VPDES PERMIT PROGRAM FACT SHEET

This document gives pertinent information concerning the VPDES Permit listed below. This permit is being processed as a MAJOR, INDUSTRIAL permit. The effluent limitations contained in this permit will maintain the water quality standards of 9 VAC 25-260-00 et seq.

1. **PERMIT NO.:** VA0083097

EXISTING PERMIT EXPIRATION DATE: January 23, 2011

2. **FACILITY NAME AND LOCAL MAILING ADDRESS**

Dominion-Clover Power Station
5000 Dominion Boulevard
Glen Allen, VA 23060

FACILITY PHYSICAL LOCATION (IF DIFFERENT)

4091 Clover Road
Clover, Virginia

FACILITY CONTACT:
NAME: Tim Hamlet
TITLE: Sr. Environmental Compliance Coordinator
PHONE: (434) 454-2150
E-MAIL: Tim_Hamlet@dom.com

ALTERNATE CONTACT:
NAME: Oula K. Shehab-Dandan
TITLE: Environmental Consultant
PHONE: (804) 273-2697
E-MAIL: oula.k.shehab-dandan@dom.com

3. **OWNER CONTACT:** (TO RECEIVE PERMIT)
NAME: Mr. C. D. Holley
TITLE: VP Fossil & Hydro Systems Operation
COMPANY NAME: Virginia Electric and Power Company
& Old Dominion Electric Cooperative
ADDRESS: 4201 Dominion Boulevard
Glen Allen, VA 23060
PHONE: (804) 273-3592
E-MAIL: doug.holley@dom.com

4. **PERMIT DRAFTED BY:** DEQ, Water Permits, Blue Ridge Regional Office

Permit Writer(s): Frank Bowman — Date(s): November 29, 2010
Reviewed By: Kip D. Foster — Date(s):

5. **PERMIT CHARACTERIZATION:** (Check as many as appropriate)

( ) Issuance
( ) Reissuance
(x) Revoke & Reissue
( ) Owner Modification
( ) Board Modification
( ) Change of Ownership/Name
Effective Date:

( ) Municipal
SIC Code(s) ____
____
(x) Industrial
SIC Code(s) 4911
____
____

( ) POTW
( ) PVOTW
(x) Private
( ) Federal
( ) State
( ) Publicly-Owned Industrial

( ) Site-Specific WQ Criteria
( ) Variance to WQ Standards
( ) Water Effects Ratio

( ) Interim Limits in Other Document (attach to fact sheet)
( ) Concept Engineering Report Being Approved with Permit
( ) Possible Interstate Effect

6. **APPLICATION COMPLETE DATE:** July 13, 2010

7. **RECEIVING WATERS CLASSIFICATION:** River basin information.

Outfall No(s): 001, 002, 004, 005, and 009

Receiving Stream:	Roanoke River
River Mile:	63.68, 63.68, 62.6, 62.5, and 63.67, respectively
Basin:	Roanoke River
Subbasin:	Roanoke River
Section:	5
Class:	IV
Special Standard(s):	PWS

7-Day/10-Year Low Flow:	415.4 MGD [437 - 21.6 = 415.4]
7-Day/10-Year High Flow:	652.4 MGD [674 - 21.6 = 652.4]
1-Day/10-Year Low Flow:	178.4 MGD [200 - 21.6 = 178.4]
1-Day/10-Year High Flow:	384.4 MGD [406 - 21.6 = 384.4]
30-Day/5-Year Low Flow:	550.4 MGD [572 - 21.6 = 550.4]
30-Day/10-Year Low Flow:	463.4 MGD [485 - 21.6 = 463.4]
Harmonic Mean Flow:	1088.4 MGD [1110 - 21.6 = 1088.4]

Note: Above river flows account for a maximum facility water withdrawal of 21.6 MGD.

Outfall No(s): 003, 006, 007, 008, 011, 012, 013, 014, 015 and 016

Receiving Stream:	Black Walnut Creek	7-Day/10-Year Low Flow:	0.05 MGD
River Mile:	2.2, 2.4, 2.7, 3.0, 1.79, 1.81, 1.86, 1.1, 1.55, 1.64 and 1.69, respectively	7-Day/10-Year High Flow:	0.92 MGD
Basin:	Roanoke River	1-Day/10-Year Low Flow:	0.03 MGD
Subbasin:	Roanoke River	1-Day/10-Year High Flow:	0.78 MGD
Section:	5a	30-Day/5-Year Low Flow:	0.23 MGD
Class:	III	30-Day/10-Year Low Flow:	0.13 MGD
Special Standard(s):	PWS	Harmonic Mean Flow:	0.82 MGD

8. **FACILITY DESCRIPTION:** Describe the type facility from which the discharges originate.

Existing industrial discharge resulting from the operation of a coal-fired electric generating facility.

9. **LICENSED WASTEWATER OPERATOR REQUIREMENTS:** ( ) No (x) Yes

Class: III (for the industrial wastewater treatment facilities); IV (for the sewage treatment works

10. **RELIABILITY CLASS:** II (for the sewage treatment works); NA (for the industrial wastewater treatment works)

11. **SITE INSPECTION DATE:** 8/10/10 **REPORT DATE:** 9/7/10

Performed By: S. L. Bowman

Only the first page of the inspection report is included. See the inspection file for a full copy of the report.

SEE ATTACHMENT 1

12. **DISCHARGE(S) LOCATION DESCRIPTION:** Provide USGS Topo which indicates the discharge location, significant (large) discharger(s) to the receiving stream, water intakes, and other items of interest.

Name of Topo: Clover **Quadrant No.:** 044C

SEE ATTACHMENT 2

13. **ATTACH A SCHEMATIC OF THE WASTEWATER TREATMENT SYSTEM(S) [IND. & MUN.]. FOR INDUSTRIAL FACILITIES, ALSO PROVIDE A GENERAL DESCRIPTION OF THE PRODUCTION CYCLE(S) AND ACTIVITIES. FOR MUNICIPAL FACILITIES, PROVIDE A GENERAL DESCRIPTION OF THE TREATMENT PROVIDED.**

Narrative: This electrical generating station has two, 391 megawatt units. Water is drawn directly from the Roanoke River and treated for use. Most of the water is used in the cooling towers where 90+ percent is lost via evaporation and drift. Boiler tubes are periodically cleaned and the resulting wastewater is sent to a separate chemical waste treatment system, primarily for metals removal, which is followed by a neutralization basin (internal outfall 102). In addition, various chemical drains also are routed to the neutralization basin. The water from this process is utilized in the flue gas desulfurization process and is not discharged (thus no internal monitoring/limitations on this wastestream as required by federal effluent guidelines). Sludge from the chemical waste treatment system is collected for on-site landfill disposal. Some of the plant drains are treated by oil/water separation. Sanitary wastewater is treated by a separate on-site wastewater treatment system (internal outfall 103). With the exception of the metals cleaning wastewater, all of the above wastewaters, along with boiler blowdown, cooling tower blowdown (internal outfall 101) and reverse osmosis reject water, are sent to a final holding pond, which provides sedimentation, prior to final discharge (outfall 001) to the Roanoke River.

The facility also has a coal storage area (which also includes a synthetic fuel manufacturing plant), a limestone and lime storage and handling area, a scrubber sludge storage area and a coal combustion by-product area. Storm water runoff from these areas is diverted to a storm water retention basin, which discharges to the Roanoke River (outfall 002).

The Stage III, Phase 1 and 2 landfill storm water runoff holding ponds consists of two primary and two secondary treatment basins. The ponds collect storm water runoff and leachate from the Stage III landfill along with ground water from the underdrain system, leachate and storm water from the Stages I and II landfill and ground water well purge water. The combined wastewater from these ponds is pumped to the Roanoke River (outfall 009). Current plans are to construct Phase 2B of the Stage III landfill so that it is ready to receive combustion by-products in late 2011 or early 2012.

Finally, there are a number of regulated industrial storm water discharges (outfalls 003-008 and 011-016). The discharge from the landfill runoff pond associated with the capped and closed Stage I and II CCB landfill discharges to Black Walnut Creek (outfall 003) and can also be routed to 009 and discharged to the Roanoke River (see above). Sources of water to this pond are storm runoff from the closed landfill and small volumes of ground water well purge water.

Outfalls 002 and 009 will be combined and treated by a new wastewater treatment plant to be constructed and discharged through the existing outfall 009. The construction of the treatment plant is expected to be completed in late 2011.

SEE ATTACHMENT 3

14. **DISCHARGE DESCRIPTION:** Describe each discharge originating from this facility.

SEE ATTACHMENT 4

15. **COMBINED TOTAL FLOW:**

TOTAL: 2.59 MGD (for public notice)

PROCESS FLOW: 1.79 MGD (IND.)

NONPROCESS FLOW: MGD (IND.) [0.162 + 0.634 (outfalls 002 and 009, respectively)]

DESIGN FLOW: MGD (MUN.)

The remainder of the outfalls are composed entirely of storm water and flows are storm water dependent.

16. **STATUTORY OR REGULATORY BASIS FOR EFFLUENT LIMITATIONS AND SPECIAL CONDITIONS:** (Check all which are appropriate)

X State Water Control Law
X Clean Water Act
X VPDES Permit Regulation (9 VAC 25-31-10 et seq.)
X EPA NPDES Regulation (Federal Register)
X EPA Effluent Guidelines [40 CFR 400 – 471 (industrial)]
___ EPA Effluent Guidelines [40 CFR 133 (municipal 2^0 treatment)]
X Water Quality Standards (9 VAC 25-260-00 et seq.)
X Waste load Allocation from a TMDL or River Basin Plan

17. **LIMITATIONS/MONITORING:** Include **all effluent limitations and monitoring requirements** being placed in the permit for each outfall, including any WET limits. If applicable, include any limitations and monitoring requirements being included for sludge and ground water.

There are no applicable limitations and monitoring requirements for sludge. Sewage sludge is hauled to another VPDES permitted facility (Danville WWTP or Maple Avenue WWTP) for further treatment and final disposal. Industrial sludges are disposed of on-site in the industrial ash landfill.

The permit contains a condition which requires ground water monitoring in accordance with a December 16, 2004 approved ground water monitoring plan.

SEE ATTACHMENT 5

18. **SPECIAL CONDITIONS:** Provide **all actual permit special conditions**, including compliance schedules, toxic monitoring, sludge, ground water, storm water and pretreatment.

SEE ATTACHMENT 6

19. **EFFLUENT/SLUDGE/GROUND WATER LIMITATIONS/MONITORING RATIONALE:** For outfalls, attach any analyses completed **(MIX.EXE and WLA.EXE) and STATS printouts** for individual toxic parameters. As a minimum, it will include: waste load allocation (acute, chronic and human health); statistics summary (number of data values, quantification level, expected value, variance, covariance, 97th percentile, and statistical method); input data listing; and, effluent limitations determination. Include **all calculations** used for each outfall's set of effluent limits and incorporate the results of **any water quality model(s)**. Include all calculations/documentation of any antidegradation or anti-backsliding issues in the development of any limitations; complete the review statements below. Provide a rationale for **limited internal waste streams** and indicator pollutants. Attach any additional information used to develop the limitations, including any applicable water quality standards calculations (acute, chronic and human health).

OTHER CONSIDERATIONS IN LIMITATIONS DEVELOPMENT:

WAIVERS/VARIANCES/ALTERNATE LIMITATIONS: Provide justification or refutation rationale for requested **waivers to the permit application (e.g., testing requirements)** or variances/alternatives to required permit conditions/ limitations. This includes, but is not limited to: variances from technology guidelines or water quality standards; WER/translator study consideration; variances from standard permit limits/conditions.

N/A

SUITABLE DATA: What, if any, effluent data were considered in the establishment of effluent limitations and provide all appropriate information/calculations.

All suitable effluent data were reviewed.

ANTIDEGRADATION REVIEW: Provide all appropriate information/calculations for the antidegradation review.

Tier I: _X_ (Black Walnut Creek) **Tier II:** _X_ (Roanoke River) **Tier III:** _____

The State Water Control Board's Water Quality Standards regulations include an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I, existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters. The limitations in this permit were developed in accordance with section 303(d)(4) of the Clean Water Act. Therefore, antidegradation restrictions do not apply.

The antidegradation review begins with the Tier determination. The facility has some outfalls which discharge directly to Black Walnut Creek (tributary to the Roanoke River) and some which discharge directly to the Roanoke River.

Black Walnut Creek is currently listed as Category 4B on the 303(d) list for non-attainment of sulfates, ammonia, selenium and manganese. Therefore, Black Walnut Creek, at the point of this facility's discharge, is designated as Tier I and no further review is needed. The limitations in this permit were developed in accordance with section 303(d)(4) of the Clean Water Act, therefore, antidegradation restrictions do not apply. Permit limits have been established by determining waste load allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These waste load allocations will provide for the protection and maintenance of all existing uses.

The Roanoke River is listed as Category 5A on the 303(d) list for non-attainment of fecal coliform and PCB contamination in fish tissue. Fecal coliform is not used as a sole basis for classifying a receiving stream as Tier I. Non-attainment based on fish consumption advisories, bans, and prohibitions (e.g., PCB fish consumption advisory based on PCBs in fish tissue) is also no longer used as a sole basis for classifying a receiving stream as Tier I. Finally, the Roanoke River has elevated levels of manganese which exceed the water quality standard; however, public water supply criteria (those associated with taste and odor only) that apply at drinking water source intakes do not constitute a basis for classifying a stream as Tier 1. Therefore, the Roanoke River, at the point of this facility's discharge, is designated as Tier II and no significant degradation of the existing water quality will be allowed.

Antidegradation baselines would be evaluated for all parameters for which data exist, but because there is no proposed expansion for this existing discharge (no increase in pollutant loading), the baselines are not established. If this permit action had included an expansion of the design capacity for this facility, then baselines would have been calculated as not more than 25% of the unused assimilative capacity for the protection of aquatic life (acute and chronic) and not more than 10% for the protection of human health. The unused assimilative capacity is defined as the difference between existing water quality and the criterion for a specific pollutant.

NOTE: This is an existing discharge and the previous permit utilized tier 1 to determine the need for limits. No limits for the parameters of concern were required and an allocation for the existing discharge was given based on tier 1 (exceeded what would have been allowed for tier 2). Since no limits were determined to be necessary and the reasons for classifying the stream as tier 1 no longer exist, any future expansion of the facility would require the application of antidegradation (applied to current unused allocation).

ANTIBACKSLIDING REVIEW: Indicate if antibacksliding applies to this permit and, if so, provide all appropriate information.

There are no backsliding issues to address in this permit (i.e., limits as stringent or more stringent when compared to the previous permit).

SEE ATTACHMENT 7

20. **SPECIAL CONDITIONS RATIONALE:** Provide a rationale **for each of the permit's special conditions**, including compliance schedules, toxic monitoring, sludge, ground water, storm water and pretreatment.

SEE ATTACHMENT 8

21. **SLUDGE DISPOSAL PLAN:** Provide a brief description of the sludge disposal plan (e.g., type sludge, treatment provided and disposal method). Indicate if any of the plan elements are included within the permit.

Sewage sludge is hauled to another VPDES permitted facility (Danvile WWTP or Maple Avenue WWTP) for further treatment and final disposal under an approved sludge disposal plan. Industrial sludges are disposed of on-site in the industrial ash landfill.

22. **MATERIAL STORED:** List the type and quantity of wastes, fluids, or pollutants being stored at this facility. Briefly describe the storage facilities and list, if any, measures taken to prevent the stored material from reaching State waters.

SEE ATTACHMENT 9

23. **RECEIVING WATERS INFORMATION:** Refer to the State Water Control Board's Water Quality Standards [e.g., River Basin Section Tables (9 VAC 25-260 - Part IX) [along with Parts VII and VIII]. Use 9 VAC 25-260-140 C (introduction and numbered paragraph) to address tidal waters where fresh water standards would be applied or transitional waters where the most stringent of fresh or salt water standards would be applied. Attach any memoranda or other information which helped to develop permit conditions (i.e. **flow determination memo, tier determinations**, PReP complaints, special water quality studies, **STORET data** and other biological and/or chemical data, etc.

