stream 1Q10   = 0.21 MGD
Stream slope  = 0.001 ft/ft
Stream width  = 35 ft
Bottom scale  =  2
Channel scale =  1

----------------------------------------------------

Mixing Zone Predictions @ 7Q10

Depth          = 2.8091 ft
Length         = 615.82 ft
Velocity       = 1.0618 ft/sec
Residence Time = .0067 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10
may be used.

----------------------------------------------------

Mixing Zone Predictions @ 30Q10

Depth          = 2.8318 ft
Length         = 611.27 ft
Velocity       = 1.0667 ft/sec
Residence Time = .0066 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10
may be used.

----------------------------------------------------

Mixing Zone Predictions @ 1Q10

Depth          = 2.803 ft
Length         = 617.06 ft
Velocity       = 1.0605 ft/sec
Residence Time = .1616 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10
may be used.

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  Virginia DEQ Mixing Zone Analysis Version 2.1
```


Attachment 6

Mixing Zone Predictions for Noman Cole (high flows)

Effluent Flow = 67 MGD July 22, 2008 JCC
Stream 7Q10 = 3.94 MGD
Stream 30Q10 = 9.8 MGD
Stream 1Q10 = 3.23 MGD
Stream slope = 0.001 ft/ft
Stream width = 35 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.881 ft
Length = 603.96 ft
Velocity = 1.0816 ft/sec
Residence Time = .0065 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 3.0514 ft
Length = 570.27 ft
Velocity = 1.1132 ft/sec
Residence Time = .0059 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.8824 ft
Length = 601.3 ft
Velocity = 1.0776 ft/sec
Residence Time = .155 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: **Noman M. Cole, Jr. Pollution Control Plant** Permit No.: **VA0025364**

Receiving Stream: **Pohick Creek, April - October** Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	38	mg/L
90% Temperature (Annual) =	23.77	deg C
90% Temperature (Wet season) =		deg C
90% Maximum pH =	7.41	SU
10% Maximum pH =		SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	0.21	MGD
7Q10 (Annual) =	0.44	MGD
30Q10 (Annual) =	0	MGD
1Q10 (Wet season) =		MGD
30Q10 (Wet season)	6.3	MGD
30Q5 =	2.2	MGD
Harmonic Mean =	5.4	MGD
Annual Average =	N/A	MGD

Mixing Information

Annual - 1Q10 Mix =	100	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	100	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	123	mg/L
90% Temp (Annual) =	26	deg C
90% Temp (Wet season) =		deg C
90% Maximum pH =	7.3	SU
10% Maximum pH =		SU
Discharge Flow =	67	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	2.7E+03	--	--	na	2.8E+03	--	--	--	--	--	--	--	--	--	--	**na**	**2.8E+03**
Acrolein	0	--	--	na	7.8E+02	--	--	na	8.1E+02	--	--	--	--	--	--	--	--	--	--	**na**	**8.1E+02**
Acrylonitrile[c]	0	--	--	na	6.6E+00	--	--	na	7.1E+00	--	--	--	--	--	--	--	--	--	--	**na**	**7.1E+00**
Aldrin [c]	0	3.0E+00	--	na	1.4E-03	3.0E+00	--	na	1.5E-03	--	--	--	--	--	--	--	--	**3.0E+00**	--	**na**	**1.5E-03**
Ammonia-N (mg/l) (Yearly)	0	2.62E+01	2.42E+00	na	--	2.6E+01	2.4E+00	na	--	--	--	--	--	--	--	--	--	**2.6E+01**	**2.4E+00**	**na**	--
Ammonia-N (mg/l) (High Flow)	0	2.62E+01	5.05E+00	na	--	2.6E+01	5.5E+00	na	--	--	--	--	--	--	--	--	--	**2.6E+01**	**5.5E+00**	**na**	--
Anthracene	0	--	--	na	1.1E+05	--	--	na	1.1E+05	--	--	--	--	--	--	--	--	--	--	**na**	**1.1E+05**
Antimony	0	--	--	na	4.3E+03	--	--	na	4.4E+03	--	--	--	--	--	--	--	--	--	--	**na**	**4.4E+03**
Arsenic	o	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	**3.4E+02**	**1.5E+02**	**na**	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	**na**	--
Benzene [c]	0	--	--	na	7.1E+02	--	--	na	7.7E+02	--	--	--	--	--	--	--	--	--	--	**na**	**7.7E+02**
Benzidine[c]	0	--	--	na	5.4E-03	--	--	na	5.8E-03	--	--	--	--	--	--	--	--	--	--	**na**	**5.8E-03**
Benzo (a) anthracene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	**na**	**5.3E-01**
Benzo (b) fluoranthene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	**na**	**5.3E-01**
Benzo (k) fluoranthene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	**na**	**5.3E-01**
Benzo (a) pyrene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	**na**	**5.3E-01**
Bis2-Chloroethyl Ether	0	--	--	na	1.4E+01	--	--	na	1.4E+01	--	--	--	--	--	--	--	--	--	--	**na**	**1.4E+01**
Bis2-Chloroisopropyl Ether	0	--	--	na	1.7E+05	--	--	na	1.8E+05	--	--	--	--	--	--	--	--	--	--	**na**	**1.8E+05**
Bromoform [c]	0	--	--	na	3.6E+03	--	--	na	3.9E+03	--	--	--	--	--	--	--	--	--	--	**na**	**3.9E+03**
Butylbenzylphthalate	0	--	--	na	5.2E+03	--	--	na	5.4E+03	--	--	--	--	--	--	--	--	--	--	**na**	**5.4E+03**
Cadmium	0	4.9E+00	1.3E+00	na	--	5.0E+00	1.3E+00	na	--	--	--	--	--	--	--	--	--	**5.0E+00**	**1.3E+00**	**na**	--
Carbon Tetrachloride [c]	0	--	--	na	4.4E+01	--	--	na	4.8E+01	--	--	--	--	--	--	--	--	--	--	**na**	**4.8E+01**
Chlordane [c]	0	2.4E+00	4.3E-03	na	2.2E-02	2.4E+00	4.3E-03	na	2.4E-02	--	--	--	--	--	--	--	--	**2.4E+00**	**4.3E-03**	**na**	**2.4E-02**
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	**8.6E+05**	**2.3E+05**	**na**	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	**1.9E+01**	**1.1E+01**	**na**	--
Chlorobenzene	0	--	--	na	2.1E+04	--	--	na	2.2E+04	--	--	--	--	--	--	--	--	--	--	**na**	**2.2E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	3.4E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+02
Chloroform [C]	0	--	--	na	2.9E+04	--	--	na	3.1E+04	--	--	--	--	--	--	--	--	--	--	na	3.1E+04
2-Chloronaphthalene	0	--	--	na	4.3E+03	--	--	na	4.4E+03	--	--	--	--	--	--	--	--	--	--	na	4.4E+03
2-Chlorophenol	0	--	--	na	4.0E+02	--	--	na	4.1E+02	--	--	--	--	--	--	--	--	--	--	na	4.1E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	6.7E+02	8.7E+01	na	--	6.8E+02	8.8E+01	na	--	--	--	--	--	--	--	--	--	6.8E+02	8.8E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Copper	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Cyanide	0	2.2E+01	5.2E+00	na	2.2E+05	2.2E+01	5.2E+00	na	2.2E+05	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	2.2E+05
DDD [C]	0	--	--	na	8.4E-03	--	--	na	9.1E-03	--	--	--	--	--	--	--	--	--	--	na	9.1E-03
DDE [C]	0	--	--	na	5.9E-03	--	--	na	6.4E-03	--	--	--	--	--	--	--	--	--	--	na	6.4E-03
DDT [C]	0	1.1E+00	1.0E-03	na	5.9E-03	1.1E+00	1.0E-03	na	6.4E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	6.4E-03
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Dibutyl phthalate	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
Dichloromethane (Methylene Chloride) [C]	0	--	--	na	1.6E+04	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+04
1,2-Dichlorobenzene	0	--	--	na	1.7E+04	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	--	--	na	1.8E+04
1,3-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	--	--	na	2.7E+03
1,4-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	--	--	na	2.7E+03
3,3-Dichlorobenzidine[C]	0	--	--	na	7.7E-01	--	--	na	8.3E-01	--	--	--	--	--	--	--	--	--	--	na	8.3E-01
Dichlorobromomethane [C]	0	--	--	na	4.6E+02	--	--	na	5.0E+02	--	--	--	--	--	--	--	--	--	--	na	5.0E+02
1,2-Dichloroethane [C]	0	--	--	na	9.9E+02	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
1,1-Dichloroethylene	0	--	--	na	1.7E+04	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	--	--	na	1.8E+04
1,2-trans-dichloroethylene	0	--	--	na	1.4E+05	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	--	--	na	1.4E+05
2,4-Dichlorophenol	0	--	--	na	7.9E+02	--	--	na	8.2E+02	--	--	--	--	--	--	--	--	--	--	na	8.2E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	3.9E+02	--	--	na	4.2E+02	--	--	--	--	--	--	--	--	--	--	na	4.2E+02
1,3-Dichloropropene	0	--	--	na	1.7E+03	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	--	--	na	1.8E+03
Dieldrin [C]	0	2.4E-01	5.6E-02	na	1.4E-03	2.4E-01	5.6E-02	na	1.5E-03	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	1.5E-03
Diethyl Phthalate	0	--	--	na	1.2E+05	--	--	na	1.2E+05	--	--	--	--	--	--	--	--	--	--	na	1.2E+05
Di-2-Ethylhexyl Phthalate [C]	0	--	--	na	5.9E+01	--	--	na	6.4E+01	--	--	--	--	--	--	--	--	--	--	na	6.4E+01
2,4-Dimethylphenol	0	--	--	na	2.3E+03	--	--	na	2.4E+03	--	--	--	--	--	--	--	--	--	--	na	2.4E+03
Dimethyl Phthalate	0	--	--	na	2.9E+06	--	--	na	3.0E+06	--	--	--	--	--	--	--	--	--	--	na	3.0E+06
Di-n-Butyl Phthalate	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
2,4 Dinitrophenol	0	--	--	na	1.4E+04	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	na	7.65E+02	--	--	na	7.9E+02	--	--	--	--	--	--	--	--	--	--	na	7.9E+02
2,4-Dinitrotoluene [C]	0	--	--	na	9.1E+01	--	--	na	9.8E+01	--	--	--	--	--	--	--	--	--	--	na	9.8E+01
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	na	1.2E-06	--	--	na	na	--	--	--	--	--	--	--	--	--	--	na	na
1,2-Diphenylhydrazine[C]	0	--	--	na	5.4E+00	--	--	na	5.8E+00	--	--	--	--	--	--	--	--	--	--	na	5.8E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.2E-01	5.6E-02	na	2.5E+02	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	2.5E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.2E-01	5.6E-02	na	2.5E+02	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	2.5E+02
Endosulfan Sulfate	0	--	--	na	2.4E+02	--	--	na	2.5E+02	--	--	--	--	--	--	--	--	--	--	na	2.5E+02
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	8.6E-02	3.6E-02	na	8.4E-01	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	8.4E-01
Endrin Aldehyde	0	--	--	na	8.1E-01	--	--	na	8.4E-01	--	--	--	--	--	--	--	--	--	--	na	8.4E-01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.9E+04	--	--	na	3.0E+04	--	--	--	--	--	--	--	--	--	--	na	3.0E+04
Fluoranthene	0	--	--	na	3.7E+02	--	--	na	3.8E+02	--	--	--	--	--	--	--	--	--	--	na	3.8E+02
Fluorene	0	--	--	na	1.4E+04	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	2.1E-03	5.2E-01	3.8E-03	na	2.3E-03	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	2.3E-03
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	1.1E-03	5.2E-01	3.8E-03	na	1.2E-03	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	1.2E-03
Hexachlorobenzene[c]	0	--	--	na	7.7E-03	--	--	na	8.3E-03	--	--	--	--	--	--	--	--	--	--	na	8.3E-03
Hexachlorobutadiene[c]	0	--	--	na	5.0E+02	--	--	na	5.4E+02	--	--	--	--	--	--	--	--	--	--	na	5.4E+02
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	1.3E-01	--	--	na	1.4E-01	--	--	--	--	--	--	--	--	--	--	na	1.4E-01
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	4.6E-01	--	--	na	5.0E-01	--	--	--	--	--	--	--	--	--	--	na	5.0E-01
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	6.3E-01	9.5E-01	--	na	6.8E-01	--	--	--	--	--	--	--	--	9.5E-01	--	na	6.8E-01
Hexachlorocyclopentadiene	0	--	--	na	1.7E+04	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	--	--	na	1.8E+04
Hexachloroethane[c]	0	--	--	na	8.9E+01	--	--	na	9.6E+01	--	--	--	--	--	--	--	--	--	--	na	9.6E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	2.6E+04	--	--	na	2.8E+04	--	--	--	--	--	--	--	--	--	--	na	2.8E+04
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	1.5E+02	1.7E+01	na	--	1.5E+02	1.8E+01	na	--	--	--	--	--	--	--	--	--	1.5E+02	1.8E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.4E+00	7.8E-01	na	5.3E-02	--	--	--	--	--	--	--	--	1.4E+00	7.8E-01	na	5.3E-02
Methyl Bromide	0	--	--	na	4.0E+03	--	--	na	4.1E+03	--	--	--	--	--	--	--	--	--	--	na	4.1E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Monochlorobenzene	0	--	--	na	2.1E+04	--	--	na	2.2E+04	--	--	--	--	--	--	--	--	--	--	na	2.2E+04
Nickel	0	2.2E+02	2.4E+01	na	4.6E+03	2.2E+02	2.4E+01	na	4.8E+03	--	--	--	--	--	--	--	--	2.2E+02	2.4E+01	na	4.8E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	1.9E+03	--	--	na	2.0E+03	--	--	--	--	--	--	--	--	--	--	na	2.0E+03
N-Nitrosodimethylamine[c]	0	--	--	na	8.1E+01	--	--	na	8.8E+01	--	--	--	--	--	--	--	--	--	--	na	8.8E+01
N-Nitrosodiphenylamine[c]	0	--	--	na	1.6E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+02
N-Nitrosodi-n-propylamine[c]	0	--	--	na	1.4E+01	--	--	na	1.5E+01	--	--	--	--	--	--	--	--	--	--	na	1.5E+01
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB-1016	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1221	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1232	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1242	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1248	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1254	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1260	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB Total[c]	0	--	--	na	1.7E-03	--	--	na	1.8E-03	--	--	--	--	--	--	--	--	--	--	na	1.8E-03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Pentachlorophenol [C]	0	7.7E-03	5.9E-03	na	8.2E+01	7.7E-03	5.9E-03	na	8.9E+01	--	--	--	--	--	--	--	--	**7.7E-03**	**5.9E-03**	**na**	**8.9E+01**
Phenol	0	--	--	na	4.6E+06	--	--	na	4.8E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.8E+06**
Pyrene	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
Radionuclides (pCi/l except Beta/Photon)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Gross Alpha Activity	0	--	--	na	1.5E+01	--	--	na	1.5E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+01**
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.1E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.1E+00**
Strontium-90	0	--	--	na	8.0E+00	--	--	na	8.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.3E+00**
Tritium	0	--	--	na	2.0E+04	--	--	na	2.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+04**
Selenium	0	2.0E+01	5.0E+00	na	1.1E+04	2.0E+01	5.0E+00	na	1.1E+04	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**1.1E+04**
Silver	0	4.9E+00	--	na	--	4.9E+00	--	na	--	--	--	--	--	--	--	--	--	**4.9E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	1.1E+02	--	--	na	1.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+02**
Tetrachloroethylene[C]	0	--	--	na	8.9E+01	--	--	na	9.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.6E+01**
Thallium	0	--	--	na	6.3E+00	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Toluene	0	--	--	na	2.0E+05	--	--	na	2.1E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	7.5E-03	7.3E-01	2.0E-04	na	8.1E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**8.1E-03**
Tributyltin	0	4.6E-01	6.3E-02	na	--	4.6E-01	6.3E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**6.3E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	9.4E+02	--	--	na	9.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.7E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	4.2E+02	--	--	na	4.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.5E+02**
Trichloroethylene [C]	0	--	--	na	8.1E+02	--	--	na	8.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.8E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	6.5E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.0E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	6.1E+01	--	--	na	6.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.6E+01**
Zinc	0	1.4E+02	1.4E+02	na	6.9E+04	1.4E+02	1.4E+02	na	7.1E+04	--	--	--	--	--	--	--	--	**1.4E+02**	**1.4E+02**	**na**	**7.1E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	4.4E+03
Arsenic	9.1E+01
Barium	na
Cadmium	8.0E-01
Chromium III	5.3E+01
Chromium VI	6.4E+00
Copper	6.4E+00
Iron	na
Lead	1.1E+01
Manganese	na
Mercury	5.3E-02
Nickel	1.5E+01
Selenium	3.0E+00
Silver	2.0E+00
Zinc	5.6E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

67.000 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGI 67.000

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.210	0.000	67.210	67.000
7Q10	0.440	N/A	67.440	N/A
30Q10	0.000	6.300	67.000	73.300
30Q5	2.200	N/A	69.200	N/A
Harm. Mean	5.400	N/A	72.400	N/A
Annual Avg.	N/A	N/A	#VALUE!	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	25.993	0.000
30Q10 90th% Temp. Mix (deg C)	26.000	0.000
1Q10 90th% pH Mix (SU)	7.300	7.300
30Q10 90th% pH Mix (SU)	7.300	7.308
1Q10 10th% pH Mix (SU)	0.000	N/A
7Q10 10th% pH Mix (SU)	0.000	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	122.7	122.7
7Q10 Hardness (mg/L as CaCO3)	122.4	122.4

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.300
(7.204 - pH)	-0.096
(pH - 7.204)	0.096
Trout Present Criterion (mg N/l	17.499
Trout Absent Criterion (mg N/L	26.204
Trout Present?	n
Effective Criterion (mg N/L)	26.204

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	26.000
90th Percentile pH (SU)	7.300
MIN	1.359
MAX	26.000
(7.688 - pH)	0.388
(pH - 7.688)	-0.388
Early LS Present Criterion (mg N	2.422
Early LS Absent Criterion (mg N/	2.422
Early Life Stages Present?	y
Effective Criterion (mg N/L)	2.422

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.300
(7.204 - pH)	-0.096
(pH - 7.204)	0.096
Trout Present Criterion (mg N/l	17.506
Trout Absent Criterion (mg N/L	26.214
Trout Present?	n
Effective Criterion (mg N/L)	26.214

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	0.000
90th Percentile pH (SU)	7.308
MIN	2.850
MAX	7.000
(7.688 - pH)	0.380
(pH - 7.688)	-0.380
Early LS Present Criterion (mg N	5.049
Early LS Absent Criterion (mg N/	8.199
Early Life Stages Present?	y
Effective Criterion (mg N/L)	5.049

67.000 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGI 67.000

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.210	0.000	67.210	67.000
7Q10	0.440	N/A	67.440	N/A
30Q10	0.000	6.300	67.000	73.300
30Q5	2.200	N/A	69.200	N/A
Harm. Mean	5.400	N/A	72.400	N/A
Annual Avg.	N/A	N/A	#VALUE!	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	25.993	0.000
30Q10 90th% Temp. Mix (deg C)	26.000	0.000
1Q10 90th% pH Mix (SU)	7.300	7.300
30Q10 90th% pH Mix (SU)	7.300	7.308
1Q10 10th% pH Mix (SU)	0.000	N/A
7Q10 10th% pH Mix (SU)	0.000	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	122.734	122.734
7Q10 Hardness (mg/L as CaCO3) =	122.445	122.445

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.300
(7.204 - pH)	-0.096
(pH - 7.204)	0.096
Trout Present Criterion (mg N/l	17.499
Trout Absent Criterion (mg N/L	26.204
Trout Present?	n
Effective Criterion (mg N/L)	26.204

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	26.000
90th Percentile pH (SU)	7.300
MIN	1.359
MAX	26.000
(7.688 - pH)	0.388
(pH - 7.688)	-0.388
Early LS Present Criterion (mg N	2.422
Early LS Absent Criterion (mg N/	2.422
Early Life Stages Present?	y
Effective Criterion (mg N/L)	2.422

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.300
(7.204 - pH)	-0.096
(pH - 7.204)	0.096
Trout Present Criterion (mg N/l	17.506
Trout Absent Criterion (mg N/L	26.214
Trout Present?	n
Effective Criterion (mg N/L)	26.214

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	0.000
90th Percentile pH (SU)	7.308
MIN	2.850
MAX	7.000
(7.688 - pH)	0.380
(pH - 7.688)	-0.380
Early LS Present Criterion (mg N	5.049
Early LS Absent Criterion (mg N/	8.199
Early Life Stages Present?	y
Effective Criterion (mg N/L)	5.049

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: **Noman M. Cole, Jr. Pollution Control Plant** Permit No.: **VA0025364**

Receiving Stream: **Pohick Creek, November through March** Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	42	mg/L
90% Temperature (Annual) =	16.9	deg C
90% Temperature (Wet season) =		deg C
90% Maximum pH =	8.01	SU
10% Maximum pH =		SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	3.23	MGD
7Q10 (Annual) =	3.94	MGD
30Q10 (Annual) =	1.3	MGD
1Q10 (Wet season) =		MGD
30Q10 (Wet season)	0	MGD
30Q5 =	2.2	MGD
Harmonic Mean =	5.4	MGD
Annual Average =	0	MGD

Mixing Information

Annual - 1Q10 Mix =	100	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	100	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	87	mg/L
90% Temp (Annual) =	21	deg C
90% Temp (Wet season) =		deg C
90% Maximum pH =	7.1	SU
10% Maximum pH =		SU
Discharge Flow =	67	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	2.7E+03	--	--	na	2.8E+03	--	--	--	--	--	--	--	--	--	--	na	2.8E+03
Acrolein	0	--	--	na	7.8E+02	--	--	na	8.1E+02	--	--	--	--	--	--	--	--	--	--	na	8.1E+02
Acrylonitrile[c]	0	--	--	na	6.6E+00	--	--	na	7.1E+00	--	--	--	--	--	--	--	--	--	--	na	7.1E+00
Aldrin [c]	0	3.0E+00	--	na	1.4E-03	3.1E+00	--	na	1.5E-03	--	--	--	--	--	--	--	--	3.1E+00	--	na	1.5E-03
Ammonia-N (mg/l) (Yearly)	0	3.23E+01	3.74E+00	na	--	3.4E+01	3.8E+00	na	--	--	--	--	--	--	--	--	--	3.4E+01	3.8E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	3.29E+01	5.67E+00	na	--	3.3E+01	5.7E+00	na	--	--	--	--	--	--	--	--	--	3.3E+01	5.7E+00	na	--
Anthracene	0	--	--	na	1.1E+05	--	--	na	1.1E+05	--	--	--	--	--	--	--	--	--	--	na	1.1E+05
Antimony	0	--	--	na	4.3E+03	--	--	na	4.4E+03	--	--	--	--	--	--	--	--	--	--	na	4.4E+03
Arsenic	o	3.4E+02	1.5E+02	na	--	3.6E+02	1.6E+02	na	--	--	--	--	--	--	--	--	--	3.6E+02	1.6E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [c]	0	--	--	na	7.1E+02	--	--	na	7.7E+02	--	--	--	--	--	--	--	--	--	--	na	7.7E+02
Benzidine[c]	0	--	--	na	5.4E-03	--	--	na	5.8E-03	--	--	--	--	--	--	--	--	--	--	na	5.8E-03
Benzo (a) anthracene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Benzo (b) fluoranthene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Benzo (k) fluoranthene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Benzo (a) pyrene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Bis2-Chloroethyl Ether	0	--	--	na	1.4E+01	--	--	na	1.4E+01	--	--	--	--	--	--	--	--	--	--	na	1.4E+01
Bis2-Chloroisopropyl Ether	0	--	--	na	1.7E+05	--	--	na	1.8E+05	--	--	--	--	--	--	--	--	--	--	na	1.8E+05
Bromoform [c]	0	--	--	na	3.6E+03	--	--	na	3.9E+03	--	--	--	--	--	--	--	--	--	--	na	3.9E+03
Butylbenzylphthalate	0	--	--	na	5.2E+03	--	--	na	5.4E+03	--	--	--	--	--	--	--	--	--	--	na	5.4E+03
Cadmium	0	3.3E+00	9.9E-01	na	--	3.4E+00	1.1E+00	na	--	--	--	--	--	--	--	--	--	3.4E+00	1.1E+00	na	--
Carbon Tetrachloride [c]	0	--	--	na	4.4E+01	--	--	na	4.8E+01	--	--	--	--	--	--	--	--	--	--	na	4.8E+01
Chlordane [c]	0	2.4E+00	4.3E-03	na	2.2E-02	2.5E+00	4.6E-03	na	2.4E-02	--	--	--	--	--	--	--	--	2.5E+00	4.6E-03	na	2.4E-02
Chloride	0	8.6E+05	2.3E+05	na	--	9.0E+05	2.4E+05	na	--	--	--	--	--	--	--	--	--	9.0E+05	2.4E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	2.0E+01	1.2E+01	na	--	--	--	--	--	--	--	--	--	2.0E+01	1.2E+01	na	--
Chlorobenzene	0	--	--	na	2.1E+04	--	--	na	2.2E+04	--	--	--	--	--	--	--	--	--	--	na	2.2E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[c]	0	--	--	na	3.4E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	**3.7E+02**
Chloroform [c]	0	--	--	na	2.9E+04	--	--	na	3.1E+04	--	--	--	--	--	--	--	--	--	--	na	**3.1E+04**
2-Chloronaphthalene	0	--	--	na	4.3E+03	--	--	na	4.4E+03	--	--	--	--	--	--	--	--	--	--	na	**4.4E+03**
2-Chlorophenol	0	--	--	na	4.0E+02	--	--	na	4.1E+02	--	--	--	--	--	--	--	--	--	--	na	**4.1E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.7E-02	4.3E-02	na	--	--	--	--	--	--	--	--	--	**8.7E-02**	**4.3E-02**	na	--
Chromium III	0	5.0E+02	6.5E+01	na	--	5.2E+02	6.8E+01	na	--	--	--	--	--	--	--	--	--	**5.2E+02**	**6.8E+01**	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.7E+01	1.2E+01	na	--	--	--	--	--	--	--	--	--	**1.7E+01**	**1.2E+01**	na	--
Chromium, Total	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	**5.3E-01**
Copper	0	1.2E+01	7.8E+00	na	--	1.2E+01	8.2E+00	na	--	--	--	--	--	--	--	--	--	**1.2E+01**	**8.2E+00**	na	--
Cyanide	0	2.2E+01	5.2E+00	na	2.2E+05	2.3E+01	5.5E+00	na	2.2E+05	--	--	--	--	--	--	--	--	**2.3E+01**	**5.5E+00**	na	**2.2E+05**
DDD [c]	0	--	--	na	8.4E-03	--	--	na	9.1E-03	--	--	--	--	--	--	--	--	--	--	na	**9.1E-03**
DDE [c]	0	--	--	na	5.9E-03	--	--	na	6.4E-03	--	--	--	--	--	--	--	--	--	--	na	**6.4E-03**
DDT [c]	0	1.1E+00	1.0E-03	na	5.9E-03	1.2E+00	1.1E-03	na	6.4E-03	--	--	--	--	--	--	--	--	**1.2E+00**	**1.1E-03**	na	**6.4E-03**
Demeton	0	--	1.0E-01	na	--	--	1.1E-01	na	--	--	--	--	--	--	--	--	--	--	**1.1E-01**	na	--
Dibenz(a,h)anthracene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	**5.3E-01**
Dibutyl phthalate	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	**1.2E+04**
Dichloromethane (Methylene Chloride) [c]	0	--	--	na	1.6E+04	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	**1.7E+04**
1,2-Dichlorobenzene	0	--	--	na	1.7E+04	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	--	--	na	**1.8E+04**
1,3-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	--	--	na	**2.7E+03**
1,4-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	--	--	na	**2.7E+03**
3,3-Dichlorobenzidine[c]	0	--	--	na	7.7E-01	--	--	na	8.3E-01	--	--	--	--	--	--	--	--	--	--	na	**8.3E-01**
Dichlorobromomethane [c]	0	--	--	na	4.6E+02	--	--	na	5.0E+02	--	--	--	--	--	--	--	--	--	--	na	**5.0E+02**
1,2-Dichloroethane [c]	0	--	--	na	9.9E+02	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	**1.1E+03**
1,1-Dichloroethylene	0	--	--	na	1.7E+04	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	--	--	na	**1.8E+04**
1,2-trans-dichloroethylene	0	--	--	na	1.4E+05	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	--	--	na	**1.4E+05**
2,4-Dichlorophenol	0	--	--	na	7.9E+02	--	--	na	8.2E+02	--	--	--	--	--	--	--	--	--	--	na	**8.2E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[c]	0	--	--	na	3.9E+02	--	--	na	4.2E+02	--	--	--	--	--	--	--	--	--	--	na	**4.2E+02**
1,3-Dichloropropene	0	--	--	na	1.7E+03	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	--	--	na	**1.8E+03**
Dieldrin [c]	0	2.4E-01	5.6E-02	na	1.4E-03	2.5E-01	5.9E-02	na	1.5E-03	--	--	--	--	--	--	--	--	**2.5E-01**	**5.9E-02**	na	**1.5E-03**
Diethyl Phthalate	0	--	--	na	1.2E+05	--	--	na	1.2E+05	--	--	--	--	--	--	--	--	--	--	na	**1.2E+05**
Di-2-Ethylhexyl Phthalate [c]	0	--	--	na	5.9E+01	--	--	na	6.4E+01	--	--	--	--	--	--	--	--	--	--	na	**6.4E+01**
2,4-Dimethylphenol	0	--	--	na	2.3E+03	--	--	na	2.4E+03	--	--	--	--	--	--	--	--	--	--	na	**2.4E+03**
Dimethyl Phthalate	0	--	--	na	2.9E+06	--	--	na	3.0E+06	--	--	--	--	--	--	--	--	--	--	na	**3.0E+06**
Di-n-Butyl Phthalate	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	**1.2E+04**
2,4 Dinitrophenol	0	--	--	na	1.4E+04	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	**1.4E+04**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	7.65E+02	--	--	na	7.9E+02	--	--	--	--	--	--	--	--	--	--	na	**7.9E+02**
2,4-Dinitrotoluene [c]	0	--	--	na	9.1E+01	--	--	na	9.8E+01	--	--	--	--	--	--	--	--	--	--	na	**9.8E+01**
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	na	1.2E-06	--	--	na	na	--	--	--	--	--	--	--	--	--	--	na	**na**
1,2-Diphenylhydrazine[c]	0	--	--	na	5.4E+00	--	--	na	5.8E+00	--	--	--	--	--	--	--	--	--	--	na	**5.8E+00**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.3E-01	5.9E-02	na	2.5E+02	--	--	--	--	--	--	--	--	**2.3E-01**	**5.9E-02**	na	**2.5E+02**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.3E-01	5.9E-02	na	2.5E+02	--	--	--	--	--	--	--	--	**2.3E-01**	**5.9E-02**	na	**2.5E+02**
Endosulfan Sulfate	0	--	--	na	2.4E+02	--	--	na	2.5E+02	--	--	--	--	--	--	--	--	--	--	na	**2.5E+02**
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	9.0E-02	3.8E-02	na	8.4E-01	--	--	--	--	--	--	--	--	**9.0E-02**	**3.8E-02**	na	**8.4E-01**
Endrin Aldehyde	0	--	--	na	8.1E-01	--	--	na	8.4E-01	--	--	--	--	--	--	--	--	--	--	na	**8.4E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.9E+04	--	--	na	3.0E+04	--	--	--	--	--	--	--	--	--	--	na	3.0E+04
Fluoranthene	0	--	--	na	3.7E+02	--	--	na	3.8E+02	--	--	--	--	--	--	--	--	--	--	na	3.8E+02
Fluorene	0	--	--	na	1.4E+04	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.1E-02	na	--	--	--	--	--	--	--	--	--	--	1.1E-02	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	2.1E-03	5.5E-01	4.0E-03	na	2.3E-03	--	--	--	--	--	--	--	--	5.5E-01	4.0E-03	na	2.3E-03
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	1.1E-03	5.5E-01	4.0E-03	na	1.2E-03	--	--	--	--	--	--	--	--	5.5E-01	4.0E-03	na	1.2E-03
Hexachlorobenzene[c]	0	--	--	na	7.7E-03	--	--	na	8.3E-03	--	--	--	--	--	--	--	--	--	--	na	8.3E-03
Hexachlorobutadiene[c]	0	--	--	na	5.0E+02	--	--	na	5.4E+02	--	--	--	--	--	--	--	--	--	--	na	5.4E+02
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	1.3E-01	--	--	na	1.4E-01	--	--	--	--	--	--	--	--	--	--	na	1.4E-01
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	4.6E-01	--	--	na	5.0E-01	--	--	--	--	--	--	--	--	--	--	na	5.0E-01
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	6.3E-01	1.0E+00	--	na	6.8E-01	--	--	--	--	--	--	--	--	1.0E+00	--	na	6.8E-01
Hexachlorocyclopentadiene	0	--	--	na	1.7E+04	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	--	--	na	1.8E+04
Hexachloroethane[c]	0	--	--	na	8.9E+01	--	--	na	9.6E+01	--	--	--	--	--	--	--	--	--	--	na	9.6E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.1E+00	na	--	--	--	--	--	--	--	--	--	--	2.1E+00	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	4.9E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	--	--	na	5.3E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	2.6E+04	--	--	na	2.8E+04	--	--	--	--	--	--	--	--	--	--	na	2.8E+04
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	9.7E+01	1.1E+01	na	--	1.0E+02	1.2E+01	na	--	--	--	--	--	--	--	--	--	1.0E+02	1.2E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	1.1E-01	na	--	--	--	--	--	--	--	--	--	--	1.1E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.5E+00	8.2E-01	na	5.3E-02	--	--	--	--	--	--	--	--	1.5E+00	8.2E-01	na	5.3E-02
Methyl Bromide	0	--	--	na	4.0E+03	--	--	na	4.1E+03	--	--	--	--	--	--	--	--	--	--	na	4.1E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.2E-02	na	--	--	--	--	--	--	--	--	--	--	3.2E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Monochlorobenzene	0	--	--	na	2.1E+04	--	--	na	2.2E+04	--	--	--	--	--	--	--	--	--	--	na	2.2E+04
Nickel	0	1.6E+02	1.8E+01	na	4.6E+03	1.7E+02	1.9E+01	na	4.8E+03	--	--	--	--	--	--	--	--	1.7E+02	1.9E+01	na	4.8E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	1.9E+03	--	--	na	2.0E+03	--	--	--	--	--	--	--	--	--	--	na	2.0E+03
N-Nitrosodimethylamine[c]	0	--	--	na	8.1E+01	--	--	na	8.8E+01	--	--	--	--	--	--	--	--	--	--	na	8.8E+01
N-Nitrosodiphenylamine[c]	0	--	--	na	1.6E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+02
N-Nitrosodi-n-propylamine[c]	0	--	--	na	1.4E+01	--	--	na	1.5E+01	--	--	--	--	--	--	--	--	--	--	na	1.5E+01
Parathion	0	6.5E-02	1.3E-02	na	--	6.8E-02	1.4E-02	na	--	--	--	--	--	--	--	--	--	6.8E-02	1.4E-02	na	--
PCB-1016	0	--	1.4E-02	na	--	--	1.5E-02	na	--	--	--	--	--	--	--	--	--	--	1.5E-02	na	--
PCB-1221	0	--	1.4E-02	na	--	--	1.5E-02	na	--	--	--	--	--	--	--	--	--	--	1.5E-02	na	--
PCB-1232	0	--	1.4E-02	na	--	--	1.5E-02	na	--	--	--	--	--	--	--	--	--	--	1.5E-02	na	--
PCB-1242	0	--	1.4E-02	na	--	--	1.5E-02	na	--	--	--	--	--	--	--	--	--	--	1.5E-02	na	--
PCB-1248	0	--	1.4E-02	na	--	--	1.5E-02	na	--	--	--	--	--	--	--	--	--	--	1.5E-02	na	--
PCB-1254	0	--	1.4E-02	na	--	--	1.5E-02	na	--	--	--	--	--	--	--	--	--	--	1.5E-02	na	--
PCB-1260	0	--	1.4E-02	na	--	--	1.5E-02	na	--	--	--	--	--	--	--	--	--	--	1.5E-02	na	--
PCB Total[c]	0	--	--	na	1.7E-03	--	--	na	1.8E-03	--	--	--	--	--	--	--	--	--	--	na	1.8E-03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Pentachlorophenol [C]	0	7.7E-03	5.9E-03	na	8.2E+01	8.1E-03	6.2E-03	na	8.9E+01	--	--	--	--	--	--	--	--	**8.1E-03**	**6.2E-03**	**na**	**8.9E+01**
Phenol	0	--	--	na	4.6E+06	--	--	na	4.8E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.8E+06**
Pyrene	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
Radionuclides (pCi/l except Beta/Photon)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Gross Alpha Activity	0	--	--	na	1.5E+01	--	--	na	1.5E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+01**
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.1E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.1E+00**
Strontium-90	0	--	--	na	8.0E+00	--	--	na	8.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.3E+00**
Tritium	0	--	--	na	2.0E+04	--	--	na	2.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+04**
Selenium	0	2.0E+01	5.0E+00	na	1.1E+04	2.1E+01	5.3E+00	na	1.1E+04	--	--	--	--	--	--	--	--	**2.1E+01**	**5.3E+00**	**na**	**1.1E+04**
Silver	0	2.6E+00	--	na	--	2.7E+00	--	na	--	--	--	--	--	--	--	--	--	**2.7E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	1.1E+02	--	--	na	1.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+02**
Tetrachloroethylene[C]	0	--	--	na	8.9E+01	--	--	na	9.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.6E+01**
Thallium	0	--	--	na	6.3E+00	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Toluene	0	--	--	na	2.0E+05	--	--	na	2.1E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	7.5E-03	7.7E-01	2.1E-04	na	8.1E-03	--	--	--	--	--	--	--	--	**7.7E-01**	**2.1E-04**	**na**	**8.1E-03**
Tributyltin	0	4.6E-01	6.3E-02	na	--	4.8E-01	6.7E-02	na	--	--	--	--	--	--	--	--	--	**4.8E-01**	**6.7E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	9.4E+02	--	--	na	9.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.7E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	4.2E+02	--	--	na	4.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.5E+02**
Trichloroethylene [C]	0	--	--	na	8.1E+02	--	--	na	8.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.8E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	6.5E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.0E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	6.1E+01	--	--	na	6.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.6E+01**
Zinc	0	1.0E+02	1.0E+02	na	6.9E+04	1.1E+02	1.1E+02	na	7.1E+04	--	--	--	--	--	--	--	--	**1.1E+02**	**1.1E+02**	**na**	**7.1E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	4.4E+03
Arsenic	9.5E+01
Barium	na
Cadmium	6.3E-01
Chromium III	4.1E+01
Chromium VI	6.7E+00
Copper	4.8E+00
Iron	na
Lead	6.9E+00
Manganese	na
Mercury	5.3E-02
Nickel	1.1E+01
Selenium	3.2E+00
Silver	1.1E+00
Zinc	4.3E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

67.000 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGI 67.000

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	3.230	0.000	70.230	67.000
7Q10	3.940	N/A	70.940	N/A
30Q10	1.300	0.000	68.300	67.000
30Q5	2.200	N/A	69.200	N/A
Harm. Mean	5.400	N/A	72.400	N/A
Annual Avg.	0.000	N/A	67.000	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	20.811	0.000
30Q10 90th% Temp. Mix (deg C)	20.922	0.000
1Q10 90th% pH Mix (SU)	7.118	7.100
30Q10 90th% pH Mix (SU)	7.107	7.100
1Q10 10th% pH Mix (SU)	0.000	N/A
7Q10 10th% pH Mix (SU)	0.000	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	84.9	84.9
7Q10 Hardness (mg/L as CaCO3)	84.5	84.5

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.118
(7.204 - pH)	0.086
(pH - 7.204)	-0.086
Trout Present Criterion (mg N/l	21.551
Trout Absent Criterion (mg N/L	32.271
Trout Present?	n
Effective Criterion (mg N/L)	32.271

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	20.922
90th Percentile pH (SU)	7.107
MIN	1.886
MAX	20.922
(7.688 - pH)	0.581
(pH - 7.688)	-0.581
Early LS Present Criterion (mg N	3.738
Early LS Absent Criterion (mg N/	3.738
Early Life Stages Present?	y
Effective Criterion (mg N/L)	3.738

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.100
(7.204 - pH)	0.104
(pH - 7.204)	-0.104
Trout Present Criterion (mg N/l	21.945
Trout Absent Criterion (mg N/L	32.861
Trout Present?	n
Effective Criterion (mg N/L)	32.861

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	0.000
90th Percentile pH (SU)	7.100
MIN	2.850
MAX	7.000
(7.688 - pH)	0.588
(pH - 7.688)	-0.588
Early LS Present Criterion (mg N	5.667
Early LS Absent Criterion (mg N/	9.202
Early Life Stages Present?	y
Effective Criterion (mg N/L)	5.667

67.000 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGI 67.000

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	3.230	0.000	70.230	67.000
7Q10	3.940	N/A	70.940	N/A
30Q10	1.300	0.000	68.300	67.000
30Q5	2.200	N/A	69.200	N/A
Harm. Mean	5.400	N/A	72.400	N/A
Annual Avg.	0.000	N/A	67.000	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	20.811	0.000
30Q10 90th% Temp. Mix (deg C)	20.922	0.000
1Q10 90th% pH Mix (SU)	7.118	7.100
30Q10 90th% pH Mix (SU)	7.107	7.100
1Q10 10th% pH Mix (SU)	0.000	N/A
7Q10 10th% pH Mix (SU)	0.000	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	84.930	84.930
7Q10 Hardness (mg/L as CaCO3) =	84.501	84.501

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.118
(7.204 - pH)	0.086
(pH - 7.204)	-0.086
Trout Present Criterion (mg N/l	21.551
Trout Absent Criterion (mg N/L	32.271
Trout Present?	n
Effective Criterion (mg N/L)	32.271

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	20.922
90th Percentile pH (SU)	7.107
MIN	1.886
MAX	20.922
(7.688 - pH)	0.581
(pH - 7.688)	-0.581
Early LS Present Criterion (mg N	3.738
Early LS Absent Criterion (mg N/	3.738
Early Life Stages Present?	y
Effective Criterion (mg N/L)	3.738

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.100
(7.204 - pH)	0.104
(pH - 7.204)	-0.104
Trout Present Criterion (mg N/l	21.945
Trout Absent Criterion (mg N/L	32.861
Trout Present?	n
Effective Criterion (mg N/L)	32.861

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	0.000
90th Percentile pH (SU)	7.100
MIN	2.850
MAX	7.000
(7.688 - pH)	0.588
(pH - 7.688)	-0.588
Early LS Present Criterion (mg N	5.667
Early LS Absent Criterion (mg N/	9.202
Early Life Stages Present?	y
Effective Criterion (mg N/L)	5.667

Noman M. Cole, Jr. Pollution Control Plant
April - October
2003-2007

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
2003						
	4					
		04/01/03	6.3	16	8.1	28
		04/02/03	6.7	17	8.0	27
		04/03/03	6.9	18	8.0	27
		04/04/03	6.7	18	8.0	27
		04/05/03	7.2	18	8.0	27
		04/06/03	7.3	18	7.8	27
		04/07/03	7.2	18	7.7	27
		04/08/03	7.1	17	7.7	27
		04/09/03	7.1	17	7.6	27
		04/10/03	6.6	17	7.5	27
		04/11/03	7.0	17	7.5	27
		04/12/03	6.9	17	7.5	27
		04/13/03	7.1	18	7.5	27
		04/14/03	7.1	18	7.5	27
		04/15/03	6.6	18	7.5	27
		04/16/03	7.3	19	7.5	27
		04/17/03	7.2	19	7.5	27
		04/18/03	7.3	18	7.5	27
		04/19/03	7.2	18	7.5	27
		04/20/03	7.2	18	7.5	27
		04/21/03	6.9	19	7.5	27
		04/22/03	6.8	19	7.5	27
		04/23/03	7.2	19	7.5	27
		04/24/03	6.9	19	7.5	27
		04/25/03	7.2	19	7.5	26
		04/26/03	7.2	19	7.5	26
		04/27/03	7.4	20	7.5	26
		04/28/03	7.4	20	7.5	26
		04/29/03	7.2	20	7.5	26
		04/30/03	6.9	20	7.5	26
	5				7.4	26
		05/01/03	7.3	20	7.4	26
		05/02/03	7.3	21	7.4	26
		05/03/03	7.3	20	7.4	26
		05/04/03	7.4	20	7.4	26
		05/05/03	7.0	20	7.4	26
		05/06/03	7.2	19	7.4	26
		05/07/03	7.1	20	7.4	26
		05/08/03	7.3	20	7.4	26
		05/09/03	7.2	20	7.4	26
		05/10/03	7.3	18	7.4	26
		05/11/03	7.2	18	7.4	26
		05/12/03	7.2	20	7.4	26
		05/13/03	7.1	20	7.4	26
		05/14/03	7.0	19	7.4	26
		05/15/03	6.8	19	7.4	26
		05/16/03	6.9	20	7.4	26
		05/17/03	7.2	19	7.4	26
		05/18/03	7.2	19	7.4	26
		05/19/03	6.5	19	7.4	26
		05/20/03	6.9	19	7.4	26
		05/21/03	6.9	20	7.4	26
		05/22/03	6.5	19	7.4	26
		05/23/03	6.8	19	7.4	26
		05/24/03	7.2	20	7.4	26
		05/25/03	7.3	20	7.4	26
		05/26/03	7.1	20	7.4	26
		05/27/03	6.5	19	7.4	26
		05/28/03	6.3	19	7.4	26
		05/29/03	6.4	19	7.4	26
		05/30/03	6.6	19	7.4	26
		05/31/03	7.3	20	7.4	26
	6				7.4	26
		06/01/03	7.0	20	7.4	26
		06/02/03	6.5	19	7.4	26
		06/03/03	7.1	20	7.4	26
		06/04/03	7.1	20	7.4	26
		06/05/03	7.2	20	7.4	26
		06/06/03	7.2	20	7.4	26

Attachment 7

Noman M. Cole, Jr. Pollution Control Plant
April - October
2003-2007

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH		Sorted Temperature	
		06/07/03	7.2	21	7.4		26	
		06/08/03	7.1	20	7.4		26	
		06/09/03	7.2	20	7.4		26	
		06/10/03	7.2	20	7.4		26	
		06/11/03	7.2	21	7.4		26	
		06/12/03	7.2	21	7.4		26	
		06/13/03	7.1	22	7.4		26	
		06/14/03	7.3	22	7.4		26	
		06/15/03	7.1	22	7.4		26	
		06/16/03	7.2	21	7.4		26	
		06/17/03	7.3	21	7.4		26	
		06/18/03	7.0	21	7.4		26	
		06/19/03	7.1	21	7.4		26	
		06/20/03	7.0	21	7.4		26	
		06/21/03	7.2	20	7.4		26	
		06/22/03	7.4	21	7.4		26	
		06/23/03	7.0	21	7.3		26	
		06/24/03	7.3	22	7.3		26	
		06/25/03	7.2	22	7.3		26	
		06/26/03	7.3	23	7.3		26	
		06/27/03	7.2	23	7.3		26	
		06/28/03	7.2	23	7.3		26	
		06/29/03	7.3	23	7.3		26	
		06/30/03	7.2	23	7.3		26	
	7				7.3		26	
		07/01/03	8.0	23	7.3		26	
		07/02/03	7.1	23	7.3		26	
		07/03/03	7.0	22	7.3		26	
		07/04/03	7.0	24	7.3		26	
		07/05/03	7.1	22	7.3		26	
		07/06/03	7.2	23	7.3		26	
		07/07/03	7.0	23	7.3		26	
		07/08/03	7.1	23	7.3		26	
		07/09/03	7.0	24	7.3		26	
		07/10/03	7.0	23	7.3	90th percentile	26	90th percentile
		07/11/03	7.1	23	7.3		26	
		07/12/03	7.2	22	7.3		26	
		07/13/03	7.3	23	7.3		26	
		07/14/03	7.0	24	7.3		26	
		07/15/03	7.0	24	7.3		26	
		07/16/03	7.2	24	7.3		26	
		07/17/03	7.1	24	7.3		26	
		07/18/03	7.3	24	7.3		26	
		07/19/03	7.0	23	7.3		26	
		07/20/03	7.0	24	7.3		26	
		07/21/03	7.2	24	7.3		26	
		07/22/03	7.1	25	7.3		26	
		07/23/03	7.0	24	7.3		26	
		07/24/03	6.8	24	7.3		26	
		07/25/03	6.9	24	7.3		26	
		07/26/03	7.1	24	7.3		26	
		07/27/03	7.0	24	7.3		26	
		07/28/03	6.9	24	7.3		26	
		07/29/03	7.0	24	7.3		26	
		07/30/03	7.1	24	7.3		26	
		07/31/03	7.1	24	7.3		26	
	8				7.3		26	
		08/01/03	7.0	24	7.3		26	
		08/02/03	7.2	25	7.3		26	
		08/03/03	7.2	25	7.3		26	
		08/04/03	6.9	25	7.3		26	
		08/05/03	7.0	25	7.3		26	
		08/06/03	6.9	25	7.3		26	
		08/07/03	7.0	25	7.3		26	
		08/08/03	7.1	25	7.3		26	
		08/09/03	7.4	25	7.3		26	
		08/10/03	7.4	25	7.3		26	
		08/11/03	7.1	25	7.3		26	
		08/12/03	7.2	25	7.3		26	
		08/13/03	7.0	25	7.3		26	
		08/14/03	7.0	25	7.3		26	

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		08/15/03	7.0	25	7.3	26
		08/16/03	7.4	26	7.3	26
		08/17/03	7.4	26	7.3	26
		08/18/03	7.3	25	7.3	26
		08/19/03	7.0	25	7.3	26
		08/20/03	7.2	25	7.3	26
		08/21/03	7.1	25	7.3	26
		08/22/03	7.1	25	7.3	26
		08/23/03	7.4	26	7.3	26
		08/24/03	7.4	26	7.3	26
		08/25/03	7.2	26	7.3	26
		08/26/03	7.3	26	7.3	26
		08/27/03	7.2	26	7.3	26
		08/28/03	7.0	26	7.3	26
		08/29/03	7.0	26	7.3	26
		08/30/03	7.3	26	7.3	26
		08/31/03	7.3	26	7.3	26
	9				7.3	26
		09/01/03	7.4	26	7.3	26
		09/02/03	6.9	26	7.3	26
		09/03/03	6.9	26	7.2	26
		09/04/03	6.6	26	7.2	26
		09/05/03	7.2	25	7.2	26
		09/06/03	7.2	25	7.2	26
		09/07/03	7.2	24	7.2	26
		09/08/03	7.1	25	7.2	26
		09/09/03	7.1	25	7.2	26
		09/10/03	7.0	25	7.2	26
		09/11/03	6.9	25	7.2	26
		09/12/03	7.1	25	7.2	26
		09/13/03	7.4	25	7.2	26
		09/14/03	7.5	25	7.2	26
		09/15/03	7.3	25	7.2	26
		09/16/03	7.2	26	7.2	26
		09/17/03	7.2	26	7.2	26
		09/18/03	7.5	25	7.2	26
		09/19/03	7.1	24	7.2	26
		09/20/03	7.1	25	7.2	26
		09/21/03	7.1	24	7.2	26
		09/22/03	6.9	25	7.2	26
		09/23/03	6.7	25	7.2	26
		09/24/03	6.9	24	7.2	26
		09/25/03	6.9	23	7.2	26
		09/26/03	6.8	24	7.2	26
		09/27/03	7.0	27	7.2	26
		09/28/03	7.3	24	7.2	26
		09/29/03	6.9	24	7.2	26
		09/30/03	6.8	24	7.2	26
	10				7.2	26
		10/01/03	6.9	23	7.2	26
		10/02/03	6.9	23	7.2	26
		10/03/03	7.0	23	7.2	26
		10/04/03	7.4	23	7.2	26
		10/05/03	7.0	23	7.2	26
		10/06/03	7.1	23	7.2	26
		10/07/03	7.0	23	7.2	26
		10/08/03	7.0	24	7.2	26
		10/09/03	6.9	24	7.2	26
		10/10/03	6.8	24	7.2	26
		10/11/03	7.0	23	7.2	26
		10/12/03	6.9	24	7.2	26
		10/13/03	7.2	24	7.2	26
		10/14/03	7.3	24	7.2	26
		10/15/03	7.0	23	7.2	26
		10/16/03	7.2	23	7.2	26
		10/17/03	7.1	23	7.2	26
		10/18/03	7.3	23	7.2	26
		10/19/03	7.3	23	7.2	26
		10/20/03	7.2	23	7.2	26
		10/21/03	7.4	23	7.2	26
		10/22/03	7.5	23	7.2	26

Noman M. Cole, Jr. Pollution Control Plant
April 2003 - October 2007

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		10/23/03	7.3	22	7.2	26
		10/24/03	7.3	22	7.2	26
		10/25/03	7.4	22	7.2	26
		10/26/03	7.3	22	7.2	26
		10/27/03	7.6	23	7.2	26
		10/28/03	7.3	22	7.2	26
		10/29/03	6.8	21	7.2	26
		10/30/03	6.9	21	7.2	26
		10/31/03	7.3	21	7.2	26
2004	4				7.2	26
		04/01/04	7.0	18	7.2	26
		04/02/04	6.8	17	7.2	26
		04/03/04	6.9	17	7.2	25
		04/04/04	6.9	16	7.2	25
		04/05/04	6.7	16	7.2	25
		04/06/04	7.1	16	7.2	25
		04/07/04	6.8	17	7.2	25
		04/08/04	6.7	17	7.2	25
		04/09/04	7.1	17	7.2	25
		04/10/04	7.0	17	7.2	25
		04/11/04	7.2	16	7.2	25
		04/12/04	6.9	18	7.2	25
		04/13/04	6.6	17	7.2	25
		04/14/04	7.0	17	7.2	25
		04/15/04	6.6	16	7.2	25
		04/16/04	6.9	17	7.2	25
		04/17/04	6.8	17	7.2	25
		04/18/04	6.9	21	7.2	25
		04/19/04	6.7	18	7.2	25
		04/20/04	6.8	18	7.2	25
		04/21/04	6.9	18	7.2	25
		04/22/04	6.7	18	7.2	25
		04/23/04	6.8	19	7.2	25
		04/24/04	7.2	20	7.2	25
		04/25/04	7.0	19	7.2	25
		04/26/04	6.7	19	7.2	25
		04/27/04	6.9	19	7.2	25
		04/28/04	6.7	18	7.2	25
		04/29/04	6.6	19	7.2	25
		04/30/04	6.6	19	7.2	25
	5				7.2	25
		05/01/04	7.0	20	7.2	25
		05/02/04	7.2	20	7.2	25
		05/03/04	6.6	19	7.2	25
		05/04/04	6.7	19	7.2	25
		05/05/04	6.8	19	7.2	25
		05/06/04	6.8	20	7.2	25
		05/07/04	6.8	20	7.2	25
		05/08/04	7.1	19	7.2	25
		05/09/04	7.0	20	7.2	25
		05/10/04	6.8	21	7.2	25
		05/11/04	6.8	21	7.2	25
		05/12/04	6.7	21	7.2	25
		05/13/04	6.7	21	7.2	25
		05/14/04	6.8	21	7.2	25
		05/15/04	7.0	22	7.2	25
		05/16/04	7.1	22	7.2	25
		05/17/04	6.8	22	7.2	25
		05/18/04	6.8	22	7.2	25
		05/19/04	6.8	22	7.2	25
		05/20/04	6.8	22	7.2	25
		05/21/04	6.8	22	7.2	25
		05/22/04	7.5	23	7.2	25
		05/23/04	7.4	22	7.2	25
		05/24/04	7.0	22	7.2	25
		05/25/04	7.0	22	7.2	25
		05/26/04	7.0	22	7.2	25
		05/27/04	7.0	22	7.2	25
		05/28/04	6.9	23	7.2	25
		05/29/04	7.2	21	7.2	25
		05/30/04	7.0	21	7.2	25

Noman M. Cole, Jr. Pollution Control Plant
April 2003 - October 2007

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		05/31/04	7.1	22	7.2	25
	6				7.2	25
		06/01/04	7.0	23	7.2	25
		06/02/04	7.1	23	7.2	25
		06/03/04	7.1	23	7.2	25
		06/04/04	7.0	22	7.2	25
		06/05/04	7.0	21	7.2	25
		06/06/04	6.9	21	7.2	25
		06/07/04	6.9	22	7.2	25
		06/08/04	7.0	23	7.2	25
		06/09/04	6.9	23	7.2	25
		06/10/04	6.8	23	7.2	25