SEE ATTACHMENT 10

24. **303(d) LISTED SEGMENTS:** Indicate if the facility **discharges directly** to a segment that is listed on the current 303(d) list, if the allocations are specified by an approved TMDL and, if so, provide all appropriate information/calculations. If the facility discharges directly to a stream segment that is on the current 303(d) list, the fact sheet must include a description of how the TMDL requirements are being met.

The facility has some outfalls which discharge directly to Black Walnut Creek (tributary to the Roanoke River) and some which discharge directly to the Roanoke River.

This facility discharges directly to Roanoke River. This stream segment receiving the effluent is listed as Category 5A on the current approved 303(d) list for non-attainment of mercury and PCB contamination in fish tissue. A TMDL has not been prepared or approved for this stream segment. The permit contains a TMDL reopener clause which will allow it to be modified, in compliance with section 303(d)(4) of the Act once a TMDL is approved.

This facility discharges directly to Roanoke River. This stream segment receiving the effluent is listed as Category 4A on the current approved 303(d) list for non-attainment of bacteria. EPA approved the Staunton River Bacteria TMDL on April 9, 2010 for this segment. It does not contain a waste load allocation for this discharge. No limit for *E. coli* is included in this permit as that pollutant is either absent from the effluent or contained in such low concentrations as to not cause or contribute to the non-attainment of the stream segment.

SEE ATTACHMENT 11

25. **CHANGES TO PERMIT:** Use **TABLE A** to record any **changes from the previous permit** and the rationale for those changes. Use **TABLE B** to record any **changes made to the permit during the permit processing period** and the rationale for those changes [i.e., use for comments from the applicant, VDH, EPA, other agencies and/or the public where comments resulted in changes to the permit limitations or any other changes associated with the special conditions or reporting requirements].

SEE ATTACHMENT 12

26. **NPDES INDUSTRIAL PERMIT RATING WORKSHEET:**

TOTAL SCORE: 600 **SEE ATTACHMENT 13**

27. **EPA/VIRGINIA DRAFT PERMIT SUBMISSION CHECKLIST:**

SEE ATTACHMENT 14

28. **DEQ PLANNING COMMENTS RECEIVED ON DRAFT PERMIT:** Document any comments received from DEQ planning.

The discharge is not addressed in any planning document but will be included when the plan is updated.

29. **PUBLIC PARTICIPATION:** Document comments/responses received during the public participation process. If comments/responses provided, especially if they result in changes to the permit, place in the attachment.

VDH COMMENTS RECEIVED ON DRAFT PERMIT: Document any comments received from the Virginia Dept. of Health and noted how resolved.

By memo dated July 27, 2010, the VDH provided the following comments: "This permit application contains a proposed treatment facility to remove manganese such that the discharge from current outfalls 002/009 does not exceed 0.05 mg/l. We note that the sample result for outfall 006/007/008 was 5.89 mg/l for manganese. **We recommend that the Public Water Supply Water Quality Standards be maintained in the Public Water Supply stream segments downstream."** These are storm water outfalls and will be addressed in the SWPPP.

EPA COMMENTS RECEIVED ON DRAFT PERMIT: Document any comments received from the U.S. Environmental Protection Agency and noted how resolved.

EPA has no objections to the adequacy of the draft permit.

ADJACENT STATE COMMENTS RECEIVED ON DRAFT PERMIT: Document any comments received from an adjacent state and noted how resolved.

Not Applicable.

OTHER AGENCY COMMENTS RECEIVED ON DRAFT PERMIT: Document any comments received from any other agencies (e.g., VIMS, VMRC, DGIF, etc.) and noted how resolved.

The draft permit was sent to DGIF and no comments were received.

OTHER COMMENTS RECEIVED FROM RIPARIAN OWNERS/CITIZENS ON DRAFT PERMIT: Document any comments received from other sources and note how resolved.

The application and draft permit have received public notice in accordance with the VPDES Permit Regulation, and no comments were received.

PUBLIC NOTICE INFORMATION: Comment Period: **Start Date:** December 9, 2010
End Date: January 10, 2011

Persons may comment in writing or by e-mail to the DEQ on the proposed reissuance of the permit within 30 days from the date of the first notice. Address all comments to the contact person listed below. Written or e-mail 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 Director of 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 requestor's interests would be directly and adversely affected by the proposed permit action.

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Frank Bowman at: Department of Environmental Quality (DEQ), Blue Ridge Regional Office, 7705

Timberlake Road, Lynchburg, VA 24502. Telephone: 434-582-6207 E-mail: frank.bowman@deq.virginia.gov

Following the comment period, the Board will make a determination regarding the proposed reissuance. This determination will become effective, unless the Director grants a public hearing. Due notice of any public hearing will be given.

30. **ADDITIONAL FACT SHEET COMMENTS/PERTINENT INFORMATION:**

The permittee is current with their annual permit maintenance fees.

31. **SUMMARY OF SPECIFIC ATTACHMENTS LABELED AS:**

Attachment 1 Site Inspection Report/Memorandum
Attachment 2 Discharge Location/Topographic Map
Attachment 3 Schematic/Plans & Specs/Site Map/Water Balance
Attachment 4 Discharge/Outfall Description
Attachment 5 Limitations/Monitoring
Attachment 6 Special Conditions
Attachment 7 Effluent/Sludge/Ground Water Limitations/Monitoring Rationale/Suitable Data/ Stream Modeling/Antidegradation/Antibacksliding
Attachment 8 Special Conditions Rationale
Attachment 9 Material Stored
Attachment 10 Receiving Waters Info./Tier Determination/STORET Data
Attachment 11 303(d) Listed Segments
Attachment 12 TABLE A and TABLE B - Change Sheets
Attachment 13 NPDES Industrial Permit Rating Worksheet
Attachment 14 EPA/Virginia Draft Permit Submission Checklist
Attachment 15 Chronology Sheet
Attachment ___

ATTACHMENT 1

SITE INSPECTION REPORT/MEMORANDUM

Virginia Department of Environmental Quality

COMPLIANCE INSPECTION REPORT

FACILITY NAME: Dominion Clover Power Station		**INSPECTION DATE:** 08/10/10	
		INSPECTOR: Stephanie Bowman	
PERMIT No.: VA0083097		**REPORT DATE:** 09/07/10	
TYPE OF FACILITY: ☐ Municipal ☑ Major ☑ Industrial ☐ Minor ☐ Federal ☐ Small Minor ☐ HP ☐ LP		**TIME OF INSPECTION:**	Arrival 10:45 / Departure 13:45
		TOTAL TIME SPENT (including prep & travel)	19 hours
PHOTOGRAPHS: ☑ Yes ☐ No		**UNANNOUNCED INSPECTION?**	☑ Yes ☐ No
REVIEWED BY / Date: Fred T. DiLella			
PRESENT DURING INSPECTION: Timothy Hamlet, Beverly Renfrow, Mike Wall			

WL/NOV #: Paraphrase Noncompliance issues	Reported Cause of Noncompliance:	Corrective Action Taken:
N/A	N/A	N/A

EFFLUENT DATA

May 2010

001

Flow	-	0.953 MGD
pH	-	7.25-8.68 (SU)
Dissolved Oxygen	-	5.7 (mg/l)
Temperature	-	32.15 ^{0}C
TSS (1/3M)	-	Not sampled in July
Oil & Grease (1/3M)	-	Not sampled in July
TPH (1/YR)	-	Not sampled in July

002

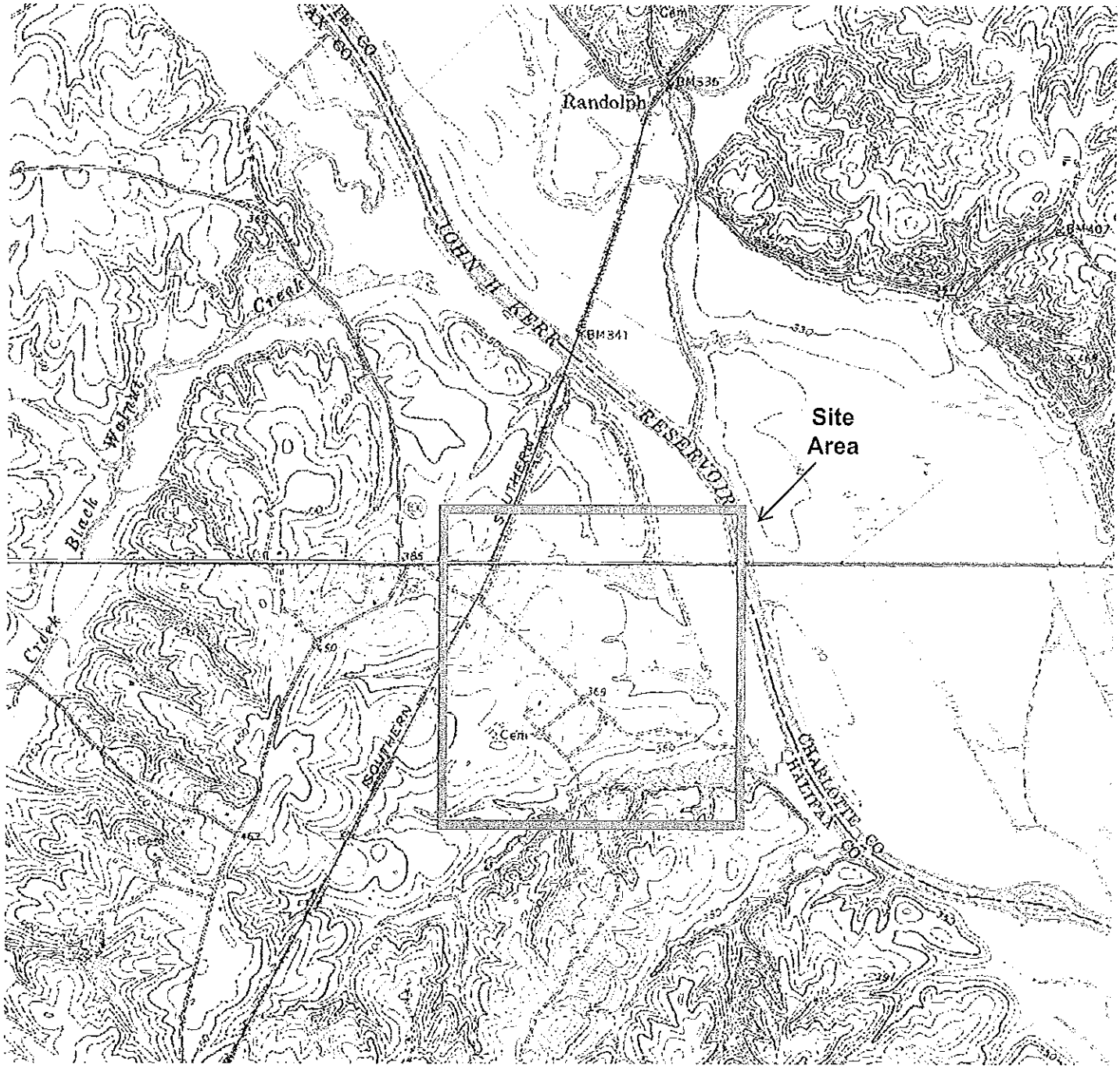
Flow	-	No Discharge
pH	-	No Discharge
TSS	-	No Discharge

009

Flow	-	0.230 MGD
pH	-	6.86-6.99 (mg/l)
TSS	-	20.6 (mg/l)

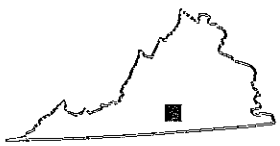
ATTACHMENT 2

DISCHARGE LOCATION/TOPOGRAPHIC MAP



SOURCE:
U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE
Saxe, VA 1968
Clover, VA 1968
Photo Revised 1981

CONTOUR INTERVAL = 10 FEET



APPROXIMATE QUADRANGLE LOCATION

N

GRAPHIC SCALE (approx.)

2000 0 2000 4000

1" = 2000'

PROJECT:

Storm Water Pollution Prevention Plan (SWPPP)

Clover Power Station
P.O. Box 245
Clover, VA 24534

EarthTech
A tyco International Ltd. Company

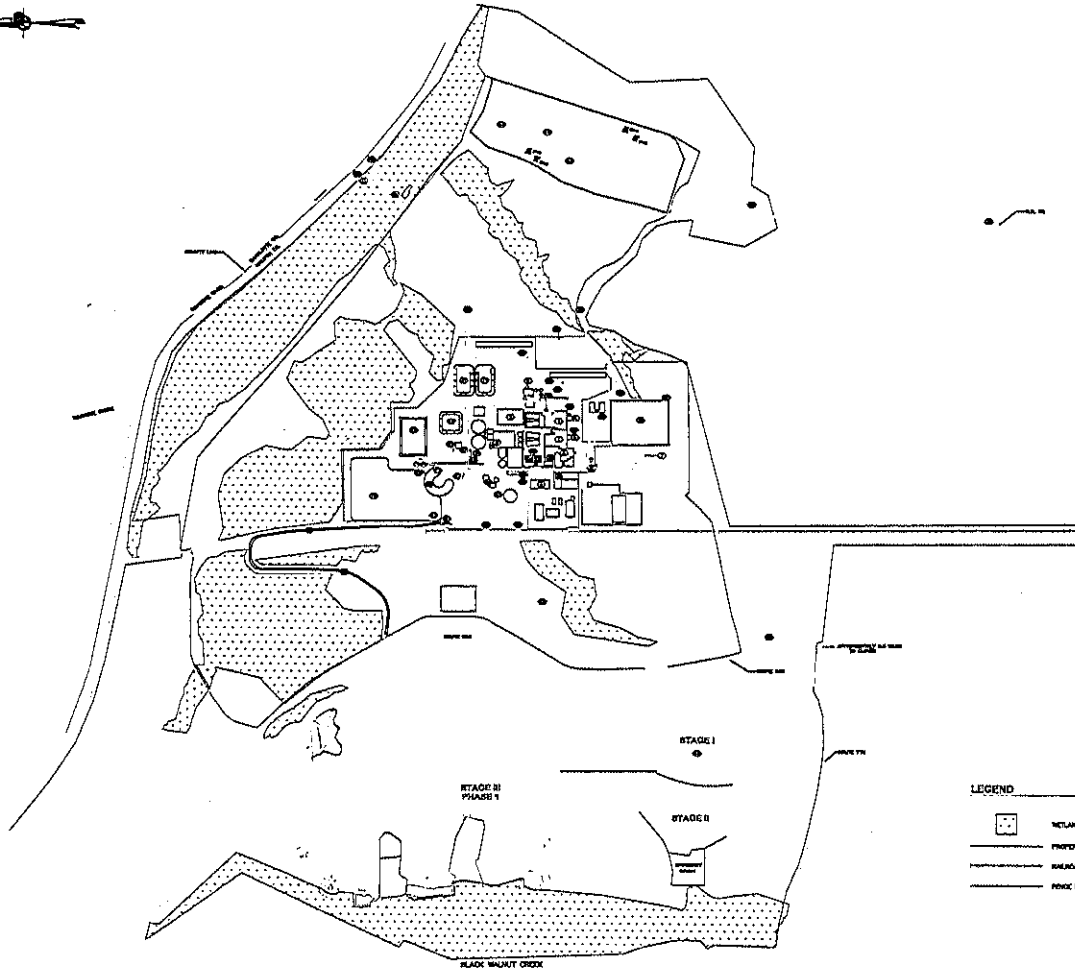
FIGURE TITLE:

Topographic Map
Clover Power Station
Clover, VA

PROJECT MANAGER:	PROJECT NO.:	DATE:	SCALE:	FIGURE NO.:
RAW	83424	05/24/05	AS SHOWN	1

ATTACHMENT 3

SCHEMATIC/PLANS & SPECS/SITE MAP/ WATER BALANCE



FACILITIES LEGEND

1. ADMINISTRATION BUILDING
2. AIR QUALITY CONTROL AREA
3. SLUDGE PROCESSING AREA
4. TRANSFORMER AREA
5. PLANT SERVICE/ADMINISTRATION AREA
6. GUARD BUILDING
7. PLANT PERSONNEL PARKING
8. WAREHOUSE AREA
9. WATER TREATMENT/STORAGE AREA (OUTFALL 102)
10. COOLING TOWER AREA (OUTFALL 101)
11. RAINWAT STORAGE POND
12. HOLDING POND
13. COAL PILE/LIMESTONE RUN-OFF POND
14. RAW WATER STORAGE POND
15. COAL CRUSHER BUILDING
16. COAL STACKOUT AREA
17. COAL RECLAIM STRUCTURE
18. CONCRETE COAL SILO
19. COAL STORAGE
20. COAL UNLOADING AREA
21. COAL YARD MAINTENANCE BUILDING
22. LIMESTONE UNLOADING AREA
23. LIMESTONE & SAND STORAGE AREA
24. DFB HANDLING AREA
25. LIME UNLOADING AREA
26. CONSTRUCTION WATER WELL
27. EQUIPMENT MAINTENANCE FACILITY
28. CONSTRUCTION PARKING
29. CONSTRUCTION OFFICE AREA
30. SANITATION
31. SEWAGE TREATMENT STRUCTURE (OUTFALL 103)
32. RIVER INTAKE SCREENS
33. RIVER WATER PUMP STRUCTURE
34. INITIAL COMBUSTION WASTE LANDFILL AREA
35. WAREHOUSE
36. CONDENSATE STORAGE TANK
37. TRUCK SCALE
38. COMBUSTION WASTE LANDFILL ACCESS ROAD
39. PLANT ACCESS ROAD
40. SECURITY FENCE
41. PLANT DISCHARGE STRUCTURE
42. PLANT INTAKE AND DISCHARGE PIPELINE
43. RAW WATER POND INTAKE STRUCTURE
44. RAW WATER POND PUMP STRUCTURE
45. EMERGENCY DIESEL GENERATOR
46. AUXILIARY BOILER/STARTUP FUEL TANK
47. MOBILE EQUIPMENT FUEL TANKS
48. POTABLE WATER WELL
49. SAND AND STONE STORAGE AREAS
50. SCRAP METAL, SOLID OILY WASTES AND TRASH DUMPSTERS

LEGEND

- WETLANDS
- PROPERTY LINE
- RAILROAD TRACK
- FENCE LINE

NOTES

1. THERE ARE NO SIGNIFICANT SOURCES OF POLLUTION FROM OFF-SITE FACILITIES.
2. A DESCRIPTION OF SITE MAPS CAN BE FOUND IN THE MEASURES AND CONTROLS SECTION OF THE PLAN TEXT.
3. THIS DRAWING SCANNED FROM BLACK & VEATCH ENGINEERS-ARCHITECTS DRAWING NUMBER 16345-MTN-9100, DATED JANUARY 8, 1992 AND IS NOT TO SCALE.

0 500 900 1000
SCALE IN FEET

Revision No.	Date	Description	By

Drawn By: JF
Date: 10/31/96
Checked By: RJP
Scale: N/A
Approved By: K

ESSI | ECO-II

ENGINEERING-SCIENCE
ONE OUE NOVA AVE
SUITE 200
FOLSOM, CA 95630
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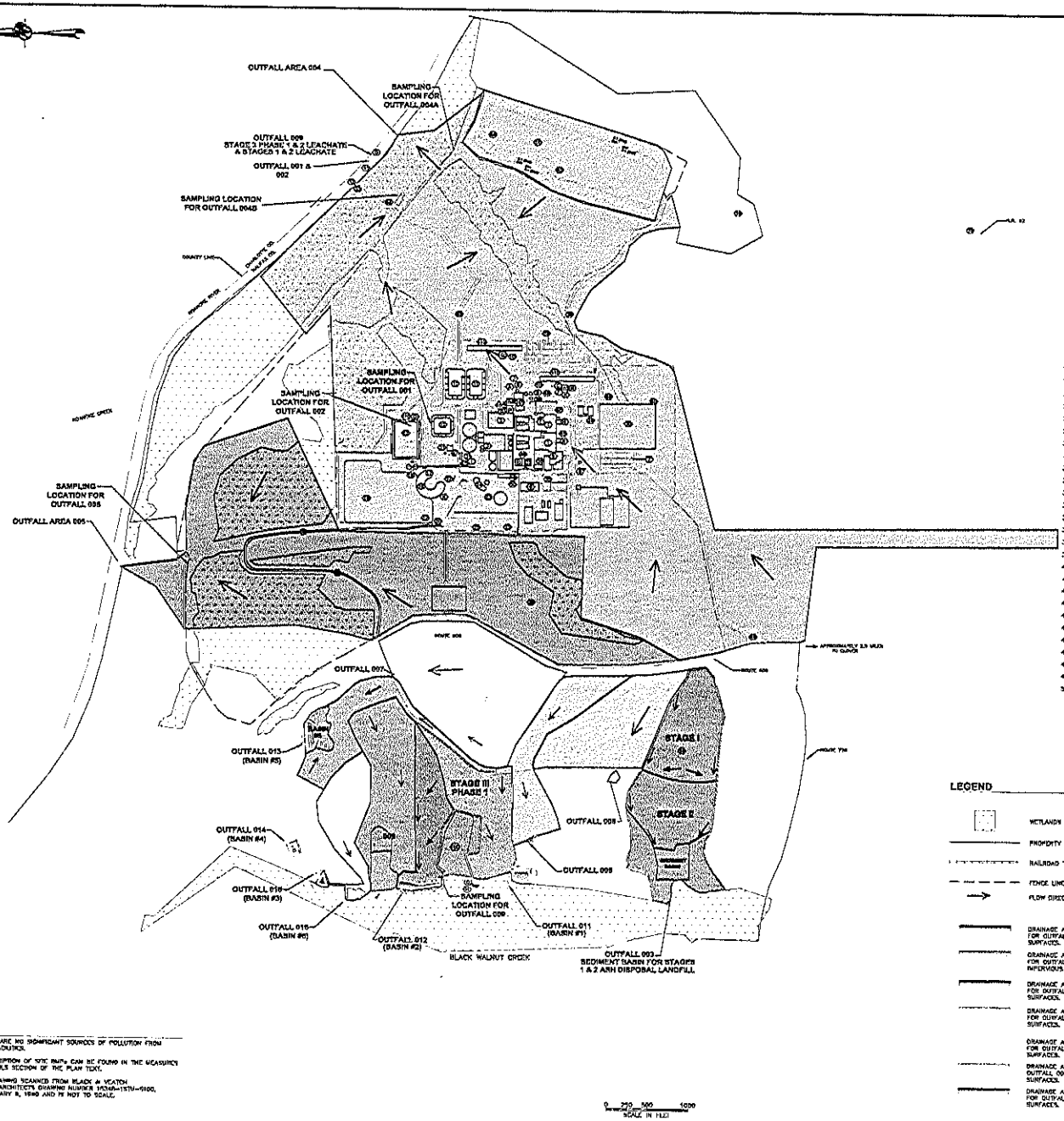
BASE MAP
DONIVON
CLOVER POWER STATION
HALIFAX COUNTY, VIRGINIA

DRAWN: JFB
DATE: 10/31/96
PROJECT NO.: 02285-373-003
SIZE: 24X36 SCALE:

1

REVISION NUMBER
X



FACILITIES LEGEND

1 GENERATION BUILDING
2 AIR QUALITY CONTROL AREA
3 SLUDGE PROCESSING AREA
4 TRANSFORMER AREA
5 PLANT SERVICES/ADMINISTRATION AREA
6 GUARD BUILDING
7 PLANT PERSONNEL PARKING
8 WAREHOUSE AREA
9 WATER TREATMENT/STORAGE AREA (OUTFALL 102)
10 COOLING TOWER AREA (OUTFALL 101)
11 SLUDGE STORAGE POND
12 HOLDING POND
13 COAL PILE/LIMESTONE RUN-OFF POND
14 RAW WATER STORAGE POND
15 COAL CRUSHER BUILDING
16 COAL STACKOUT AREA
17 COAL RECLAIM STRUCTURE
18 CONCRETE COAL SILO
19 COAL STORAGE
20 COAL UNLOADING AREA
21 COAL YARD MAINTENANCE BUILDING
22 LIMESTONE UNLOADING AREA
23 LIMESTONE & SAND STORAGE AREA
24 CCR HANDLING AREA
25 LIME UNLOADING AREA
26 CONSTRUCTION WATER WELL
27 EQUIPMENT MAINTENANCE FACILITY
28 CONSTRUCTION PARKING
29 CONSTRUCTION OFFICE AREA
30 SUBSTATION
31 SEWAGE TREATMENT STRUCTURE (OUTFALL 103)
32 RIVER INTAKE SCREENS
33 HYDY WATER PUMP STRUCTURE
34 INITIAL COMBUSTION WASTE LANDFILL AREA
35 WAREHOUSE
36 CONDENSATE STORAGE TANK
37 TRUCK SCALE
38 COMBUSTION WASTE LANDFILL ACCESS ROAD
39 PLANT ACCESS ROAD
40 SECURITY FENCE
41 PLANT DISCHARGE STRUCTURE
42 PLANT INTAKE AND DISCHARGE PIPELINE
43 RAW WATER POND INTAKE STRUCTURE
44 RAW WATER POND PUMP STRUCTURE
45 EMERGENCY DIESEL GENERATOR
46 AUXILIARY BOILER/STARTUP FUEL TANK
47 MOBILE EQUIPMENT FUEL TANKS
48 POTABLE WATER WELL
49 SAND AND STONE STORAGE AREAS
50 SCRAP METAL, SOLID OILY WASTES AND TRASH DUMPSTERS

SPILLS AND LEAKS

A 20,000 SOLIDS SLURRY SUMP OVERFLOW AT WATER PLANT

B ~64,420 GAL DEMINERALIZED WATER, DEMIN STORAGE TANK AT WATER PLANT.

C ~200 GAL SODIUM HYPOCHLORITE, UNIT #1 COOLING TOWER STORAGE TANK.

D ~17.6 CUBIC YARDS COAL COMBUSTION BYPRODUCTS, SOUTHWEST CORNER OF STAGE II LANDFILL.

E ~2,000 GAL BOILER AREA SUMP OVERFLOW ON #1, BOTTOM OF ASH PIT OVERFLOWED TO STORMDRAIN NEXT TO #2 FUEL OIL TANKS.

F UNKNOWN AMOUNT SODIUM HYPOCHLORITE SOLUTION INTO GROUND, #1 COOLING TOWER NEXT TO CIRC WATER PUMPS.

G SEDIMENT RELEASED INTO WETLANDS, ~7 CUBIC YARDS OF SOIL. STAGE 3 LANDFILL PIPELINE PROJECT RELEASED SOIL TO WETLANDS.

H SEDIMENT RELEASED INTO WETLANDS, ~3.34 CUBIC YARDS OF SOIL. STAGE 3 LANDFILL PIPELINE PROJECT RELEASED SOIL TO WETLANDS.

I UNKNOWN AMOUNT TREATED WASTEWATER FROM SEWAGE PLANT. JUST EAST OF SEWAGE TREATMENT PLANT.

J. 5,000 GAL WATER TREATMENT SLUDGE SPILL TO THE GROUND, DID NOT DISCHARGE OFF-SITE. BEHIND WATER PLANT AT SLUDGE THICKENER TANK.

K. UNKNOWN AMOUNT OF UNTREATED SEWAGE INTO THE GROUND, NEAR TRUCK SCALES UNDERNEATH CONCRETE COAL PILE PERIMETER DITCH.

L. ~1,000 GAL BOILER AREA SUMP OVERFLOW ON #2, #2 BOTTOM ASH PIT OVERFLOWED TO STORMDRAIN NEXT TO #2 FUEL OIL TANKS.

M 300-400 GAL SODIUM HYPOCHLORITE SOLUTION ONTO THE GROUND, #1 COOLING TOWER CHEMICAL TREATMENT ROOM.

N 1,000-2,000 GAL SODIUM HYPOCHLORITE SOLUTION ONTO THE GROUND, #1 COOLING TOWER CHEMICAL TREATMENT ROOM.

O ~400 GAL OF WASTEWATER LEAKED FROM VALVE FROM OUTFALL 002. COAL PILE RUNOFF POND DISCHARGE STRUCTURE.

P 200-300 GALLONS OF SCRUBBER SLURRY TO THE STORM DRAIN

Q High pH DISCHARGE EVENT AT OUTFALL 001.

CHEMICAL/MATERIAL STORAGE

100 5,000 GAL SODIUM HYDROXIDE TANK AT STAGE III LANDFILL/UNLOADING
101 SODIUM HYDROXIDE UNLOADING AT WATER TREATMENT PLANT
101 5,000 GAL SULFURIC ACID TANK AT WATER TREATMENT PLANT/ UNLOADING
101 ALUMINUM SULFATE UNLOADING AT WATER TREATMENT PLANT
102 5,000 GAL SULFURIC ACID TANK AT UNIT 1 COOLING TOWER/UNLOADING
102 SODIUM HYPOCHLORITE UNLOADING UNIT 1 COOLING TOWER
102 PHOSPHATE BASED INHIBITOR UNLOADING AT UNIT 1 COOLING TOWER
107 4,000 GAL SODIUM BROMIDE TANK/ UNLOADING
103 5,000 GAL SULFURIC ACID TANK AT UNIT 2 COOLING TOWER/ UNLOADING
103 PHOSPHATE BASED INHIBITOR UNLOADING AT UNIT 2 COOLING TOWER
104 150 GAL SULFURIC ACID TANK AT WATER TREATMENT PLANT/ UNLOADING
105 550 GAL SCALE CONTROL CHEMICAL TANK AT SNCR
106 2 UREA SILOS 450,000 LBS EACH/ UNLOADING
108 40,000 GAL UREA SOLUBILIZER/ MIX TANK/ UNLOADING
108 2 UREA SILO SOLUTION STORAGE TANKS 40,000 GAL/ UNLOADING
110 SODIUM HYDROXIDE UNLOADING AT COAL PILE RUN-OFF POND
111 HYDROGEN PEROXIDE (300 GAL TOTES) UNIT 1 COOLING TOWER
111 BIOCIDE (350 GAL TOTES) UNIT 1 COOLING TOWER
112 HYDROGEN PEROXIDE (350 GAL TOTES) UNIT 2 COOLING TOWER
112 BIOCIDE (350 GAL TOTES) UNIT 2 COOLING TOWER

LEGEND

WETLANDS
PROPERTY LINE
RAILROAD TRACK
FENCE LINE
FLOW DIRECTION ARROW
DRAINAGE AREA (APPROXIMATELY 53.33 ACRES) FOR OUTFALL 003. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 473.7 ACRES) FOR OUTFALL 004. APPROXIMATELY 30% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 198.06 ACRES) FOR OUTFALL 005. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 21.35 ACRES) FOR OUTFALL 006. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 56.37 ACRES) FOR OUTFALL 007. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 29.7 ACRES) FOR OUTFALL 008. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 38.37 ACRES) FOR OUTFALL 009. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 22.11 ACRES) FOR OUTFALL 011. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 16.71 ACRES) FOR OUTFALL 012. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 0.81 ACRES) FOR OUTFALL 013. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 0.47 ACRES) FOR OUTFALL 014. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 20.07 ACRES) FOR OUTFALL 015. APPROXIMATELY 5% IMPERVIOUS SURFACES.
DRAINAGE AREA (APPROXIMATELY 15.71 ACRES) FOR OUTFALL 016. APPROXIMATELY 5% IMPERVIOUS SURFACES.
PROCESS/WASTE WATER DRAINAGE

NOTES

1. THERE ARE NO SIGNIFICANT SOURCES OF POLLUTION FROM OFF-SITE FACILITIES.

3. A DESCRIPTION OF SITE BMPs CAN BE FOUND IN THE MEASURES AND CONTROLS SECTION OF THE PLAN TEXT.

4. THIS DRAWING SCANNED FROM BLACK & VEATCH ENGINEERS-ARCHITECTS DRAWING NUMBER 16340-157M-0100, DATED JANUARY 8, 1980 AND IS NOT TO SCALE.