		06/11/04	6.8	23	7.2	25
		06/12/04	7.0	22	7.1	25
		06/13/04	7.1	22	7.1	25
		06/14/04	6.8	23	7.1	25
		06/15/04	6.9	23	7.1	25
		06/16/04	6.9	23	7.1	25
		06/17/04	6.9	24	7.1	25
		06/18/04	6.9	24	7.1	25
		06/19/04	6.9	24	7.1	25
		06/20/04	7.0	23	7.1	25
		06/21/04	6.9	23	7.1	25
		06/22/04	6.8	24	7.1	25
		06/23/04	6.8	24	7.1	25
		06/24/04	6.7	23	7.1	25
		06/25/04	6.7	24	7.1	25
		06/26/04	7.1	24	7.1	25
		06/27/04	7.1	23	7.1	25
		06/28/04	7.0	24	7.1	25
		06/29/04	6.9	24	7.1	25
		06/30/04	6.9	24	7.1	25
	7				7.1	25
		07/01/04	6.9	24	7.1	25
		07/02/04	6.8	24	7.1	25
		07/03/04	7.0	25	7.1	25
		07/04/04	7.0	25	7.1	25
		07/05/04	6.9	25	7.1	25
		07/06/04	6.9	25	7.1	25
		07/07/04	7.1	25	7.1	25
		07/08/04	6.9	25	7.1	25
		07/09/04	6.9	25	7.1	25
		07/10/04	7.2	25	7.1	25
		07/11/04	7.1	25	7.1	25
		07/12/04	6.9	25	7.1	25
		07/13/04	6.9	25	7.1	25
		07/14/04	7.0	25	7.1	25
		07/15/04	7.0	25	7.1	25
		07/16/04	7.0	25	7.1	25
		07/17/04	7.0	25	7.1	25
		07/18/04	7.1	25	7.1	25
		07/19/04	6.9	25	7.1	25
		07/20/04	7.0	25	7.1	25
		07/21/04	7.3	25	7.1	25
		07/22/04	7.0	25	7.1	25
		07/23/04	7.0	25	7.1	25
		07/24/04	7.3	25	7.1	25
		07/25/04	7.3	25	7.1	25
		07/26/04	7.2	25	7.1	25
		07/27/04	7.1	25	7.1	25
		07/28/04	7.0	25	7.1	25
		07/29/04	7.0	25	7.1	25
		07/30/04	7.1	25	7.1	25
		07/31/04	6.9	26	7.1	25
	8				7.1	25
		08/01/04	6.9	26	7.1	25
		08/02/04	7.1	26	7.1	25
		08/03/04	7.3	25	7.1	25
		08/04/04	7.2	25	7.1	25
		08/05/04	7.3	25	7.1	25
		08/06/04	7.3	24	7.1	25

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		08/07/04	7.4	24	7.1	25
		08/08/04	7.0	23	7.1	25
		08/09/04	7.1	25	7.1	25
		08/10/04	7.2	25	7.1	25
		08/11/04	7.2	26	7.1	25
		08/12/04	7.3	25	7.1	25
		08/13/04	7.1	25	7.1	25
		08/14/04	7.5	24	7.1	25
		08/15/04	7.5	24	7.1	25
		08/16/04	7.3	25	7.1	25
		08/17/04	7.2	25	7.1	25
		08/18/04	7.2	25	7.1	25
		08/19/04	7.1	25	7.1	25
		08/20/04	7.2	26	7.1	25
		08/21/04	7.1	26	7.1	25
		08/22/04	6.7	25	7.1	25
		08/23/04	7.4	25	7.1	25
		08/24/04	7.2	25	7.1	25
		08/25/04	7.3	26	7.1	25
		08/26/04	7.2	25	7.1	25
		08/27/04	7.4	26	7.1	25
		08/28/04	7.1	24	7.1	25
		08/29/04	7.0	26	7.1	25
		08/30/04	7.3	26	7.1	25
		08/31/04	7.4	26	7.1	25
	9				7.1	25
		09/01/04	7.4	25	7.1	25
		09/02/04	7.4	26	7.1	25
		09/03/04	7.4	26	7.1	25
		09/04/04	7.5	25	7.1	25
		09/05/04	7.4	25	7.1	25
		09/06/04	7.3	25	7.1	25
		09/07/04	7.3	25	7.1	25
		09/08/04	7.4	26	7.1	25
		09/09/04	7.4	26	7.1	25
		09/10/04	7.3	25	7.1	25
		09/11/04	7.1	25	7.1	25
		09/12/04	7.2	25	7.1	25
		09/13/04	7.1	26	7.1	25
		09/14/04	7.5	26	7.1	25
		09/15/04	7.1	25	7.1	25
		09/16/04	7.2	25	7.1	25
		09/17/04	7.0	26	7.1	25
		09/18/04	7.5	26	7.1	25
		09/19/04	7.3	24	7.1	25
		09/20/04	8.0	24	7.1	25
		09/21/04	7.0	24	7.1	25
		09/22/04	7.0	25	7.1	25
		09/23/04	7.1	24	7.1	25
		09/24/04	7.2	25	7.1	25
		09/25/04	7.2	24	7.1	25
		09/26/04	7.4	25	7.1	25
		09/27/04	7.3	25	7.1	25
		09/28/04	7.2	26	7.1	25
		09/29/04	7.0	25	7.1	25
		09/30/04	7.0	25	7.1	25
	10				7.1	24
		10/01/04	7.2	24	7.1	24
		10/02/04	7.5	24	7.1	24
		10/03/04	7.4	24	7.1	24
		10/04/04	7.1	24	7.1	24
		10/05/04	7.0	24	7.1	24
		10/06/04	7.0	24	7.1	24
		10/07/04	7.1	24	7.1	24
		10/08/04	7.0	24	7.1	24
		10/09/04	7.2	23	7.1	24
		10/10/04	7.1	23	7.1	24
		10/11/04	7.0	24	7.1	24
		10/12/04	7.1	23	7.1	24
		10/13/04	7.0	23	7.1	24
		10/14/04	6.9	23	7.1	24

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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		10/15/04	7.0	24	7.1	24
		10/16/04	7.1	23	7.1	24
		10/17/04	7.2	23	7.1	24
		10/18/04	7.0	23	7.1	24
		10/19/04	7.1	23	7.1	24
		10/20/04	7.1	23	7.1	24
		10/21/04	6.9	24	7.1	24
		10/22/04	6.9	23	7.1	24
		10/23/04	7.1	22	7.1	24
		10/24/04	7.2	22	7.1	24
		10/25/04	7.0	23	7.1	24
		10/26/04	7.0	23	7.1	24
		10/27/04	7.0	21	7.1	24
		10/28/04	7.0	23	7.1	24
		10/29/04	7.1	23	7.1	24
		10/30/04	7.3	22	7.1	24
		10/31/04	7.3	23	7.1	24
2005	4				7.1	24
		04/01/05	6.8	17	7.1	24
		04/02/05	6.9	17	7.1	24
		04/03/05	6.8	16	7.1	24
		04/04/05	6.7	15	7.1	24
		04/05/05	6.8	16	7.1	24
		04/06/05	6.6	16	7.1	24
		04/07/05	6.6	17	7.1	24
		04/08/05	6.8	18	7.1	24
		04/09/05	7.0	17	7.1	24
		04/10/05	7.0	17	7.1	24
		04/11/05	6.8	18	7.1	24
		04/12/05	6.7	18	7.1	24
		04/13/05	6.9	18	7.1	24
		04/14/05	6.7	18	7.1	24
		04/15/05	6.9	18	7.1	24
		04/16/05	7.2	18	7.1	24
		04/17/05	7.2	17	7.1	24
		04/18/05	6.7	18	7.1	24
		04/19/05	6.7	19	7.1	24
		04/20/05	6.6	19	7.1	24
		04/21/05	7.0	20	7.1	24
		04/22/05	7.0	19	7.1	24
		04/23/05	7.2	19	7.1	24
		04/24/05	6.8	19	7.1	24
		04/25/05	6.8	18	7.1	24
		04/26/05	6.8	18	7.1	24
		04/27/05	6.7	19	7.1	24
		04/28/05	6.8	19	7.1	24
		04/29/05	6.8	19	7.1	24
		04/30/05	6.7	19	7.0	24
	5				7.0	24
		05/01/05	7.0	19	7.0	24
		05/02/05	6.8	19	7.0	24
		05/03/05	7.1	19	7.0	24
		05/04/05	7.0	19	7.0	24
		05/05/05	7.0	19	7.0	24
		05/06/05	7.0	19	7.0	24
		05/07/05	7.0	17	7.0	24
		05/08/05	6.9	20	7.0	24
		05/09/05	6.9	20	7.0	24
		05/10/05	6.8	20	7.0	24
		05/11/05	7.0	20	7.0	24
		05/12/05	7.0	21	7.0	24
		05/13/05	7.0	20	7.0	24
		05/14/05	7.4	20	7.0	24
		05/15/05	7.2	21	7.0	24
		05/16/05	6.9	21	7.0	24
		05/17/05	6.9	21	7.0	24
		05/18/05	7.0	21	7.0	24
		05/19/05	6.9	21	7.0	24
		05/20/05	6.8	20	7.0	24
		05/21/05	7.2	19	7.0	24
		05/22/05	6.8	19	7.0	24

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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		05/23/05	7.0	20	7.0	24
		05/24/05	7.0	20	7.0	24
		05/25/05	6.8	20	7.0	24
		05/26/05	6.9	19	7.0	24
		05/27/05	6.8	20	7.0	24
		05/28/05	7.2	21	7.0	24
		05/29/05	7.3	20	7.0	24
		05/30/05	6.9	21	7.0	24
		05/31/05	6.8	21	7.0	24
	6				7.0	24
		06/01/05	7.0	21	7.0	24
		06/02/05	6.9	21	7.0	24
		06/03/05	6.9	21	7.0	24
		06/04/05	6.8	21	7.0	24
		06/05/05	6.8	22	7.0	24
		06/06/05	6.8	22	7.0	24
		06/07/05	6.8	22	7.0	24
		06/08/05	6.8	22	7.0	24
		06/09/05	7.0	22	7.0	24
		06/10/05	7.0	23	7.0	24
		06/11/05	7.4	25	7.0	24
		06/12/05	7.4	24	7.0	24
		06/13/05	6.9	23	7.0	24
		06/14/05	6.9	23	7.0	24
		06/15/05	6.9	24	7.0	24
		06/16/05	6.9	23	7.0	24
		06/17/05	7.0	23	7.0	24
		06/18/05	7.5	23	7.0	24
		06/19/05	7.5	23	7.0	24
		06/20/05	7.1	23	7.0	24
		06/21/05	7.0	23	7.0	24
		06/22/05	7.1	24	7.0	24
		06/23/05	7.0	23	7.0	24
		06/24/05	6.8	24	7.0	24
		06/25/05	7.0	24	7.0	24
		06/26/05	6.7	26	7.0	24
		06/27/05	6.8	24	7.0	24
		06/28/05	7.0	24	7.0	24
		06/29/05	7.0	24	7.0	24
		06/30/05	6.9	24	7.0	24
	7				7.0	24
		07/01/05	7.1	24	7.0	24
		07/02/05	7.1	25	7.0	24
		07/03/05	7.2	25	7.0	24
		07/04/05	7.0	24	7.0	24
		07/05/05	7.0	24	7.0	24
		07/06/05	7.0	24	7.0	24
		07/07/05	7.0	24	7.0	24
		07/08/05	6.9	24	7.0	24
		07/09/05	7.1	24	7.0	24
		07/10/05	7.2	25	7.0	24
		07/11/05	6.8	24	7.0	24
		07/12/05	6.8	24	7.0	24
		07/13/05	6.9	25	7.0	24
		07/14/05	6.9	25	7.0	24
		07/15/05	6.9	25	7.0	24
		07/16/05	7.3	25	7.0	24
		07/17/05	7.2	25	7.0	24
		07/18/05	6.9	25	7.0	24
		07/19/05	7.0	25	7.0	24
		07/20/05	6.9	25	7.0	24
		07/21/05	6.8	25	7.0	24
		07/22/05	6.8	26	7.0	23
		07/23/05	7.0	26	7.0	23
		07/24/05	7.0	26	7.0	23
		07/25/05	6.9	26	7.0	23
		07/26/05	6.9	26	7.0	23
		07/27/05	7.0	26	7.0	23
		07/28/05	6.9	26	7.0	23
		07/29/05	6.8	25	7.0	23
		07/30/05	7.0	26	7.0	23

Noman M. Cole, Jr. Pollution Control Plant
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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		07/31/05	7.0	25	7.0	23
	8				7.0	23
		08/01/05	6.9	25	7.0	23
		08/02/05	7.0	26	7.0	23
		08/03/05	7.0	26	7.0	23
		08/04/05	7.0	26	7.0	23
		08/05/05	7.0	26	7.0	23
		08/06/05	7.2	26	7.0	23
		08/07/05	7.0	27	7.0	23
		08/08/05	7.0	26	7.0	23
		08/09/05	7.0	26	7.0	23
		08/10/05	7.0	26	7.0	23
		08/11/05	6.8	26	7.0	23
		08/12/05	6.8	26	7.0	23
		08/13/05	8.1	27	7.0	23
		08/14/05	8.0	27	7.0	23
		08/15/05	6.7	27	7.0	23
		08/16/05	7.0	27	7.0	23
		08/17/05	6.9	26	7.0	23
		08/18/05	6.9	26	7.0	23
		08/19/05	7.0	26	7.0	23
		08/20/05	7.0	26	7.0	23
		08/21/05	7.2	26	7.0	23
		08/22/05	6.9	26	7.0	23
		08/23/05	7.0	26	7.0	23
		08/24/05	7.1	26	7.0	23
		08/25/05	6.9	26	7.0	23
		08/26/05	7.0	26	7.0	23
		08/27/05	7.1	26	7.0	23
		08/28/05	7.1	26	7.0	23
		08/29/05	7.0	26	7.0	23
		08/30/05	6.9	27	7.0	23
		08/31/05	7.0	26	7.0	23
	9				7.0	23
		09/01/05	6.9	26	7.0	23
		09/02/05	7.0	26	7.0	23
		09/03/05	7.4	26	7.0	23
		09/04/05	7.0	26	7.0	23
		09/05/05	7.0	26	7.0	23
		09/06/05	7.0	26	7.0	23
		09/07/05	6.9	26	7.0	23
		09/08/05	6.9	26	7.0	23
		09/09/05	7.1	26	7.0	23
		09/10/05	7.1	26	7.0	23
		09/11/05	7.1	26	7.0	23
		09/12/05	7.2	26	7.0	23
		09/13/05	7.4	26	7.0	23
		09/14/05	7.4	26	7.0	23
		09/15/05	7.4	26	7.0	23
		09/16/05	7.2	26	7.0	23
		09/17/05	7.7	26	7.0	23
		09/18/05	7.3	26	7.0	23
		09/19/05	7.3	26	7.0	23
		09/20/05	7.4	26	7.0	23
		09/21/05	7.5	26	7.0	23
		09/22/05	7.5	26	7.0	23
		09/23/05	7.4	26	7.0	23
		09/24/05	7.4	26	7.0	23
		09/25/05	7.4	26	7.0	23
		09/26/05	7.4	26	7.0	23
		09/27/05	7.4	26	7.0	23
		09/28/05	7.2	27	7.0	23
		09/29/05	7.3	26	7.0	23
		09/30/05	7.4	25	7.0	23
	10				7.0	23
		10/01/05	7.7	25	7.0	23
		10/02/05	7.8	26	7.0	23
		10/03/05	7.4	26	7.0	23
		10/04/05	7.5	26	7.0	23
		10/05/05	7.5	27	7.0	23
		10/06/05	7.5	27	7.0	23

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		10/07/05	7.5	27	7.0	23
		10/08/05	7.2	26	7.0	23
		10/09/05	7.0	24	7.0	23
		10/10/05	7.1	25	7.0	23
		10/11/05	7.2	25	7.0	23
		10/12/05	7.1	25	7.0	23
		10/13/05	7.1	25	7.0	23
		10/14/05	7.0	25	7.0	23
		10/15/05	7.1	24	7.0	23
		10/16/05	7.0	24	7.0	23
		10/17/05	7.1	24	7.0	23
		10/18/05	7.1	25	7.0	23
		10/19/05	7.1	25	7.0	23
		10/20/05	7.0	25	7.0	23
		10/21/05	6.6	25	7.0	23
		10/22/05	6.8	22	7.0	23
		10/23/05	6.9	21	7.0	23
		10/24/05	7.1	23	7.0	23
		10/25/05	7.0	23	7.0	23
		10/26/05	7.0	22	7.0	23
		10/27/05	6.7	22	7.0	23
		10/28/05	6.8	22	7.0	23
		10/29/05	7.1	20	7.0	23
		10/30/05	7.1	20	7.0	23
		10/31/05	7.0	22	7.0	23
2006	4				7.0	23
		04/01/06	6.9	20	7.0	23
		04/02/06	6.9	19	7.0	23
		04/03/06	6.7	19	7.0	23
		04/04/06	7.0	18	7.0	23
		04/05/06	6.8	18	7.0	23
		04/06/06	6.8	18	7.0	23
		04/07/06	6.7	18	7.0	23
		04/08/06	7.0	20	7.0	23
		04/09/06	6.7	18	7.0	23
		04/10/06	6.7	18	7.0	23
		04/11/06	6.9	19	7.0	23
		04/12/06	6.6	19	7.0	23
		04/13/06	6.8	19	7.0	23
		04/14/06	6.8	19	7.0	23
		04/15/06	7.3	20	7.0	23
		04/16/06	7.3	21	7.0	23
		04/17/06	6.9	20	7.0	23
		04/18/06	6.8	19	7.0	22
		04/19/06	6.8	19	7.0	22
		04/20/06	6.8	19	7.0	22
		04/21/06	6.7	20	7.0	22
		04/22/06	7.0	20	7.0	22
		04/23/06	6.9	20	7.0	22
		04/24/06	6.9	20	7.0	22
		04/25/06	6.8	19	7.0	22
		04/26/06	6.9	19	7.0	22
		04/27/06	6.9	20	7.0	22
		04/28/06	6.9	19	7.0	22
		04/29/06	7.1	20	7.0	22
		04/30/06	6.9	19	7.0	22
	5				7.0	22
		05/01/06	6.8	20	7.0	22
		05/02/06	7.0	20	7.0	22
		05/03/06	6.8	20	7.0	22
		05/04/06	6.7	20	7.0	22
		05/05/06	6.8	21	7.0	22
		05/06/06	7.0	22	7.0	22
		05/07/06	7.0	21	7.0	22
		05/08/06	6.6	21	7.0	22
		05/09/06	6.7	20	7.0	22
		05/10/06	6.9	21	7.0	22
		05/11/06	6.7	21	7.0	22
		05/12/06	7.0	21	7.0	22
		05/13/06	6.9	21	6.9	22
		05/14/06	6.9	21	6.9	22

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		05/15/06	6.9	21	6.9	22
		05/16/06	7.0	21	6.9	22
		05/17/06	7.0	20	6.9	22
		05/18/06	6.9	20	6.9	22
		05/19/06	6.6	20	6.9	22
		05/20/06	7.0	20	6.9	22
		05/21/06	6.9	21	6.9	22
		05/22/06	6.8	20	6.9	22
		05/23/06	6.9	20	6.9	22
		05/24/06	6.8	21	6.9	22
		05/25/06	6.9	21	6.9	22
		05/26/06	6.8	22	6.9	22
		05/27/06	6.8	22	6.9	22
		05/28/06	8.0	23	6.9	22
		05/29/06	6.7	22	6.9	22
		05/30/06	6.9	22	6.9	22
		05/31/06	7.0	23	6.9	22
	6				6.9	22
		06/01/06	6.7	22	6.9	22
		06/02/06	6.7	23	6.9	22
		06/03/06	6.9	23	6.9	22
		06/04/06	7.2	23	6.9	22
		06/05/06	6.8	23	6.9	22
		06/06/06	7.0	23	6.9	22
		06/07/06	6.8	23	6.9	22
		06/08/06	6.9	23	6.9	22
		06/09/06	6.9	23	6.9	22
		06/10/06	7.0	23	6.9	22
		06/11/06	7.1	23	6.9	22
		06/12/06	6.9	23	6.9	22
		06/13/06	6.9	23	6.9	22
		06/14/06	6.8	23	6.9	22
		06/15/06	6.6	23	6.9	22
		06/16/06	6.7	23	6.9	22
		06/17/06	6.9	24	6.9	22
		06/18/06	6.9	25	6.9	22
		06/19/06	7.0	24	6.9	22
		06/20/06	6.9	24	6.9	22
		06/21/06	6.8	24	6.9	22
		06/22/06	6.8	24	6.9	22
		06/23/06	6.8	24	6.9	22
		06/24/06	7.1	26	6.9	22
		06/25/06	7.1	26	6.9	22
		06/26/06	6.8	25	6.9	22
		06/27/06	6.7	23	6.9	21
		06/28/06	6.6	22	6.9	21
		06/29/06	6.7	23	6.9	21
		06/30/06	6.7	23	6.9	21
	7				6.9	21
		07/01/06	6.7	24	6.9	21
		07/02/06	6.8	26	6.9	21
		07/03/06	6.7	24	6.9	21
		07/04/06	6.8	24	6.9	21
		07/05/06	6.7	24	6.9	21
		07/06/06	6.5	23	6.9	21
		07/07/06	6.6	23	6.9	21
		07/08/06	6.8	24	6.9	21
		07/09/06	6.6	24	6.9	21
		07/10/06	7.1	24	6.9	21
		07/11/06	6.5	24	6.9	21
		07/12/06	6.8	25	6.9	21
		07/13/06	6.5	24	6.9	21
		07/14/06	6.5	25	6.9	21
		07/15/06	6.8	26	6.9	21
		07/16/06	6.8	26	6.9	21
		07/17/06	6.7	25	6.9	21
		07/18/06	6.6	26	6.9	21
		07/19/06	6.5	26	6.9	21
		07/20/06	6.5	25	6.9	21
		07/21/06	7.0	26	6.9	21
		07/22/06	7.2	26	6.9	21

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		07/23/06	7.3	26	6.9	21
		07/24/06	7.1	25	6.9	21
		07/25/06	7.1	25	6.9	21
		07/26/06	7.0	25	6.9	21
		07/27/06	7.0	25	6.9	21
		07/28/06	7.1	25	6.9	21
		07/29/06	7.0	27	6.9	21
		07/30/06	7.0	27	6.9	21
		07/31/06	7.0	26	6.9	21
	8				6.9	21
		08/01/06	7.1	26	6.9	21
		08/02/06	7.1	26	6.9	21
		08/03/06	7.0	26	6.9	21
		08/04/06	7.1	26	6.9	21
		08/05/06	7.4	27	6.9	21
		08/06/06	7.1	28	6.9	21
		08/07/06	7.1	26	6.9	21
		08/08/06	7.0	26	6.9	21
		08/09/06	7.1	26	6.9	21
		08/10/06	6.9	26	6.9	21
		08/11/06	7.2	26	6.9	21
		08/12/06	7.2	25	6.9	21
		08/13/06	7.1	24	6.9	21
		08/14/06	7.1	26	6.9	21
		08/15/06	7.1	26	6.9	21
		08/16/06	7.1	26	6.9	21
		08/17/06	6.8	26	6.9	21
		08/18/06	7.1	26	6.9	21
		08/19/06	7.2	26	6.9	21
		08/20/06	7.1	27	6.9	21
		08/21/06	7.2	26	6.9	21
		08/22/06	7.1	26	6.9	21
		08/23/06	7.2	26	6.9	21
		08/24/06	7.1	26	6.9	21
		08/25/06	7.2	26	6.9	21
		08/26/06	7.0	27	6.9	21
		08/27/06	7.1	27	6.9	21
		08/28/06	7.3	27	6.9	21
		08/29/06	7.4	27	6.9	21
		08/30/06	7.3	27	6.9	21
		08/31/06	7.0	26	6.9	21
	9				6.9	21
		09/01/06	7.1	26	6.9	21
		09/02/06	7.2	23	6.9	20
		09/03/06	7.0	23	6.9	20
		09/04/06	7.1	26	6.9	20
		09/05/06	7.1	26	6.9	20
		09/06/06	7.1	25	6.9	20
		09/07/06	7.1	25	6.9	20
		09/08/06	7.1	25	6.9	20
		09/09/06	7.0	26	6.9	20
		09/10/06	7.0	26	6.9	20
		09/11/06	7.0	26	6.9	20
		09/12/06	7.0	25	6.9	20
		09/13/06	7.0	25	6.9	20
		09/14/06	6.9	25	6.9	20
		09/15/06	6.7	25	6.9	20
		09/16/06	7.1	25	6.9	20
		09/17/06	7.0	25	6.9	20
		09/18/06	7.0	26	6.9	20
		09/19/06	7.1	26	6.9	20
		09/20/06	7.2	25	6.9	20
		09/21/06	7.1	24	6.9	20
		09/22/06	7.1	24	6.9	20
		09/23/06	7.0	24	6.9	20
		09/24/06	7.1	23	6.9	20
		09/25/06	7.1	25	6.9	20
		09/26/06	7.1	25	6.9	20
		09/27/06	7.2	25	6.9	20
		09/28/06	7.0	25	6.9	20
		09/29/06	6.7	24	6.9	20

Noman M. Cole, Jr. Pollution Control Plant
April 2003 - October 2007

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		09/30/06	7.2	22	6.9	20
	10				6.9	20
		10/01/06	7.5	23	6.9	20
		10/02/06	7.2	24	6.9	20
		10/03/06	7.2	24	6.9	20
		10/04/06	7.2	25	6.9	20
		10/05/06	7.2	25	6.9	20
		10/06/06	7.1	24	6.8	20
		10/07/06	7.0	22	6.8	20
		10/08/06	7.0	23	6.8	20
		10/09/06	7.1	25	6.8	20
		10/10/06	7.0	24	6.8	20
		10/11/06	7.0	24	6.8	20
		10/12/06	7.1	24	6.8	20
		10/13/06	7.0	23	6.8	20
		10/14/06	7.0	21	6.8	20
		10/15/06	7.4	22	6.8	20
		10/16/06	7.0	22	6.8	20
		10/17/06	7.0	23	6.8	20
		10/18/06	6.9	23	6.8	20
		10/19/06	6.9	24	6.8	20
		10/20/06	7.0	24	6.8	20
		10/21/06	6.6	21	6.8	20
		10/22/06	6.9	22	6.8	20
		10/23/06	7.0	22	6.8	20
		10/24/06	7.0	22	6.8	20
		10/25/06	7.0	21	6.8	20
		10/26/06	6.9	21	6.8	20
		10/27/06	7.0	22	6.8	20
		10/28/06	7.1	20	6.8	20
		10/29/06	7.2	20	6.8	20
		10/30/06	6.7	21	6.8	20
		10/31/06	6.8	22	6.8	20
2007	4				6.8	20
		04/01/07	6.9	18	6.8	20
		04/02/07	6.8	18	6.8	20
		04/03/07	6.9	18	6.8	20
		04/04/07	6.9	18	6.8	20
		04/05/07	6.8	17	6.8	20
		04/06/07	6.9	17	6.8	20
		04/07/07	6.6	17	6.8	20
		04/08/07	6.9	17	6.8	20
		04/09/07	6.8	17	6.8	20
		04/10/07	6.9	17	6.8	20
		04/11/07	6.8	17	6.8	20
		04/12/07	6.8	18	6.8	20
		04/13/07	6.8	17	6.8	20
		04/14/07	6.8	18	6.8	20
		04/15/07	6.6	18	6.8	20
		04/16/07	6.8	16	6.8	20
		04/17/07	6.8	16	6.8	20
		04/18/07	6.8	16	6.8	20
		04/19/07	6.7	17	6.8	20
		04/20/07	6.6	18	6.8	19
		04/21/07	6.8	18	6.8	19
		04/22/07	6.9	18	6.8	19
		04/23/07	7.0	18	6.8	19
		04/24/07	6.6	19	6.8	19
		04/25/07	6.7	19	6.8	19
		04/26/07	7.0	19	6.8	19
		04/27/07	6.8	19	6.8	19
		04/28/07	6.9	19	6.8	19
		04/29/07	6.7	19	6.8	19
		04/30/07	6.7	19	6.8	19
	5				6.8	19
		05/01/07	7.1	20	6.8	19
		05/02/07	6.7	20	6.8	19
		05/03/07	6.7	20	6.8	19
		05/04/07	6.8	20	6.8	19
		05/05/07	7.0	20	6.8	19
		05/06/07	7.0	19	6.8	19

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		05/07/07	7.3	19	6.8	19
		05/08/07	7.0	19	6.8	19
		05/09/07	6.9	20	6.8	19
		05/10/07	6.8	21	6.8	19
		05/11/07	6.7	21	6.8	19
		05/12/07	6.8	21	6.8	19
		05/13/07	6.9	20	6.8	19
		05/14/07	7.0	20	6.8	19
		05/15/07	7.2	20	6.8	19
		05/16/07	7.0	21	6.8	19
		05/17/07	7.1	21	6.8	19
		05/18/07	6.9	21	6.8	19
		05/19/07	6.9	18	6.8	19
		05/20/07	6.9	18	6.8	19
		05/21/07	7.0	21	6.8	19
		05/22/07	6.8	21	6.8	19
		05/23/07	6.8	21	6.8	19
		05/24/07	7.2	21	6.8	19
		05/25/07	6.9	21	6.8	19
		05/26/07	6.8	22	6.8	19
		05/27/07	7.1	22	6.8	19
		05/28/07	6.9	22	6.8	19
		05/29/07	7.0	22	6.8	19
		05/30/07	7.1	22	6.8	19
		05/31/07	6.7	22	6.8	19
	6				6.8	19
		06/01/07	6.8	22	6.8	19
		06/02/07	6.9	23	6.8	19
		06/03/07	7.0	23	6.8	19
		06/04/07	6.9	23	6.8	19
		06/05/07	6.9	23	6.8	19
		06/06/07	7.0	22	6.8	19
		06/07/07	7.1	22	6.8	19
		06/08/07	6.8	23	6.8	19
		06/09/07	7.2	24	6.8	19
		06/10/07	6.8	23	6.8	19
		06/11/07	7.1	23	6.8	19
		06/12/07	7.0	23	6.8	19
		06/13/07	7.0	23	6.8	19
		06/14/07	6.8	23	6.8	19
		06/15/07	6.7	22	6.8	19
		06/16/07	6.9	22	6.8	19
		06/17/07	6.8	24	6.8	19
		06/18/07	7.1	24	6.8	19
		06/19/07	7.1	23	6.8	19
		06/20/07	7.1	24	6.8	19
		06/21/07	7.1	24	6.8	19
		06/22/07	7.1	23	6.8	19
		06/23/07	7.4	23	6.8	19
		06/24/07	7.4	24	6.8	19
		06/25/07	7.2	24	6.8	19
		06/26/07	7.2	24	6.8	19
		06/27/07	7.3	24	6.8	19
		06/28/07	7.3	24	6.7	19
		06/29/07	7.3	24	6.7	19
		06/30/07	7.1	24	6.7	18
	7				6.7	18
		07/01/07	7.4	24	6.7	18
		07/02/07	7.3	24	6.7	18
		07/03/07	7.1	24	6.7	18
		07/04/07	7.2	24	6.7	18
		07/05/07	7.1	24	6.7	18
		07/06/07	7.1	24	6.7	18
		07/07/07	7.1	25	6.7	18
		07/08/07	7.1	25	6.7	18
		07/09/07	7.2	25	6.7	18
		07/10/07	7.0	25	6.7	18
		07/11/07	7.0	25	6.7	18
		07/12/07	7.0	25	6.7	18
		07/13/07	7.2	25	6.7	18
		07/14/07	6.9	24	6.7	18

Noman M. Cole, Jr. Pollution Control Plant
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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		07/15/07	6.8	26	6.7	18
		07/16/07	7.1	25	6.7	18
		07/17/07	7.1	25	6.7	18
		07/18/07	7.1	26	6.7	18
		07/19/07	7.0	25	6.7	18
		07/20/07	7.0	25	6.7	18
		07/21/07	7.1	25	6.7	18
		07/22/07	7.1	25	6.7	18
		07/23/07	7.2	25	6.7	18
		07/24/07	7.1	25	6.7	18
		07/25/07	7.0	25	6.7	18
		07/26/07	7.0	26	6.7	18
		07/27/07	7.0	25	6.7	18
		07/28/07	7.0	26	6.7	18
		07/29/07	7.2	26	6.7	18
		07/30/07	7.1	25	6.7	18
		07/31/07	7.0	26	6.7	18
	8				6.7	18
		08/01/07	7.2	26	6.7	18
		08/02/07	7.1	24	6.7	18
		08/03/07	7.0	26	6.7	18
		08/04/07	7.2	26	6.7	18
		08/05/07	7.2	26	6.7	18
		08/06/07	7.0	26	6.7	18
		08/07/07	6.9	26	6.7	18
		08/08/07	7.0	26	6.7	18
		08/09/07	6.9	27	6.7	18
		08/10/07	7.1	26	6.7	18
		08/11/07	6.9	26	6.7	18
		08/12/07	6.9	26	6.7	18
		08/13/07	7.2	26	6.7	18
		08/14/07	7.1	26	6.7	18
		08/15/07	7.2	26	6.7	18
		08/16/07	7.1	26	6.7	17
		08/17/07	7.1	26	6.7	17
		08/18/07	7.2	26	6.7	17
		08/19/07	7.2	26	6.7	17
		08/20/07	7.2	26	6.7	17
		08/21/07	7.1	25	6.7	17
		08/22/07	7.0	25	6.6	17
		08/23/07	7.1	26	6.6	17
		08/24/07	7.1	26	6.6	17
		08/25/07	6.9	26	6.6	17
		08/26/07	7.2	25	6.6	17
		08/27/07	7.3	26	6.6	17
		08/28/07	7.3	26	6.6	17
		08/29/07	7.4	26	6.6	17
		08/30/07	7.2	26	6.6	17
		08/31/07	7.4	26	6.6	17
	9				6.6	17
		09/01/07	7.5	26	6.6	17
		09/02/07	7.5	26	6.6	17
		09/03/07	7.4	26	6.6	17
		09/04/07	7.2	26	6.6	17
		09/05/07	7.3	26	6.6	17
		09/06/07	7.4	26	6.6	17
		09/07/07	7.3	26	6.6	17
		09/08/07	7.3	27	6.6	17
		09/09/07	7.0	26	6.6	17
		09/10/07	7.1	27	6.6	17
		09/11/07	7.2	26	6.6	17
		09/12/07	7.3	26	6.6	17
		09/13/07	7.3	26	6.6	17
		09/14/07	7.2	26	6.6	17
		09/15/07	7.2	26	6.6	17
		09/16/07	7.0	25	6.5	16
		09/17/07	7.2	24	6.5	16
		09/18/07	7.2	25	6.5	16
		09/19/07	7.2	25	6.5	16
		09/20/07	7.1	25	6.5	16
		09/21/07	7.2	25	6.5	16

Noman M. Cole, Jr. Pollution Control Plant
April 2003 - October 2007

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		09/22/07	7.1	25	6.5	16
		09/23/07	7.0	25	6.5	16
		09/24/07	7.3	26	6.5	16
		09/25/07	7.3	26	6.5	16
		09/26/07	7.1	25	6.4	16
		09/27/07	7.0	26	6.3	16
		09/28/07	7.0	26	6.3	15
		09/29/07	7.0	24		
		09/30/07	7.1	24		
	10					
		10/01/07	7.1	25		
		10/02/07	7.3	25		
		10/03/07	7.1	26		
		10/04/07	7.1	26		
		10/05/07	7.0	26		
		10/06/07	7.0	26		
		10/07/07	7.0	26		
		10/08/07	7.1	26		
		10/09/07	7.1	26		
		10/10/07	7.4	26		
		10/11/07	7.4	25		
		10/12/07	7.0	24		
		10/13/07	7.1	24		
		10/14/07	7.3	24		
		10/15/07	7.3	24		
		10/16/07	7.2	24		
		10/17/07	7.2	25		
		10/18/07	7.1	25		
		10/19/07	7.2	25		
		10/20/07	6.7	24		
		10/21/07	7.0	23		
		10/22/07	7.0	24		
		10/23/07	7.0	25		
		10/24/07	7.0	25		
		10/25/07	7.1	24		
		10/26/07	7.0	24		
		10/27/07	7.2	23		
		10/28/07	7.1	21		
		10/29/07	7.0	23		
		10/30/07	7.0	22		
		10/31/07	6.9	22		

Noman M. Cole, Jr. Pollution Control Plant
November - March
2003-2008

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
2003	*11*					
		11/01/03	7.3	23	7.4	23
		11/02/03	7.1	22	7.4	23
		11/03/03	7.4	22	7.4	23
		11/04/03	7.2	22	7.4	23
		11/05/03	7.2	23	7.4	23
		11/06/03	7.1	23	7.4	23
		11/07/03	7.0	22	7.4	23
		11/08/03	7.0	21	7.4	23
		11/09/03	7.1	21	7.3	22
		11/10/03	7.2	21	7.3	22
		11/11/03	7.1	21	7.3	22
		11/12/03	7.3	21	7.3	22
		11/13/03	7.3	21	7.3	22
		11/14/03	7.1	19	7.3	22
		11/15/03	7.1	20	7.3	22
		11/16/03	7.1	21	7.3	22
		11/17/03	6.9	21	7.3	22
		11/18/03	7.3	21	7.3	22
		11/19/03	7.2	21	7.3	22
		11/20/03	7.0	21	7.3	22
		11/21/03	6.8	20	7.3	22
		11/22/03	7.1	20	7.3	22
		11/23/03	7.1	20	7.3	22
		11/24/03	7.2	21	7.3	22
		11/25/03	7.4	20	7.3	22
		11/26/03	6.9	20	7.2	22
		11/27/03	7.3	20	7.2	22
		11/28/03	7.3	21	7.2	22
		11/29/03	7.0	20	7.2	22
		11/30/03	7.0	19	7.2	22
	12				7.2	22
		12/01/03	7.0	20	7.2	22
		12/02/03	7.1	20	7.2	22
		12/03/03	7.4	19	7.2	22
		12/04/03	7.3	19	7.2	22
		12/05/03	7.1	19	7.2	22
		12/06/03	6.9	18	7.2	22
		12/07/03	6.9	18	7.2	22
		12/08/03	7.1	18	7.2	22
		12/09/03	7.0	19	7.2	22
		12/10/03	7.0	19	7.2	22
		12/11/03	7.0	19	7.2	22
		12/12/03	6.9	18	7.2	22
		12/13/03	7.1	18	7.2	22
		12/14/03	6.9	17	7.2	22
		12/15/03	6.9	17	7.2	22
		12/16/03	6.4	17	7.2	22
		12/17/03	6.6	18	7.2	22
		12/18/03	6.6	17	7.2	21
		12/19/03	6.9	17	7.2	21
		12/20/03	6.5	17	7.2	21
		12/21/03	6.7	17	7.2	21
		12/22/03	6.7	18	7.2	21
		12/23/03	6.9	18	7.2	21
		12/24/03	6.9	18	7.2	21
		12/25/03	6.8	17	7.2	21
		12/26/03	6.9	17	7.2	21
		12/27/03	7.2	17	7.2	21
		12/28/03	7.0	17	7.2	21
		12/29/03	6.9	17	7.2	21
		12/30/03	6.9	18	7.2	21
		12/31/03	6.9	18	7.2	21
2004					7.2	21
	1				7.2	21
		01/01/04	6.9	17	7.2	21
		01/02/04	6.9	18	7.2	21
		01/03/04	7.3	19	7.2	21
		01/04/04	7.3	19	7.2	21
		01/05/04	7.0	19	7.2	21

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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH		Sorted Temperature	
		01/06/04	7.0	18	7.2		21	
		01/07/04	6.8	17	7.1		21	
		01/08/04	7.1	17	7.1		21	
		01/09/04	7.0	17	7.1	90th percentile	21	90th percentile
		01/10/04	6.8	16	7.1		21	
		01/11/04	6.9	16	7.1		21	
		01/12/04	6.8	17	7.1		21	
		01/13/04	6.9	17	7.1		21	
		01/14/04	6.8	17	7.1		21	
		01/15/04	6.8	17	7.1		21	
		01/16/04	7.0	16	7.1		21	
		01/17/04	7.0	16	7.1		21	
		01/18/04	7.1	16	7.1		21	
		01/19/04	6.8	16	7.1		21	
		01/20/04	6.8	16	7.1		21	
		01/21/04	6.8	15	7.1		21	
		01/22/04	6.8	16	7.1		21	
		01/23/04	6.8	15	7.1		21	
		01/24/04	6.9	15	7.1		21	
		01/25/04	6.8	15	7.1		21	
		01/26/04	6.7	15	7.1		21	
		01/27/04	7.0	16	7.1		21	
		01/28/04	6.8	16	7.1		21	
		01/29/04	6.7	15	7.1		21	
		01/30/04	7.0	16	7.1		21	
		01/31/04	7.0	15	7.1		21	
	2				7.1		21	
		02/01/04	7.0	15	7.1		21	
		02/02/04	6.7	16	7.1		21	
		02/03/04	6.8	16	7.1		21	
		02/04/04	6.7	18	7.1		21	
		02/05/04	6.7	16	7.1		21	
		02/06/04	6.7	16	7.1		21	
		02/07/04	6.8	14	7.1		20	
		02/08/04	6.7	14	7.1		20	
		02/09/04	6.7	14	7.1		20	
		02/10/04	6.7	15	7.1		20	
		02/11/04	6.7	16	7.1		20	
		02/12/04	6.5	16	7.1		20	
		02/13/04	6.6	16	7.1		20	
		02/14/04	6.9	15	7.1		20	
		02/15/04	6.9	16	7.1		20	
		02/16/04	6.7	14	7.1		20	
		02/17/04	6.6	15	7.1		20	
		02/18/04	6.5	15	7.1		20	
		02/19/04	6.7	15	7.1		20	
		02/20/04	6.7	15	7.1		20	
		02/21/04	7.0	16	7.1		20	
		02/22/04	6.9	15	7.1		20	
		02/23/04	6.8	15	7.1		20	
		02/24/04	6.9	16	7.1		20	
		02/25/04	6.9	16	7.1		20	
		02/26/04	6.8	16	7.1		20	
		02/27/04	6.7	15	7.1		20	
		02/28/04	6.9	16	7.1		20	
		02/29/04	6.9	16	7.1		20	
	3				7.1		20	
		03/01/04	6.8	16	7.1		20	
		03/02/04	6.8	17	7.1		20	
		03/03/04	6.4	17	7.1		20	
		03/04/04	6.7	17	7.1		20	
		03/05/04	6.9	17	7.1		20	
		03/06/04	7.0	18	7.1		20	
		03/07/04	7.0	18	7.1		20	
		03/08/04	6.9	16	7.1		20	
		03/09/04	6.9	16	7.1		20	
		03/10/04	7.0	16	7.1		20	
		03/11/04	6.9	16	7.1		20	
		03/12/04	6.8	17	7.1		20	
		03/13/04	7.4	16	7.1		20	

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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		03/14/04	7.3	16	7.1	20
		03/15/04	6.8	17	7.1	20
		03/16/04	7.0	17	7.1	20
		03/17/04	7.0	16	7.1	20
		03/18/04	6.9	16	7.1	20
		03/19/04	7.0	17	7.1	20
		03/20/04	7.1	16	7.1	20
		03/21/04	7.1	17	7.1	20
		03/22/04	6.9	16	7.1	20
		03/23/04	6.9	16	7.1	20
		03/24/04	6.8	17	7.1	20
		03/25/04	6.8	17	7.1	20
		03/26/04	7.0	18	7.1	20
		03/27/04	7.0	18	7.1	20
		03/28/04	7.0	18	7.1	20
		03/29/04	6.9	18	7.1	20
		03/30/04	6.9	18	7.1	20
		03/31/04	6.8	18	7.1	20
	11				7.0	20
		11/01/04	7.1	22	7.0	20
		11/02/04	7.1	22	7.0	20
		11/03/04	7.1	23	7.0	20
		11/04/04	7.3	23	7.0	20
		11/05/04	7.1	21	7.0	20
		11/06/04	7.1	21	7.0	20
		11/07/04	7.4	22	7.0	20
		11/08/04	7.2	22	7.0	19
		11/09/04	7.1	22	7.0	19
		11/10/04	6.9	22	7.0	19
		11/11/04	7.0	22	7.0	19
		11/12/04	7.0	22	7.0	19
		11/13/04	7.2	21	7.0	19
		11/14/04	7.2	19	7.0	19
		11/15/04	7.0	20	7.0	19
		11/16/04	7.1	20	7.0	19
		11/17/04	7.0	21	7.0	19
		11/18/04	6.9	21	7.0	19
		11/19/04	6.8	21	7.0	19
		11/20/04	7.1	21	7.0	19
		11/21/04	7.1	21	7.0	19
		11/22/04	6.9	22	7.0	19
		11/23/04	7.1	21	7.0	19
		11/24/04	7.2	21	7.0	19
		11/25/04	7.0	22	7.0	19
		11/26/04	7.3	20	7.0	19
		11/27/04	7.3	20	7.0	19
		11/28/04	7.4	21	7.0	19
		11/29/04	7.1	20	7.0	19
		11/30/04	6.8	20	7.0	19
	12				7.0	19
		12/01/04	7.0	21	7.0	19
		12/02/04	6.8	20	7.0	19
		12/03/04	6.5	18	7.0	19
		12/04/04	6.8	19	7.0	19
		12/05/04	6.8	20	7.0	19
		12/06/04	6.8	20	7.0	19
		12/07/04	6.9	20	7.0	19
		12/08/04	6.7	20	7.0	19
		12/09/04	6.8	20	7.0	19
		12/10/04	6.6	19	7.0	19
		12/11/04	6.6	18	7.0	19
		12/12/04	7.1	18	7.0	19
		12/13/04	6.7	19	7.0	19
		12/14/04	6.5	19	7.0	19
		12/15/04	6.5	18	7.0	19
		12/16/04	6.7	18	7.0	19
		12/17/04	6.8	18	7.0	19
		12/18/04	7.1	18	7.0	19
		12/19/04	6.9	19	7.0	19
		12/20/04	6.8	17	7.0	19

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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		12/21/04	6.8	17	7.0	19
		12/22/04	6.8	18	7.0	19
		12/23/04	7.2	19	7.0	19
		12/24/04	7.0	18	7.0	19
		12/25/04	7.1	17	7.0	19
		12/26/04	7.1	17	7.0	19
		12/27/04	6.8	17	7.0	19
		12/28/04	6.9	17	7.0	19
		12/29/04	6.9	18	7.0	19
		12/30/04	6.7	18	7.0	19
		12/31/04	7.0	18	7.0	19
2005					7.0	19
	1				7.0	19
		01/01/05	7.0	18	7.0	19
		01/02/05	7.2	18	7.0	19
		01/03/05	7.1	18	7.0	19
		01/04/05	7.0	18	7.0	19
		01/05/05	7.0	19	7.0	19
		01/06/05	7.1	19	7.0	19
		01/07/05	7.2	18	7.0	19
		01/08/05	7.2	17	7.0	19
		01/09/05	7.0	17	7.0	19
		01/10/05	6.9	18	7.0	18
		01/11/05	7.1	18	7.0	18
		01/12/05	7.0	18	7.0	18
		01/13/05	6.9	19	7.0	18
		01/14/05	6.9	19	7.0	18
		01/15/05	7.1	16	7.0	18
		01/16/05	7.0	16	7.0	18
		01/17/05	6.9	16	7.0	18
		01/18/05	6.9	16	7.0	18
		01/19/05	6.9	16	7.0	18
		01/20/05	6.9	17	7.0	18
		01/21/05	7.0	17	7.0	18
		01/22/05	7.1	14	7.0	18
		01/23/05	7.1	13	7.0	18
		01/24/05	6.8	16	7.0	18
		01/25/05	6.9	16	7.0	18
		01/26/05	6.8	16	7.0	18
		01/27/05	6.7	16	7.0	18
		01/28/05	6.7	16	7.0	18
		01/29/05	7.2	16	7.0	18
		01/30/05	7.2	16	7.0	18
		01/31/05	6.7	16	7.0	18
	2				7.0	18
		02/01/05	6.9	16	7.0	18
		02/02/05	6.8	16	7.0	18
		02/03/05	7.1	17	7.0	18
		02/04/05	6.9	17	7.0	18
		02/05/05	7.2	16	7.0	18
		02/06/05	7.0	16	7.0	18
		02/07/05	6.9	17	7.0	18
		02/08/05	7.0	17	7.0	18
		02/09/05	7.0	17	7.0	18
		02/10/05	6.9	17	7.0	18
		02/11/05	6.9	15	7.0	18
		02/12/05	7.2	15	7.0	18
		02/13/05	7.4	15	7.0	18
		02/14/05	7.0	15	7.0	18
		02/15/05	7.0	17	7.0	18
		02/16/05	7.0	17	7.0	18
		02/17/05	7.2	17	7.0	18
		02/18/05	7.1	16	7.0	18
		02/19/05	7.0	16	7.0	18
		02/20/05	7.1	14	7.0	18
		02/21/05	6.9	16	7.0	18
		02/22/05	6.9	17	7.0	18
		02/23/05	6.9	17	7.0	18
		02/24/05	6.8	16	7.0	18
		02/25/05	6.7	16	7.0	18

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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		02/26/05	7.2	16	7.0	18
		02/27/05	7.2	16	7.0	18
		02/28/05	6.8	16	7.0	18
	3				7.0	18
		03/01/05	6.7	16	7.0	18
		03/02/05	6.7	15	7.0	18
		03/03/05	6.8	15	7.0	18
		03/04/05	6.8	16	7.0	18
		03/05/05	7.0	15	7.0	18
		03/06/05	7.0	15	7.0	18
		03/07/05	6.8	16	7.0	18
		03/08/05	6.8	16	7.0	18
		03/09/05	6.8	15	7.0	18
		03/10/05	6.8	15	7.0	18
		03/11/05	6.7	16	6.9	18
		03/12/05	7.0	15	6.9	18
		03/13/05	6.9	15	6.9	18
		03/14/05	7.0	16	6.9	18
		03/15/05	7.0	16	6.9	18
		03/16/05	6.9	16	6.9	18
		03/17/05	6.9	16	6.9	18
		03/18/05	6.8	16	6.9	18
		03/19/05	7.0	16	6.9	18
		03/20/05	7.2	16	6.9	18
		03/21/05	6.8	17	6.9	18
		03/22/05	6.8	17	6.9	18
		03/23/05	6.9	17	6.9	18
		03/24/05	6.7	16	6.9	18
		03/25/05	6.7	16	6.9	18
		03/26/05	6.9	16	6.9	18
		03/27/05	6.9	16	6.9	18
		03/28/05	6.8	17	6.9	18
		03/29/05	6.6	16	6.9	18
		03/30/05	6.6	16	6.9	18
		03/31/05	6.8	17	6.9	18
	11				6.9	18
		11/01/05	7.0	22	6.9	18
		11/02/05	7.1	21	6.9	18
		11/03/05	7.0	22	6.9	18
		11/04/05	7.1	22	6.9	18
		11/05/05	7.1	22	6.9	18
		11/06/05	7.2	22	6.9	18
		11/07/05	7.3	23	6.9	18
		11/08/05	7.1	22	6.9	18
		11/09/05	7.0	22	6.9	18
		11/10/05	7.1	22	6.9	18
		11/11/05	7.1	21	6.9	18
		11/12/05	7.2	20	6.9	18
		11/13/05	7.2	20	6.9	18
		11/14/05	7.1	23	6.9	18
		11/15/05	7.2	21	6.9	18
		11/16/05	7.2	23	6.9	18
		11/17/05	7.1	22	6.9	18
		11/18/05	7.1	21	6.9	18
		11/19/05	7.0	20	6.9	18
		11/20/05	6.6	20	6.9	18
		11/21/05	6.8	21	6.9	18
		11/22/05	6.8	20	6.9	18
		11/23/05	7.0	19	6.9	18
		11/24/05	6.9	20	6.9	18
		11/25/05	6.9	18	6.9	18
		11/26/05	7.2	17	6.9	18
		11/27/05	7.3	17	6.9	18
		11/28/05	6.8	18	6.9	18
		11/29/05	6.9	21	6.9	18
		11/30/05	6.9	21	6.9	18
	12				6.9	18
		12/01/05	6.7	22	6.9	18
		12/02/05	7.0	20	6.9	18
		12/03/05	6.9	18	6.9	18

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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		12/04/05	6.9	19	6.9	18
		12/05/05	6.6	20	6.9	18
		12/06/05	7.0	19	6.9	18
		12/07/05	6.5	19	6.9	18
		12/08/05	6.7	18	6.9	18
		12/09/05	6.8	19	6.9	18
		12/10/05	7.1	18	6.9	18
		12/11/05	6.9	18	6.9	18
		12/12/05	6.8	19	6.9	18
		12/13/05	7.0	18	6.9	18
		12/14/05	6.8	17	6.9	17
		12/15/05	6.6	18	6.9	17
		12/16/05	6.7	18	6.9	17
		12/17/05	7.2	18	6.9	17
		12/18/05	7.0	16	6.9	17
		12/19/05	7.0	18	6.9	17
		12/20/05	7.0	17	6.9	17
		12/21/05	7.2	17	6.9	17
		12/22/05	7.1	17	6.9	17
		12/23/05	7.2	17	6.9	17
		12/24/05	7.0	17	6.9	17
		12/25/05	7.0	16	6.9	17
		12/26/05	7.1	18	6.9	17
		12/27/05	7.0	17	6.9	17
		12/28/05	7.1	17	6.9	17
		12/29/05	7.1	18	6.9	17
		12/30/05	7.0	17	6.9	17
		12/31/05	6.9	17	6.9	17
2006					6.9	17
	1				6.9	17
		01/01/06	7.0	17	6.9	17
		01/02/06	7.1	17	6.9	17
		01/03/06	7.1	18	6.9	17
		01/04/06	7.0	17	6.9	17
		01/05/06	7.0	18	6.9	17
		01/06/06	7.0	18	6.9	17
		01/07/06	7.0	16	6.9	17
		01/08/06	6.9	16	6.9	17
		01/09/06	7.0	17	6.9	17
		01/10/06	7.1	17	6.9	17
		01/11/06	7.1	18	6.9	17
		01/12/06	7.0	18	6.9	17
		01/13/06	7.1	18	6.9	17
		01/14/06	7.4	16	6.9	17
		01/15/06	7.3	16	6.9	17
		01/16/06	7.0	17	6.9	17
		01/17/06	7.0	17	6.9	17
		01/18/06	7.2	18	6.9	17
		01/19/06	7.0	16	6.9	17
		01/20/06	7.0	17	6.9	17
		01/21/06	7.0	17	6.9	17
		01/22/06	7.1	17	6.9	17
		01/23/06	7.0	17	6.9	17
		01/24/06	6.9	17	6.9	17
		01/25/06	7.0	17	6.9	17
		01/26/06	7.0	16	6.9	17
		01/27/06	7.0	16	6.9	17
		01/28/06	7.1	16	6.9	17
		01/29/06	7.1	16	6.9	17
		01/30/06	7.0	17	6.9	17
		01/31/06	7.1	18	6.9	17
	2				6.9	17
		02/01/06	7.0	17	6.9	17
		02/02/06	7.1	17	6.9	17
		02/03/06	7.0	18	6.9	17
		02/04/06	7.2	17	6.9	17
		02/05/06	7.1	17	6.9	17
		02/06/06	6.9	16	6.9	17
		02/07/06	6.9	16	6.9	17
		02/08/06	6.9	16	6.9	17

Noman M. Cole, Jr. Pollution Control Plant
November - March
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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		02/09/06	7.1	16	6.9	17
		02/10/06	7.1	16	6.9	17
		02/11/06	6.9	15	6.9	17
		02/12/06	7.0	15	6.9	17
		02/13/06	6.9	16	6.9	17
		02/14/06	7.0	16	6.9	17
		02/15/06	7.0	17	6.9	17
		02/16/06	7.0	17	6.9	17
		02/17/06	7.0	17	6.9	17
		02/18/06	7.2	16	6.9	17
		02/19/06	6.9	15	6.9	17
		02/20/06	6.9	15	6.9	17
		02/21/06	6.9	16	6.9	17
		02/22/06	7.0	16	6.9	17
		02/23/06	7.1	16	6.9	17
		02/24/06	6.9	17	6.9	17
		02/25/06	7.3	15	6.9	17
		02/26/06	7.2	16	6.9	17
		02/27/06	6.9	16	6.9	17
		02/28/06	6.8	16	6.9	17
	3				6.9	17
		03/01/06	6.8	16	6.9	17
		03/02/06	6.8	16	6.9	17
		03/03/06	6.8	16	6.9	17
		03/04/06	6.9	16	6.9	17
		03/05/06	6.9	16	6.9	17
		03/06/06	6.9	17	6.8	17
		03/07/06	6.9	16	6.8	17
		03/08/06	7.0	16	6.8	17
		03/09/06	6.8	17	6.8	17
		03/10/06	6.9	17	6.8	17
		03/11/06	7.0	18	6.8	17
		03/12/06	7.0	18	6.8	17
		03/13/06	6.9	18	6.8	17
		03/14/06	7.0	18	6.8	17
		03/15/06	7.0	17	6.8	17
		03/16/06	6.9	17	6.8	17
		03/17/06	6.9	18	6.8	17
		03/18/06	7.0	14	6.8	17
		03/19/06	7.0	15	6.8	17
		03/20/06	7.0	17	6.8	17
		03/21/06	6.9	17	6.8	17
		03/22/06	6.9	17	6.8	17
		03/23/06	6.9	17	6.8	17
		03/24/06	6.8	17	6.8	17
		03/25/06	7.0	17	6.8	17
		03/26/06	7.1	17	6.8	17
		03/27/06	6.7	17	6.8	17
		03/28/06	6.8	18	6.8	17
		03/29/06	6.7	18	6.8	17
		03/30/06	6.6	18	6.8	17
		03/31/06	6.6	18	6.8	17
	11				6.8	17
		11/01/06	7.1	22	6.8	17
		11/02/06	6.9	22	6.8	17
		11/03/06	6.8	21	6.8	17
		11/04/06	6.7	20	6.8	17
		11/05/06	7.2	20	6.8	17
		11/06/06	6.9	21	6.8	17
		11/07/06	6.9	21	6.8	17
		11/08/06	6.8	22	6.8	17
		11/09/06	6.7	21	6.8	17
		11/10/06	6.7	21	6.8	17
		11/11/06	6.8	22	6.8	17
		11/12/06	7.0	22	6.8	17
		11/13/06	6.7	20	6.8	17
		11/14/06	6.8	21	6.8	17
		11/15/06	6.9	21	6.8	17
		11/16/06	6.9	21	6.8	17
		11/17/06	6.8	20	6.8	17

Noman M. Cole, Jr. Pollution Control Plant
November - March
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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		11/18/06	6.6	20	6.8	17
		11/19/06	6.6	21	6.8	17
		11/20/06	7.1	20	6.8	17
		11/21/06	6.8	20	6.8	17
		11/22/06	6.7	19	6.8	17
		11/23/06	6.8	20	6.8	17
		11/24/06	6.7	20	6.8	17
		11/25/06	7.0	20	6.8	17
		11/26/06	7.1	20	6.8	17
		11/27/06	6.8	20	6.8	17
		11/28/06	6.8	20	6.8	17
		11/29/06	6.8	20	6.8	17
		11/30/06	7.0	20	6.8	17
	12				6.8	17
		12/01/06	6.7	21	6.8	17
		12/02/06	6.9	20	6.8	17
		12/03/06	6.9	20	6.8	17
		12/04/06	6.8	19	6.8	17
		12/05/06	6.7	19	6.8	17
		12/06/06	6.6	19	6.8	17
		12/07/06	7.0	20	6.8	17
		12/08/06	7.2	18	6.8	17
		12/09/06	6.9	18	6.8	17
		12/10/06	6.9	18	6.8	17
		12/11/06	6.6	19	6.8	17
		12/12/06	6.7	19	6.8	16
		12/13/06	6.8	20	6.8	16
		12/14/06	6.4	19	6.8	16
		12/15/06	6.5	19	6.8	16
		12/16/06	6.8	19	6.8	16
		12/17/06	6.7	19	6.8	16
		12/18/06	6.7	19	6.8	16
		12/19/06	6.7	19	6.8	16
		12/20/06	6.7	18	6.8	16
		12/21/06	6.9	19	6.8	16
		12/22/06	6.7	20	6.8	16
		12/23/06	7.1	20	6.8	16
		12/24/06	7.2	19	6.8	16
		12/25/06	6.7	19	6.8	16
		12/26/06	6.6	18	6.8	16
		12/27/06	6.7	18	6.8	16
		12/28/06	6.7	18	6.8	16
		12/29/06	6.6	18	6.8	16
		12/30/06	6.7	18	6.8	16
		12/31/06	6.9	19	6.8	16
2007					6.8	16
	1				6.8	16
		01/01/07	6.6	18	6.8	16
		01/02/07	6.9	18	6.8	16
		01/03/07	7.0	17	6.8	16
		01/04/07	6.9	18	6.8	16
		01/05/07	7.1	19	6.8	16
		01/06/07	6.8	19	6.8	16
		01/07/07	6.8	19	6.8	16
		01/08/07	7.0	19	6.8	16
		01/09/07	7.0	17	6.8	16
		01/10/07	7.0	17	6.8	16
		01/11/07	6.8	17	6.8	16
		01/12/07	6.8	18	6.8	16
		01/13/07	7.0	18	6.8	16
		01/14/07	6.6	19	6.8	16
		01/15/07	6.8	19	6.8	16
		01/16/07	6.9	19	6.8	16
		01/17/07	6.8	17	6.8	16
		01/18/07	6.9	17	6.8	16
		01/19/07	6.8	18	6.8	16
		01/20/07	6.9	17	6.8	16
		01/21/07	7.0	17	6.8	16
		01/22/07	6.8	17	6.8	16
		01/23/07	6.8	17	6.8	16

Noman M. Cole, Jr. Pollution Control Plant
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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		01/24/07	6.7	16	6.8	16
		01/25/07	6.7	16	6.8	16
		01/26/07	6.9	16	6.8	16
		01/27/07	6.9	16	6.8	16
		01/28/07	6.9	17	6.8	16
		01/29/07	7.1	16	6.8	16
		01/30/07	7.0	16	6.8	16
		01/31/07	6.9	16	6.8	16
	2				6.8	16
		02/01/07	6.9	16	6.8	16
		02/02/07	6.8	17	6.8	16
		02/03/07	6.9	16	6.8	16
		02/04/07	6.8	16	6.8	16
		02/05/07	7.0	16	6.8	16
		02/06/07	7.1	15	6.8	16
		02/07/07	6.8	16	6.8	16
		02/08/07	6.8	15	6.8	16
		02/09/07	6.9	15	6.8	16
		02/10/07	7.0	15	6.8	16
		02/11/07	6.8	15	6.8	16
		02/12/07	7.0	16	6.8	16
		02/13/07	6.8	16	6.8	16
		02/14/07	6.8	15	6.8	16
		02/15/07	6.9	15	6.8	16
		02/16/07	7.2	15	6.8	16
		02/17/07	7.0	15	6.8	16
		02/18/07	6.9	16	6.8	16
		02/19/07	6.8	15	6.8	16
		02/20/07	6.7	16	6.8	16
		02/21/07	6.9	16	6.8	16
		02/22/07	6.8	16	6.8	16
		02/23/07	6.7	15	6.8	16
		02/24/07	6.8	14	6.8	16
		02/25/07	6.9	15	6.8	16
		02/26/07	7.0	16	6.8	16
		02/27/07	7.0	15	6.7	16
		02/28/07	7.0	15	6.7	16
	3				6.7	16
		03/01/07	6.7	15	6.7	16
		03/02/07	6.9	16	6.7	16
		03/03/07	6.9	15	6.7	16
		03/04/07	6.9	15	6.7	16
		03/05/07	6.8	15	6.7	16
		03/06/07	6.8	14	6.7	16
		03/07/07	6.9	15	6.7	16
		03/08/07	6.7	15	6.7	16
		03/09/07	6.8	16	6.7	16
		03/10/07	6.8	15	6.7	16
		03/11/07	6.7	15	6.7	16
		03/12/07	7.0	16	6.7	16
		03/13/07	6.8	16	6.7	16
		03/14/07	6.7	17	6.7	16
		03/15/07	7.1	17	6.7	16
		03/16/07	6.7	16	6.7	16
		03/17/07	7.0	15	6.7	16
		03/18/07	6.9	14	6.7	16
		03/19/07	6.8	15	6.7	16
		03/20/07	6.8	16	6.7	16
		03/21/07	7.0	16	6.7	16
		03/22/07	7.0	16	6.7	16
		03/23/07	6.8	17	6.7	16
		03/24/07	6.8	17	6.7	16
		03/25/07	6.7	17	6.7	16
		03/26/07	6.9	17	6.7	16
		03/27/07	6.9	18	6.7	16
		03/28/07	6.9	18	6.7	16
		03/29/07	6.9	17	6.7	16
		03/30/07	6.8	17	6.7	16
		03/31/07	6.8	18	6.7	16
	11				6.7	16

Noman M. Cole, Jr. Pollution Control Plant
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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		11/01/07	6.8	22	6.7	16
		11/02/07	6.9	22	6.7	16
		11/03/07	6.8	22	6.7	16
		11/04/07	7.2	22	6.7	16
		11/05/07	7.2	22	6.7	16
		11/06/07	7.2	22	6.7	16
		11/07/07	7.1	22	6.7	16
		11/08/07	6.9	21	6.7	16
		11/09/07	7.2	22	6.7	16
		11/10/07	6.8	20	6.7	16
		11/11/07	7.0	21	6.7	16
		11/12/07	7.0	18	6.7	16
		11/13/07	7.1	22	6.7	16
		11/14/07	7.1	22	6.7	16
		11/15/07	6.8	21	6.7	16
		11/16/07	6.9	20	6.7	16
		11/17/07	7.0	20	6.7	16
		11/18/07	7.1	21	6.7	16
		11/19/07	6.9	21	6.7	16
		11/20/07	6.8	21	6.7	16
		11/21/07	6.7	21	6.7	16
		11/22/07	6.9	22	6.7	16
		11/23/07	7.0	21	6.7	16
		11/24/07	7.2	20	6.7	16
		11/25/07	7.1	19	6.7	16
		11/26/07	6.8	21	6.7	16
		11/27/07	7.1	21	6.7	16
		11/28/07	6.8	21	6.7	16
		11/29/07	6.4	21	6.7	16
		11/30/07	6.7	20	6.7	16
	12				6.7	16
		12/01/07	6.9	19	6.7	16
		12/02/07	6.9	19	6.7	16
		12/03/07	7.2	20	6.7	16
		12/04/07	7.0	19	6.7	16
		12/05/07	6.8	19	6.7	16
		12/06/07	6.9	18	6.7	16
		12/07/07	6.7	19	6.7	16
		12/08/07	6.8	19	6.7	16
		12/09/07	6.7	20	6.7	16
		12/10/07	6.8	20	6.7	16
		12/11/07	6.9	20	6.7	16
		12/12/07	7.0	20	6.7	16
		12/13/07	6.8	20	6.7	16
		12/14/07	6.6	20	6.7	16
		12/15/07	6.9	18	6.7	15
		12/16/07	6.8	19	6.7	15
		12/17/07	6.9	18	6.7	15
		12/18/07	6.8	18	6.7	15
		12/19/07	6.8	18	6.7	15
		12/20/07	6.6	18	6.7	15
		12/21/07	6.6	18	6.7	15
		12/22/07	6.9	18	6.6	15
		12/23/07	6.7	18	6.6	15
		12/24/07	6.6	19	6.6	15
		12/25/07	6.8	19	6.6	15
		12/26/07	6.9	18	6.6	15
		12/27/07	6.6	18	6.6	15
		12/28/07	6.6	19	6.6	15
		12/29/07	6.8	19	6.6	15
		12/30/07	7.1	18	6.6	15
		12/31/07	6.6	18	6.6	15
2008					6.6	15
	1				6.6	15
		01/01/08	6.8	18	6.6	15
		01/02/08	6.9	18	6.6	15
		01/03/08	6.7	17	6.6	15
		01/04/08	6.5	17	6.6	15
		01/05/08	6.6	18	6.6	15
		01/06/08	6.5	18	6.6	15

Noman M. Cole, Jr. Pollution Control Plant
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Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		01/07/08	6.8	18	6.6	15
		01/08/08	6.8	19	6.6	15
		01/09/08	6.8	19	6.6	15
		01/10/08	6.7	18	6.6	15
		01/11/08	6.6	18	6.6	15
		01/12/08	6.2	18	6.6	15
		01/13/08	6.5	18	6.6	15
		01/14/08	6.7	19	6.6	15
		01/15/08	6.9	18	6.6	15
		01/16/08	6.7	18	6.6	15
		01/17/08	6.5	17	6.6	15
		01/18/08	6.6	18	6.6	15
		01/19/08	6.9	17	6.6	15
		01/20/08	6.7	16	6.6	15
		01/21/08	6.4	16	6.6	15
		01/22/08	6.5	17	6.6	15
		01/23/08	6.8	17	6.6	15
		01/24/08	6.6	17	6.6	15
		01/25/08	6.4	16	6.6	15
		01/26/08	6.6	14	6.6	15
		01/27/08	6.6	16	6.6	15
		01/28/08	6.6	17	6.6	15
		01/29/08	6.7	17	6.6	15
		01/30/08	6.8	17	6.6	15
		01/31/08	6.7	17	6.5	15
	2				6.5	15
		02/01/08	6.5	17	6.5	15
		02/02/08	6.8	16	6.5	15
		02/03/08	6.8	16	6.5	15
		02/04/08	6.8	17	6.5	15
		02/05/08	6.8	17	6.5	15
		02/06/08	6.8	18	6.5	15
		02/07/08	6.7	18	6.5	15
		02/08/08	6.9	17	6.5	15
		02/09/08	6.9	18	6.5	15
		02/10/08	7.1	18	6.5	15
		02/11/08	7.0	16	6.5	14
		02/12/08	6.7	16	6.5	14
		02/13/08	6.8	17	6.5	14
		02/14/08	6.7	15	6.5	14
		02/15/08	6.8	16	6.4	14
		02/16/08	6.8	16	6.4	14
		02/17/08	6.8	16	6.4	14
		02/18/08	6.5	17	6.4	14
		02/19/08	6.9	17	6.4	14
		02/20/08	6.7	17	6.4	14
		02/21/08	6.8	16	6.4	14
		02/22/08	6.5	16	6.2	13
		02/23/08	6.8	16		
		02/24/08	7.0	17		
		02/25/08	6.7	17		
		02/26/08	6.7	17		
		02/27/08	6.7	16		
		02/28/08	6.6	16		
		02/29/08	6.7	16		
	3					
		03/01/08	6.8	17		
		03/02/08	6.8	16		
		03/03/08	6.6	17		
		03/04/08	6.9	18		
		03/05/08	6.6	18		
		03/06/08	6.6	16		
		03/07/08	6.6	17		
		03/08/08	6.7	17		
		03/09/08	6.9	15		
		03/10/08	6.8	16		
		03/11/08	6.7	17		
		03/12/08	6.8	17		
		03/13/08	6.8	17		
		03/14/08	6.8	18		

Noman M. Cole, Jr. Pollution Control Plant
November - March
2003-2008

Year	Month	Collection Date	Oufall pH	Outfall Temperature	Sorted pH	Sorted Temperature
		03/15/08	6.7	18		
		03/16/08	6.8	18		
		03/17/08	6.6	17		
		03/18/08	6.7	17		
		03/19/08	7.1	18		
		03/20/08	6.4	18		
		03/21/08	6.6	16		

DEQ's Water Quality Data for 1aPOH005.36 (Route 1 Bridge) - Pohick Creek
Lat 38 42 4 / Long 77 12 36
(Approximately 0.57 Rivermiles Upstream from Noman Cole PCP's Discharge Point)
September 2001 through March 2008

Collection Date	Field pH	Temp (Celsuis)	pH Sorted		Temp Sorted
9/6/2001	7.28	19.64	8.21		25.36
12/19/2001	6.35	7.18	8.07		23.77
2/26/2002	6.67	6.95	8.01		23.37
5/22/2002	7.18	12.36	8.01	90th percentile	23.3
6/19/2002	7.01	19.9	7.7		21.7
3/20/2003	7.25	7.63	7.41		19.9
8/4/2003	7.41	23.3	7.4		19.64
10/7/2003	6.61	13.77	7.39		19.5
12/16/2003	8.07	3.64	7.37		16.9
2/4/2004	8.01	1.09	7.35		13.77
4/8/2004	7.37	10.83	7.28		12.67
6/8/2004	7.39	19.5	7.28		12.36
8/5/2004	8.21	23.77	7.25		10.83
10/12/2004	7.28	12.67	7.18		8.97
12/6/2004	7.35	7.62	7.14		8.86
7/19/2005	7.14	25.36	7.14		7.63
8/30/2005	7.14	23.37	7.11		7.62
9/22/2005	6.96	21.7	7.01		7.18
11/28/2005	7.11	8.97	6.96		6.95
1/18/2006	8.01	8.86	6.7		5.5
3/14/2006	7.7	16.9	6.67		5.1
1/30/2008	7.4	5.5	6.61		3.64
3/3/2008	6.7	5.1	6.35		1.09

November 2001 - March 2008

Collection Date	Field pH	Temp (Celsuis)	pH Sorted		Temp Sorted
9/6/2001	7.28	19.64	8.07		19.64
12/19/2001	6.35	7.18	8.01	90th percentile	16.9
2/26/2002	6.67	6.95	8.01		12.67
3/20/2003	7.25	7.63	7.7		8.97
12/16/2003	8.07	3.64	7.4		8.86
2/4/2004	8.01	1.09	7.35		7.63
10/12/2004	7.28	12.67	7.28		7.62
12/6/2004	7.35	7.62	7.28		7.18
11/28/2005	7.11	8.97	7.25		6.95
1/18/2006	8.01	8.86	7.11		5.5
3/14/2006	7.7	16.9	6.7		5.1
1/30/2008	7.4	5.5	6.67		3.64
3/3/2008	6.7	5.1	6.35		1.09

April 2002 - October 2005

Collection Date	Field pH	Temp (Celsuis)	pH sorted		Temp Sorted
5/22/2002	7.18	12.36	8.21		25.36
6/19/2002	7.01	19.9	7.41	90th percentile	23.77
8/4/2003	7.41	23.3	7.39		23.37
10/7/2003	6.61	13.77	7.37		23.3
4/8/2004	7.37	10.83	7.28		21.7
6/8/2004	7.39	19.5	7.18		19.9
8/5/2004	8.21	23.77	7.14		19.5
10/12/2004	7.28	12.67	7.14		13.77
7/19/2005	7.14	25.36	7.01		12.67
8/30/2005	7.14	23.37	6.96		12.36
9/22/2005	6.96	21.7	6.61		10.83

2003 Ammonia Calculations
data in mg/l

Facility = Noman Cole
Chemical = Ammonia November - March
Chronic averaging period = 30
WLAa = 11.97
WLAc = 2.06
Q.L. = .2
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 4.1564003924376
Average Weekly limit = 2.47931397313502
Average Monthly LImit = 2.06

The data are:

9

Attachment 8

2003 Ammonia calculations
data in mg/l

Facility = Noman Cole
Chemical = Ammonia April - October
Chronic averaging period = 30
WLAa = 11.93
WLAc = 2.05
Q.L. = .2
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 4.13622369150344
Average Weekly limit = 2.46727846841106
Average Monthly LImit = 2.05

The data are:

9

Facility = Noman Cole
Chemical = Ammonia - April - October
Chronic averaging period = 30
WLAa = 26
WLAc = 5.5
Q.L. = .2
# samples/mo. = 30
# samples/wk. = 8

2008 Ammonia calculations
JCC 7/28/08

data expressed in mg/l

Summary of Statistics:

PPRE effluent limits are in effect for this time period.