REVISED BY	REVISION	DATE	BY
JF			
JMW			
RLP			
DESIGN BY			
APPROVED BY			

EASR | AECOM

EBASCO CORPORATION
1700 MARKET STREET, STE 2800
CHICAGO, IL 60103
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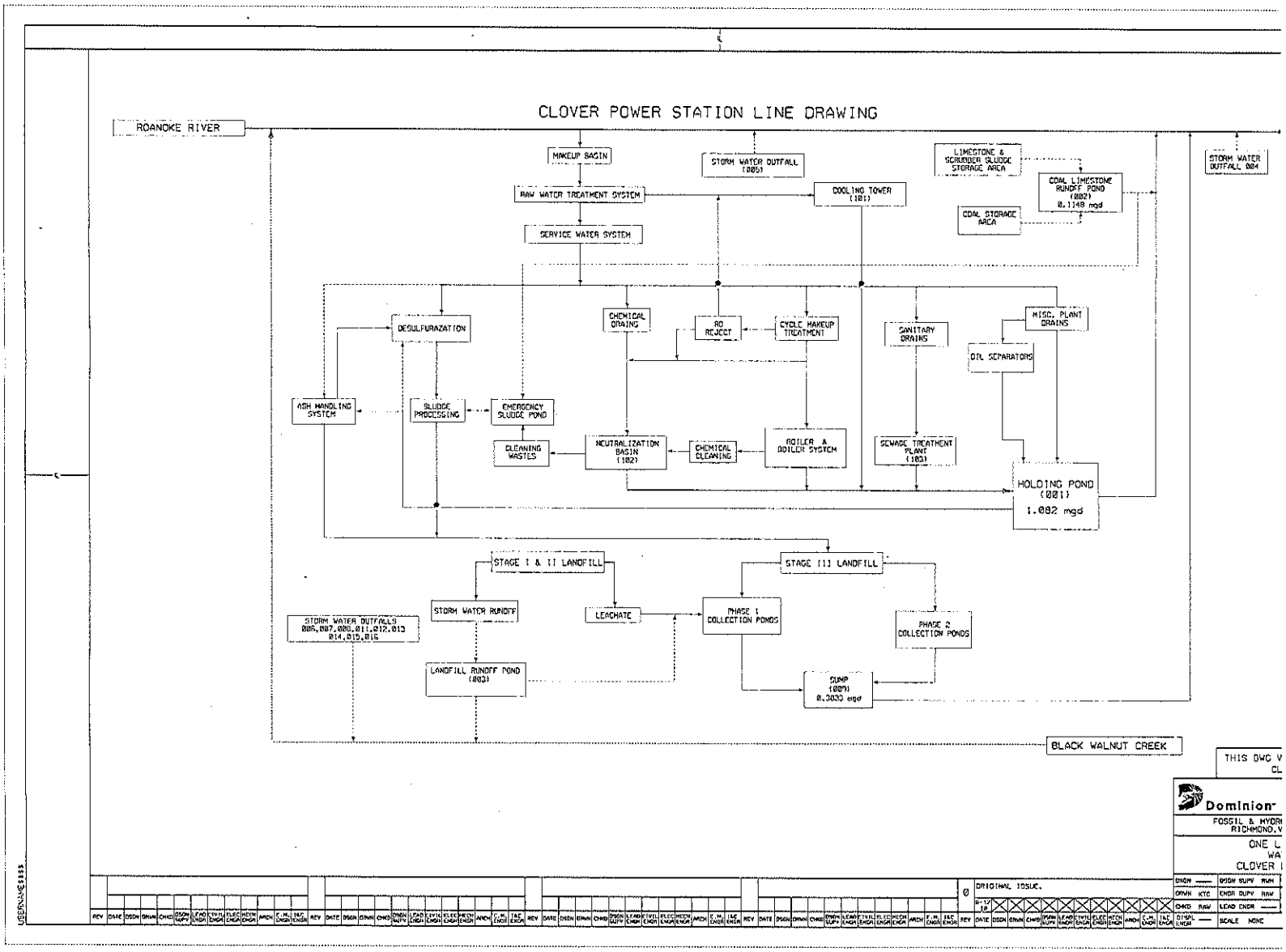
STORMWATER POLLUTION PREVENTION PLAN
DRAINAGE MAP

DOMINION
CLOVER POWER STATION
HALIFAX COUNTY, VIRGINIA

SCALE	DATE	PROJECT NUMBER
SEE 24X SCALE	01/07/03	02285-073-0031

DRAWING NUMBER
3

SHEET NUMBER
X



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ATTACHMENT 4

DISCHARGE/OUTFALL DESCRIPTION

TABLE I

NUMBER AND DESCRIPTION OF OUTFALLS

OUTFALL NO.	DISCHARGE LOCATION	DISCHARGE SOURCE (1)	TREATMENT (2)	FLOW (3)
001	36° 52' 07" 78° 41' 40" RR*	Cooling towers, sanitary sewage treatment works and floor drains	Sanitary sewage - activated sludge Some floor drains - oil/water separation The above flows, along with boiler blowbown, cooling tower blowdown and reverse osmosis reject water, goes to a final holding pond which provides sedimentation prior to discharge.	1.79 MGD
101	36°52'07" 78°41'40"	Cooling tower blowdown	Sedimentation	Included in 001 above.
102	36°52'07" 78°41'40"	Neutralization basin - Chemical drains, chemical cleaning wastes	Sedimentation, neutralization	Included in 001 above.
103	36°52'07" 78°41'40"	Sewage treatment plant	Ginding, sedimentation, activated sludge, disinfection	Included in 001 above.
002	36°52'07" 78°41'40" RR*	Coal storage area and limestone & scrubber sludge storage area	Neutralization, sedimentation	0.162 MGD
003	36°52'11" 78°43'41" BWC**	Storm water runoff from the closed and capped Stage I and II landfill	Sedimentation	Storm water dependent
004	36°51'07" 78°41'27" RR*	Storm water	None	Storm water dependent
005	36°59'59" 78°41'01" RR*	Storm water	None	Storm water dependent
006	36°52'33" 78°42'01" BWC**	Storm water	None	Storm water dependent
007	36°52'38" 78°42'41" BWC**	Storm water	None	Storm water dependent
008	36°51'10" 78°42'41" BWC**	Storm water	None	Storm water dependent
009	36°52'19" 78°41'52" RR*	Storm water runoff and leachate from the Stage III, Phase I landfill, ground water from the underdrain system, leachate and storm water from the Stage I and II landfill and ground water well purge water.	Sedimentation, neutralization, chemical precipitation, mixing	0.634 MGD
011	36°52'49" 78°43'20" BWC**	Storm water	None	Storm water dependent

OUTFALL NO.	DISCHARGE LOCATION	DISCHARGE SOURCE (1)	TREATMENT (2)	FLOW (3)
012	36°52'42" 78°43'15" BWC**	Storm water	None	Storm water dependent
013	36°52'53" 78°42'46" BWC**	Storm water	None	Storm water dependent
014	36°52'47" 78°43'12" BWC**	Storm water	None	Storm water dependent
015	36°52'44" 78°43'17" BWC**	Storm water	None	Storm water dependent
016	36°52'41" 78°43'21" BWC**	Storm water	None	Storm water dependent

(1) List operations contributing to flow
(2) Give brief description, unit by unit
(3) Give maximum 30-day average flow for industry and design flow for municipal

* RR = Roanoke River
** BWC = Black Walnut Creek

ATTACHMENT 5

LIMITATIONS/MONITORING

INDUSTRIAL EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 001
Outfall Description: final holding pond
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
	mg/l*	lbs/day*	mg/l*	mg/l*	lbs/day*		
Flow (MGD)	NL		NA	NL		1/Day	Estimated
pH (standard units)	NA		6.0	9.0		5 Days/Week	Grab
Temperature (deg. C)	NA		NA	40		5 Days/Week	I.S.
Total Suspended Solids [a]	30	NA	NA	100	NA	1/3 Months	Grab
Oil & Grease (mg/l) [a]	15	NA	NA	20	NA	1/3Months	Grab
Dissolved Oxygen	NA		5.7	NA		5 Days/Week	Grab
Total Petroleum Hydrocarbons	NL	NA	NA	NA		1/Year	Grab

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

"I.S" means immersion stabilization.

1/3 Months = In accordance with the following schedule: 1st quarter (January 1 - March 31, **due April 10**); 2nd quarter (April 1 - June 30, **due July 10**); 3rd quarter (July 1 - September 30, **due October 10**); 4th quarter (October 1 - December 31, **due January 10**).

1/Year = Between January 1 and December 31, **due January 10 of following year.**

[a] See Part I.D.7. for additional instructions regarding effluent monitoring frequencies.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	MULTIPLIER OR PRODUCTION	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X
pH		X		
TSS		X		
DO				X
Temperature				X
Oil & Grease		X		
Total Petroleum Hydrocarbons				X

INDUSTRIAL EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 101
Outfall Description: cooling tower blowdown
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
	mg/l*	lbs/day*	mg/l*	mg/l*	lbs/day*		
Flow (MGD)	NL		NA	NL		1/Week	Estimated
Free Available Chlorine	0.2	NA	NA	0.5	NA	2/Month	Grab
Total Chromium [a] [b] [c]	0.2	NA	NA	0.2	NA	1/3 Months	Grab
Total Zinc [a] [b] [c]	1.0	NA	NA	1.0	NA	1/3 Months	Grab
The 126 priority pollutants contained in chemicals added for cooling tower maintenance, except chromium and zinc. [c]	Non-detectable.					1/3 Months	Grab

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

1/3 Months = In accordance with the following schedule: 1st quarter (January 1 - March 31, **due April 10**); 2nd quarter (April 1 - June 30, **due July 10**); 3rd quarter (July 1 - September 30, **due October 10**); 4th quarter (October 1 - December 31, **due January 10**).

[a] See Parts I.D.6.a. and I.D.6.b. for quantification levels and reporting requirements, respectively.

[b] See Part I.D.7. for additional instructions regarding effluent monitoring frequencies.

[c] As an alternative to routine monitoring by sample and analysis for the 126 priority pollutants (including chromium and zinc), compliance with the limitations may be determined by engineering calculations submitted by the permittee. The engineering calculations must demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136.

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	MULTIPLIER OR PRODUCTION	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X
Free Available Chlorine		X		
Total Chromium		X		
Total Zinc		X		
The 126 priority pollutants contained in chemicals added for cooling tower maintenance, excepting chromium and zinc.		X		

INDUSTRIAL EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 102
Outfall Description: neutralization basin
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
	mg/l*	lbs/day*	mg/l*	mg/l*	lbs/day*		
Flow (MGD)	NL		NA	NL		1/Week	Estimated

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	MULTIPLIER OR PRODUCTION	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X

INDUSTRIAL EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 103
Outfall Description: sewage plant discharge
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
	mg/l*	lbs/day*	mg/l*	mg/l*	lbs/day*		
Flow (MGD)	NL		NA	NL		5 Days/Week	Estimated
BOD5 [b]	30	NA	NA	45	NA	1/6 Months	Grab
Total Suspended Solids [b]	30	NA	NA	45	NA	1/6 Months	Grab
Total Residual Chlorine [a]	NA	NA	1.5	NA	NA	5 Days/Week	Grab

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

[a] See Part I.B for additional chlorine monitoring instructions.

[b] See Part I.D.7. for additional instructions regarding effluent monitoring frequencies.

The design flow of this treatment facility is 0.013 MGD.

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	MULTIPLIER OR PRODUCTION	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X
BOD5 (mg/l)		X		
TSS (mg/l)		X		
Total residual chlorine				X

INDUSTRIAL EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 002
Outfall Description: Runoff holding pond for coal storage, limestone and lime storage and handling, scrubber sludge storage and coal combustion by-product areas.
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
	mg/l*	lbs/day*	mg/l*	mg/l*	lbs/day*		
Flow (MGD)	NL		NA	NL		1/Day	Estimated
pH (standard units)	NA		6.0	9.0		2/Month	Grab
Total Suspended Solids	NA	NA	NA	50	NA	2/Month	Grab

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

There shall be no discharge of floating solids or visible foam in other than trace amounts.

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	MULTIPLIER OR PRODUCTION	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X
pH		X		
TSS		X		

STORM WATER EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 003, 011, 012, 013, 014, 015 and 016
Outfall Description: Storm water from regulated SIC code industrial activity areas
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	MINIMUM ug/l*	MAXIMUM ug/l*	FREQUENCY	SAMPLE TYPE
Flow (MG)	NA	NL	1/Year	Estimated [a]
pH (standard units)	NL	NL	1/Year	Grab
Total Suspended Solids (mg/l)	NA	NL	1/Year	Grab
Total Recoverable Iron	NA	NL	1/Year	Grab

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

1/Year = Between January 1 and December 31, **due January 10 of following year.**

[a] Estimate of the total volume of the discharge sampled during the storm event.

For outfall 003, the monitoring and reporting in Part I.F.1.a. b. c are not applicable to these outfalls. In addition, the substitute samples required in Part I.F.c are not necessary.

For outfalls 011, 012, 013, 014, 015 and 016, the monitoring and reporting in Part I.F.1.a. and b. are not applicable to these outfalls. In addition, the substitute samples required in Part I.F.c are not necessary.

Outfalls 011, 012, 013, 014, 015, and 016, are substantially identical and a sample at any 1 of the 6 can be considered representative of the remaining 5 outfalls.

For outfalls 014, 015, and 016, no monitoring and reporting requirements are required until the completion of Stage III Phase 2B of the landfill and the initiation of the placement of ash into that phase. (Stormwater is not currently from industrialized areas). At that time, these outfalls will be considered substantially identical to outfalls 011, 012, and 013.

Samples shall be taken within the first 30 minutes after receiving 0.1 inches of rain if outfall is discharging or within 30 minutes of first flow after receiving 0.1 inches of rain.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	INDUSTRIAL STORM WATER CATEGORY	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X
Total recoverable iron, TSS	(11) Landfills, Land Application Sites & Open Dumps			X (based on the permits for storm water from industrial sites - EPA's multi-sector permit and DEQ's general permit)
pH				X

STORM WATER CATEGORIES:

(1) Timber Products
(2) Paper & Allied Products
(3) Chemical & Allied Products
(4) Asphalt Paving/Roofing Materials & Lubricant
(5) Glass, Clay, Cement, Concrete & Gypsum Products
(6) Primary Metals
(7) Metal Mining (Ore Mining & Dressing)
(8) Coal Mines & Coal Mining Related
(9) Oil & Gas Extraction & Petroleum Refineries
(10) Hazardous Waste Treatment, Storage, Disposal
(11) Landfills, Land Application Sites & Open Dumps
(12) Automobile Salvage Yards
(13) Scrap/Waste Recycling
(14) Steam Electric Power Generating, Inc. Coal Handling Areas
(15) Motor Freight, Passenger, Rail, U.S. Postal Transportation & Petroleum Bulk Oil Stations and Terminals
(16) Water Transportation With Maintenance and/or Equipment Cleaning
(17) Ship/Boat Building or Repairing
(18) Vehicle Maintenance, Equipment Cleaning or Deicing Areas At Air Transportation Facilities
(19) Treatment Works
(20) Food & Kindred Products
(21) Textile Mills, Apparel & Other Fabric Products Mfg.
(22) Wood & Metal Furniture and Fixture Mfg.
(23) Printing & Publishing
(24) Rubber, Miscellaneous Plastic Products & Miscellaneous Mfg.
(25) Leather Tanning & Finishing
(26) Fabricated Metal Products
(27) Transportation Equipment, Industrial Or Commercial Machinery Mfg.
(28) Electronic & Electrical Equipment and Components, Photographic & Optical Goods Mfg.
(29) Nonclassified Facilities

STORM WATER EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 004, 005, 006, 007 and 008
Outfall Description: Storm water from regulated SIC code industrial activity areas
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	MINIMUM ug/l*	MAXIMUM ug/l*	FREQUENCY	SAMPLE TYPE
Flow (MG)	NA	NL	1/Year	Estimated [a]
pH (standard units)	NL	NL	1/Year	Grab
Total Suspended Solids (mg/l)	NA	NL	1/Year	Grab
Total Recoverable Iron	NA	NL	1/Year	Grab

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

1/Year = Between January 1 and December 31, **due January 10 of following year.**

[a] Estimate of the total volume of the discharge sampled during the storm event.