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 11.0971855137897
Average Weekly limit = 6.61952759817602
Average Monthly LImit = 5.5

The data are:

9

2008 Ammonia
Calculations -
JCC 7/28/08
data expressed in mg/l.

Facility = Noman Cole
Chemical = Ammonia November - March
Chronic averaging period = 30
WLAa = 34
WLAc = 3.8
Q.L. = .2
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 7.66714635498198
Average Weekly limit = 4.57349179510343
Average Monthly LImit = 3.8

The data are:

9

Noman M. Cole, Jr. Pollution Control Plant
VA0025364
Outfall Number: 001

Appendix A

Hardness		
5/21/2002	126	
7/5/2002	144	
9/23/2002	154	2002 Permit App
7/14/2003	106	
7/15/2003	92	
7/16/2003	111	
7/17/2003	110	
7/18/2003	118	
7/19/2003	118	
7/20/2003	120	
7/21/2003	116	Local Limits Determi
12/19/2006	87	
5/30/2007	106	
6/25/2007	161	
9/5/2007	144	2007 Permit App
	121	Average Hardness
April - October		
5/21/2002	126	
7/5/2002	144	
9/23/2002	154	
7/14/2003	106	
7/15/2003	92	
7/16/2003	111	
7/17/2003	110	
7/18/2003	118	
7/19/2003	118	
7/20/2003	120	
7/21/2003	116	
5/30/2007	106	
6/25/2007	161	
9/5/2007	144	
	123	Average Hardness
November through March		
12/19/2006	87	

DEQ's Water Quality Hardness Data for 1aPOH005.36 (Route 1 Bridge) - Pohick Creek
Lat 38 42 4 / Long 77 12 36
(Approximately 0.57 Rivermiles Upstream from Noman Cole PCP's Discharge Point)
May 1985 through March 2005

Collection Date	Value
5/13/1985	26
6/10/1985	32
7/8/1985	40
8/6/1985	46
11/19/1985	40
12/9/1985	44
9/6/2001	42
12/19/2001	32.8
2/26/2002	50.8
5/22/2002	41.3
6/19/2002	28.4
3/20/2003	41.7
3/9/2005	44
Average =	**39**

For the months of April through October

Collection date	Value
5/13/1985	26
6/10/1985	32
7/8/1985	40
8/6/1985	46
9/6/2001	42
5/22/2002	41.3
6/19/2002	28.4
3/20/2003	41.7
3/9/2005	44
Average =	**38**

For the months of November through March

Collection date	Value
11/19/1985	40
12/9/1985	44
12/19/2001	32.8
2/26/2002	50.8
Average =	**42**

Define Point of Interest

38,41,53.0 -77,12,03.0
is the Search Point

Submit Cancel

Search Point

- (●) **Change** to "clicked" map point
- ( ) **Fixed** at 38,41,53.0 - 77,12,03.0

Show Position Rings

(●) Yes ( ) No

1 mile and 1/4 mile at the **Search Point**

Show Search Area

(●) Yes ( ) No

2 miles

Search Point is at map center

Base Map Choices

Topography

Map Overlay Choices

Current List: Position, Search

Map Overlay Legend

Position Rings 1 mile and 1 4 mile at the Search Point

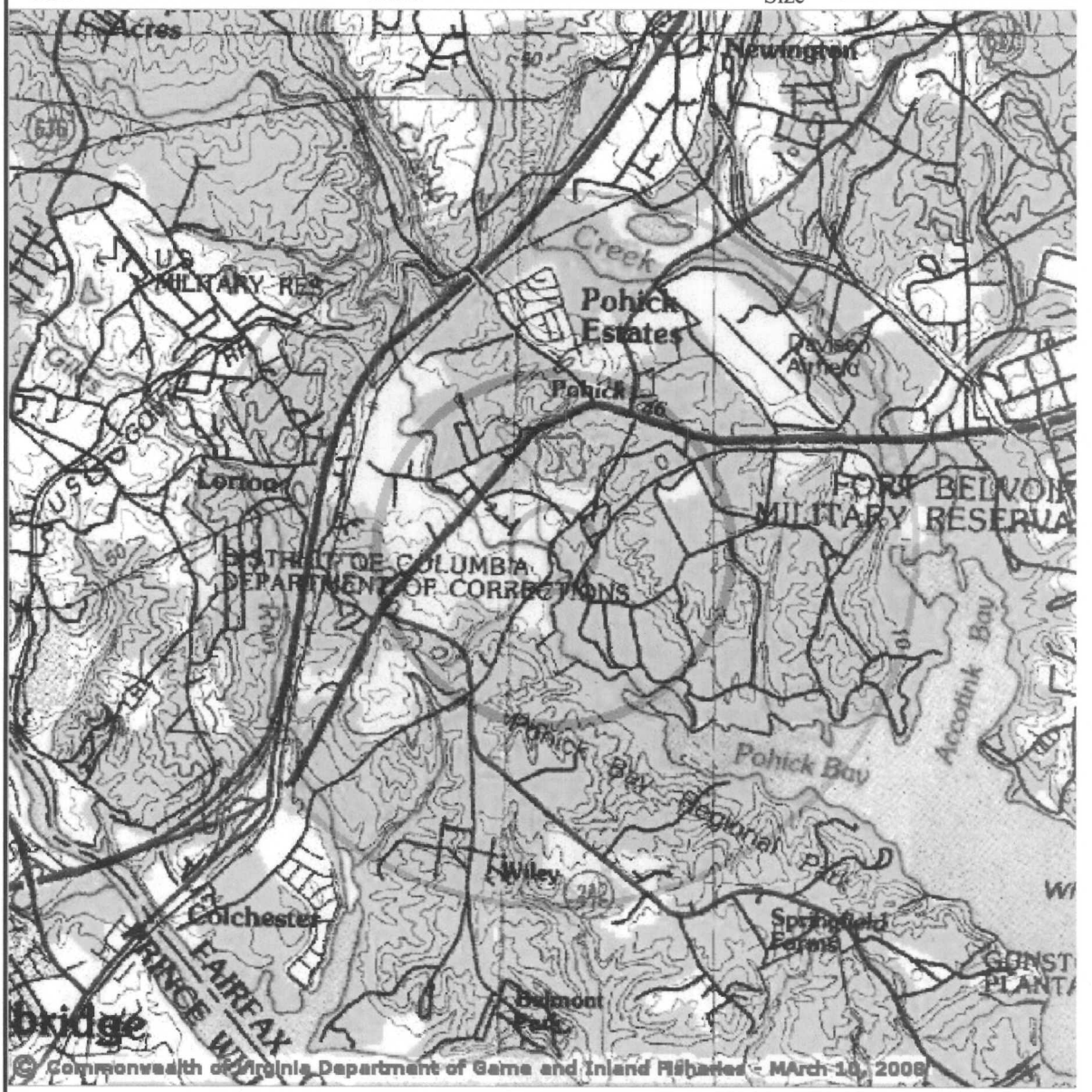
2 mile radius Search Area

Map Click: Pan Id M

Refresh Browser Page

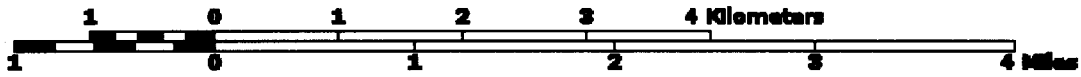
Map Scale: In Zoom Out

Screen Size: Small Size



N

Attachment 10



Point of Search 38,41,53.0 -77,12,03.0
Map Location 38,41,53.0 -77,12,03.0

Select **Coordinate System:**
- (●) Degrees,Minutes,Seconds Latitude - Longitude
- ( ) Decimal Degrees Latitude - Longitude
- ( ) Meters UTM NAD83 East North Zone
- ( ) Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 303822 and top 4290380. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West.Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.16 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.59 square miles.

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map assembled 2008-03-10 16:04:17 (qa/qc December 21, 2007 12 11 - tn=166835 dist=3218 I)

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Virginia Department of Game and Inland Fisheries

3/10/2008 4:04:58 PM

Fish and Wildlife Information Service

VaFWIS Initial Project Assessment Report Compiled on 3/10/2008, 4:04:58 PM

Help

Known or likely to occur within a **2 mile radius of 38,41,53. 77,12,03.**
in **059 Fairfax County, VA**

598 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 45) (45 species with Status* or Tier I**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
060006	FSSE	II	Floater, brook	Alasmidonta varicosa		BOVA
030062	ST	I	Turtle, wood	Glyptemys insculpta	Yes	Collections,BOVA
040096	ST	I	Falcon, peregrine	Falco peregrinus	Yes	CBC
040129	ST	I	Sandpiper, upland	Bartramia longicauda		BOVA
040293	ST	I	Shrike, loggerhead	Lanius ludovicianus	Yes	CBC,BOVA
040379	FSST	I	Sparrow, Henslow's	Ammodramus henslowii		BOVA
100155	FSST	I	Skipper, Appalachian grizzled	Pyrgus wyandot		BOVA
040093	ST	II	Eagle, bald	Haliaeetus leucocephalus	Yes	Collections,BBA,CBC,BOVA
040292	FSST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
100248	FS	I	Fritillary, regal	Speyeria idalia idalia		BOVA
010032	FSSS	II	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
040320	FS	II	Warbler, cerulean	Dendroica cerulea		BOVA
100154	FS	II	Butterfly, Persius duskywing	Erynnis persius persius		BOVA
060071	FSSS	III	Lampmussel,	Lampsilis		BOVA

			yellow	cariosa		
060029	FSSS	III	Lance, yellow	Elliptio lanceolata		BOVA
040084	FS		Goshawk, northern	Accipiter gentilis	Yes	CBC
010077	SS	I	Shiner, bridle	Notropis bifrenatus	Yes	Collections
040372	SS	I	Crossbill, red	Loxia curvirostra	Yes	CBC,BOVA
040306	SS	I	Warbler, golden-winged	Vermivora chrysoptera		BOVA
040029	SS	II	Heron, little blue	Egretta caerulea caerulea		BOVA
040213	SS	II	Owl, northern saw-whet	Aegolius acadicus		BOVA
040304	SS	II	Warbler, Swainson's	Limnothlypis swainsonii		BOVA
040266	SS	II	Wren, winter	Troglodytes troglodytes	Yes	CBC,BOVA
030063	CC	III	Turtle, spotted	Clemmys guttata	Yes	Collections,BOVA
040094	SS	III	Harrier, northern	Circus cyaneus	Yes	CBC,BOVA
040036	SS	III	Night-heron, yellow-crowned	Nyctanassa violacea violacea	Yes	BBA,BOVA
040204	SS	III	Owl, barn	Tyto alba pratincola	Yes	CBC,BOVA
040270	SS	III	Wren, sedge	Cistothorus platensis	Yes	CBC
030012	CC	IV	Rattlesnake, timber	Crotalus horridus		BOVA
040264	SS	IV	Creeper, brown	Certhia americana	Yes	BBA,CBC,BOVA
040180	SS	IV	Tern, Forster's	Sterna forsteri		BOVA
040364	SS		Dickcissel	Spiza americana		BOVA
040032	SS		Egret, great	Ardea alba egretta	Yes	BBA,CBC,BOVA
040366	SS		Finch, purple	Carpodacus purpureus	Yes	CBC,BOVA

040285	SS		Kinglet, golden-crowned	Regulus satrapa	Yes	CBC,BOVA
040112	SS		Moorhen, common	Gallinula chloropus cachinnans		BOVA
040262	SS		Nuthatch, red-breasted	Sitta canadensis	Yes	CBC,BOVA
040189	SS		Tern, Caspian	Sterna caspia		BOVA
040278	SS		Thrush, hermit	Catharus guttatus	Yes	CBC,BOVA
040314	SS		Warbler, magnolia	Dendroica magnolia		BOVA
040335	SS		Warbler, mourning	Oporornis philadelphia	Yes	Collections,BOVA
050045	SS		Otter, northern river	Lontra canadensis lataxina		BOVA
060076	SS		Lampmussel, eastern	Lampsilis radiata radiata		BOVA
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius	Yes	CBC,BOVA
040319		I	Warbler, black-throated green	Dendroica virens		BOVA

To view **All 598 species** View 598

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; SC=State Candidate; CC=Collection Concern; SS=State Special Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Anadromous Fish Use Streams (2 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	View Map
C2	Accotink creek	Confirmed	Yes
C62	Pohick creek	Confirmed	Yes

Fish Impediments

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Cold Water Stream Survey (Trout Streams)
Summary of Recent Observations

N/A

Public Holdings: (1 names)

Name	Agency	Level
Fort Belvoir Military Reservation	U.S. Dept. of Army	Federal

audit no. 166835 3/10/2008 4:04:58 PM Virginia Fish and Wildlife Information Service

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Anadromous Fish Use Streams

38,41,53.0 -77,12,03.0
is the Search Point

Show Position Rings
○ Yes ◉ No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
◉ Yes ○ No
2 miles

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Search, Anadromous

Map Overlay Legend

Anadromous Fish Reach

Confirmed

Potential

Impediment

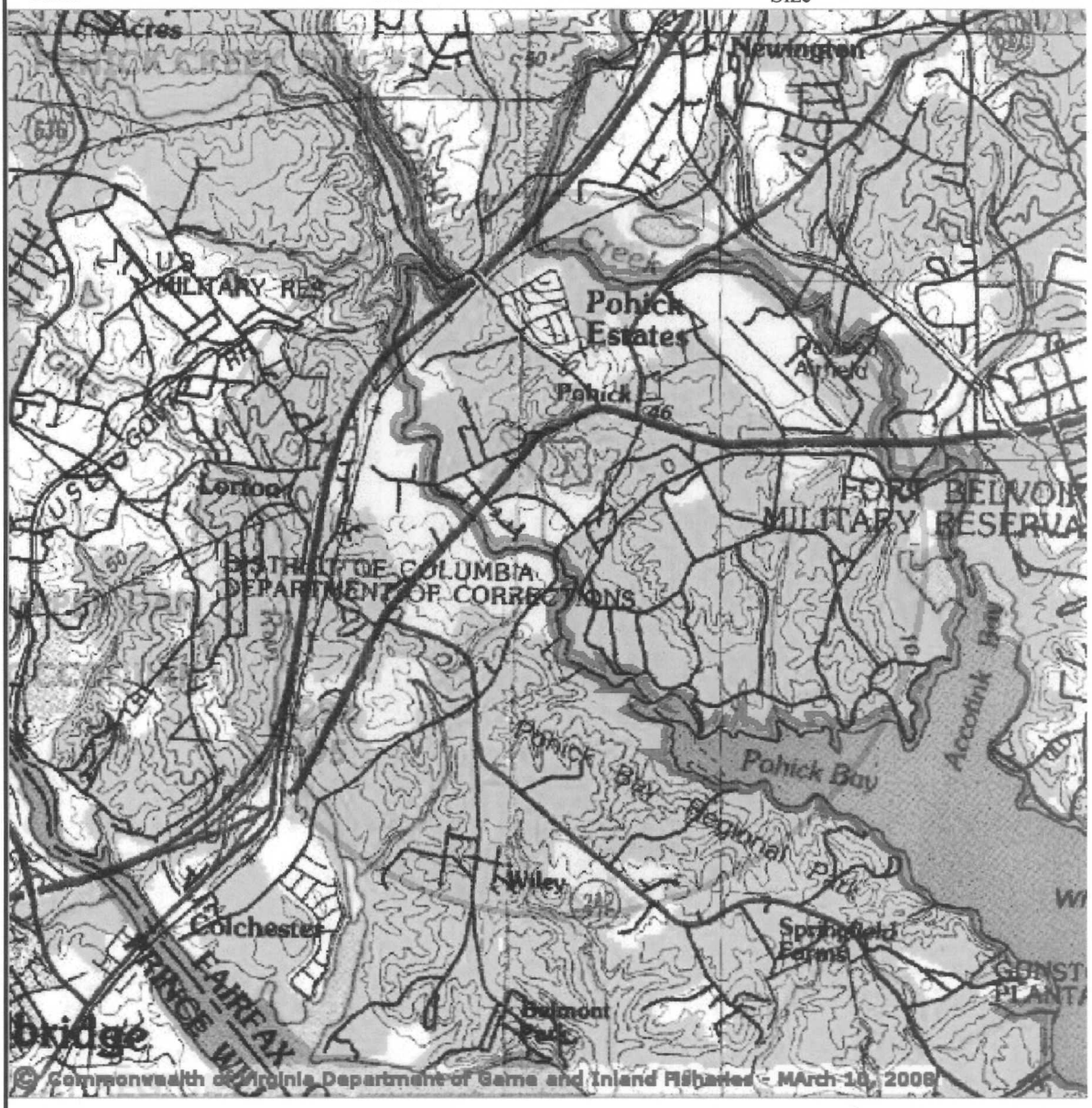
2 mile radius Search Area

Refresh Browser Page

Map Click: Pan Id M

Map Scale: In Zoom Out

Screen Size: Small Size



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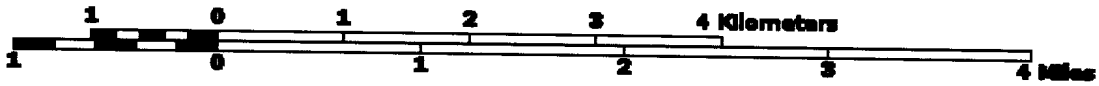

Point of Search 38,41,53.0 -77,12,03.0
Map Location 38,41,53.0 -77,12,03.0

Select **Coordinate System:**
- (●) Degrees,Minutes,Seconds Latitude - Longitude
- ( ) Decimal Degrees Latitude - Longitude
- ( ) Meters UTM NAD83 East North Zone
- ( ) Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 303822 and top 4290381. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West.Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.16 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.59 square miles.

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map assembled 2008-03-10 16:05:15 (qa/qc December 21, 2007 12 11 - tn=166835 dist=3218 I)

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Crowther,Joan

From: Motsch, Sarah [Sarah.Motsch@fairfaxcounty.gov]
Sent: Thursday, July 03, 2008 11:49 AM
To: Crowther,Joan
Subject: Selenium & Cadmium Form 2A data

Ms. Crowther,

Please find attached the complete total recoverable metals data for the NMCPCP permit renewal application submitted October 2007. These analysis were completed by Schneider Laboratories, a NELAC accredited laboratory. In keeping with the instructions for completing Form 2A, Schneider Laboratories report an actual numeric value even if the values were below the quantitation level of the analysis.

For both the selenium and cadmium analysis, the numeric values reported are below the quantitation, or "reportable", level of the analysis method. Since the values are below the reportable limit, we feel that the accuracy of these values is questionable.

We believe earlier testing completed by our Environmental Monitoring Laboratory at NMCPCP, as well as more recent local effluent limits testing are more representative of the plant's effluent. These analysis were completed using a more sensitive method than the one used by Schneider Laboratories. The recent local effluent limits results for selenium and cadmium testing has been included in the attachment.

We hope this information provides some clarity regarding the accuracy of the values provided for Selenium and Cadmium in our Form 2A. Also, we would like to know how this information is being used and if there are any potential impacts on our permit renewal. Should you have any questions or require further information, please do not hesitate to contact us.

Sincerely,
Sarah Motsch

Sarah Motsch
Senior Process Engineer
Fairfax County Noman M Cole Pollution Control Plant
703-550-9740 x227

Attachment 11

Noman M. Cole, Jr. Pollution Control Plant
VA0025364
Outfall Number: 001

NPDES Form 2A

D. Expanded Effluent Testing Data

METALS

(Total Recoverable)		5/30/2007 ug/L		6/25/2007 ug/L		9/5/2007 ug/L		Average ug/L	MRL (ug/L)	Method
Antimony		1.0	<	1.0		2.7	<	1.6	40	EPA 200.7
Arsenic	<	1.0		4.1		3.3*	<	2.8	40/25	EPA 200.7
Beryllium	<	1.0	<	1.0		1.2	<	1.1	40	EPA 200.7
Cadmium	<	1.0	<	1.0		1.7	<	0.41	40/25	EPA 200.7
Chromium	<	1.0	<	1.0		1.5	<	1.0	100/25	EPA 200.7
Copper		3.1		7.6		8.1		4.2	100/25	EPA 200.7
Lead	<	1.0	<	1.0		4.1*	<	1.3	40/25	EPA 200.7/200.9
Mercury	<	0.2	<	0.2	<	0.2	<	0.2	0.5	EPA 245.2
Nickel	<	1.0		16.5		11.1	<	9.5	40	EPA 200.7
Selenium		7.9		26.7		15.6*		16.7/5.3	40/25	EPA 200.7
Silver	<	1.0	<	1.0	<	1.0	<	0.42	40/25	EPA 200.7/200.9
Thallium		1.5		2.2		6.3		3.33	40	EPA 200.7
Zinc		39.4		38.7		39.8		38.1	100/25	EPA 200.7

Local Limits, Effluent

07/14/03	07/15/03	07/16/03	07/17/03	07/18/03	07/19/03	07/20/03	07/21/03	
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	EPA 200.9, Graphite Furnace
<1	<1	<1	<1	<1	<1	<1	<1	EPA 200.9, Graphite Furnace
0.5	0.5	3.1	4.4	3.7	6.6	4.5	4.6	EPA 200.9, Graphite Furnace
<1	<1	<1	<1	<1	<1	<1	<1	EPA 200.9, Graphite Furnace
<1	<1	<1	<1	<1	<1	<1	<1	EPA 200.9, Graphite Furnace
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	EPA 200.9, Graphite Furnace
30	32	30	42	49	37	34	47	Flame AA EPA 289.1

5/30, 6/25, and 9/5 sample analyses conducted by Schneider Laboratories, Inc., Richmond, VA
All Samples collected were Grabs
Repeats by NMCPCP Lab by Graphite Furnace for sample collected 9/5, EPA 200.9:
*Average of two analyses.

Arsenic 0.31 by NMC; 6.3 SLI:
Lead <1.0 by NMC; 7.2 SLI
Selenium 2.5 by NMC; 28.7 by SLI. The average of all 11 analyses = 5.3.

FACILITY NAME AND PERMIT NUMBER:

Noman M Cole Jr., Pollution Control Plant VA0025364

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART D. EXPANDED EFFLUENT TESTING DATA

Refer to the directions on the cover page to determine whether this section applies to the treatment works.

Effluent Testing: 1.0 mgd and Pretreatment Treatment Works. If the treatment works has a design flow greater than or equal to 1.0 mgd or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information and any other information required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analyses conducted using 40 CFR Part 136 methods. In addition, these data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS, AND HARDNESS.											
ANTIMONY	2.7	ug/L	0.38	Kg/D	<1.6	ug/L	<0.23	Kg/D	3	EPA 200.7	40/NA
ARSENIC	4.1	ug/L	0.60	Kg/D	<2.8	ug/L	<0.41	Kg/D	3	EPA 200.7	40/NA
BERYLLIUM	1.2	ug/L	0.17	Kg/D	<1.1	ug/L	<0.16	Kg/D	3	EPA 200.7	40/NA
CADMIUM	1.7	ug/L	0.24	Kg/D	<0.41	ug/L	<0.06	Kg/D	11	EPA 200.7	40/0.1
CHROMIUM	1.5	ug/L	0.21	Kg/D	<1.0	ug/L	<0.16	Kg/D	11	EPA 200.7	100/2
COPPER	8.1	ug/L	1.2	Kg/D	4.2	ug/L	0.65	Kg/D	11	EPA 200.7	100/1
LEAD	4.1	ug/L	0.58	Kg/D	<1.3	ug/L	<0.20	Kg/D	11	EPA 200.7	40/1
MERCURY	<0.20	ug/L	<0.03	Kg/D	<0.20	ug/L	<0.03	Kg/D	3	EPA 245.2	0.5/0.2
NICKEL	16.5	ug/L	2.4	Kg/D	<9.5	ug/L	<1.4	Kg/D	3	EPA 200.7	40/NA
SELENIUM	26.7	ug/L	3.9	Kg/D	16.7	ug/L	2.4	Kg/D	3	EPA 200.7	40/25
SILVER	<1.0	ug/L	0.15	Kg/D	<0.42	ug/L	<0.06	Kg/D	11	EPA 200.7	40/0.2
THALLIUM	6.3	ug/L	0.89	Kg/D	3.3	ug/L	0.48	Kg/D	3	EPA 200.7	40/NA
ZINC	49.0	ug/L	8.0	Kg/D	38.1	ug/L	5.9	Kg/D	11	EPA 200.7	100/2
CYANIDE	5	ug/L	0.71	Kg/D	3.2	ug/L	0.47	Kg/D	8	Lach 10204001	10/5
TOTAL PHENOLIC COMPOUNDS	9.5	ug/L	1.2	Kg/D	3.3	ug/L	0.43	Kg/D	5	HACH 8047	5
HARDNESS (AS $CaCO_3$)	161	mg/L	23705	Kg/D	116	mg/L	17916	Kg/D	12	SM 2340 B	2
Use this space (or a separate sheet) to provide information on other metals requested by the permit writer.											

FACILITY NAME AND PERMIT NUMBER:
Noman M Cole Jr., Pollution Control Plant VA0025364

Form Approved 1/14/99
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Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
VOLATILE ORGANIC COMPOUNDS.											
ACROLEIN	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	3	8260A/8260B	5
ACRYLONITRILE	0.59	ug/L	0.09	Kg/D	0.20	ug/L	0.02	Kg/D	3	8260A/8260B	5
BENZENE	0.43	ug/L	0.06	Kg/D	0.11	ug/L	0.02	Kg/D	4	8260A/8260B	5
BROMOFORM	1.0	ug/L	0.14	Kg/D	0.25	ug/L	0.04	Kg/D	4	8260A/8260B	5
CARBON TETRACHLORIDE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
CLOROBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
CHLORODIBROMO-METHANE	10	ug/L	1.5	Kg/D	6.6	ug/L	0.96	Kg/D	4	8260A/8260B	5
CHLOROETHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
2-CHLORO-ETHYLVINYL ETHER	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
CHLOROFORM	13	ug/L	1.8	Kg/D	10	ug/L	1.5	Kg/D	4	8260A/8260B	5
DICHLOROBROMO-METHANE	14	ug/L	1.9	Kg/D	11	ug/L	1.6	Kg/D	4	8260A/8260B	5
1,1-DICHLOROETHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
1,2-DICHLOROETHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
TRANS-1,2-DICHLORO-ETHYLENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
1,1-DICHLOROETHYLENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
1,2-DICHLOROPROPANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
1,3-DICHLORO-PROPYLENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
ETHYLBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
METHYL BROMIDE	2.2	ug/L	0.32	Kg/D	0.55	ug/L	0.08	Kg/D	4	8260A/8260B	5
METHYL CHLORIDE	0.51	ug/L	0.08	Kg/D	0.13	ug/L	.02	Kg/D	4	8260A/8260B	5
METHYLENE CHLORIDE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
1,1,2,2-TETRACHLORO-ETHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
TETRACHLORO-ETHYLENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
TOLUENE	0.50	ug/L	0.07	Kg/D	0.12	ug/L	0.02	Kg/D	4	8260A/8260B	5

FACILITY NAME AND PERMIT NUMBER:
Noman M Cole Jr., Pollution Control Plant VA0025364

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
1,1,1-TRICHLOROETHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
1,1,2-TRICHLOROETHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
TRICHLORETHYLENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5
VINYL CHLORIDE	1.0	ug/L	0.15	Kg/D	0.25	ug/L	0.04	Kg/D	4	8260A/8260B	5
Use this space (or a separate sheet) to provide information on other volatile organic compounds requested by the permit writer.											
Total Xylenes	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8260A/8260B	5/o-;10/m,p-
ACID-EXTRACTABLE COMPOUNDS											
P-CHLORO-M-CRESOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2-CHLOROPHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2,4-DICHLOROPHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2,4-DIMETHYLPHENOL	1.5	ug/L	0.21	Kg/D	0.38	ug/L	0.05	Kg/D	4	8270 C	10
4,6-DINITRO-O-CRESOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2,4-DINITROPHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2-NITROPHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
4-NITROPHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
PENTACHLOROPHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
PHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2,4,6-TRICHLOROPHENOL	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
Use this space (or a separate sheet) to provide information on other acid-extractable compounds requested by the permit writer.											
BASE-NEUTRAL COMPOUNDS.											
ACENAPHTHENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
ACENAPHTHYLENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
ANTHRACENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BENZIDINE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BENZO(A)ANTHRACENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BENZO(A)PYRENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10

FACILITY NAME AND PERMIT NUMBER:
Noman M Cole Jr., Pollution Control Plant VA0025364

Form Approved 1/14/99
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Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
3,4 BENZO-FLUORANTHENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BENZO(GHI)PERYLENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BENZO(K)FLUORANTHENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BIS (2-CHLOROETHOXY) METHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BIS (2-CHLOROETHYL)-ETHER	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BIS (2-CHLOROISO-PROPYL) ETHER	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BIS (2-ETHYLHEXYL) PHTHALATE	2.1	ug/L	0.31	Kg/D	0.92	ug/L	0.13	Kg/D	4	8270 C	10
4-BROMOPHENYL PHENYL ETHER	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
BUTYL BENZYL PHTHALATE	0.13	ug/L	0.02	Kg/D	0.03	ug/L	<0.01	Kg/D	4	8270 C	10
2-CHLORONAPHTHALENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
4-CHLORPHENYL PHENYL ETHER	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
CHRYSENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
DI-N-BUTYL PHTHALATE	0.19	ug/L	0.03	Kg/D	0.05	ug/L	<0.01	Kg/D	4	8270 C	10
DI-N-OCTYL PHTHALATE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
DIBENZO(A,H) ANTHRACENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
1,2-DICHLOROBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
1,3-DICHLOROBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
1,4-DICHLOROBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
3,3-DICHLOROBENZIDINE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
DIETHYL PHTHALATE	1.8	ug/L	0.26	Kg/D	0.45	ug/L	0.06	Kg/D	4	8270 C	10
DIMETHYL PHTHALATE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2,4-DINITROTOLUENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
2,6-DINITROTOLUENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
1,2-DIPHENYLHYDRAZINE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10

FACILITY NAME AND PERMIT NUMBER:
Noman M Cole Jr., Pollution Control Plant VA0025364

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
FLUORANTHENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
FLUORENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
HEXACHLOROBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
HEXACHLOROBUTADIENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
HEXACHLOROETHANE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
INDENO(1,2,3-CD)PYRENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
ISOPHORONE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
NAPHTHALENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
NITROBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
N-NITROSODI-N-PROPYLAMINE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
N-NITROSODI- METHYLAMINE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
N-NITROSODI-PHENYLAMINE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
PHENANTHRENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
PYRENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10
1,2,4-TRICHLOROBENZENE	ND	ug/L	ND	Kg/D	ND	ug/L	ND	Kg/D	4	8270 C	10

Use this space (or a separate sheet) to provide information on other base-neutral compounds requested by the permit writer.

Use this space (or a separate sheet) to provide information on other pollutants (e.g., pesticides) requested by the permit writer.

END OF PART D.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

Facility = Noman Cole
Chemical = Chlorine November - March
Chronic averaging period = 4
WLAa = 20
WLAc = 12
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 8

data expressed in ug/l.
QC 7/29/08

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average= 241.210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 17.5508974086388
Average Weekly limit = 10.4691995664012
Average Monthly LImit = 8.69859620059179

The data are:

200

Attachment 12

Facility = Noman Cole
Chemical = Chlorine - April - October
Chronic averaging period = 4
WLAa = 19
WLAc = 11
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 8

data expressed in ug/l.

JC 7/29/08

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average= 241.210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 16.0883226245855
Average Weekly limit = 9.59676626920107
Average Monthly LImit = 7.9737131838758

The data are:

200

Facility = Noman Cole - November - March
Chemical = Selenium
Chronic averaging period = 4
WLAa = 21
WLAc = 5.3
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

data expressed in ug/l.

JC 7/29/08

Summary of Statistics:

observations = 11
Expected Value = 1.68829
Variance = 1.02612
C.V. = 0.6
97th percentile daily values = 4.10832
97th percentile 4 day average = 2.80896
97th percentile 30 day average= 2.03617
< Q.L. = 8
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

7.9
26.7
15.6
1
1
1
1
1
1
1
1

Facility = Noman Cole - April - October
Chemical = Selenium
Chronic averaging period = 4
WLAa = 20
WLAc = 5
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

data expressed in ug/l

Summary of Statistics:

observations = 11
Expected Value = 1.68829
Variance = 1.02612
C.V. = 0.6
97th percentile daily values = 4.10832
97th percentile 4 day average = 2.80896
97th percentile 30 day average= 2.03617
< Q.L. = 8
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

7.9
26.7
15.6
1
1
1
1
1
1
1
1

JC
7/10/08

Facility = Noman Cole - November - March -
Chemical = Cadmium
Chronic averaging period = 4
WLAa = 3.4
WLAc = 1.1
Q.L. = .3
# samples/mo. = 1
# samples/wk. = 1

data expressed in ug/l.

JC 7/29/08

Summary of Statistics:

observations = 11
Expected Value = .253244
Variance = .023087
C.V. = 0.6
97th percentile daily values = .616249
97th percentile 4 day average = .421345
97th percentile 30 day average= .305426
< Q.L. = 8
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

1
1
1.7
0.1
0.1
0.1
0.1
0.1
0.1
0.1
0.1

Facility = Noman Cole - April - October
Chemical = Cadmium
Chronic averaging period = 4
WLAa = 5
WLAc = 1.3
Q.L. = .3
# samples/mo. = 1
# samples/wk. = 1

data expressed in ug/l.

Summary of Statistics:

observations = 11
Expected Value = .253244
Variance = .023087
C.V. = 0.6
97th percentile daily values = .616249
97th percentile 4 day average = .421345
97th percentile 30 day average= .305426
< Q.L. = 8
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

1
1
1.7
0.1
0.1
0.1
0.1
0.1
0.1
0.1
0.1

JCC
7/10/08

This book contains model printouts used in the "Engineering Study for the Expansion of the Lower Potomac Pollution Control Plant Beyond 54 MGD", Project No. 524/N00321, Contract No. AE 24064. The two models utilized were Virginia Institute of Marine Science Gunston Cove (VIMS) and the Potomac Eutrophication Model (PEM-1991). The VIMS Model was run by Limno-Tech, Inc. in March 1992 using input environmental conditions presented in Volume I Chapter 4.4 and PEM-1991 was run by Metropolitan Washington Council of Government (MWCOG) in March 1992. The summary results of these model runs is presented in Volume I Chapter 4.5.

Attachment 13

TABLE 4.7

LPPCP EFFLUENT LIMITATION SCENARIOS FOR THE EXISTING OUTFALL LOCATION

Case	Description	Period of Time	$CBOD_5$ (mg/l) (1)	Total Phosphorus (mg P/l)	Organic Nitrogen (mg N/l)	Ammonia Nitrogen (mg N/l)	Nitrite + Nitrate Nitrogen (mg N/1)
A	Baseline	Year Round	5	0.18	2	17	2
B	Seasonal ammonia removal	April 1-October 31	5	0.18	2	1	18
		November 1-March 31	5	0.18	2	17	2
C	Constant ammonia removal	Year Round	5	0.18	2	1	18
D	Seasonal total nitrogen removal to 3 mg/l	April 1-October 31	5	0.18	1	1	1
		November 1-March 31	5	0.18	2	17	2
E	Total nitrogen removal to 3 mg/l	Year Round	5	0.18	1	1	1
F	Seasonal total nitrogen removal to 10 mg/l	April 1-October 31	5	0.18	1	1	8
		November 1-March 31	5	0.18	2	17	2
G	Total nitrogen removal to 10 mg/l	Year Round	5	0.18	1	1	8
H	Seasonally varying ammonia removal	April 1-October 31	5	0.18	2	1	18
		November 1-March 31	5	0.18	2	2	17

(1) $CBOD_5$ = Five-day carbonaceous biochemcial oxygen demand.

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- Scenario E considers year-round total nitrogen removal to 3 mg/l (the most stringent treatment required).
- Scenario F consists of seasonal total nitrogen removal to 10 mg/l, and cold weather treatment consistent with the baseline.
- Scenario G consists of year-round total nitrogen removal to 10 mg/l.
- Scenario H considers seasonally varying levels of ammonia removal.

4.5.3 Model Simulations

Specific simulations were conducted using the VIMS Gunston Cove Model for pollutant impacts within Gunston Cove and the PEM-1991 for impacts in the mainstem Potomac River. Since the results of the PEM-1991 model runs are used as boundary conditions for the VIMS model, the PEM-1991 results are discussed first.

Potomac Eutrophication Model

The PEM-1991 was used to predict water quality in the mainstem Potomac estuary in response to the four year-round scenarios (Scenario A, Scenario C, Scenario E, and Scenario G).

The purpose of the PEM simulations was twofold: 1) to predict water quality at the Gunston Cove-Potomac River boundary for use as input to the VIMS model, and 2) to predict water quality concentrations in the mainstem of the Potomac River in response to the effluent limitation scenarios. Each of the four scenarios was evaluated by performing PEM-1991 simulations for a sufficient time period such that there were no day-to-day changes in predicted water quality.

An important assumption made for this analysis was that the four treatment scenarios tested with the PEM were part of a regionally consistent wastewater treatment strategy. The basic assumption in this evaluation will be that <u>all</u> Washington-area Potomac River WWTPs would treat at the same level as LPPCP for each case. Non-Virginia WWTPs would follow suit where the effluent limitations are more stringent than currently permitted, but effluent limitations would not "backslide" beyond current levels. For example, Blue Plains and Piscataway WWTPs would not discontinue nitrifying and

revert back to the ammonia limit of 17 mg/l suggested in Scenario A. Instead, their current limits will remain in place in cases where current limitations are stricter than those in Table 4.7.

Virginia Institute of Marine Sciences Gunston Cove Model

The VIMS Gunston Cove Model was used to predict dissolved oxygen and chlorophyll *a* concentrations within Gunston Cove in response to each effluent limitation scenario for LPPCP. Water quality at the Gunston Cove-Potomac River boundary was taken from the PEM simulation consistent with the warm weather treatment level for the scenario under consideration. Each scenario was evaluated by performing simulations for 40 consecutive days at the critical environmental conditions described in Section 4.4. After 40 days of simulation, model predictions were at steady-state conditions. This approach is the same as that taken by the NVPDC (1987) during the Potomac Embayments Wasteload Allocation Study.

The seasonally varying treatment scenarios were evaluated using the same approach discussed in Section 4.4. Specifically, the impact of relaxed cold weather treatment on summer critical conditions is represented in the model by increased summertime benthic flux rates. The change in benthic flux rates is determined by relative increase in algae and particulate phosphorus settling during periods of reduced treatment. Year-round VIMS model simulations were conducted to determine the difference in phosphorus and chlorophyll loading to sediments corresponding to each of the eight treatment scenarios. Concentrations at the Gunston Cove-Potomac River boundary were varied to represent observed seasonal trends in water quality. The Potomac River boundary concentration was not changed between effluent limitation scenarios, on the assumption that only LPPCP would have seasonally varying treatment, with all other discharges at baseline levels. This contrasts with the year-round simulations, which assumed that all regional WWTPs would follow a regionally consistent wastewater treatment strategy. Effluent limitations at other regional WWTPs were not changed because: 1) this approach was consistent with the seasonally varying treatment analyses conducted by NVPDC (1987); and 2) the effect of region-wide seasonal treatment on Gunston Cove boundary conditions cannot be readily determined.

The difference in pollutant flux to the sediments between scenarios was insignificant (less than 0.1 percent) for all cases. The reason for similar pollutant flux to the sediments among all scenarios is that the only difference between scenarios is the extent of nitrogen removal. Since algal growth in Gunston Cove is not nitrogen-limited under baseline conditions (i.e., without region-wide total nitrogen removal), changes in nitrogen removal at LPPCP alone have little effect on algal levels or net biomass settling in the cove.

Benthic flux rates therefore are expected to remain constant across all eight treatment scenarios. Because there is no change in benthic flux rates corresponding to seasonal treatment, water quality impacts during summer critical conditions will be influenced solely by the treatment processes operating during the warm weather. This means identical model results will be obtained for those scenarios with identical warm weather treatment levels (i.e., Scenarios B, C, and H will be identical; Scenarios D and E will be identical; and Scenarios F and G will be identical).

4.5.4 Model Results

Results for all model simulations are provided below in both tabular and graphic formats. Impacts on the mainstem of the Potomac River and within Gunston Cove are described separately.

Potomac River

The predicted dissolved oxygen concentration in the Potomac River was 7.0 mg/l under the Blue Plains Feasibility Study's critical conditions. This value is well above the required Virginia dissolved oxygen standards of 5.0 mg/l. Predicted Potomac River chlorophyll *a* concentrations in the vicinity of Gunston Cove are shown in Table 4.8 for the four year-round scenarios.

It is important to note some differences in the PEM-1991 results compared to the PEM-1982 results used in the Potomac Embayments Wasteload Allocation Study (NVPDC, 1987). One primary difference was the addition of a new state variable to PEM-1991, representing the blue-green algae *Microcystis*. In the steady-state PEM

TABLE 4.8

PREDICTED POTOMAC RIVER CHLOROPHYLL *a* CONCENTRATIONS IN THE VICINITY OF GUNSTON COVE

Scenario	Chlorophyll *a* (μg/l) (1)
A: Baseline	58
C: Ammonia Removal to 1 mg/l	64
E: Total Nitrogen Removal to 3 mg/l	41
G: Total Nitrogen Removal to 10 mg/l	64

(1) The chlorophyll *a* goal is a maximum concentration of 100 μg/l (NVPDC, 1987).

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simulations conducted for this study, *Microcystis* concentrations were predicted to go to zero since *Microcystis* has a competitive advantage over other algal species during periods of low wind. The PEM simulations for this study considered summer average wind speed, under which *Microcystis* apparently has no competitive advantage. The best method in which to consider *Microcystis* impacts, which appear related to short-term periods of decreased wind, will be an important question for MWCOG to consider in future PEM applications, but is not part of this study.

Another significant difference is that predicted Potomac estuary phosphorus concentrations are more than twice as high in the PEM-1991 results as those received from PEM-1982. More importantly, the PEM-1991 predicted available phosphorus (i.e., dissolved inorganic phosphorus) concentrations of up to 15 times higher than those obtained from PEM-1982. This difference is primarily caused by the change in the sediment phosphorus release predictions between the two models. The PEM-1991 contains a new (compared to PEM-1982) sediment phosphorus release framework which considers the effect of overlying water pH on sediment phosphorus releases.

An important feature of the newer model results is that predicted chlorophyll *a* concentrations for the baseline scenario are lower than those predicted for ammonia removal or total nitrogen removal to 10 mg/l. This is caused by the fact that PEM inputs for scenarios considering ammonia removal assume lower effluent alkalinity than for the baseline scenario. This reduced alkalinity lowers the buffering capacity of the Potomac River, and leads to an increase in pH-mediated sediment release, thus increasing chlorophyll *a* levels.

<u>Gunston Cove</u>

The results of the VIMS model predictions of dissolved oxygen and chlorophyll *a* are summarized in Table 4.9, and shown graphically in Figures 4-9 and 4-10 (for dissolved oxygen) and Figure 4-11 (for chlorophyll *a*). All predicted concentrations are in clear compliance with Virginia's dissolved oxygen standards (daily minimum = 4.0 mg/l, daily average = 5.0 mg/l). The baseline scenario shows that ammonia removal is not required to meet dissolved oxygen standards even during warm weather periods.

TABLE 4.9

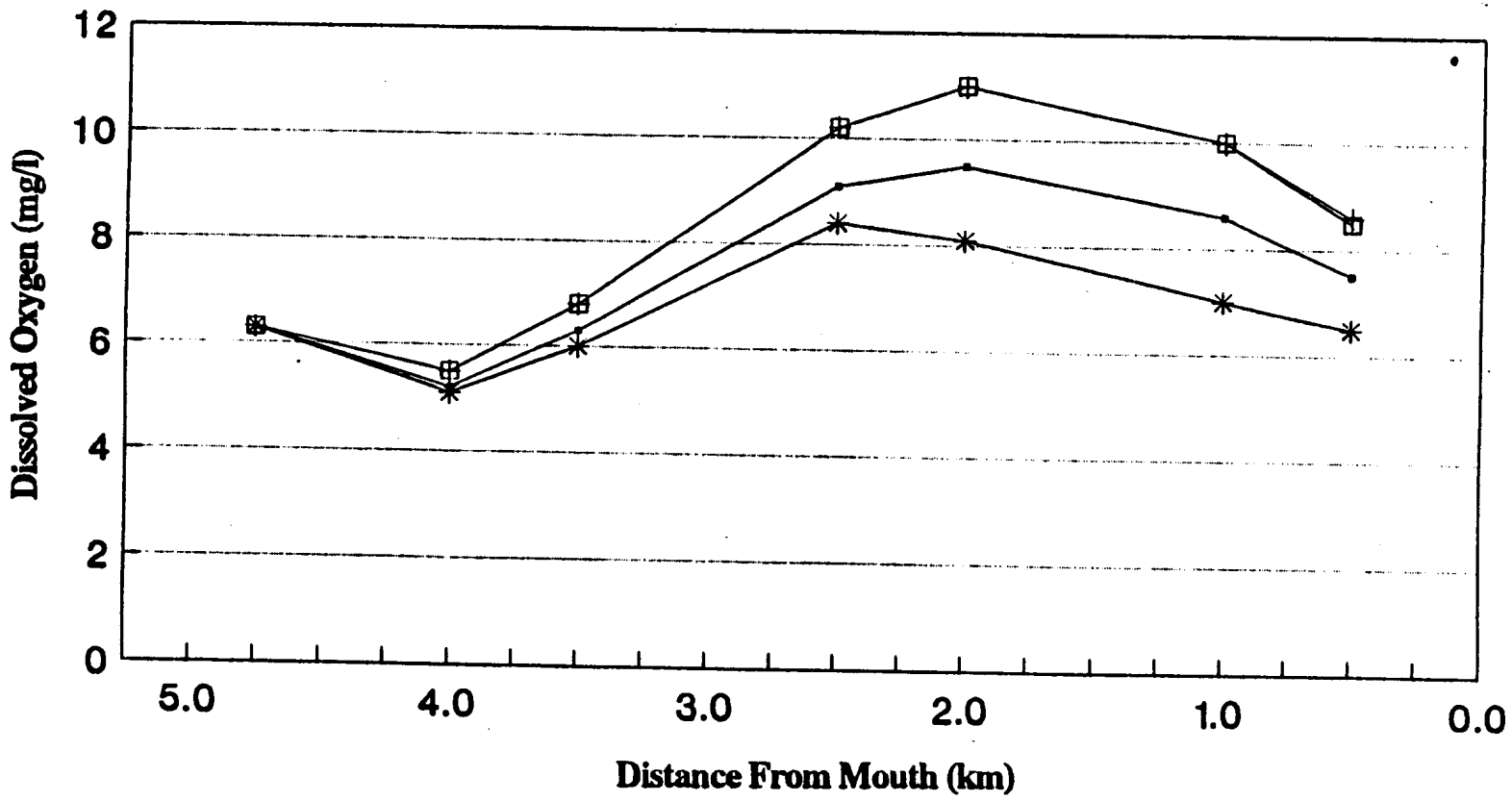
PREDICTED GUNSTON COVE WATER QUALITY

Scenario	Lowest Daily Minimum Dissolved Oxygen (mg/l)	Lowest Daily Average Dissolved Oxygen (mg/l)	Highest Chlorophyll *a* (μg/l) (1)
A	5.3	6.2	97
B	5.6	6.4	103
C	5.6	6.4	103
D	5.2	6.0	77
E	5.2	6.0	77
F	5.6	6.4	103
G	5.6	6.4	103
H	5.6	6.4	103

(1) The chlorophyll *a* goal is a maximum concentration of 100 μg/l (NVPDC, 1987).

FIGURE 4-9

PREDICTED GUNSTON COVE DAILY MINIMUM DISSOLVED OXYGEN



EFFLUENT LIMITATION SCENARIOS

A — B,C, & H — D & E — F & G

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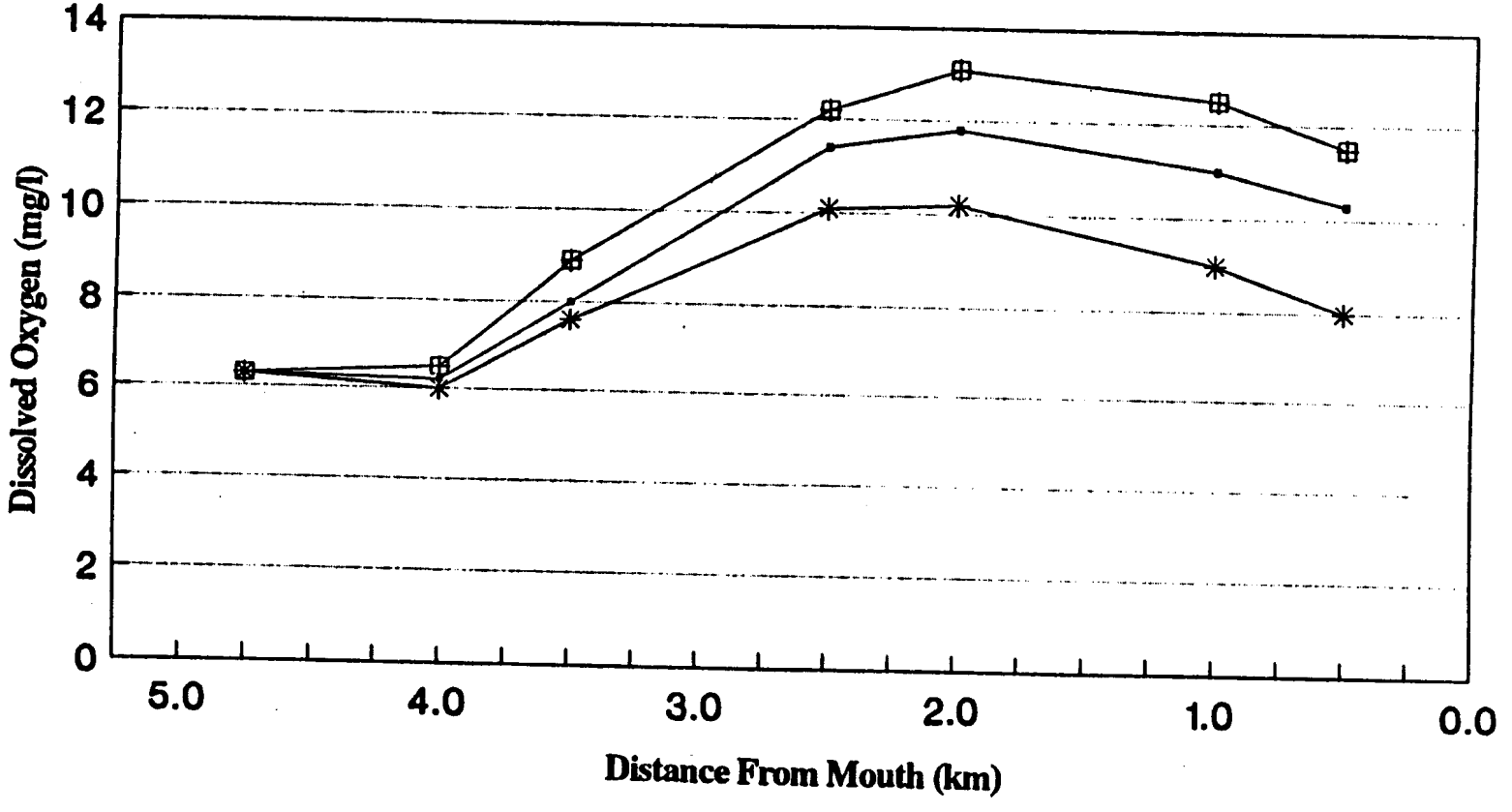
FIGURE 4-10

PREDICTED GUNSTON COVE DAILY AVERAGE DISSOLVED OXYGEN



EFFLUENT LIMITATION SCENARIOS

A — B,C, & H — D & E — F & G

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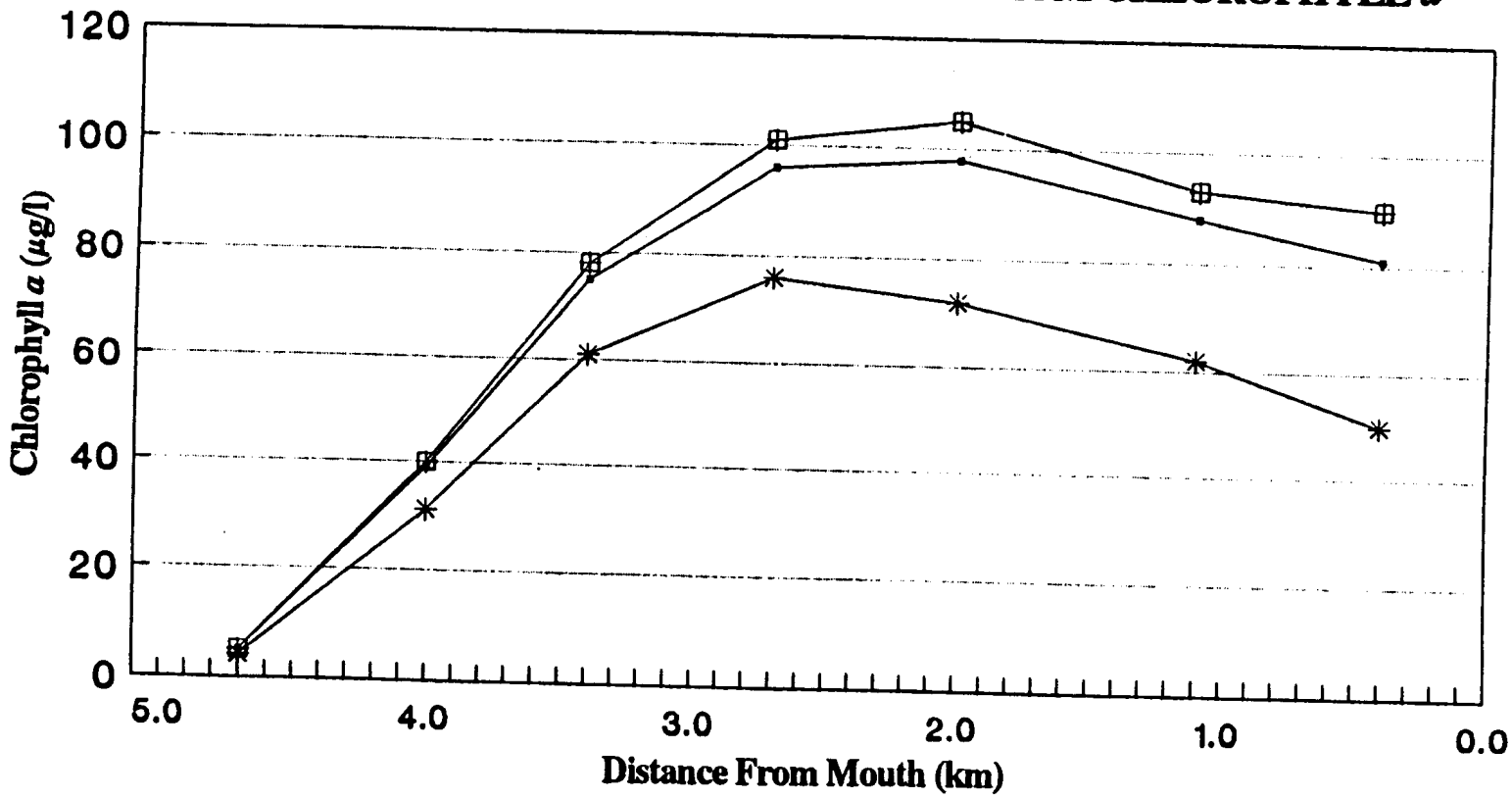
FIGURE 4-11

PREDICTED GUNSTON COVE DAILY MAXIMUM CHLOROPHYLL *a*



EFFLUENT LIMITATION SCENARIOS

A — B,C, & H — D & E — F & G

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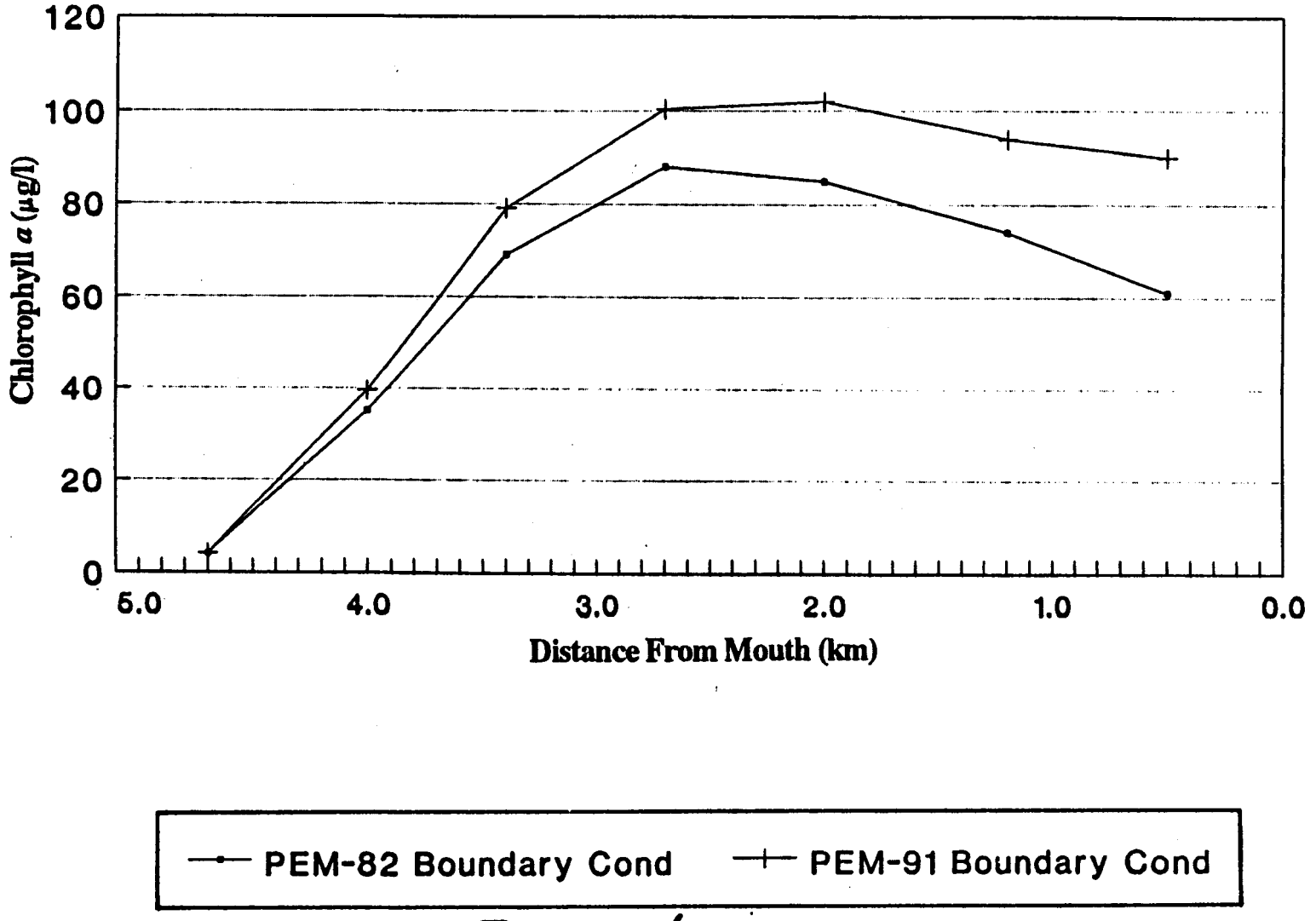
Predicted chlorophyll *a* concentrations (Figure 4-11) slightly exceed the 100 μg/l chlorophyll *a* goal for Gunston Cove for the ammonia removal scenarios (Scenarios B, C, and H) and for the total nitrogen removal to 10 mg/l scenarios (Scenarios F and G). These results directly contrast with previous studies, which indicated that effluent phosphorus concentrations of 0.18 mg/l (regardless of nitrogen concentration) would result in compliance with the 100 μg/l chlorophyll *a* goal.

The difference between past and present VIMS model chlorophyll *a* predictions can be traced to assumptions made regarding water quality at the Gunston Cove-Potomac River boundary. The importance of PEM-predicted Potomac boundary conditions on predicted Gunston Cove chlorophyll *a* concentrations is demonstrated in Figure 4-12. The figure compares VIMS model-predicted chlorophyll *a* concentrations within Gunston Cove for each of two boundary condition assumptions: the PEM-1982 boundary used in the NVPDC (1987) study and the PEM-1991 results generated for this study. For identical effluent conditions at LPPCP (corresponding to Scenario C), the different boundary assumptions result in differences of up to 29 μg/l chlorophyll *a* in Gunston Cove. The difference is due primarily to increased phosphorus concentrations at the boundary, as chlorophyll *a* concentrations at the boundary differ by only 12 μg/l (50 μg/l for PEM-1982 versus 62 μg/l for PEM-1991).

Predicted maximum Gunston Cove chlorophyll *a* concentrations for six of the eight scenarios are within 3 μg/l of the 100 μg/l chlorophyll *a* goal. Scenario A (baseline treatment) just results in compliance with the goal, while Scenarios B, C, F, G, and H (ammonia removal and total nitrogen removal to 10 mg/l) just exceed the goal. The cause of the difference between these scenarios is the variation in PEM-predicted concentrations at the Gunston Cove-Potomac River boundary. As discussed previously, the cause of the difference in PEM predictions is the assumption that ammonia removal reduces the alkalinity of the effluent, which reduces the capacity of Potomac River water to buffer against pH-mediated sediment phosphorus release.

FIGURE 4-12

MAXIMUM CHLOROPHYLL *a* IN GUNSTON COVE UNDER VARIOUS POTOMAC BOUNDARY ASSUMPTIONS



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4.5.5 Summary

Eight conventional pollutant treatment scenarios were tested for their impacts on Gunston Cove and Potomac River water quality. All eight scenarios result in predicted compliance with Virginia's dissolved oxygen standards, indicating that additional ammonia removal will not be required to protect dissolved oxygen.

The PEM-1991 results indicate that nitrogen removal at all regional wastewater treatment plants would have an impact on Potomac estuary chlorophyll *a* concentrations in the vicinity of Gunston Cove. These results, used in conjunction with VIMS Gunston Cove Model predictions for Gunston Cove, indicate that total nitrogen removal to 3 mg/l will clearly meet the 100 μg/l chlorophyll *a* objective within Gunston Cove. These PEM-1991 predictions do not, however, address the likely possibility of proliferating nitrogen-fixing blue-green algae associated with regional total nitrogen removal, which could negate any predicted reduction in chlorophyll *a*. The VIMS model predictions for all other effluent treatment scenarios result in predicted maximum chlorophyll *a* concentrations within 3 μg/l of the 100 μg/l goal, ranging from 97 to 103 μg/l. Model results indicate that nitrogen removal at LPPCP alone (with all other regional plants at their baseline levels) does not lead to a noticeable improvement in Gunston Cove water quality. Instead, due to tidal influence, water quality in Gunston Cove is largely determined by water quality in the Potomac River.

Chlorophyll *a* predictions within Gunston Cove are very sensitive to assumed concentrations at the Gunston Cove-Potomac River boundary. The use of PEM-1982 predictions to define Gunston Cove boundary conditions results in predicted achievement of the 100 μg/l chlorophyll *a* goal for all scenarios. The increase in predicted Gunston Cove chlorophyll *a* concentrations (over previous modeling studies) is caused primarily by improvements made in the PEM's sediment phosphorus release between the 1982 and 1991 versions and not by expansion of the LPPCP.

4.6 SUMMARY

Applicable water quality regulations and water quality models related to the LPPCP expansion were reviewed, along with simulations of conventional pollutant impacts (i.e. dissolved oxygen, chlorophyll *a*) at the present outfall location. The primary water quality regulations relevant to the LPPCP expansion are contained in the May 1992 Virginia Water Quality Standards. These establish the water quality conditions that must be maintained in Virginia waters. The Potomac Embayment Standards were not addressed or changed under the recent amendments to Virginia standards. However, recent revisions to the Potomac Embayment Standards by Fairfax County were forwarded to the VSWCB for review in October 1992. This represents a source of uncertainty to LPPCP expansion requirements, as future revisions to the Potomac Embayment Standards could affect required treatment levels at LPPCP.