Samples shall be taken within the first 30 minutes after receiving 0.1 inches of rain if outfall is discharging or within 30 minutes of first flow after receiving 0.1 inches of rain.

Outfalls 006, 007, and 008 are substantially identical and a sample collected at any 1 of 3 outfalls can be considered representative of the remaining 2 outfalls.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	INDUSTRIAL STORM WATER CATEGORY	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X
Total recoverable iron, TSS	(11) Landfills, Land Application Sites & Open Dumps			X (based on the permits for storm water from industrial sites - EPA's multi-sector permit and DEQ's general permit)
pH				X

STORM WATER CATEGORIES:

(1) Timber Products
(2) Paper & Allied Products
(3) Chemical & Allied Products
(6) Asphalt Paving/Roofing Materials & Lubricant
(7) Glass, Clay, Cement, Concrete & Gypsum Products
(6) Primary Metals
(7) Metal Mining (Ore Mining & Dressing)
(8) Coal Mines & Coal Mining Related
(9) Oil & Gas Extraction & Petroleum Refineries
(10) Hazardous Waste Treatment, Storage, Disposal
(11) Landfills, Land Application Sites & Open Dumps
(12) Automobile Salvage Yards
(13) Scrap/Waste Recycling
(14) Steam Electric Power Generating, Inc. Coal Handling Areas
(15) Motor Freight, Passenger, Rail, U.S. Postal Transportation & Petroleum Bulk Oil Stations and Terminals
(16) Water Transportation With Maintenance and/or Equipment Cleaning
(17) Ship/Boat Building or Repairing
(18) Vehicle Maintenance, Equipment Cleaning or Deicing Areas At Air Transportation Facilities
(19) Treatment Works
(20) Food & Kindred Products
(21) Textile Mills, Apparel & Other Fabric Products Mfg.
(22) Wood & Metal Furniture and Fixture Mfg.
(23) Printing & Publishing
(24) Rubber, Miscellaneous Plastic Products & Miscellaneous Mfg.
(25) Leather Tanning & Finishing
(26) Fabricated Metal Products
(27) Transportation Equipment, Industrial Or Commercial Machinery Mfg.
(28) Electronic & Electrical Equipment and Components, Photographic & Optical Goods Mfg.
(29) Nonclassified Facilities

INDUSTRIAL EFFLUENT LIMITATIONS/MONITORING

OUTFALL # 009
Outfall Description: Holding pond for storm water runoff and leachate from the Stage III, Phase I landfill, ground water from the underdrain system, leachate and storm water from the Stage I and II landfill and ground water well purge water (future Stage III, Phase II landfill runoff and leachate)
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
	mg/l*	lbs/day*	mg/l*	mg/l*	lbs/day*		
Flow (MGD)	NL		NA	NL		1/Day	Estimated
pH (standard units)	NA		6.0	9.0		2/Month	Grab
Total Suspended Solids	NL	NA	NA	50	NA	2/Month	Grab
Total Recoverable Manganese (µg/l) [a][b]	NA		NA	50	NA	1/Month	Grab

* = UNLESS OTHERWISE NOTED NA = NOT APPLICABLE NL = NO LIMIT, MONITORING REQUIREMENT ONLY

[a] See Parts I.D.6.a. and I.D.6.b. for quantification levels and reporting requirements, respectively.

[b] See Part I.C. for Schedule of Compliance. No monitoring or reporting required until after completion of the schedule.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

BASES FOR LIMITATIONS/MONITORING:

PARAMETER	MULTIPLIER OR PRODUCTION	TECHNOLOGY	WATER QUALITY	BEST PROFESSIONAL JUDGMENT
Flow				X
pH, TSS		X		
Total Recoverable Manganese			X	

GROUND WATER LIMITATIONS/MONITORING

GW WELL # PW-1 and PW-2 (upgradient wells); PW-3, PW-4, PW-5, PW-6, PW-7 and PW-8 (perimeter wells)
Site Description: groundwater monitoring wells
SIC CODE: 4911 NAICS CODE: 221112

(x) Final Limits ( ) Interim Limits Effective Dates - From: Permit Effective date To: Permit expiration date

PARAMETER	LIMITATIONS	UNITS	MONITORING REQUIREMENTS	
			FREQUENCY	SAMPLE TYPE
Static Water Level	NL	0.01 FT	1/6 Months	Measured
pH (standard units)	NL	SU	1/6 Months	Grab
Specific Conductance	NL	µmhos/cm	1/6 Months	Grab
Total Dissolved Solids (TDS)	NL	mg/l	1/6 Months	Grab
Total Organic Carbon (TOC)	NL	mg/l	1/6 Months	Grab
Sulfate	NL	mg/l	1/6 Months	Grab
Dissolved Chromium	NL	mg/l	1/6 Months	Grab
Dissolved Manganese	NL	mg/l	1/6 Months	Grab

NA = NOT APPLICABLE; NL = NO LIMIT, MONITORING REQUIREMENT ONLY

1/6 Months = In accordance with the following schedule: 1st half (January 1 - June 30, **due August 10**); 2nd half (July 1 - December 31, **due February 10**).

Grab samples - An individual sample should be taken after three (3) well volumes of ground water are removed (allowing the well to recharge between each well volume removed) or until well purging parameters (i.e. pH, temperature, and specific conductance) stabilize to ± 10%. The bailer or hose used should not contaminate samples.

The bases for the limitations/monitoring are noted in Attachment 7 of this fact sheet.

ATTACHMENT 6

SPECIAL CONDITIONS

B. ADDITIONAL TOTAL RESIDUAL CHLORINE (TRC) LIMITATIONS AND MONITORING REQUIREMENTS – Outfall 103

1. a. The permittee shall monitor the TRC at the outlet of the chlorine contact tank, prior to dechlorination, five days per week by grab sample.

   b. No more than 4 of all samples taken after the chlorine contact tank, prior to dechlorination, shall be less than 1.5 mg/l for any one calendar month.

   c. No TRC sample collected after the chlorine contact tank, prior to dechlorination, shall be less than 0.6 mg/l.

2. If an alternative to chlorination as a disinfection method is chosen, *E. coli* shall be limited and monitored by the permittee as specified below:

	Discharge Limitations	Monitoring Requirements	
	Monthly Average	Frequency	Sample Type
E. coli (n/100 ml)	126*	1/Month	Grab (Between 10 AM & 4 PM)

The above requirements, if applicable, shall substitute for the TRC requirements delineated in Parts I.A. and I.B.1 above.

* Geometric Mean

C. SCHEDULE OF COMPLIANCE – Outfall 009

The permittee shall achieve compliance with the final limitations and monitoring requirements for Total Recoverable Manganese as specified in Part I.A. of this permit in accordance with the following schedule:

1.	Submit Progress Reports to the DEQ Regional Office	**Quarterly, with the first report due April 10, 2011.**
2.	Achieve Compliance with Part I.A. Limitations	**No later than one year from the effective date of this permit.**

Quarterly = In accordance with the following schedule: 1st quarter (January 1 - March 31, **due April 10**); 2nd quarter (April 1 - June 30, **due July 10**); 3rd quarter (July 1 - September 30, **due October 10**); 4th quarter (October 1 - December 31, **due January 10**).

No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to the DEQ Regional Office, either a **report of progress** or, in the case of specific actions being required by identified dates, a written **notice of compliance or noncompliance**. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

D. OTHER REQUIREMENTS OR SPECIAL CONDITIONS

1. Permit Reopeners

a. Sludge Reopener

This permit may be modified or, alternatively, revoked and reissued if any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the Clean Water Act is more stringent than any requirements for sludge use or disposal in this permit, or controls a pollutant or practice not limited in this permit.

b. Water Quality Criteria Reopener

Should effluent monitoring indicate the need for any water quality-based limitation, this permit may be modified or, alternatively, revoked and reissued to incorporate appropriate limitations.

c. Total Maximum Daily Load (TMDL) Reopener

This permit shall be modified or, alternatively, revoked and reissued if any approved waste load allocation procedure, pursuant to section 303(d) of the Clean Water Act, imposes waste load allocations, limits or conditions on the facility that are not consistent with the requirements of this permit.

2. Licensed Wastewater Operator Requirement

The permittee shall employ or contract at least one Class III licensed wastewater works operator (for the industrial wastewater treatment facilities), and at least one IV licensed wastewater works operator (for the sewage treatment works). The license shall be issued in accordance with Title 54.1 of the Code of Virginia and the regulations of the Board for Waterworks and Wastewater Works Operators. The permittee shall notify the DEQ Regional Office, in writing, whenever the permittee is not complying, or has grounds for anticipating the permittee will not comply with this requirement. The notification shall include a statement of reasons and a prompt schedule for achieving compliance.

3. Operations and Maintenance (O & M) Manual

The permittee shall review the existing O & M Manual and notify the DEQ Regional Office, in writing, that it is still accurate and complete. If the O & M Manual is no longer accurate and complete, a revised O & M Manual shall be submitted for approval to the DEQ Regional Office. The permittee shall maintain an accurate, approved O & M Manual for the treatment works and operate the treatment works in accordance with the approved O & M manual. This manual shall include, but not necessarily be limited to, the following items, as appropriate:

a. Treatment works design and operation, routine preventative maintenance of units within the treatment works, critical spare parts inventory and record keeping;
b. Procedures for measuring and recording the duration and volume of treated wastewater discharged; and
c. Techniques to be employed in the collection, preservation and analysis of effluent samples.

Any changes in the practices and procedures followed by the permittee shall be documented and submitted for approval within 90 days of the effective date of the changes. Upon approval of the submitted manual changes, the revised manual becomes an enforceable part of this permit. Noncompliance with the O & M Manual shall be deemed a violation of the permit.

Letter/Revised Manual Due: No later than May 10, 2011.

4. 95% Design Capacity Notification

A written notice and a **plan of action** for ensuring continued compliance with the terms of this permit shall be submitted to the DEQ Regional Office when the monthly average flow influent to the sewage treatment plant reaches 95 percent of the design capacity authorized in this permit for each month of any three consecutive month period. The written notice shall be submitted within 30 days and the plan of action shall be received at the DEQ Regional Office **no later than 90 days from the third consecutive month for which the flow reached 95 percent of the design capacity.** The plan shall include the necessary steps and a prompt schedule of implementation for controlling any current or reasonably anticipated problem resulting from high influent flows. Failure to submit an adequate plan in a timely manner shall be deemed a violation of this permit.

5. Notification Levels

The permittee shall notify the Department as soon as they know or have reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(1) One hundred micrograms per liter (100 ug/l);
(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application; or
(4) The level established by the Board.

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(1) Five hundred micrograms per liter (500 µg/l);
(2) One milligram per liter (1 mg/l) for antimony;
(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application.
(4) The level established by the Board.

6. Compliance Reporting Under Part I.A. and I.B.

a. Quantification Levels

(1) Maximum quantification levels (QL) shall be as follows:

Effluent Characteristic	Quantification Level
Chlorine	0.10 mg/l
Total Recoverable Iron	250 µg/l
Total Recoverable Manganese	10 µg/l
Total Chromium	0.05 mg/l
Total Zinc	0.05 mg/l

(2) The permittee may use any approved method which has a QL equal to or lower than the QL listed in a.(1) above. The QL is defined as the lowest concentration used to calibrate a measurement system in accordance with the procedures published for the method.

(3) It is the responsibility of the permittee to ensure that proper QA/QC protocols are followed during the sampling and analytical procedures. QA/QC information shall be documented to confirm that appropriate analytical procedures have been used and the required QLs have been attained.

(4) An appropriate analytic method for metals shall be selected from the following list of EPA methods, or any approved method in 40 CFR Part 136, which will achieve a QL that is less than or equal to the QL specified in a.(1) above.

Metal	Analytical Methods
Chromium	218.1; 200.7; 218.2; 218.3; 200.9; 1639; 200.8
Iron	236.1; 200.7; 236.2
Manganese	243.1; 200.7; 200.9; 243.2; 200.8
Zinc	289.1; 200.7; 1638; 1639; 200.8; 289.2

b. Reporting

(1) **Monthly Average** -- Compliance with the monthly average limitations and/or reporting requirements for the parameters listed in a.(1) above shall be determined as follows: All concentration data below the test method QL shall be treated as zeros. All concentration data equal to or above the QL shall be treated as reported. An arithmetic average shall be calculated using all reported data for the month, including the defined zeros. This arithmetic average shall be reported on the DMR as calculated. If all data are below the QL, then the average shall be reported as "<QL". If reporting for quantity is required on the DMR and the calculated concentration is <QL, then report "<QL" for the quantity; otherwise, use the calculated concentration to calculate the quantity.

(2) **Daily maximum** -- Compliance with the daily maximum limitations and/or reporting requirements for the parameters listed in a.(1) above shall be determined as follows: All concentration data below the test method QL shall be treated as zeros. All concentration data equal to or above the QL shall be treated as reported. An arithmetic average of the values shall be calculated using all reported data, including the defined zeros, collected within each day during the reporting month. The maximum value of these daily averages thus determined shall be reported on the DMR as the Daily Maximum. If all data for each daily maximum are below the QL, then the average shall be reported as <[QL]. If reporting for quantity is required on the DMR and the calculated concentration for each daily average is <QL, then report "<QL" for the quantity; otherwise, use the calculated maximum value of the daily averages to calculate the quantity.

(3) Any single datum required shall be reported as "<QL" if it is less than the test method QL listed in a.(1) above. Otherwise, the numerical value shall be reported.

7. Effluent Monitoring Frequencies

If the facility permitted herein is issued a Notice of Violation for any of the parameters listed below, then the following effluent monitoring frequencies shall become effective upon written notice from DEQ and remain in effect until permit expiration date.

Effluent Parameter	Outfall	Frequency
TSS	001	1/Week
Oil and Grease	001	1/Week
Total Chromium	101	2/Month
Total Zinc	101	2/Month
BOD5	103	1/Month

TSS	103	1/Month

No other effluent limitations or monitoring requirements are affected by this special condition.

8. Water Quality Monitoring

The permittee shall monitor the effluent at outfalls 002 and 009 for the substances noted in Attachment A of the permit according to the indicated analysis number, quantification level, sample type and frequency. **Monitoring shall be initiated after the start of the third year from the permit's effective date.** Using Attachment A as the reporting form, the data shall be submitted with the next permit reissuance application. Monitoring and analysis shall be conducted in accordance with 40 CFR Part 136 or alternative EPA approved method. It is the responsibility of the permittee to ensure that proper QA/QC protocols are followed during the sample gathering and analytical procedures. The DEQ will use these data for making specific permit decisions in the future. This permit may be modified or, alternatively, revoked and reissued to incorporate limits for any of the substances listed in Attachment A.

Completed Attachment A Due: No later than June 30, 2015

9. Ground Water Monitoring Plan

The permittee shall continue sampling and reporting in accordance with the ground water monitoring plan approved on December 16, 2004. The purpose of this plan is to determine if the system integrity is being maintained and to indicate if activities at the site are resulting in violations of the Board's Ground Water Standards. The approved plan is an enforceable part of the permit. Any changes to the plan must be submitted for approval to the DEQ Regional Office.

If monitoring results indicate that any unit has contaminated the ground water, the permittee shall submit a corrective action plan within 60 days of being notified by the DEQ Regional Office. The plan shall set forth the steps to be taken by the permittee to ensure that the contamination source is eliminated or that the contaminant plume is contained on the permittee's property. In addition, based on the extent of contamination, a risk analysis may be required. Once approved, this plan and/or analysis shall be incorporated into the permit by reference and become an enforceable part of this permit.

Monitoring Schedule:

Semi-annual (1/6 Months) Monitoring = In accordance with the following schedule: 1st half (January 1 - June 30, **due August 10**); 2nd half (July 1 - December 31, **due February 10**).

10. Sludge Management Plan

The permittee shall conduct all sewage sludge use or disposal activities in accordance with the Sludge Management Plan (SMP) approved with the issuance of this permit. Any **proposed changes** in the sewage sludge use or disposal practices or procedures followed by the permittee shall be documented and **submitted for Department of Environmental Quality approval 90 days prior to the effective date of the changes.** Upon approval, the revised SMP becomes an enforceable part of the permit. The permit may be modified or, alternatively, revoked and reissued to incorporate limitations or conditions necessitated by substantive changes in sewage sludge use or disposal practices.

11. PCB Discharge Prohibition

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid. Compliance with this requirement will be determined using EPA Method 608.

12. Metals Cleaning Waters Discharge Prohibition

There shall be no discharge of metal cleaning wastewater to State waters. Following metal cleaning activities, the neutralization basin shall be filled with water or wastewater and the entire contents discharged to the scrubber ponds for use as make-up water to the flue gas desulfurization system.

13. PCB Monitoring

The permittee shall monitor the effluent at Outfalls 001, 002, 003, 007 & 009 for Polychlorinated Biphenyls (PCBs) in accordance with the schedule in f. below. DEQ will use these data for development of a PCB TMDL for the Roanoke River and not for compliance purposes. The permittee shall conduct the sampling and analysis in accordance with the requirements specified below. At a minimum:

a. Monitoring and analysis shall be conducted in accordance with the most current version of EPA Method 1668, congener specific results as specified in the PCB Point Source Monitoring Guidance. It is the responsibility of the permittee to ensure that proper QA/QC protocols are followed during the sample gathering and analytical procedures.

b. The permittee shall collect a minimum of 2 wet weather samples (Outfall 007), 2 dry weather samples (Outfalls 001 and 009) and 2 samples (Outfall 003) according to the PCB Point Source Guidance No. 09-2001, Appendix C (Sample Collection Methods for Effluent and Storm Water) and/or its amendments. Samples previously collected from these outfalls and analyzed with Method 1668, may be used in satisfying the total number of samples required even if the collection occurred prior to the current permit term.

c. The sampling protocol shall be submitted to DEQ-BRRO Lynchburg Regional Office for review and approval in accordance with the schedule in f. below prior to the first sample collection.

d. The data shall be submitted to DEQ-BRRO Lynchburg Regional Office by the 10th day of the month following receipt of the results according to the PCB Point Source Guidance No. 09-2001, Appendix E (Reporting Requirements for Analytical (PCB) Data Generated Using EPA Method 1668) and/or its amendments. The submittal shall include the unadjusted and appropriately quantified individual PCB congener analytical results. Additionally, laboratory and field QA/QC documentation and results should be reported. Total PCBs are to be computed as the summation of the reported, quantified congeners.

e. If the results of this monitoring indicate actual or potential exceedance of the water quality criterion or the Waste Load Allocation specified in the approved TMDL, the permittee shall submit to DEQ-BRRO Lynchburg Regional Office for review and approval a Pollutant Minimization Plan (PMP) designed to locate and reduce sources of PCBs in the collection system. A component of the plan may include an evaluation of the PCB congener distribution in the initial source intake water to determine the net contributions of PCBs introduced to the treatment works.

f. PCB monitoring shall proceed in accordance with the following schedule:

1.	Submit PCB sampling protocol	**No later than December 10, 2011.**
2.	Complete and Submit PCB monitoring results to the DEQ Blue Ridge Regional Office – Lynchburg.	**No later than January 10, 2013.**
3.	If required, Submit Pollutant Minimization Plan (PMP)	**Within 1 year of notification by DEQ.**

14. Application Requirement

In accordance with Part II. M. of this permit, a new and complete permit application shall be submitted for the reissuance of this permit.

Application Due: No later than July 17, 2015

E. TOXICS MANAGEMENT PROGRAM

1. Biological Monitoring

a. In accordance with the schedule in 2. below, the permittee shall conduct annual acute toxicity tests for the length of the permit. The permittee should collect 24-hour flow-proportioned composite samples of final effluent from outfall 001, and grab samples from outfalls 002 and 009. The acute tests for outfalls 001 and 002 to use are:

48 Hour Static Acute test using *Ceriodaphnia dubia*

The acute tests for outfalls 002 and 009 to use are:

48 Hour Static Acute test using *Ceriodaphnia dubia*
48 Hour Static Acute test using *Pimephales promelas*

These acute tests shall be performed with a minimum of 5 dilutions, derived geometrically, for calculation of a valid LC_{50}. Express as the results as TU_a (Acute Toxic Units) by dividing $100/LC_{50}$ for reporting.

The permittee may provide additional samples. These data shall be reported and may be included in the evaluation of effluent toxicity. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3

b. The test dilutions should be able to determine compliance with the following endpoint:

Outfall 001 – Acute LC_{50} of 100% equivalent to a TU_a of 1.00
Outfall 002 – Acute LC_{50} of 2% equivalent to a TU_a of 50.00
Outfall 009 – Acute LC_{50} of 11% equivalent to a TU_a of 9.09

c. The test data will be evaluated for reasonable potential at the conclusion of the test period. The data may be evaluated sooner if requested by the permittee, or if toxicity has been noted. Should evaluation of the data indicate that a limit is needed, a WET limit and compliance schedule will be required and the toxicity tests of 1.a. may be discontinued.

d. All applicable data will be reevaluated for reasonable potential at the end of the permit term.

e. If, in the testing according to E.1., any toxicity tests are invalidated, the tests shall be repeated within the testing period that the original test was taken, or if already past that period, within thirty (30) days of notification. If there is no discharge during this period, a sample must be taken during the first discharge.

2. Reporting Schedule:

The permittee shall report the results as specified in this Toxics Management Program in accordance with the following schedule:

(a)	**Conduct first annual biological tests**	**Between February 1, 2011 and December 31, 2011**
(b)	**Submit results of all biological tests**	**With a Discharge Monitoring Report (DMR) by January 10, 2012**
(c)	**Conduct subsequent annual biological tests**	**By December 31, 2012, 2013, 2014**
(d)	**Submit results of all biological tests**	**With a DMR by January 10, 2013, 2014, 2015**

F. STORM WATER MANAGEMENT CONDITIONS

1. General Storm Water Special Conditions

a. Sample Type

For all storm water monitoring required in Part I.A or other applicable sections of this permit, a minimum of one grab sample shall be taken. Unless otherwise specified, all such samples shall be collected from the discharge resulting from a storm event that occurs at least 72 hours from the previously measurable storm event (a "measurable storm event" is defined as a storm event that results in an actual discharge from the site). The required 72-hour storm event interval is waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the permittee shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If storm water discharges associated with industrial activity commingle with process or non-process water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

b. Recording of Results

For each measurement or sample taken pursuant to the storm event monitoring requirements of this permit, the permittee shall record and report with the DMRs the following information:

(1) The date and duration (in hours) of the storm event(s) sampled;

(2) The rainfall total (in inches) of the storm event which generated the sampled discharge; and

(3) The duration between the storm event sampled and the end of the previous measurable storm event.

In addition, the permittee shall maintain a monthly log documenting the amount of rainfall received at this facility on a daily basis. A summarization of this information shall also be maintained at the site.

In the event that sampling of an outfall is not possible due to the absence of effluent flow during a particular testing period, the permittee shall provide written notification to DEQ with the DMR for the month following the period in which samples were to be collected.

c. Sampling Waiver

When a permittee is unable to collect storm water samples required in Part I.A or other applicable sections of this permit within a specified sampling period due to adverse climatic conditions, the permittee shall collect a substitute sample from a separate qualifying event in the next period and submit these data along with the data for the routine sample in that period. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

d. Representative Discharges

When a facility has two or more outfalls that discharge substantially identical effluents, based on similarities of the industrial activities, significant materials, size of drainage areas, and storm water management practices occurring within the drainage areas of the outfalls, the permittee may test the effluent of one of such outfalls and report that the quantitative data also apply to the

substantially identical outfall(s) provided that: (1) the representative outfall determination has been approved by DEQ prior to data submittal; and (2) the permittee includes in the SWPPP a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents.

e. Quarterly Visual Examination of Storm Water Quality

The permittee must perform and document a quarterly visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination(s) must be made at least once in each of the following three-month periods: January through March, April through June, July through September, and October through December. The visual examination must be made during daylight hours (e.g., normal working hours). If no storm event resulted in runoff from the facility during a monitoring quarter, the permittee is excused from visual monitoring for that quarter provided that documentation is included with the monitoring records indicating that no runoff occurred. The documentation must be signed and certified in accordance with Part II.K. of this permit.

(1) Visual examinations must be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when the runoff or snowmelt begins discharging from the facility. The examination must document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well-lit area. No analytical tests are required to be performed on the samples. All samples (except snowmelt samples) must be collected from the discharge resulting from a storm event that results in an actual discharge from the site (defined as a "measurable storm event"), and that occurs at least 72 hours from the previously measurable storm event. The 72-hour storm interval is waived if the permittee is able to document that less than a 72-hour interval is representative for local storm events during the sampling period. Where practicable, the same individual should carry out the collection and examination of discharges for the entire permit term. If no qualifying storm event resulted in runoff during daylight hours from the facility during a monitoring quarter, the permittee is excused from visual monitoring for that quarter provided that documentation is included with the monitoring records indicating that no qualifying storm event occurred during daylight hours that resulted in storm water runoff during that quarter. The documentation must be signed and certified in accordance with Part II.K.

(2) The visual examination reports must be maintained on-site with the Storm Water Pollution Prevention Plan (SWPPP). The report must include the outfall location, the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

(3) If the facility has two or more outfalls that discharge substantially identical effluents, based on similarities of the industrial activities, significant materials, size of drainage areas, and storm water management practices occurring within the drainage areas of the outfalls, the permittee may conduct visual monitoring on the effluent of just one of the outfalls and report that the observations also apply to the substantially identical outfall(s), provided that the permittee includes in the SWPPP a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (i.e., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)) shall be provided in the plan.

(4) When the permittee is unable to conduct the visual examination due to adverse climatic conditions, the permittee must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

f. Allowable Non-Storm Water Discharges

(1) The following non-storm water discharges are authorized by this permit provided the non-storm water component of the discharge is in compliance with f.(2), below:

(a) Discharges from fire fighting activities;
(b) Fire hydrant flushings;
(c) Potable water including water line flushings;
(d) Uncontaminated air conditioning or compressor condensate;
(e) Irrigation drainage;
(f) Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with manufacturer's instructions;
(g) Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed);
(h) Routine external building wash down which does not use detergents;
(i) Uncontaminated ground water or spring water;
(j) Foundation or footing drains where flows are not contaminated with process materials;
(k) Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but NOT intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains);
(l) Makeup water storage tank water (provided chlorine is non detectable); and
(m) Condensate storage tank water.

(2) Except for flows from fire fighting activities, the SWPPP must include:

(a) Identification of each allowable non-storm water source;
(b) The location where the non-storm water is likely to be discharged; and
(c) Descriptions of appropriate BMPs for each source.

(3) If mist blown from cooling towers is included as one of the allowable non-storm water discharges from the facility, the permittee must specifically evaluate the discharge for the presence of chemicals used in the cooling tower. The evaluation shall be included in the SWPPP.

g. Releases of Hazardous Substances or Oil in Excess of Reportable Quantities

The discharge of hazardous substances or oil in the storm water discharge(s) from the facility shall be prevented or minimized in accordance with the SWPPP for the facility. This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill. This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 and 40 CFR 302 or § 62.1-44.34:19 of the Code of Virginia. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 40 CFR 117 or 40 CFR 302 occurs during a 24-hour period:

(1) The permittee is required to notify the Department in accordance with the requirements of Part II.G. as soon as he or she has knowledge of the discharge;

(2) Where a release enters a municipal separate storm sewer system (MS4), the permittee shall also notify the owner or the MS4; and

(3) The SWPPP required by this permit must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

h. Additional Requirements for Salt Storage

Storage piles of salt or piles containing salt used for deicing or other commercial or industrial purposes shall be enclosed or covered to prevent exposure to precipitation. The permittee shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. All salt storage piles shall be located on an impervious surface. All runoff from the pile, and/or runoff that comes in contact with salt, including under drain systems, shall be collected and contained within a bermed basin lined with concrete or other impermeable materials, or within an underground storage tank(s), or within an above ground storage tank(s), or disposed of through a sanitary sewer (with the permission of the treatment facility). A combination of any or all of these methods may be used. In no case shall salt contaminated storm water be allowed to discharge directly to the ground or to state waters.

2. Storm Water Pollution Prevention Plan

A SWPPP is required to be maintained and implemented for the facility. The plan shall include Best Management Practices (BMPs) that are reasonable, economically practicable, and appropriate in light of current industry practices. The BMPs shall be selected, designed, installed, implemented and maintained in accordance with good engineering practices to eliminate or reduce the pollutants in all storm water discharges from the facility. The plan shall also include any control measures necessary for the storm water discharges to meet applicable water quality standards.

Permittees shall implement the provisions of the SWPPP as a condition of this permit.

The SWPPP requirements of this permit may be fulfilled, in part, by incorporating by reference other plans or documents such as a spill prevention control and countermeasure (SPCC) plan developed for the facility under Section 311 of the Clean Water Act, or best management practices (BMP) programs otherwise required for the facility, provided that the incorporated plan meets or exceeds the plan requirements of section b. below (Contents of the Plan). All plans incorporated by reference into the SWPPP become enforceable under this permit. If a plan incorporated by reference does not contain all of the required elements of the SWPPP of Part I.F.2.b. below, the permittee shall develop the missing SWPPP elements and include them in the required plan.

a. Deadlines for Plan Preparation and Compliance

(1) The facility shall review and implement the existing plan as expeditiously as practicable, but not later than 270 days from the effective date of the permit. Verification of compliance shall be provided, in writing, within 10 days of the above deadline.

(2) Measures That Require Construction. In cases where construction is necessary to implement measures required by the plan, the plan shall contain a schedule that provides compliance with the plan as expeditiously as practicable, but no later than 3 years after the effective date of this permit. Where a construction compliance schedule is included in the plan, the schedule shall include appropriate nonstructural and/or temporary controls to be implemented in the affected portion(s) of the facility prior to completion of the permanent control measure.

b. Contents of the Plan

The contents of the SWPPP shall comply with the requirements listed below and those in Part I.F.3. below (Sector-Specific SWPPP Requirements). The plan shall include, at a minimum, the following items:

(1) Pollution Prevention Team. The plan shall identify the staff individuals by name or title that comprise the facility's storm water pollution prevention team. The pollution prevention team is responsible for assisting the facility or plant manager in developing, implementing, maintaining, revising, and ensuring compliance with the facility's SWPPP. Specific responsibilities of each staff individual on the team shall be identified and listed.

(2) Site Description.

The SWPPP shall include the following:

(a) Activities at the Facility.

A description of the nature of the industrial activities at the facility.

(b) General Location Map

A general location map (e.g., USGS quadrangle or other map) with enough detail to identify the location of the facility and the receiving waters within one mile of the facility.

(c) Site Map

A site map identifying the following:

(i) The size of the property (in acres);

(ii) The location and extent of significant structures and impervious surfaces (roofs, paved areas and other impervious areas);

(iii) Locations of all storm water conveyances including ditches, pipes, swales, and inlets, and the directions of storm water flow (use arrows to show which ways storm water will flow);

(iv) Locations of all existing structural and source control BMPs;

(v) Locations of all surface water bodies, including wetlands;

(vi) Locations of potential pollutant sources identified under in paragraph b.(3) below;

(vii) Locations where significant spills or leaks identified under paragraph b.(4) below, have occurred;

(viii) Locations of the following activities where such activities are exposed to precipitation: fueling stations; vehicle and equipment maintenance and/ or cleaning areas; loading/unloading areas; locations used for the treatment, storage or disposal of wastes; liquid storage tanks; processing and storage areas; access roads, rail cars and tracks; transfer areas for substances in bulk; and machinery;

(ix) Locations of storm water outfalls and an approximate outline of the area draining to each outfall, and location of municipal storm sewer systems, if the storm water from the facility discharges to them;

(x) Location and description of all non-storm water discharges;

(xi) Location of any storage piles containing salt used for deicing or other commercial or industrial purposes; and

(xii) Locations and sources of runon to the site from adjacent property where the runon contains significant quantities of pollutants. The permittee shall include an evaluation with the SWPPP of how the quality of the storm water running onto the facility impacts the facility's storm water discharges.