A matrix of models (Table 4.2) has been recommended for use in this study, with different models best suited for specific pollutants and discharge locations. The recommended models consist of:

- Virginia Institute of Marine Sciences Gunston Cove Model: Simulation of conventional and far-field toxic impacts within Gunston Cove.
- Dynamic Estuary Model: Simulation of dissolved oxygen and far-field toxic impacts in the mainstem of the Potomac River.
- Potomac Eutrophication Model (PEM-1991): Simulation of eutrophication impacts in the mainstem of the Potomac River.
- CORMIX2: Simulation of near-field (mixing zone) toxic inputs in Gunston Cove and the Potomac River.

Each model to be applied as part of this study requires unique information regarding environmental conditions. An acceptable approach to defining environmental conditions for these models has already been developed and will be followed for this study. The established precedent for conventional pollutant modeling in Gunston Cove is to use statistically defined "critical" values for the most important model inputs and to use the average observed values for other inputs. Mainstem Potomac boundary conditions will be based on the PEM-1991 predictions, as historical data do not represent recent

improvements in the Potomac River water quality in response to improved regional wastewater treatment. Little accepted precedent exists for toxicity and toxic pollutant modeling. Environmental conditions selected for modeling these parameters are based upon existing USEPA guidance and best professional judgement. The most significant environmental condition for assessing toxicity and toxic pollutant impacts at the present outfall location is upstream Pohick Creek flow. The 1Q10 will be used as upstream Pohick Creek flow when assessing potential acute toxicity impacts. The 7Q10 will be used when evaluating potential chronic toxicity impacts.

Eight conventional pollutant treatment scenarios (Scenarios A through H) were tested for their impacts on Gunston Cove and Potomac River water quality. All eight scenarios result in predicted compliance with Virginia dissolved oxygen standards, indicating that additional ammonia removal will not be required to protect dissolved oxygen.

The PEM-1991 results indicate that nitrogen removal at all regional wastewater treatment plants would have an impact on chlorophyll *a* concentrations in the vicinity of Gunston Cove. The model results indicate that total nitrogen removal to 3 mg/l will clearly meet the 100 μg/l chlorophyll *a* goal within Gunston Cove; however, the PEM-1991 predictions do not address the likelihood of proliferating nitrogen-fixing blue-green algae associated with regional total nitrogen removal. The VIMS model predictions for all other effluent treatment scenarios result in predicted maximum chlorophyll *a* concentrations near the 100 μg/l goal, with values ranging from 97 μg/l to 103 μg/l. Model results also indicate that due to tidal influence, water quality in Gunston Cove is largely determined by water quality in the Potomac River. Therefore, nitrogen removal at the LPPCP alone (with all other regional plants at their baseline levels) does not result in a predicted noticeable improvement in Gunston Cove water quality.

POTOMAC EMBAYMENTS
WASTELOAD ALLOCATION STUDY

FINAL REPORT, VOLUME I

Prepared for

Commonwealth of Virginia
State Water Control Board
2111 North Hamilton Street
Richmond, Virginia 23230

Prepared by

Northern Virginia Planning District Commission
7630 Little River Turnpike, Suite 400
Annandale, Virginia 22003

(Staff Technical Analysis)

With Technical Assistance Provided by
Camp Dresser & McKee

June 12, 1987

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REFERENCES

APPENDICES

APPENDIX A - Load/Debug VIMS Embayment Models

APPENDIX B - Model Modifications

APPENDIX C - Minutes of Public and Northern Virginia Embayment Standards Technical Advisory Committee Meetings

PO MAC BAYMENTS WASTELOAD ALLOCA N S Y
FINAL REPORT, VOLUME I:
Study Methodology, Water Quality Goals,
and Loading and Debugging of Computer Models

EXECUTIVE SUMMARY

The initial stages of the Potomac Embayments Wasteload Allocation Study lay the groundwork for the technical analyses that are performed to develop recommended effluent limits for point source discharges to seven Virginia embayments of the Potomac Estuary. First, modeling tools to be used in the study are obtained and tested. Next, a regionally consistent methodology for wasteload allocation analysis is developed. Finally, water quality goals are developed for use as evaluation criteria in screening wasteload allocation alternatives in later stages of the study.

Embayment hydrodynamics and water quality models developed by the Virginia Institute of Marine Science (VIMS) are obtained from VIMS and loaded onto the mainframe computer system used by NVPDC. The computer codes are modified as necessary to ensure successful operation on the system. The model codes are further modified to enhance their capability and, in several cases, to correct minor errors.

The regionally consistent methodology established for the study defines the modeling approach and the general procedures for establishing design conditions, defining water quality goals, performing sensitivity studies, and completing final wasteload allocation analyses. As part of the methodology, specific data for computer model application are developed, including nonpoint loadings, Potomac main stem boundary conditions, and design values for tidal ranges, streamflows, water temperature, and solar radiation.

The water quality goals established for the study focus primarily on concentrations of dissolved oxygen and chlorophyll-a. The selected dissolved oxygen goals are the Virginia state water quality standards of 5.0 mg/L daily average and 4.0 mg/L daily minimum. Chlorophyll-a goals are developed based on the concept of no further deterioration of existing conditions, which is consistent with the State's antidegradation policy. Specific chlorophyll-a goals are established for each embayment, primarily based on computer model simulations that show the impacts of point source loadings and Potomac main stem boundary conditions on chlorophyll-a concentrations throughout the embayment.

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APPENDIX F - Computer Model Source Codes, Sample Input Files, and Sample Output Files (bound separately)

POTOMAC EMBAYMENTS
WASTELOAD ALLOCATION STUDY
FINAL REPORT, VOLUME II

Prepared for

Commonwealth of Virginia
State Water Control Board
2111 North Hamilton Street
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(Staff Technical Analysis)

With Technical Assistance Provided by
Camp Dresser & McKee

June 12, 1987

POTOMAC EMBAYMENTS WASTELOAD ALLOCATION STUDY
FINAL REPORT, VOLUME II:

Sensitivity Studies and Final Analyses for the
Little Hunting Creek, Gunston Cove, Belmont-Occoquan Bay,
and Aquia Creek Embayments

EXECUTIVE SUMMARY

In accordance with the regionally consistent methodology presented in the Volume I final report, NVPDC and CDM conduct sensitivity studies and final analyses for the Little Hunting Creek, Gunston Cove, Belmont-Occoquan Bay, and Aquia Creek embayments. Modeling tools developed by the Virginia Institute of Marine Science are used to predict the embayment water quality impacts of alternative treatment plant wasteloads. The modeling results are compared to water quality goals developed and presented in the Volume I final report to determine appropriate treatment plant effluent limits.

The sensitivity studies predict the extent to which embayment water quality would be affected by changes in parameters such as treatment plant loading, Potomac main stem boundary conditions, benthic flux rates, and treatment plant discharge location. After comparing the modeling results to the appropriate water quality goals, several different wasteload allocation alternatives for each embayment are selected for further analysis.

For the alternatives selected in the sensitivity studies, the final analyses include a comparison of wastewater treatment costs and of pollutant exchange between the embayment and the Potomac main stem. In addition, analyses of seasonal treatment limits for phosphorus and unoxidized nitrogen are conducted. The analysis of seasonal phosphorus removal is limited by a lack of data; as a result, no recommendations are made regarding the feasibility of seasonal phosphorus limits.

Based on the sensitivity studies and final analyses, the following effluent limits for dissolved oxygen (DO), 5-day carbonaceous biochemical oxygen demand (CBOD5), total Kjeldahl nitrogen (TKN), and total phosphorus (TP) are recommended for protection of embayment water quality:

EMBAYMENT	TREATMENT PLANT	PLANT FLOW (MGD)	RECOMMENDED EFFLUENT CONCENTRATION (mg/l)			
			DO	CBOD5	TKN	TP
Little Hunting Creek	Little Hunting Creek*	6.0	6.0	10.0	5.0**	0.20
Gunston Cove	Lower Potomac	54.0	6.0	10.0	---	0.30
Belmont-Occoquan Bay	Lorton	1.0	6.0	30.0	---	1.00
	Harbor View	0.08	6.0	10.0	---	1.00
Aquia Creek	Aquia	3.0	6.0	10.0	10.0**	0.20

* Recommendation is based on the assumption of continued discharge from the plant to the Little Hunting Creek embayment. Fairfax County plans to close the plant, and has begun construction of pumpover facilities to the Lower Potomac Pollution Control Plant.

** April 1 through October 31 only; no TKN limits November 1 through March 31.

To protect the main stem of the Potomac Estuary, an interim total phosphorus limit of 0.18 mg/L is regionally accepted as presented in the Interim Control Policy of the 1986 Supplement to the Metropolitan Washington 208 Plan. Therefore, at the present time, the more restrictive constraint on total phosphorus is the 0.18 mg/L limit for protection of the main stem of the Potomac. As indicated in the 208 Plan Supplement, long-term Potomac studies now under way will better define the total phosphorus limits required for protection of the Potomac main stem.

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
14.	**If item 13. is "NO" for meeting the minimum DO levels for the organism used, was the DO adjusted to the acceptable range (see a., b., and c. above) prior to test initiation?**	**NA**		**F-8.8.3**
15.	If the DO of the sample was greater than saturation at the test temperature, was the sample aerated to reduce it prior to test initiation?	X		F-8.8.3
16.	If the sample had a chlorine residual, was it dechlorinated?	N/A		F-8.8.7 S-8.8.7
17.	Did the permit allow for dechlorination of the sample? (Only if it contains a compliance schedule for a chlorine limit or for dechlorination)	N/A		DEQ guidance
18.	If the sample was dechlorinated, were controls treated with the same amount of dechlorination agent and run with untreated controls? (This determines any adverse effect of the dechlorination agent.)	N/A		F-8.8.7 S-8.8.7
19.	Was each sample pH within the 6.0 - 9.0 range?	X		F-8.8.8 S-8.8.9
20.	If 19. is NO, **and** if the sample pH was adjusted, were parallel tests, one with an adjusted pH and one without an adjusted pH, run? ***NOTE: DEQ prefers that the effluent is used "as is", with regard to pH due to the problems associated with multiple samples.***	N/A		F-8.8.8 S-8.8.9
21.	If the pH was adjusted, was it adjusted to pH 7.0 (Freshwater tests) or pH 8.0 (Saltwater tests) by adding 1N NaOH or 1N HCl?	N/A		F-8.8.8 S 8.8.9
22.	**Was the age of the organisms in the correct range at test initiation?** **a. *P. promelas* and *C. variegatus* - <24 hours old preferred (0-48 hours old is acceptable if the organisms are all within 24 hours in age of each other)** **b. *C. dubia* - <24 hours old, within 8 hours of age of each other?** **c. *M. bahia* - 7 days old, within 24 hours of age of each other**	X X		F-Tbl 11-1 S-Tbl 11-3 S-11.10.2.2 F-Tbl 13-3 S-Tbl 13-3
23.	**If the test organisms were obtained from an outside source, was a reference toxicant test run concurrently?**	**N/A**		**F-4.7.1** **4.7.3** **S-4.7.1**
24.	If the concurrently run reference toxicant test should fail to meet acceptability criteria, was the reference toxicant test repeated?	N/A		F-4.7.4 S-4.7.4
25.	**Was a minimum of 5 test concentrations and 1 control set up using concentrations appropriate for the limit or monitoring endpoint specified in the permit?**	**X**		**F-8.10.** **S-8.10**
26.	Was the test chamber size acceptable? a. *P. promelas* - 500 ml minimum b. *C. variegatus* - 300-1000 ml c. *M. bahia* - 400 ml beaker or 8 oz cup (236 ml capacity) d. *C. dubia* - 30 ml minimum	X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3
27.	Was the sample volume acceptable? a. *P. promelas* - 250 ml minimum b. *C. variegatus* - 250-750 ml c. *M. bahia* - 150 ml d. *C. dubia* - 15 ml minimum	X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
28.	Was the minimum number of replicates per concentration represented? *a.* 4 replicates - *P. promelas, C. variegatus* *b.* 8 replicates - *M. bahia* *c.* 10 replicates - *C. dubia*	 X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3
29.	Was the minimum number of organisms in each replicate? a. 10 organisms - *P. promelas, C. variegatus,* b. 5 organisms - *M. bahia* c. 1 organism - *C. dubia*	 X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3
30.	a. Was the dilution water synthetic moderately hard water or 20% DMW? (applies to freshwater species *P. promelas, C. dubia)* b. Was the dilution water synthetic sea water made with deionized water and sea salts adjusted to 20 $\pm$ 2 ppt, or the same salinity as the receiving water? (applies to salt water species, *C. variegatus, M. bahia*)	X		F-7.1.1.1 S-14.6.10.2 DEQ guidance
31.	Freshwater - Was the dilution water hardness within the approximate range of 80-100 mg $CaCO_3$/L?	X		F-Tables 3 & 4
32.	Freshwater - Was the dilution water alkalinity within the approximate range of 57- 64 mg $CaCO_3$/L?	X		F-Tables 3 & 4
33.	Freshwater - Was the dilution water pH within the approximate range of 7.4 – 7.8; or 7.9 – 8.3 for mineral water?	X		F-Tables 3 & 4
34.	**a. The average test temperature for tests using *P. promelas, C. dubia, or C. variegatus* should be 25$\pm$1° C upon initiation and throughout the test. Did the test temperatures deviate by more than 3° C (maximum minus minimum temperature) during the test?** **b. The average test temperature for tests using *M. bahia* should be 26$\pm$1° C upon initiation and throughout the test. Did the test temperatures deviate by more than 3° C (maximum minus minimum temperature) during the test?**		X	**F-4.6.1** **S-Table 3**
35.	**Was the temperature measured daily in one replicate of each concentration?**	X		**F-4.6.1** **S-11.10.7.1.2**
NOTE	***If surrogate sample chambers were used for probe measurements, they MUST have contained the same number of organisms as the test chambers and have been subject to the same conditions as the test chambers; else, the data are not acceptable. This applies to pH, DO and conductivity readings.***			
36.	Was the DO measured daily, at the beginning and end of each 24 hour period, in one replicate of each concentration?	X		F-4.6.1 S-13.10.6.1.1
37.	If the DO dropped to <4.0 mg/l in a test using P. promelas, C. variegatus, or M. bahia, was aeration initiated? (For a test using C. dubia, a low DO sample should be aerated prior to test initiation or renewal, as aeration with the organisms present is impractical.)	N/A		F-8.8.4. S-11.10.4.1
38.	If aeration was necessary (and acceptable), were **all** test chambers aerated for the duration of the test, and the time at which aeration was initiated recorded? (Not applicable to tests using *C. dubia*)	N/A		F-8.8.4.2 S-11.10.4.1
39.	If aeration was necessary (and acceptable), was it applied at a maximum rate of 100 bubbles/minute so as not to cause injury to the organisms?	N/A		F-8.8.4.2 S-11.10.4.1

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
40.	Was pH measured at test initiation and at the end of each 24-hour period in one replicate of each concentration?	X		F-8.8.5 S-11.10.7.1.2
41.	Was the pH measured in the effluent sample each day before new test solutions are made?	X		F-8.8.6 S-11.10.7.1.3
42.	If toxicity may be caused by un-ionized ammonia (or where the ammonia is ≥ 5.0 mg/L), was total ammonia measured?	X		F-8.8.6
43.	a. For a freshwater test, was conductivity measured at the beginning of each 24-hour period in the 100% sample and the control? (applies to freshwater species *P. promelas, C. dubia*) ***NOTE: It is recommended that conductivity is measured in one replicate of each dilution at the beginning of each 24-hour period.*** b. For a saltwater test, was the salinity measured at the end of each 24-hour period in one replicate of each concentration? (applies to salt water species, *C. variegatus, M. bahia*)	X		F-8.8.5 DEQ guidance S-11.10.7.1.2
44.	For both freshwater and saltwater tests, was the alkalinity measured in 100% effluent and the control at test initiation, and for each new sample? (For saltwater tests, the effluent alkalinity should be measured prior to adjustment with salts.)	X		F-8.8.5.1 S-8.8.5.1
45.	For both freshwater and saltwater tests, was the hardness measured in 100% effluent and the control at test initiation, and for each new sample? (For saltwater tests, the effluent hardness should be measured prior to adjustment with salts.)	X		F-8.8.5.1 S-8.8.5.1
46.	a. For a test using *Mysidopsis bahia*, were the mysids fed *Artemia* nauplii (at a rate of 75/mysid) twice daily? b. For a test using *Pimephales promelas*, were the larvae fed 0.15 ml concentrated *Artemia* nauplii a minimum of twice daily? c. For a test using *Cyprinodon variegatus*, were the larvae fed *Artemia* nauplii once per day at a rate of 0.1 g (wet weight) for days 0-2, and 0.15 g (wet weight) for days 3-6? d. For a test using *Ceriodaphnia dubia*, were the organisms fed 0.1 ml YCT and 0.1 ml algae per day after renewal?	X X		F-11.10.5.1 S-11.10.5 F-13.10.5.1
47.	Was the sample data for the renewal days consistent with the data for the first use of that sample?	X		DEQ guidance
48.	Was the daily photoperiod 16 hours light/8 hours dark?	X		F-13.10.3.1 S-11.10.3
49.	Were the surviving organisms counted daily in all test chambers?	X		F-11.10.6.2.1 S-11.10.7.2.1
50.	Were the number of young produced recorded daily for the *C. dubia* test?	X		F-13.10.6.2.3
51.	Was the occurrence of males present noted in the *C. dubia* test? (Tests with no males noted may be indicative of no males present)	X		F-13.10.9.3
52.	**Were individual treatments with males (1 or 2 replicates) and blocked rows containing ≥ 50% males (3 replicates or more) excluded from data analysis for the reproduction endpoint? (The males are used for survival analysis)**	**X**		**F-13.13.1.4**
53.	Were the daily renewals of chronic test solutions performed no earlier or later than subsequent 24±2 hour periods from test initiation?		X	DEQ guidance

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
54.	**a. For tests using *P. promelas, C. variegatus*, or *M. bahia*, was the test terminated 7 days (this is interpreted as 7 24-hour periods) and within ± 1 hour of the time of day at which it was initiated?** **b. For tests using *C. dubia*, was the test terminated when 60% or more of the surviving females in the controls had produced their third brood within 8 days?**	X X		**F-Table 1 and DEQ guidance** **S-11.10.9.1** **F-13.10.9.1**
55.	Was the percent survival in each concentration recorded at the end of the test?	X		DEQ guidance
56.	**Was the percent survival in the controls ≥80%?**	X		**F-13.12.1** **F-11.12.1** **S-11.12.1** **S-14.12.1**
57.	**Did the test meet the additional acceptability criteria?** **a. *P. promelas* - For tests initiated with larvae ≤ 24 hours old, was the average dry weight of the control larvae surviving at the end of the test ≥ 0.25 mg?** **b. *C. variegatus* - For tests initiated with larvae ≤ 24 hours old, was the average dry weight of control larvae ≥ 0.60 mg (unpreserved), or ≥ 0.50 mg (preserved)?** **c. *M. bahia* - Was the average weight of the controls ≥ 0.20 mg?** **d. *C. dubia* - Did reproduction in the controls average 15 or more young per surviving female? NOTE: Fourth brood neonates should not be counted. In addition to these test acceptability criteria, if fewer than eight replicates in the control remain after excluding males and blocks with 50% or more surviving organisms identified as males, the test is invalid and must be repeated with newly collected samples.**	X X		**F-11.12.1** **S-11.12.1** **S-14.12.1** **F-13.2.1** **13.13.1.4**
58.	Were the data Arcsin transformed prior to statistical analysis (*M. bahia, C. variegatus, P. promelas* – survival)?	X		S-Figure 5
59.	Was the NOEC correctly determined using the appropriate statistical method?	X		F-9.1
60.	**Was the PMSD for the sublethal endpoint within upper bounds? (applicable for tests performed after 12/1/02)** **a. *P. promelas* growth - 30%** **b. *C. dubia* reproduction - 47%** **c. *M. bahia* growth - 37%** **If the PMSD was greater than the criterion but significant reduction identified at the IWC then the test is acceptable (A bold item?)**	**X**		**F,S-10.2.8**
61.	**If the PMSD exceeded the upper bound and no significant reduction was identified at the IWC, was the test repeated?**	**N/A**		**F,S-10.2.8.2.4.2**
62.	Did the test result in a calculable NOEC (Result reported as "<" is not acceptable. Lower dilutions should have been added or the test rerun to determine the result.)	X		DEQ guidance
63.	Was the IC_{25} reported for the test?	X		F-9.1
64.	Was the LC_{50} at 48 hours reported for the test?	X		DEQ guidance

Items in bold type (and shaded) are significant in that if they are answered "NO", the test is automatically invalidated and must be repeated to fulfill permit TMP requirements. Bold type items are numbers 2, 3, 4, 7, 10, 11, 14, 22, 23, 25, 34, 35, 52, 54, 56, 57, 60 and 61.

RESPONSE GUIDE

1. Yes
2. Yes
3. Yes
4. Yes
5. Yes, preferably
6. Yes
7. Yes
8. Yes, preferably
9. Yes, preferably; NA
10. Yes, unless granted variance
11. Yes, unless granted variance
12. Yes, or NA
13. Yes
14. If 13. is "No", then Yes; NA
15. Yes; No; NA
16. Yes; No; NA
17. If 16. is "Yes", then Yes
18. If 16. is "Yes", then Yes
19. Yes; No
20. Yes; NA
21. Yes; NA
22. Yes
23. Yes; NA
24. Yes; NA
25. Yes
26. Yes
27. Yes
28. Yes
29. Yes
30. Yes
31. Yes
32. Yes
33. Yes
34. No
35. Yes
36. Yes
37. Yes; NA
38. If 37. is "Yes", then Yes; NA
39. If 37. is "Yes", then Yes; NA
40 Yes
41. Yes
42. Yes; NA
43. Yes
44. Yes
45. Yes
46. Yes
47. Yes
48. Yes
49. Yes
50. Yes
51. Yes; NA
52. Yes
53. Yes, preferably
54. Yes
55. Yes
56. Yes
57. Yes
58. Yes
59. Yes
60. Yes
61. Yes
62-64. Yes

RESULTS

ACCEPTABLE	

COMMENTS:

test date
11/14/06

CHRONIC TEST DATA REVIEW CHECKLIST

Revised October 13, 2004

Referencing:

Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition, EPA 821-R-02-013, October 2002 (Citations preceded by "F")

and

Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms, Third Edition, EPA 821-R-02-014, October 2002 (Citations preceded by "S")

Permit Number VA0025364 Outfall 001 Permittee: Fairfax County – Noman Cole PCP

Test Start Date 11/14/06 Period Reviewed: QT ___ SA ___ AN X Other ___
1st ___ 2nd ___ 3rd ___ 4th ___

Testing Laboratory: CBI

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
1.	Was the test performed as per schedule?	X		Permit
2.	**Was the correct test performed?**	X		Permit
3.	**Was the correct type of sample collected at each sampling event?**	X		Permit
4.	**Was a minimum of 3 samples collected?**	X		F-8.3.2
5.	Were pH, temp, Cl of sample checked at sample site (or within 15 minutes of sample retrieval) for each sample?	X		DEQ guidance F-8.5.3
6.	If the samples were collected for off-site toxicity testing, were they held at 0-6° C during collection (composite) or chilled immediately following collection (grab)?	X		F-8.5.2 S-8.5.1
7.	**Was each sample packed in ice and chilled to 0-6° C for transport? NOTE: Frozen samples are not valid! NOTE: An exception to this would be for samples that are delivered for same day testing that may not have a chance to cool to this temperature range.**	X		F-8.5.7.1 S-8.5.7.1
8.	Were temperature and sample description recorded upon receipt of each sample?	X		S-8.6.1 DEQ guidance
9.	Does the description (visual, obvious scent) of each sample (when received at lab) seem typical for this type of facility?	X		DEQ guidance
10.	**Was the test initiated within 36 hours of sample retrieval from sampler?** NOTE: In isolated cases, an extension to this holding time can be allowed by DEQ (CO). Documentation of this permission must be presented with the test report and include the supportive data mentioned in 8.5.4 and 8.7.1	X		F-8.5.4 S-8.5.4
11.	**Was the last use of the sample within 72 HOURS AFTER FIRST USE (sample age should not exceed 108 hours)?**	X		**F-8.5.4** **S-8.5.4**
12.	If filtration was necessary to remove debris or indigenous organisms, was a sieve with ∃60 Φm mesh openings (or larger) used?	X		F-8.8.2 S-7.3.4
13.	**a. Was the sample DO ≥ 4.0 mg/l and ≤ saturation at 25° C prior to test initiation? (applies *to C. dubia* and *P. promelas)*** **b. Was the sample DO ≥ 4.0 mg/l and ≤ saturation at 25° C and 20 g/kg salinity prior to test initiation? (applies to *C. variegatus)*** **c. Was the sample DO ≥ 4.0 mg/l and ≤ saturation at 26° C and 20 g/kg salinity prior to test initiation? (applied to *M. bahia*)**		**X**	**F-8.8.3** **S-8.8.4**

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
14.	**If item 13. is "NO" for meeting the minimum DO levels for the organism used, was the DO adjusted to the acceptable range (see a., b., and c. above) prior to test initiation?**	**X**		**F-8.8.3**
15.	If the DO of the sample was greater than saturation at the test temperature, was the sample aerated to reduce it prior to test initiation?	X		F-8.8.3
16.	If the sample had a chlorine residual, was it dechlorinated?	N/A		F-8.8.7 S-8.8.7
17.	Did the permit allow for dechlorination of the sample? (Only if it contains a compliance schedule for a chlorine limit or for dechlorination)	N/A		DEQ guidance
18.	If the sample was dechlorinated, were controls treated with the same amount of dechlorination agent and run with untreated controls? (This determines any adverse effect of the dechlorination agent.)	N/A		F-8.8.7 S-8.8.7
19.	Was each sample pH within the 6.0 - 9.0 range?	X		F-8.8.8 S-8.8.9
20.	If 19. is NO, **and** if the sample pH was adjusted, were parallel tests, one with an adjusted pH and one without an adjusted pH, run? ***NOTE: DEQ prefers that the effluent is used "as is", with regard to pH due to the problems associated with multiple samples.***	N/A		F-8.8.8 S-8.8.9
21.	If the pH was adjusted, was it adjusted to pH 7.0 (Freshwater tests) or pH 8.0 (Saltwater tests) by adding 1N NaOH or 1N HCl?	N/A		F-8.8.8 S 8.8.9
22.	**Was the age of the organisms in the correct range at test initiation?** ***a. P. promelas* and *C. variegatus* - <24 hours old preferred (0-48 hours old is acceptable if the organisms are all within 24 hours in age of each other)** ***b. C. dubia* - <24 hours old, within 8 hours of age of each other?** ***c. M. bahia* - 7 days old, within 24 hours of age of each other**	X X		F-Tbl 11-1 S-Tbl 11-3 S-11.10.2.2 F-Tbl 13-3 S-Tbl 13-3
23.	**If the test organisms were obtained from an outside source, was a reference toxicant test run concurrently?**	**N/A**		**F-4.7.1** **4.7.3** **S-4.7.1**
24.	If the concurrently run reference toxicant test should fail to meet acceptability criteria, was the reference toxicant test repeated?	N/A		F-4.7.4 S-4.7.4
25.	**Was a minimum of 5 test concentrations and 1 control set up using concentrations appropriate for the limit or monitoring endpoint specified in the permit?**	**X**		**F-8.10.** **S-8.10**
26.	Was the test chamber size acceptable? *a. P. promelas* - 500 ml minimum *b. C. variegatus* - 300-1000 ml *c. M. bahia* - 400 ml beaker or 8 oz cup (236 ml capacity) *d. C. dubia* - 30 ml minimum	X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3
27.	Was the sample volume acceptable? *a. P. promelas* - 250 ml minimum *b. C. variegatus* - 250-750 ml *c. M. bahia* - 150 ml *d. C. dubia* - 15 ml minimum	X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
28.	Was the minimum number of replicates per concentration represented? *a.* 4 replicates - *P. promelas, C. variegatus* *b.* 8 replicates - *M. bahia* *c.* 10 replicates - *C. dubia*	X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3
29.	Was the minimum number of organisms in each replicate? a. 10 organisms - *P. promelas, C. variegatus,* b. 5 organisms - *M. bahia* c. 1 organism - *C. dubia*	X X		F-Tbl 11-1 S-Tbl 11-3 F-Tbl 13-3 S-Tbl 13-3
30.	a. Was the dilution water synthetic moderately hard water or 20% DMW? (applies to freshwater species *P. promelas, C. dubia)* b. Was the dilution water synthetic sea water made with deionized water and sea salts adjusted to 20 $\pm$ 2 ppt, or the same salinity as the receiving water? *(*applies to salt water species, *C. variegatus, M. bahia)*	X		F-7.1.1.1 S-14.6.10.2 DEQ guidance
31.	Freshwater - Was the dilution water hardness within the approximate range of 80-100 mg $CaCO_3$/L?	X		F-Tables 3 & 4
32.	Freshwater - Was the dilution water alkalinity within the approximate range of 57- 64 mg $CaCO_3$/L?	X		F-Tables 3 & 4
33.	Freshwater - Was the dilution water pH within the approximate range of 7.4 – 7.8; or 7.9 – 8.3 for mineral water?	X		F-Tables 3 & 4
34.	**a. The average test temperature for tests using *P. promelas, C. dubia, or C. variegatus* should be 25$\pm$1° C upon initiation and throughout the test. Did the test temperatures deviate by more than 3° C (maximum minus minimum temperature) during the test?** **b. The average test temperature for tests using *M. bahia* should be 26$\pm$1° C upon initiation and throughout the test. Did the test temperatures deviate by more than 3° C (maximum minus minimum temperature) during the test?**	X		**F-4.6.1** **S-Table 3**
35.	**Was the temperature measured daily in one replicate of each concentration?**	X		**F-4.6.1** **S-11.10.7.1.2**
NOTE	***If surrogate sample chambers were used for probe measurements, they MUST have contained the same number of organisms as the test chambers and have been subject to the same conditions as the test chambers; else, the data are not acceptable. This applies to pH, DO and conductivity readings.***			
36.	Was the DO measured daily, at the beginning and end of each 24 hour period, in one replicate of each concentration?	X		F-4.6.1 S-13.10.6.1.1
37.	If the DO dropped to <4.0 mg/l in a test using *P. promelas, C. variegatus*, or *M. bahia,* was aeration initiated? (For a test using *C. dubia*, a low DO sample should be aerated prior to test initiation or renewal, as aeration with the organisms present is impractical.)	N/A		F-8.8.4. S-11.10.4.1
38.	If aeration was necessary (and acceptable), were **all** test chambers aerated for the duration of the test, and the time at which aeration was initiated recorded? (Not applicable to tests using *C. dubia*)	N/A		F-8.8.4.2 S-11.10.4.1
39.	If aeration was necessary (and acceptable), was it applied at a maximum rate of 100 bubbles/minute so as not to cause injury to the organisms?	N/A		F-8.8.4.2 S-11.10.4.1

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
40.	Was pH measured at test initiation and at the end of each 24-hour period in one replicate of each concentration?	X		F-8.8.5 S-11.10.7.1.2
41.	Was the pH measured in the effluent sample each day before new test solutions are made?	X		F-8.8.6 S-11.10.7.1.3
42.	If toxicity may be caused by un-ionized ammonia (or where the ammonia is ∃5.0 mg/l), was total ammonia measured?	X		F-8.8.6
43.	a. For a freshwater test, was conductivity measured at the beginning of each 24-hour period in the 100% sample and the control? *(*applies to freshwater species *P. promelas, C. dubia)* ***NOTE: It is recommended that conductivity is measured in one replicate of each dilution at the beginning of each 24-hour period.*** b. For a saltwater test, was the salinity measured at the end of each 24-hour period in one replicate of each concentration? *(*applies to salt water species, *C. variegatus, M. bahia)*	X		F-8.8.5 DEQ guidance S-11.10.7.1.2
44.	For both freshwater and saltwater tests, was the alkalinity measured in 100% effluent and the control at test initiation, and for each new sample? (For saltwater tests, the effluent alkalinity should be measured prior to adjustment with salts.)	X		F-8.8.5.1 S-8.8.5.1
45.	For both freshwater and saltwater tests, was the hardness measured in 100% effluent and the control at test initiation, and for each new sample? (For saltwater tests, the effluent hardness should be measured prior to adjustment with salts.)	X		F-8.8.5.1 S-8.8.5.1
46.	a. For a test using *Mysidopsis bahia*, were the mysids fed *Artemia* nauplii (at a rate of 75/mysid) twice daily? b. For a test using *Pimephales promelas*, were the larvae fed 0.15 ml concentrated *Artemia* nauplii a minimum of twice daily? c. For a test using *Cyprinodon variegatus*, were the larvae fed *Artemia* nauplii once per day at a rate of 0.1 g (wet weight) for days 0-2, and 0.15 g (wet weight) for days 3-6? d. For a test using *Ceriodaphnia dubia*, were the organisms fed 0.1 ml YCT and 0.1 ml algae per day after renewal?	X X		F-11.10.5.1 S-11.10.5 F-13.10.5.1
47.	Was the sample data for the renewal days consistent with the data for the first use of that sample?	X		DEQ guidance
48.	Was the daily photoperiod 16 hours light/8 hours dark?	X		F-13.10.3.1 S-11.10.3
49.	Were the surviving organisms counted daily in all test chambers?	X		F-11.10.6.2.1 S-11.10.7.2.1
50.	Were the number of young produced recorded daily for the *C. dubia* test?	X		F-13.10.6.2.3
51.	Was the occurrence of males present noted in the *C. dubia* test? (Tests with no males noted may be indicative of no males present)	X		F-13.10.9.3
52.	**Were individual treatments with males (1 or 2 replicates) and blocked rows containing ≥ 50% males (3 replicates or more) excluded from data analysis for the reproduction endpoint? (The males are used for survival analysis)**	**X**		**F-13.13.1.4**
53.	Were the daily renewals of chronic test solutions performed no earlier or later than subsequent 24±2 hour periods from test initiation?	X		DEQ guidance

#	CHRONIC DATA PARAMETERS - (Some are organism specific)	YES	NO	Manual or Permit Req.
54.	**a. For tests using *P. promelas, C. variegatus*, or *M. bahia*, was the test terminated 7 days (this is interpreted as 7 24-hour periods) and within ± 1 hour of the time of day at which it was initiated?** **b. For tests using *C. dubia*, was the test terminated when 60% or more of the surviving females in the controls had produced their third brood within 8 days?**	X X		**F-Table 1 and DEQ guidance** **S-11.10.9.1** **F-13.10.9.1**
55.	Was the percent survival in each concentration recorded at the end of the test?	X		DEQ guidance
56.	**Was the percent survival in the controls ≥80%?**	X		**F-13.12.1** **F-11.12.1** **S-11.12.1** **S-14.12.1**
57.	**Did the test meet the additional acceptability criteria?** **a. *P. promelas* - For tests initiated with larvae ≤ 24 hours old, was the average dry weight of the control larvae surviving at the end of the test ≥ 0.25 mg?** **b. *C. variegatus* - For tests initiated with larvae ≤ 24 hours old, was the average dry weight of control larvae ≥ 0.60 mg (unpreserved), or ≥ 0.50 mg (preserved)?** **c. *M. bahia* - Was the average weight of the controls ≥ 0.20 mg?** **d. *C. dubia* - Did reproduction in the controls average 15 or more young per surviving female? NOTE: Fourth brood neonates should not be counted. In addition to these test acceptability criteria, if fewer than eight replicates in the control remain after excluding males and blocks with 50% or more surviving organisms identified as males, the test is invalid and must be repeated with newly collected samples.**	X X		**F-11.12.1** **S-11.12.1** **S-14.12.1** **F-13.2.1** **13.13.1.4**
58.	Were the data Arcsin transformed prior to statistical analysis (*M. bahia, C. variegatus, P. promelas* – survival)?	X		S-Figure 5
59.	Was the NOEC correctly determined using the appropriate statistical method?	X		F-9.1
60.	**Was the PMSD for the sublethal endpoint within upper bounds? (applicable for tests performed after 12/1/02)** **a. *P. promelas* growth - 30%** **b. *C. dubia* reproduction - 47%** **c. *M. bahia* growth - 37%** **If the PMSD was greater than the criterion but significant reduction identified at the IWC then the test is acceptable (A bold item?)**	**X** **X**		**F,S-10.2.8**
61.	**If the PMSD exceeded the upper bound and no significant reduction was identified at the IWC, was the test repeated?**	**N/A**		**F,S-10.2.8.2.4.2**
62.	Did the test result in a calculable NOEC (Result reported as "<" is not acceptable. Lower dilutions should have been added or the test rerun to determine the result.)	X		DEQ guidance
63.	Was the IC_{25} reported for the test?	X		F-9.1
64.	Was the LC_{50} at 48 hours reported for the test?	X		DEQ guidance

Items in bold type (and shaded) are significant in that if they are answered "NO", the test is automatically invalidated and must be repeated to fulfill permit TMP requirements. Bold type items are numbers 2, 3, 4, 7, 10, 11, 14, 22, 23, 25, 34, 35, 52, 54, 56, 57, 60 and 61.