(d) Receiving Waters and Wetlands

The name of all surface waters receiving discharges from the site, including intermittent streams, dry sloughs, and arroyos. Provide a description of wetland sites that may receive discharges from the facility. If the facility discharges through a municipal separate storm sewer system (MS4), identify the MS4 operator, and the receiving water to which the MS4 discharges.

(3) Summary of Potential Pollutant Sources

The plan shall identify each separate area at the facility where industrial materials or activities are exposed to storm water. Industrial materials or activities include, but are not limited to: material handling equipment or activities, industrial machinery, raw materials, industrial production and processes, intermediate products, byproducts, final products, and waste products. Material handling activities include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For each separate area identified, the description shall include:

(a) Activities in Area

A list of the activities (e.g., material storage, equipment fueling and cleaning, cutting steel beams); and

(b) Pollutants

A list of the associated pollutant(s) or pollutant constituents (e.g. crankcase oil, zinc, sulfuric acid, cleaning solvents, etc.) for each activity. The pollutant list shall include all significant materials handled, treated, stored or disposed in a manner such that they are exposed to storm water. The list shall include any hazardous substances or oil at the facility.

(4) Spills and Leaks

The SWPPP shall clearly identify areas where potential spills and leaks that can contribute pollutants to storm water discharges can occur and their corresponding outfalls. The plan shall include a list of significant spills and leaks of toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a storm conveyance during the three-year period prior to the date this SWPP was prepared or amended. The list shall be updated if significant spills or leaks occur in exposed areas of the facility

during the term of the permit. Significant spills and leaks include releases of oil or hazardous substances in excess of reportable quantities.

(5) Sampling Data

The plan shall include a summary of existing storm water discharge sampling data taken at the facility.

(6) Storm Water Controls

(a) BMPs shall be implemented for all the areas identified in Part I.F.2.b.(3) above (Summary of Potential Pollutant Sources) to prevent or control pollutants in storm water discharges from the facility. All reasonable steps shall be taken to control or address the quality of discharges from the site that may not originate at the facility. The SWPPP shall describe the type, location and implementation of all BMPs for each area where industrial materials or activities are exposed to storm water. Selection of BMPs shall take into consideration:

(i) That preventing storm water from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from storm water;

(ii) BMPs generally shall be used in combination with each other for most effective water quality protection;

(iii) Assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures;

(iv) That minimizing impervious areas at the facility can reduce runoff and improve groundwater recharge and stream base flows in local streams (however, care must be taken to avoid ground water contamination);

(v) Flow attenuation by use of open vegetated swales and natural depressions can reduce in-stream impacts of erosive flows;

(vi) Conservation or restoration of riparian buffers will help protect streams from storm water runoff and improve water quality; and

(vii) Treatment interceptors (e.g., swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

(b) Control Measures

The permittee shall implement the following types of BMPs to prevent and control pollutants in the storm water discharges from the facility, unless it can be demonstrated and documented that such controls are not relevant to the discharges (e.g., there are no storage piles containing salt).

(i) Good Housekeeping

The permittee shall keep clean all exposed areas of the facility that are potential sources of pollutants to storm water discharges. Typical problem areas include areas around trash containers, storage areas, loading docks, and vehicle fueling and maintenance areas. The plan shall include a schedule for regular pickup and disposal of waste

materials, along with routine inspections for leaks and conditions of drums, tanks and Containers. The introduction of raw, final or waste materials to exposed areas of the facility shall be minimized to the maximum extent practicable. The generation of dust, along with off-site vehicle tracking of raw, final or waste materials, or sediments, shall be minimized to the maximum extent practicable.

(ii) Eliminating and Minimizing Exposure

To the extent practicable, industrial materials and activities shall be located inside, or protected by a storm-resistant covering to prevent exposure to rain, snow, snowmelt, and runoff. Note: Eliminating exposure at all industrial areas may make the facility eligible for the "Conditional Exclusion for No Exposure" provision of 9 VAC 25-31-120 E, thereby eliminating the need to have a permit.

(iii) Preventive Maintenance

The permittee shall have a preventive maintenance program that includes regular inspection, testing, maintenance and repairing of all industrial equipment and systems to avoid breakdowns or failures that could result in leaks, spill and other releases. This program is in addition to the specific BMP maintenance required under Part I.F.2.c. below (Maintenance of BMPs).

(iv) Spill Prevention and Response Procedures

The plan shall describe the procedures that will be followed for preventing and responding to spills and leaks.

(A) Preventive measures include barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling.

(B) Response procedures shall include notification of appropriate facility personnel, emergency agencies, and regulatory agencies, and procedures for stopping, containing and cleaning up spills. Measures for cleaning up hazardous material spills or leaks shall be consistent with applicable RCRA regulations at 40 CFR Part 264 and 40 CFR Part 265. Employees who may cause, detect or respond to a spill or leak shall be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals shall be a member of the Pollution Prevention Team.

(C) Contact information, or the location of contact information, for individuals and agencies that must be notified in the event of a spill shall be included in the SWPPP, and in other locations where it will be readily available.

(v) Routine Facility Inspections

Facility personnel who possess the knowledge and skills to assess conditions and activities that could impact storm water quality at the facility, and who can also evaluate the effectiveness of BMPs shall quarterly inspect all areas of the facility where industrial materials or activities are exposed to storm water. These

inspections are in addition to, or as part of, the comprehensive site evaluation required under section d. below (Comprehensive Site Compliance Evaluation). At least one member of the Pollution Prevention Team shall participate in the routine facility inspections.

The inspection frequency shall be specified in the plan based upon a consideration of the level of industrial activity at the facility, but shall be a minimum of quarterly unless more frequent intervals are specified elsewhere in the permit or written approval is received from the department for less frequent intervals. At least once each calendar year, the routine facility inspection must be conducted during a period when a storm water discharge is occurring.

Any deficiencies in the implementation of the SWPPP that are found shall be corrected as soon as practicable, but not later than within 90 days of the inspection, unless permission for a later date is granted in writing by the director. The results of the inspections shall be documented in the SWPPP, along with the date(s) and description(s) of any corrective actions that were taken in response to any deficiencies or opportunities for improvement that were identified.

(vi) Employee Training

The permittee shall implement a storm water employee training program for the facility. The SWPPP shall include a schedule for all types of necessary training, and shall document all training sessions and the employees who received the training. Training shall be provided for all employees who work in areas where industrial materials or activities are exposed to storm water, and for employees who are responsible for implementing activities identified in the SWPPP (e.g., inspectors, maintenance personnel, etc.). The training shall cover the components and goals of the SWPPP, and include such topics as spill response, good housekeeping, material management practices, BMP operation and maintenance, etc. The SWPPP shall include a summary of any training performed.

(vii) Sediment and Erosion Control

The plan shall identify areas at the facility that, due to topography, land disturbance (e.g., construction, landscaping, site grading), or other factors, have a potential for soil erosion. The permittee shall identify and implement structural, vegetative, and/or stabilization BMPs to prevent or control on-site and off-site erosion and sedimentation. Flow velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel if the flows would otherwise create erosive conditions.

(viii) Management of Runoff

The plan shall describe the storm water runoff management practices (i.e., permanent structural BMPs) for the facility. These types of BMPs are typically used to divert, infiltrate, reuse, or otherwise reduce pollutants in storm water discharges from the site.

Structural BMPs may require a separate permit under § 404 of the CWA and the Virginia Water Protection Permit Program Regulation (9VAC25-210) before installation begins.

c. Maintenance

All BMPs identified in the SWPPP shall be maintained in effective operating condition. Storm water BMPs identified in the SWPPP shall be observed during active operation (i.e., during a storm water runoff event) to ensure that they are functioning correctly. Where discharge locations are inaccessible, nearby downstream locations shall be observed. The observations shall be documented in the SWPPP.

The SWPPP shall include a description of procedures and a regular schedule for preventive maintenance of all BMPs, and shall include a description of the back-up practices that are in place should a runoff event occur while a BMP is off-line. The effectiveness of nonstructural BMPs shall also be maintained by appropriate means (e.g., spill response supplies available and personnel trained, etc.).

If site inspections required by Part I.F.2.b.(6)(b)(v) above (Routine Facility Inspections) and Part I.F.2.d. below (Comprehensive Site Compliance Evaluation) identify BMPs that are not operating effectively, repairs or maintenance shall be performed before the next anticipated storm event. If maintenance prior to the next anticipated storm event is not possible, maintenance shall be scheduled and accomplished as soon as practicable. In the interim, back-up measures shall be employed and documented in the SWPPP until repairs or maintenance is complete. Documentation shall be kept in a location specified in the SWPPP, of maintenance and repairs of BMPs, including the date(s) of regular maintenance, date(s) of discovery of areas in need of repair or replacement, and for repairs, date(s) that the BMP(s) returned to full function, and the justification for any extended maintenance or repair schedules.

d. Comprehensive Site Compliance Evaluation

The permittee shall conduct comprehensive site compliance evaluations at least once a year. The evaluations shall be done by qualified personnel who possess the knowledge and skills to assess conditions and activities that could impact storm water quality at the facility, and who can also evaluate the effectiveness of BMPs. The personnel conducting the evaluations may be either facility employees or outside constituents hired by the facility.

(1) Scope of the Compliance Evaluation

Evaluations shall include all areas where industrial materials or activities are exposed to storm water, as identified in Part I.F.2.b.(3) above. The personnel shall evaluate:

(a) Industrial materials, residue or trash that may have or could come into contact with storm water;

(b) Leaks or spills from industrial equipment, drums, barrels, tanks or other containers that have occurred within the past three years;

(c) Off-site tracking of industrial or waste materials or sediment where vehicles enter or exit the site;

(d) Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas;

(e) Evidence of, or the potential for, pollutants entering the drainage system;

(f) Evidence of pollutants discharging to surface waters at all facility outfalls, and the condition of and around the outfall, including flow dissipation measures to prevent scouring;

(g) Review of training performed, inspections completed, maintenance performed, quarterly visual examinations, and effective operation of BMPs;

(h) Results of both visual and any analytical monitoring done during the past year shall be taken into consideration during the evaluation.

(2) Based on the results of the evaluation, the SWPPP shall be modified as necessary (e.g., show additional controls on the map required by Part I.E.2.b.(2)(c); revise the description of controls required by Part I.E.2.b(6) to include additional or modified BMPs designed to correct problems identified). Revisions to the SWPPP shall be completed within 30 days following the evaluation, unless permission for a later date is granted in writing by the director. If existing BMPs need to be modified or if additional BMPs are necessary, implementation shall be completed before the next anticipated storm event, if practicable, but not more than 60 days after completion of the comprehensive site evaluation, unless permission for a later date is granted in writing by the Department;

(3) Compliance Evaluation Report

A report shall be written summarizing the scope of the evaluation, name(s) of personnel making the evaluation, the date of the evaluation, and all observations relating to the implementation of the SWPPP, including elements stipulated in Part I.E.2.d.(1) (a) through (h) above. Observations shall include such things as: the location(s) of discharges of pollutants from the site; location(s) of previously unidentified sources of pollutants; location(s) of BMPs that need to be maintained or repaired; location(s) of failed BMPs that need replacement; and location(s) where additional BMPs are needed. The report shall identify any incidents of noncompliance that were observed. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the SWPPP and this permit. The report shall be signed in accordance with Part II.K. and maintained with the SWPPP.

(4) Where compliance evaluation schedules overlap with routine inspections required under Part I.E.2.b(6)(b)(v), the annual compliance evaluation may be used as one of the routine inspections.

e. Signature and Plan Review

(1) Signature/Location

The SWPPP shall be signed in accordance with Part II.K., dated, and retained on-site at the facility covered by this permit in accordance with Part II.B.2. All other changes to the SWPPP, and other permit compliance documentation, must be signed and dated by the person preparing the change or documentation.

(2) Availability

The permittee shall make the SWPPP, annual site compliance evaluation report, and other information available to the Department upon request.

(3) Required Modifications

The director may notify the permittee at any time that the SWPPP, BMPs, or other components of the facility's storm water program do not meet one or more of the requirements of this permit. The notification shall identify specific provisions of the permit that are not being met, and may include required modifications to the storm water program, additional monitoring requirements, and special reporting requirements. The permittee shall make any required changes to the SWPPP within 60 days of receipt of such notification, unless permission for a later date is granted in writing by the director, and shall submit a written certification to the director that the requested changes have been made.

f. Maintaining an Updated SWPPP

(1) The permittee shall review and amend the SWPPP as appropriate whenever:

(a) There is construction or a change in design, operation, or maintenance at the facility that has a significant effect on the discharge, or the potential for the discharge, of pollutants from the facility;

(b) Routine inspections or compliance evaluations determine that there are deficiencies in the BMPs;

(c) Inspections by local, state, or federal officials determine that modifications to the SWPPP are necessary;

(d) There is a spill, leak or other release at the facility; or

(e) There is an unauthorized discharge from the facility.

(2) SWPPP modifications shall be made within 30 calendar days after discovery, observation or event requiring a SWPPP modification. Implementation of new or modified BMPs (distinct from regular preventive maintenance of existing BMPs described in Part I.F.2.b(6)(b)(iii)) shall be initiated before the next storm event if possible, but no later than 60 days after discovery, or as otherwise provided or approved by the Director. The amount of time taken to modify a BMP or implement additional BMPs shall be documented in the SWPPP.

(3) If the SWPPP modification is based on a release or unauthorized discharge, include a description and date of the release, the circumstances leading to the release, actions taken in response to the release, and measures to prevent the recurrence of such releases. Unauthorized releases and discharges are subject to the reporting requirements of Part II.G. of this permit.

4. SECTOR-SPECIFIC STORM WATER POLLUTION PREVENTION PLAN REQUIREMENTS

The requirements listed under this section apply to storm water discharges associated with industrial activity from steam electric power generating facilities using coal, natural gas, oil, nuclear energy, etc. to produce a steam source, including coal handling areas (Industrial Activity Code "O").

Storm water discharges from ancillary facilities (e.g., fleet centers, gas turbine stations, and substations) that are not contiguous to a steam electric power generating facility are not covered by this permit. Heat capture/heat recovery combined cycle generation facilities are also not covered by this permit; however, dual fuel co-generation facilities that generate electric power are included.

In addition to the requirements of Part I.F.2., the SWPPP shall include, at a minimum, the following items:

a. Site Description

(1) Site Map

The site map shall identify the locations of any of the following activities or sources that may be exposed to precipitation/surface runoff: storage tanks, scrap yards, general refuse areas; short and long term storage of general materials (including, but not limited to: supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills; construction sites; and stock pile areas (such as coal or limestone piles).

(2) Storm Water Controls

(a) Good Housekeeping Measures

(i) Fugitive Dust Emissions

The permittee shall describe and implement measures that prevent or minimize fugitive dust emissions from coal handling areas. The permittee shall consider establishing procedures to minimize off-site tracking of coal dust such as installing specially designed tires, or washing vehicles in a designated area before they leave the site, and controlling wash water.

(ii) Delivery Vehicles

The plan shall describe measures that prevent or minimize contamination of storm water runoff from delivery vehicles arriving on the plant site. At a minimum the permittee shall consider the following:

i. Develop procedures for the inspection of delivery vehicles arriving on the plant site, and ensure overall integrity of the body or container; and

ii. Develop procedures to deal with leakage/spillage from vehicles or containers.