RESPONSE GUIDE

1. Yes
2. Yes
3. Yes
4. Yes
5. Yes, preferably
6. Yes
7. Yes
8. Yes, preferably
9. Yes, preferably; NA
10. Yes, unless granted variance
11. Yes, unless granted variance
12. Yes, or NA
13. Yes
14. If 13. is "No", then Yes; NA
15. Yes; No; NA
16. Yes; No; NA
17. If 16. is "Yes", then Yes
18. If 16. is "Yes", then Yes
19. Yes; No
20. Yes; NA
21. Yes; NA
22. Yes
23. Yes; NA
24. Yes; NA
25. Yes
26. Yes
27. Yes
28. Yes
29. Yes
30. Yes
31. Yes
32. Yes
33. Yes
34. No
35. Yes
36. Yes
37. Yes; NA
38. If 37. is "Yes", then Yes; NA
39. If 37. is "Yes", then Yes; NA
40 Yes
41. Yes
42. Yes; NA
43. Yes
44. Yes
45. Yes
46. Yes
47. Yes
48. Yes
49. Yes
50. Yes
51. Yes; NA
52. Yes
53. Yes, preferably
54. Yes
55. Yes
56. Yes
57. Yes
58. Yes
59. Yes
60. Yes
61. Yes
62-64. Yes

RESULTS

ACCEPTABLE	NOT ACCEPTABLE

COMMENTS: The test met all decision criteria and was deemed valid. The resulting NOEC of 100 equals an TUc of 1.0. The effluent did not demonstrate toxicity.

Reviewed by: Jim Olson 01/11/07

test date
11/15/04

MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY
Northern Virginia Regional Office

13901 Crown Court Woodbridge, VA 22193 (703) 583-3840

SUBJECT: TOXICS MANAGEMENT PROGRAM DATA REVIEW
Noman M. Cole Jr. Pollution Control Plant (VA0025364)
REVIEWER: Shih-Cheng Chang
DATE: March 30, 2005
COPIES: OWPP-TMP; EPA Region III; Tom Faha

PREVIOUS REVIEW: April 8, 2004

DATA REVIEWED:

This review covers the second annual chronic toxicity tests conducted in November 2004 for Outfall 001, since the permit was reissued in April 2003. These tests were performed on *C. dubia* and *P. promelas* using 24-hour composite samples of final effluent collected from the outfall.

DISCUSSION:

The results of these toxicity tests, along with the results of previous toxicity tests performed on effluent samples collected from Outfall 001, are summarized in Table 1.

The chronic toxicity of the effluent samples was determined with a 3-brood static daily renewal survival and reproduction chronic toxicity test using *C. dubia* as the test species and a 7-day static daily renewal survival and growth chronic test using *P. promelas*.

Statistical analysis based on hypothesis testing of the test results yielded for both species a No Observed Effect Concentration (NOEC) of 100% effluent, equivalent to 1 TUc, and thus passed the chronic toxicity criteria.

These test results indicate that the effluent samples from Outfall 001 exhibit no chronic toxicity to the test organisms.

CONCLUSION:

The toxicity tests are valid and the test results acceptable. The effluent from Outfall 001 exhibits no chronic toxicity to the test organisms.

FACILITY INFORMATION

FACILITY: Noman M. Cole Jr. Pollution Control Plant
LOCATION: 9399 Richmond Highway
Lorton, VA 22199
Fairfax County
VPDES#: VA0025364
TYPE OF FACILITY: Municipal, major
REGION/PERMIT WRITER: NVRO/ Alison Thompson
PERMIT EFFECTIVE DATE: April 13, 2003
SIC CODE/DESCRIPTION: 4952/Sewage treatment

TREATMENT: Recently upgraded to BNR. The treatment facilities include preliminary (bar screens and primary sedimentation), secondary (extended activated sludge aeration, polymer addition followed by secondary clarification), and advanced wastewater treatment (chemical addition/sedimentation followed by filtration), disinfection (sodium hypochlorite) and dechlorination (sodium bisulfite).

Sludge thickened by floatation and dewatered by filter press. Sludge cake incinerated on site in multiple-hearth incinerators and ash hauled off-site for land disposal.

OUTFALL/FLOW (MGD): Outfall 001/67 MGD.

RECEIVING STREAM/7Q10/IWC:
Pohick Creek(Outfalls 001, 002, 003 and 006); Potomac River basin; Potomac River subbasin; Section 7; Class III; Special Standards b, NEW-10
7Q10: 0.44 MGD
IWC: 99.2% (54 MGD) ; 99.3% (67 MGD)

TMP EFFECTIVE DATE: April 13, 1998

TMP REQUIREMENTS:
Biological Monitoring
Annual chronic toxicity tests using 24-hour flow-proportioned composite samples of final effluent from Outfall 00. The chronic tests shall be static renewal, survival and reproduction/growth tests using *C. dubia* and *P. promelas*.

Chronic endpoint: NOEC = 100%; or 1 TUc

BIOLOGICAL TESTING PERFORMED BY: Coastal Bioanalysts, Inc.

BIOMONITORING RESULTS
Noman M. Cole Jr. Pollution Control Plant (VA0025364)

Table 1. Summary of Toxicity Test Results for Outfall 001.

TEST DATE	TEST TYPE/ORGANISM	48-h LC_{50} (%)	IC_{25} (%)	NOEC (%)	% SURV	LAB	REMARKS
6/10/98	Acute *C. dubia*	>100			100	CBI	1st quarterly
6/10/98	Acute *P. promelas*	>100			95	CBI	
6/08/98	Chronic *C. dubia*			100 SR	100	CBI	
6/08/98	Chronic *P. promelas*			100 SG	90	CBI	
9/24/98	Acute *C. dubia*	>100			100	CBI	2nd quarterly
9/24/98	Acute *P. promelas*	**84.1**			35	CBI	
9/22/98	Chronic *C. dubia*			100 S **49.6 R**	90	CBI	
9/22/98	Chronic *P. promelas*			**49.6 SG**	0	CBI	
12/10/98	Acute *C. dubia*	>100			100	CBI	3rd quarterly
12/10/98	Acute *P. promelas*	>100			85	CBI	
12/08/98	Chronic *C. dubia*			100 SR	100	CBI	
12/08/98	Chronic *P. promelas*			**49.6 SG**	75	CBI	
	TRE notification April 28, 1999						
12/02/02	Chronic *C. dubia*	>100	>100	100 SR	90	CBI	1st confirmation
12/02/02	Chronic *P. promelas*	>100	>100	100 SG	88	CBI	
12/10/02	Chronic *C. dubia*	>100	>100	100 SR	100	CBI	2nd confirmation
12/10/02	Chronic *P. promelas*	>100	>100	100 SG	100	CBI	
12/17/02	Chronic *C. dubia*	>100	>100	100 SR	90	CBI	3rd confirmation
12/17/02	Chronic *P. promelas*	>100	>100	100 SG	93	CBI	
01/13/03	Chronic *C. dubia*	>100	>100	100 SR	100	CBI	4th confirmation
01/13/03	Chronic *P. promelas*	>100	>100	100 SG	95	CBI	
	Permit reissued April 13, 2003						
12/02/03	Chronic *C. dubia*	>100	>100	100 SR	80	CBI	1st annual
12/02/03	Chronic *P. promelas*	>100	>100	100 SG	95	CBI	
*11/15/04	Chronic *C. dubia*	>100	>100	100 SR	100	CBI	2nd annual
*11/15/04	Chronic *P. promelas*	>100	>100	100 SG	100	CBI	

FOOTNOTES:

* Test included in the current data review.

A bold faced LC50 or NOEC value indicates that the test failed the criteria.

ABBREVIATIONS:

S - Survival; R - Reproduction; G - Growth

% SURV - Percent survival in 100% effluent

CBI - Coastal Bioanalysts, Inc.

No Letter

Mr. Allen H. Hogge, Director
Noman M. Cole Jr. Pollution Control Plant
9399 Richmond Highway
P.O. Box 268
Lorton, Virginia 22199

Re: Noman M. Cole Jr. Pollution Control Plant
VPDES Permit No. VA0025364
Toxicity Reduction Evaluation

Dear Mr. Hogge:

This letter is to inform you of the following:

Should you have any questions regarding the above, please call me at (703) 583-3882.

Sincerely,

Shih-Cheng Chang
Environmental Engineer Senior

Enclosure: TMP data review
cc: Tom Faha
A. Birmingham

test date
12/02/03

MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY
Northern Virginia Regional Office

13901 Crown Court **Woodbridge, VA 22193** **(703) 583-3840**

SUBJECT: TOXICS MANAGEMENT PROGRAM DATA REVIEW
Noman M. Cole Jr. Pollution Control Plant (VA0025364)
REVIEWER: Shih-Cheng Chang
DATE: April 8, 2004
COPIES: OWPS-TMP; EPA Region III; Tom Faha

PREVIOUS REVIEW: May 1, 2003

DATA REVIEWED:

This review covers the first annual chronic toxicity testing conducted in December 2003 for Outfall 001, since the permit was reissued in April 2003. These tests were performed on *C. dubia* and *P. promelas* using 24-hour flow-proportional composite samples of final effluent collected from the outfall.

DISCUSSION:

The results of these toxicity tests, along with the results of previous tests performed on effluent samples collected from Outfall 001, are summarized in Table 1.

The effluent toxicity was determined with a static daily renewal chronic toxicity test for survival, growth or reproduction using *C. dubia* and *P. promelas* as the test species. The chronic tests yielded for both species a No Observed Effect Concentration (NOEC) of 100% effluent, equivalent to 1 TUc and thus passed the chronic toxicity criteria..

These test results indicate that the effluent samples from Outfall 001 exhibited no toxicity to the test organisms. Apparently, implementation of nitrification recently at the plant has successfully eliminated the ammonia toxicity used to be present in the discharge.

CONCLUSION:

The toxicity tests are valid and the test results acceptable. The effluent from Outfall 001 exhibited no toxicity to the test organisms.

FACILITY INFORMATION

FACILITY: Noman M. Cole Jr. Pollution Control Plant
LOCATION: 9399 Richmond Highway
Lorton, VA 22199
Fairfax County
VPDES#: VA0025364
TYPE OF FACILITY: Municipal, major
REGION/PERMIT WRITER: NVRO/ Alison Thompson
PERMIT EFFECTIVE DATE: April 13, 2003
SIC CODE/DESCRIPTION: 4952/Sewage treatment

TREATMENT: Recently upgraded to BNR. The treatment facilities include preliminary (bar screens and primary sedimentation), secondary (extended activated sludge aeration, polymer addition followed by secondary clarification), and advanced wastewater treatment (chemical addition/sedimentation followed by filtration), disinfection (sodium hypochlorite) and dechlorination (sodium bisulfite).

Sludge thickened by floatation and dewatered by filter press. Sludge cake incinerated on site in multiple-hearth incinerators and ash hauled off-site for land disposal.

OUTFALL/FLOW (MGD): Outfall 001/67 MGD.

RECEIVING STREAM/7Q10/IWC:
Pohick Creek(Outfalls 001, 002, 003 and 006); Potomac River basin; Potomac River subbasin; Section 7; Class III; Special Standards b, NEW-10
7Q10: 0.44 MGD
IWC: 99.2% (54 MGD) ; 99.3% (67 MGD)

TMP EFFECTIVE DATE: April 13, 1998

TMP REQUIREMENTS:
Biological Monitoring
Annual chronic toxicity tests using 24-hour flow-proportioned composite samples of final effluent from Outfall 00. The chronic tests shall be static renewal, survival and reproduction/growth tests using *C. dubia* and *P. promelas*.

Chronic endpoint: NOEC = 100%; or 1 TUc

BIOLOGICAL TESTING PERFORMED BY: Coastal Bioanalysts, Inc.

BIOMONITORING RESULTS
Noman M. Cole Jr. Pollution Control Plant (VA0025364)

Table 1. Summary of Toxicity Test Results for Outfall 001.

TEST DATE	TEST TYPE/ORGANISM	48-h LC_{50} (%)	IC_{25} (%)	NOEC (%)	% SURV	LAB	REMARKS
6/10/98	Acute *C. dubia*	>100			100	CBI	1st quarterly
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6/08/98	Chronic *C. dubia*			100 SR	100	CBI	
6/08/98	Chronic *P. promelas*			100 SG	90	CBI	
9/24/98	Acute *C. dubia*	>100			100	CBI	2nd quarterly
9/24/98	Acute *P. promelas*	**84.1**			35	CBI	
9/22/98	Chronic *C. dubia*			100 S **49.6 R**	90	CBI	
9/22/98	Chronic *P. promelas*			**49.6 SG**	0	CBI	
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12/10/98	Acute *P. promelas*	>100			85	CBI	
12/08/98	Chronic *C. dubia*			100 SR	100	CBI	
12/08/98	Chronic *P. promelas*			**49.6 SG**	75	CBI	
	TRE notification April 28, 1999						
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12/10/02	Chronic *P. promelas*	>100	>100	100 SG	100	CBI	
12/17/02	Chronic *C. dubia*	>100	>100	100 SR	90	CBI	3rd confirmation
12/17/02	Chronic *P. promelas*	>100	>100	100 SG	93	CBI	
01/13/03	Chronic *C. dubia*	>100	>100	100 SR	100	CBI	4th confirmation
01/13/03	Chronic *P. promelas*	>100	>100	100 SG	95	CBI	
	Permit reissued April 13, 2003						
*12/02/03	Chronic *C. dubia*	>100	>100	100 SR	80	CBI	1st annual
*12/02/03	Chronic *P. promelas*	>100	>100	100 SG	95	CBI	

FOOTNOTES:

* Test included in the current data review.

A bold faced LC50 or NOEC value indicates that the test failed the criteria.

ABBREVIATIONS:

S - Survival; R - Reproduction; G - Growth

% SURV - Percent survival in 100% effluent

CBI - Coastal Bioanalysts, Inc.

No Letter

Mr. Allen H. Hogge, Director
Noman M. Cole Jr. Pollution Control Plant
9399 Richmond Highway
P.O. Box 268
Lorton, Virginia 22199

Re: Noman M. Cole Jr. Pollution Control Plant
VPDES Permit No. VA0025364
Toxicity Reduction Evaluation

Dear Mr. Hogge:

This letter is to inform you of the following:

1. The toxicity tests you have conducted since June 1998 on the effluent from Outfall 001 have failed the Toxics Management Program (TMP) decision criteria listed in Part I.F.1.b of your permit. The effluent, therefore, is considered to have demonstrated actual or potential toxicity. According to the permit, a Toxicity Reduction Evaluation (TRE) to reduce or eliminate the toxicity of the effluent needs to be conducted.

   Based on the weight of evidence present in your 1993 effluent evaluations, we accept your conclusion that ammonia is the sole toxicant.

3. Given the above and the facilities expansion and biological nutrient removal (BNR) upgrade currently underway at the plant, you are not required to conduct any further toxicity reduction evaluations or continue with toxicity testing of Part I.F.1.a of the permit.

3. At the completion of the BNR program, you are required to perform a series of confirmation tests to verify that the effluent toxicity has been eliminated. The tests shall include eight acute and eight chronic tests using two test species and be conducted as specified in Part I.F.1.a of the permit.

4. Should the confirmation tests fail to meet the TMP decision criteria, a Whole Effluent Toxicity (WET) limit will be placed in the permit. And you will be required to present a plan to further reduce the effluent toxicity.

Should you have any questions regarding the above, please call me at (703) 583-3882.

Sincerely,

Shih-Cheng Chang
Environmental Engineer Senior

Enclosure: TMP data review
cc: Tom Faha
A. Birmingham

COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD
2111 Hamilton Street

R. V. Davis, P. E.
Executive Director

Post Office Box 11143
Richmond, Virginia 23230
(804) 257-0056

MAR 1 1983

Good job

Mr. Richard Gozikowski
Director
Wastewater Treatment Division
County of Fairfax
4100 Chain Bridge Road
Fairfax, VA 22030

Re: Lower Potomac STP (NPDES No. VA0025364)

Dear Mr. Gozikowski:

By letter dated Feburary 16, 1983, from Robert J. Mitkus, Acting Director, Evnrionmental Services Division, Region III, U. S. Environmental Protection Agency (EPA), we have received limited-use approval of a request for use of an alternate test procedure for total phosphorus analyses at the referenced facility's laboratory. In accordance with the above, the State Water Control Board joins with EPA in its approval of the requested alternate method.

This approval for use of the stannous chloride procedure for total phosphorus determinations is authorized with the understanding that this method is limited to monitoring effluent samples from the following facilities:

1. Lower Potomac STP (NPDES No. VA0025364)
2. Little Hunting Creek STP (NPDES No. VA0025372)
3. Convict Road Camp #30 STP (NPDES No. VA0023574)
4. Lorton Correctional Unit STP (NPDES No. VA0030163)
5. Harbor View Subdivision STP (NPDES No. VA0029416)

Both the Board and EPA commend the manner in which the data supporting the requested procedure was presented and documented.

If you have any questions concerning this approval, please feel free to contact our Northern Regional Office.

Sincerely,

R. V. Davis, P.E.
Acting Executive Director

cc SWCB-Bureau of Applied Technology
SWCB-Northern Regional Office
USEPA-Region III

Attachment 15

RECEIVED
MAR - 7 1983
Office
Waste Management
Public Works

cy-CUD
~~MAG~~
BAT
BE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

FEB 10 1983

Mr. Robert V. Davis
Executive Secretary
Commonwealth of Virginia
State Water Control Board
2111 Hamilton Street
Richmond, Virginia 23230

RE: 42-0405-2-63

Dear Mr. Davis:

Your correspondence, referenced above, requested approval of the application for a variance in test methodology submitted on the behalf of the County of Fairfax. The county's Lower Potomac Wastewater Treatment Plant wishes to use an alternate test method for total phosphorous analyses instead of an approved procedure. They propose to use the stannous chloride procedure when analyzing the following NPDES permittee effluents:

1. VA0023574 - Convict Road Camp #30
2. VA0030163 - Lorton Correctional Unit
3. VA0025372 - Little Hunting Creek STP
4. VA0025364 - Lower Potomac STP
5. VA0029416 - Harbor View Subdivision STP

The Water Management and Environmental Services Divisions, as well as the Cincinnati Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) have carefully reviewed the application, In their technical review, EMSL-Cincinnati stated that the statistical analyses of the comparability data provided in support of the request indicate no significant statistical difference in precision of accuracy when compared to the data from use of the U.S.-EPA approved procedure. EMSL-Cincinnati also stated that the County of Fairfax, Department of Public Works, should be commended for the excellent manner in which the performance of the proposed methodology was documented and presented for review. All groups recommended approval of the request.

On the basis of their recommendations and in compliance with the recommendations from the Virginia State Water Control Board, limited-use approval is granted for the use of the stannous chloride procedure for total phosphorous by the Lower Potomac Wastewater Treatment Plant laboratory. The laboratory may use this procedure when monitoring the NPDES effluents listed above.

Sincerely,

Robert J. Mitkus, Acting Director
Environmental Services Division

PHOSPHATE

Phosphorus occurs in natural waters and waste waters almost exclusively in the form of various forms of phosphate. These forms are commonly classified as orthophosphates, condensed phosphates, and organically bound phosphates. The various forms may occur as soluble phosphates, or they may be present in particulate matter or in the bodies of aquatic organisms. Phosphorus enters waste water and polluted water from various sources. Large quantities of condensed phosphates may be added to wastewater from commercial cleaning products. Organic phosphates are formed primarily in biological processes, and are contributed to sewage in body and food wastes. Organic phosphate may also be formed from orthophosphates in biological treatment processes, or by organisms in receiving waters.

Phosphorus is essential to the growth of organisms and can often be the nutrient which limits the amount of growth that a body of water can support. Discharge of effluents from secondary treatment processes, which remove little phosphorus, can stimulate excessive growth of photosynthetic aquatic organisms in receiving waters.

Phosphate anaylsis requires two procedural steps:

(1) the conversion of the phosphorus form to soluble orthophosphate; and

(2) a colorimetric determination of soluble orthophosphate. The total phosphorus content of the sample includes all of the orthophosphates and condensed phosphates, both soluble and insoluble, and organic and inorganic phosphorus. Total phosphate analysis requires a digestion method that will convert organic phosphate to orthophosphate.

The severity of the oxidation required depends upon the form, and to some extent, the amount of organic phosphate present. The persulfate oxidation technique is suitable for wastewater and stream samples. Perchloric acid digestion, the most rigorous method, is used with samples such as sediments.

The selection of a colorimetric method for orthophosphate determination depends largely on the concentration of orthophosphate. The stannous chloride method is applicable for the range of 0.01 - 6 mg P/1. A calibration curve must be constructed by carrying suitable volumes of standard phosphate solution through the persulfate digestion procedure.

PERSULFATE DIGESTION METHOD

Apparatus

1. Hot plate
2. Acid-cleaned glassware
3. Porcelain spatula

Procedure

1. Place appropriate volume of thoroughly mixed sample in an acid-cleaned flask.
2. Add 1 ml 1 N H_2SO_4 to sample flask and a blank.
3. Add $\approx$ 0.4 g potassium persulfate to sample flask and blank using the porcelain spatula.
4. Dilute all flasks to 50 ml with distilled H_2O.
5. Place flasks on hot plate set at high temperature.
6. Allow sample to boil until 5 - 10 ml remains in flask - about 30 minutes.
7. Remove flasks and allow to cool to room temperature.

8. Restore the volume to 50 ml with distilled H_2O.

STANNOUS CHLORIDE METHOD FOR COLORIMETRIC DETERMINATION OF ORTHOPHOSPHATE

The principle of this method involves the formation of molybdophosphoric acid, which is reduced to the intensely colored complex, molybdenum blue, by stannous chloride. Color development is measured with a spectrophotometer at 690 mμ. Milligrams P is calculated from %T using a standard phosphate calibration curve.

Apparatus

1. Spectrophotometer, for use at 690 mμ.

Procedure

1. Add 2.0 ml molybdenum reagent to sample flasks and blank.
2. Add 2 drops stannous chloride to sample flasks and blank and swirl to mix.
3. After 10 minutes, but before 12 minutes, read the %T at 690 mμ, using the blank to calibrate the spectrophotometer.
4. Record mg P using the standard solution calibration curve.

Calculations

Calculate the results with the following equation:

$$\text{mg/l P} = \frac{\text{mg P} \times 1000}{\text{ml sample used}}$$

Notes

1. %T should fall between 30% and 70% to yield the most accurate results. If the %T falls outside these values, the test may be repeated, at the

discretion of the supervisor, using a smaller or larger sample size.

2. If repeats cannot be run the same day, the persulfate digestion step may be performed and the digested sample saved overnight. (Entire procedure can also be performed the following day on refridgerated sample.)

PHOSPHORUS REAGENTS

POTASSIUM PHOSPHATE STOCK SOLUTION

Dissolve 2.1965g of predried (105°C for 1 hr.) anhydrous potassium dihydrogen phosphate, monobasic, KH_2PO_4, in approximately 500 ml in a volumetric flask. Dilute to volume. Stock = 500 mg/L.

WORKING STANDARD SOLUTION, 2.5 mg/L

Using volumetric glassware, dilute 5 ml of the Stock Solution to 1000 ml using reagent grade water.

11 NORMAL SULFURIC ACID SOLUTION

Add 620 ml of concentrated H_2SO_4 to about 1200 ml of reagent grade water, cool to room temperature, and dilute to 2 L with reagent grade water.

AMMONIUM MOLYBDATE SOLUTION

Dissolve 100 g of Ammonium Molybdate into 700 ml of reagent grade water. Cautiously add 310 ml of concentrated H_2SO_4 to 1600 ml of reagent grade water, and cool to room temperature. Add the molybdate solution to the acid solution, and dilute to 4 L.

STANNOUS CHLORIDE SOLUTION

Dissolve 12.5 g of $SnCl_2$ $*2H_2O$ into 500 ml of Glycerol (Glycerine), using dry glassware. The Glycerol should be heated, using a hotplate/magnetic stirrer unit to insure the complete dissolution of the stannous chloride.

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Fairfax County, Virginia.

PUBLIC COMMENT PERIOD: XXX, 2005 to 5:00 p.m. on XXX, 2005

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Fairfax County Board of Supervisors, P. O. Box 268, Lorton, VA 22079, VA0025364

NAME AND ADDRESS OF FACILITY: Noman M. Cole Pollution Control Plant, 9399 Richmond Highway, Lorton, VA 22079

This facility is an Exemplary Environmental Enterprise participant in Virginia's Environmental Excellence Program.

PROJECT DESCRIPTION: Fairfax County Board of Supervisors has applied for a reissuance of a permit for the public Noman M. Cole Pollution Control Plant. The applicant proposes to release treated sewage wastewaters from residential areas at a rate of 67.0 million gallons per day into a water body. The sludge will be disposed by incineration. The facility proposes to release the treated sewage water in the Pohick Creek in Fairfax County in the Potomac River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, $cBOD_5$, Total Residual Chlorine, Total Phosphorus, Total Suspended Solids, Ammonia, *E. coli*, Total Nitrogen, and Chronic Toxicity testing.

This facility is subject to the requirements of 9 VAC 25-820 and has registered for coverage under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. DEQ may hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the documents at the DEQ-Northern Regional Office by appointment.
Name: Joan C. Crowther
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (540) 899-4506 E-mail: jccrowther@deq.virginia.gov Fax: (703) 583-3841

Attachment 16

*Appendix A - List of Impaired (Category5) Waters in 2008**

Potomac and Shenandoah River Basins

Cause Group Code **A12E-01-PCB** **Potomac River Embayments (FOU downstream until POM)**

Location: Includes the tidal portions of the following tributaries and embayments from the I-395 bridge (above the Woodrow Wilson Bridge) to the Potomac River Bridge at Route 301: Fourmile Run, Hunting Creek, Little Hunting Creek, Pohick Creek, Accotink Creek, Occoquan River, Neabsco Creek, Powells Creek, Quantico Creek, Chopawamsic Creek, Aquia Creek, and Potomac Creek.

City / County Alexandria City Arlington Co. Fairfax Co. King George Co. Prince William Co. Stafford Co.

Use(s): Fish Consumption

Cause(s) / VA Category: PCB in Fish Tissue / 5A

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The advisory, dated 4/19/99 and modified 12/13/04, limits consumption of American eel, bullhead catfish, channel catfish less than eighteen inches long, largemouth bass, anadromous (coastal) striped bass, sunfish species, smallmouth bass, white catfish, white perch, gizzard shad, and yellow perch consumption to no more than two meals per month. The advisory also bans the consumption of carp and channel catfish greater than eighteen inches long.

Potomac River Embayments (FOU downstream until POM) **Fish Consumption**	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
PCB in Fish Tissue - Total Impaired Size by Water Type:	**23.765**		

Sources:

Source Unknown

Attachment 17

*Appendix A - List of Impaired (Category5) Waters in 2008**

Potomac and Shenandoah River Basins

Cause Group Code **A15E-01-BAC** **Pohick Creek**

Location: Extends from rivermile 1.31 in Gunston Cove until the confluence with the Potomac River.

City / County Fairfax Co.

Use(s): Recreation

Cause(s) / VA Category: Escherichia coli / 5A

E. coli bacteria criterion excursions (2 of 12 samples - 16.7%) from station 1aPOH000.21.

Pohick Creek **Recreation**	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Escherichia coli - Total Impaired Size by Water Type:	**1.504**		

Sources:

Source Unknown

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Noman M. Cole Pollution Control Plant
NPDES Permit Number:	VA0025364
Permit Writer Name:	Joan C. Crowther
Date:	July 10, 2008

Major [X] **Minor** [ ] **Industrial** [ ] **Municipal** [X]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?	X		
8. Whole Effluent Toxicity Test summary and analysis?	X		
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	X		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?	X		
5. Has there been any change in streamflow characteristics since the last permit was developed?	X		
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?	X		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?		X	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	

Attachment 18

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?	X		
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs
(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?	X		
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?	X		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?		X	

II.F. Special Conditions – cont.	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?		X	
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?		X	
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?	X		

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

List of Standard Conditions – 40 CFR 122.41

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
	Monitoring and records	Transfers
Duty to mitigate	Signatory requirement	Monitoring reports
Proper O & M	Bypass	Compliance schedules
Permit actions	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Joan C. Crowther
Title	VPDES Permit Writer
Signature	
Date	7/10/08