(iii) Fuel Oil Unloading Areas

The plan shall describe measures that prevent or minimize contamination of precipitation/surface runoff from fuel oil unloading areas. At a minimum the permittee shall consider using the following measures, or an equivalent:

i. Use of containment curbs in unloading areas;

ii. During deliveries, having station personnel familiar with spill prevention and response procedures present to ensure that any leaks/spills are immediately contained and cleaned up; and

iii. Use of spill and overflow protection (e.g., drip pans, drip diapers, and/or other containment devices placed beneath

fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

(iv) Chemical Loading/Unloading Areas

The permittee shall describe and implement measures that prevent or minimize the contamination of precipitation/surface runoff from chemical loading/unloading areas. At a minimum the permittee shall consider using the following measures (or their equivalents):

i. Use of containment curbs at chemical loading/unloading areas to contain spills;

ii. During deliveries, having station personnel familiar with spill prevention and response procedures present to ensure that any leaks/spills are immediately contained and cleaned up; and

iii. Covering chemical loading/unloading areas, and storing chemicals indoors.

(v) Miscellaneous Loading/Unloading Areas

The permittee shall describe and implement measures that prevent or minimize the contamination of storm water runoff from loading and unloading areas. The permittee shall consider the following, at a minimum (or their equivalents):

i. Covering the loading area;

ii. Grading, berming or curbing around the loading areas to divert runon; or

iii. Locating the loading/unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems.

(vi) Liquid Storage Tanks

The permittee shall describe and implement measures that prevent or minimize contamination of storm water runoff from aboveground liquid storage tanks. At a minimum the permittee shall consider employing the following measures (or their equivalents):

i. Use of protective guards around tanks;

ii. Use of containment curbs;

iii. Use of spill and overflow protection; and

iv. Use of dry cleanup methods

(vii) Large Bulk Fuel Storage Tanks

The permittee shall describe and implement measures that prevent or minimize contamination of storm water runoff from large bulk fuel storage tanks. At a minimum the permittee shall consider employing

containment berms (or its equivalent). The permittee shall also comply with applicable state and federal laws, including Spill Prevention Control and Countermeasures (SPCC).

(viii) Spill Reduction Measures

The permittee shall describe and implement measures to reduce the potential for an oil/chemical spill, or reference the appropriate section of the SPCC plan. At a minimum the structural integrity of all aboveground tanks, pipelines, pumps and other related equipment shall be visually inspected on a weekly basis. All repairs deemed necessary based on the finding of the inspections shall be completed immediately to reduce the incidence of spills and leaks occurring from such faulty equipment.

(ix) Oil Bearing Equipment in Switchyards

The permittee shall describe and implement measures to prevent or minimize contamination of surface runoff from oil bearing equipment in switchyard areas. The permittee shall consider the use of level grades and gravel surfaces to retard flows and limit the spread of spills, and the collection of storm water runoff in perimeter ditches.

(x) Residue Hauling Vehicles

All residue hauling vehicles shall be inspected for proper covering over the load, adequate gate sealing and overall integrity of the container body. Vehicles without load coverings or adequate gate sealing, or with leaking containers or beds shall be repaired as soon as practicable.

(xi) Ash Loading Areas

The permittee shall describe and implement procedures to reduce or control the tracking of ash/residue from ash loading areas where practicable, clear the ash building floor and immediately adjacent roadways of spillage, debris and excess water before departure of each loaded vehicle.

(xii) Areas Adjacent to Disposal Ponds or Landfills

The permittee shall describe and implement measures that prevent or minimize contamination of storm water runoff from areas adjacent to disposal ponds or landfills. The permittee shall develop procedures to:

i. Reduce ash residue which may be tracked on to access roads traveled by residue trucks or residue handling vehicles; and

ii. Reduce ash residue on exit roads leading into and out of residue handling areas

(xiii) Landfills, Scrapyards, Surface Impoundments, Open Dumps, General Refuse Sites

The plan shall address and include appropriate BMPs for landfills, scrapyards, surface impoundments, open dumps and general refuse sites.

(xiv) Vehicle Maintenance Activities

i. Vehicle and Equipment Storage Areas

The storage of vehicles and equipment awaiting maintenance with actual or potential fluid leaks shall be confined to designated areas (delineated on the site map). The permittee shall consider the following measures (or their equivalents): the use of drip pans under vehicles and equipment; indoor storage of vehicles and equipment; installation of berms or dikes; use of absorbents; roofing or covering storage areas; and cleaning pavement surface or remove oil and grease.

ii. Fueling Areas

The permittee shall describe and implement measures that prevent or minimize contamination of the storm water runoff from fueling areas. The permittee shall consider the following measures (or their equivalents): covering the fueling area; using spill/overflow protection and cleanup equipment; minimizing storm water runon/runoff to the fueling area; using dry cleanup methods; and treating and/or recycling collected storm water runoff.

iii. Material Storage Areas

Storage vessels of all materials (e.g., for used oil/oil filters, spent solvents, paint wastes, hydraulic fluids) shall be maintained in good condition, so as to prevent contamination of storm water, and plainly labeled (e.g., "used oil", "spent solvents", etc.). The permittee shall consider the following measures (or their equivalents): indoor storage of the materials; installation of berms/dikes around the areas, minimizing runoff of storm water to the areas; minimizing runoff of storm water to the areas; using dry cleanup methods and treating and/or recycling the collected storm water runoff.

iv. Vehicle and Equipment Cleaning Areas

The permittee shall describe and implement measures that prevent or minimize contamination of storm water runoff from all areas used for vehicle/equipment cleaning. The permittee shall consider the following measures (or their equivalents): performing all cleaning operations indoors; covering the cleaning operation; ensuring that all washwaters drain to a proper collection system (i.e., not the storm water drainage system unless VPDES permitted); and treating and/or recycling the collected storm water runoff.

v. Vehicle and Equipment Maintenance Areas

The permittee shall describe and implement measures that prevent or minimize contamination of storm water runoff from all areas used for vehicle/equipment maintenance. The permittee shall consider the following measures (or their equivalents): performing maintenance activities indoors; using drip pans;

keeping an organized inventory of materials used in the shop; draining all parts of fluids prior to disposal; prohibiting wet clean up practices where the practices would result in the discharge of pollutants to storm water drainage systems; using dry cleanup methods; treating and/or recycling collected storm water runoff; and minimizing runon/runoff of storm water to maintenance areas.

vii. Locomotive Sanding (Loading Sand for Traction) Areas

The plan shall describe measures that prevent or minimize contamination of the storm water runoff from areas used for locomotive sanding. The permittee shall consider the following measures (or their equivalents): covering sanding areas; minimizing storm water runon/runoff; or appropriate sediment removal practices to minimize the off-site transport of sanding material by storm water.

(xv) Material Storage Areas

The permittee shall describe and implement measures that prevent or minimize contamination of storm water runoff from material storage areas (including areas used for temporary storage of miscellaneous products, and construction materials stored in lay-down areas). The permittee shall consider the use of the following measures (or their equivalents): flat yard grades; runoff collection in graded swales or ditches; erosion protection measures at steep outfall sites (e.g., concrete chutes, riprap, stilling basins); covering lay-down areas; storing materials indoors; and covering materials temporarily with polyethylene, polyurethane, polypropylene, or hypalon. Storm water runon may be minimized by constructing an enclosure or building a berm around the area.

(xvi) Comprehensive Site Compliance Evaluation

As part of the evaluation, qualified facility personnel shall inspect the following areas on a monthly basis: coal handling areas, loading/ unloading areas, switchyards, fueling areas, bulk storage areas, ash handling areas, areas adjacent to disposal ponds and landfills, maintenance areas, liquid storage tanks, and Long term and short term material storage areas.

ATTACHMENT 7

EFFLUENT/SLUDGE/GROUND WATER LIMITATIONS/MONITORING RATIONALE/SUITABLE DATA/STREAM MODELING/ ANTIDEGRADATION/ANTIBACKSLIDING

THE EFFLUENT LIMITATIONS AND MONITORING RATIONALE ARE BASED ON THE FOLLOWING:

Outfall 001

FLOW – There is no limit on flow. The monitoring frequency is estimated once per day. This monitoring frequency and sample type should be appropriate for proper assessment of the facility's flow regime and potential discharge impacts.

pH – The limits of 6.0 S.U. (minimum) to 9.0 S.U. (maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality standards. The monitoring frequency is set at five days per week and the sample type is grab (required for pH). This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

Temperature - The limit of 40° C (maximum) is based on a model and is carried over from the previous permit (See calculations in this Attachment). The monitoring frequency is set at five days per week and the sample type is immersion stabilization. This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

TSS – The limits of 30 mg/l (monthly average) and 100 mg/l (daily maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality. The monitoring frequency of 1/3 months is based on a reduced monitoring frequency granted for good plant performance. The sample type is grab. This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

Oil & Grease - The limits of 15 mg/l (monthly average) and 20 mg/l (daily maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality. The monitoring frequency of 2/month is based on a reduced monitoring frequency previously granted for good plant performance. The sample type is grab. This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

DO – The dissolved oxygen limit of 5.7 mg/l (minimum) was originally based on a water quality model. The limit, which is being carried over from the previous permit, insures compliance with the dissolved oxygen water quality standards. The monitoring frequency is set at five days per week and the sample type is grab. This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the effluent limit and water quality standards.

TPH – There are no limits for this parameter, only monitoring. This is a BPJ determination based on facility operations and the previous permit, which requires monitoring. The monitoring frequency is set at once per year and the sample type is grab. This monitoring frequency and sample type should provide enough data for proper assessment of the parameter.

The following parameters were evaluated based on tier 2 conditions; however, no limits were necessary. See WLA printout for outfall 001 (tier 2) and STATS.EXE analyses: Arsenic, Chlorides, Chromium, Copper, Iron, Nitrate + Nitrite and Sulfate. No limits are needed for arsenic, chlorides, chromium, and copper based on STATS.EXE analysis. No limits are needed for Barium, Iron, Nitrate + Nitrite and Sulfate because the results are below the Most Limiting Allocations (Human Health), as follows:

Chemical	Result, µg/l	WLA (HH PWS), µg/l
Barium	108	640,000
Iron	170	9,600
Nitrate + Nitrite	47	3,200,000
Sulfate	199,540	8,000,000

Outfall 101

FLOW – There is no limit on flow. The monitoring frequency is estimated once per week. This monitoring frequency and sample type should be appropriate for proper assessment of the facility's flow regime and potential discharge impacts.

Free Available Chlorine – The limits of 0.2 mg/l (monthly average) and to 0.5 mg/l (daily maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality standards. The monitoring frequency is set at 2/month and the sample type is grab. This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

Total Chromium - The limits of 0.2 mg/l (monthly average) and 0.2 mg/l (daily maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality standards. The monitoring frequency of 1/3 months is based on a reduced monitoring frequency granted for good plant performance. The sample type is grab. This monitoring frequency and sample type should be adequate for assessment of compliance with the effluent limits and water quality standards.

Total Zinc - The limits of 1.0 mg/l (monthly average) and 1.0 mg/l (daily maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality standards. The monitoring frequency of 1/3 months is based on a reduced monitoring frequency granted for good plant performance. The sample type is grab. This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

126 priority pollutants – The limit of "non-detectable" for the 126 priority pollutants (with the exceptions of zinc and chromium) is based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)] and is carried over from the previous permit. The monitoring frequency is 1/3 months and the sample type is grab. This monitoring frequency and sample type should provide enough data for proper assessment of compliance with the non-detectable effluent limit.

Section 423.15(j)(1) addresses the quantity of pollutants that may be discharged in cooling tower blowdown. It specifically notes that the 126 priority pollutants contained in chemicals added for cooling tower maintenance (excluding chromium and zinc) are to be at non-detectable levels. Chromium and zinc were excluded as, at the time when the guidelines were developed, they were common constituents in cooling tower maintenance chemicals (no longer the case). In lieu of routine monitoring, section 423.15(j)(3) allows for compliance with the non-detectable limit for the 126 priority pollutants to be determined by engineering calculations which demonstrate that those pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136 . Therefore, based on the above, if chromium and zinc are not included in the specific cooling tower maintenance chemicals utilized, engineering calculations may also be used for them in determining compliance with the non-detectable limit.

Outfall 102

FLOW – There is no limit on flow. The flow is measured once per week. This monitoring frequency and sample type should be appropriate for assessment of potential discharge impacts.

Outfall 103

FLOW – There is no limit on flow. The monitoring frequency is estimated 5 days per week. This monitoring frequency and sample type should be appropriate for proper assessment of the facility's flow regime and potential discharge impacts.

BOD5 – The limits of 30 mg/l (monthly average) to 45 mg/l (maximum) are based on technology [secondary treatment limits as per Federal effluent guidelines (40 CFR 133)], are carried over from the previous permit and are protective of water quality. The monitoring frequency of 1/6 months is based on a reduced monitoring frequency granted for good plant performance. This monitoring frequency and sample type are in accordance with guidance for this size facility and should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

TSS - The limits of 30 mg/l (monthly average) and 45 mg/l (maximum) are based on technology [secondary treatment limits as per Federal effluent guidelines (40 CFR 133)], are carried over from the previous permit and are protective of water quality. The monitoring frequency of 1/6 months is based on a reduced monitoring frequency granted for good plant performance. This monitoring frequency and sample type are in accordance with guidance for this size facility and should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

TRC - The limit of 1.5 mg/l (minimum) is based on best professional judgment and is carried over from the previous permit. The monitoring frequency is set at five days per week and the sample type is grab (required for chlorine). This monitoring frequency and sample type are in accordance with guidance for this size facility and should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

Outfall 002

FLOW – There is no limit on flow based on design. The flow is estimated in MGD. The monitoring frequency is estimated once per day. This monitoring frequency and sample type should be appropriate for assessment of potential discharge impacts.

pH – The limits of 6.0 S.U. (minimum) to 9.0 S.U. (maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality standards. The monitoring frequency is 2/month and the sample type is grab (required for pH). This should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

TSS - The limit of 50 mg/l (daily maximum) is based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], is carried over from the previous permit and is protective of water quality standards. The monitoring frequency is 2/month and the sample type is grab. This sample type and monitoring frequency should be adequate for assessment of potential discharge impacts.

The following parameters were evaluated based on tier 2 conditions; however, no limits were necessary. See WLA printout for outfall 002 (tier 2) and STATS.EXE analyses: Ammonia, Barium, Chloride, Iron, Manganese, Nickel, Sulfate and Zinc. No limits are needed for Ammonia, Chloride, Copper, Cyanide, Nickel, Selenium and Zinc based on STATS.EXE analysis. No limits are needed for Barium, Iron, Manganese, Nitrate + Nitrite and Sulfate because the results are below the Most Limiting Allocations (Human Health), as follows:

Chemical	Result, µg/l	WLA (HH PWS), µg/l
Barium	69	710,000
Iron	1590	110,000
Nitrate + Nitrite	320	3,500,000
Sulfate	1,957,210	88,000,000

The result for manganese on outfall 002 was 43,200 µg/l. However, this is a storm water outfall addressed by the facility's SWPPP. That being the case, the permittee must select, install, implement and maintain BMPs at the facility that minimize pollutants in the storm water discharges as necessary to meet applicable water quality standards. If there is evidence indicating that the storm water discharges authorized by this permit are causing, have the reasonable potential to

cause, or are contributing to an excursion above an applicable water quality standard, or are causing downstream pollution (as defined in § 62.1-44.3 of the Code of Virginia), the board may take appropriate enforcement action and/or may require the permittee to include and implement appropriate controls to correct the problem.

Outfalls 003, 004, 005, 006, 007, 008, 011, 012, 013, 014, 015 and 016

FLOW – There is no limit on flow based on design as the discharge flow for these outfalls are storm dependent. The flow is estimated in MG. The monitoring frequency is once per year. This monitoring frequency and sample type should be appropriate for assessment of potential discharge impacts.

pH – There are no limits for this parameter, only monitoring. This is a BPJ determination and carried over from the previous permit. The monitoring frequency is once per year and the sample type is grab (required for pH). This monitoring frequency and sample type should be adequate for assessment of potential storm water impacts and the effectiveness of the facility's SWPPP.

TSS - There are no limits for this parameter, only monitoring. This is a BPJ determination based on the Agency's VPDES general permit for storm water associated with industrial activity (landfills) and is carried over from the previous permit. The monitoring frequency is once per year and the sample type is grab. This monitoring frequency and sample type should be adequate for assessment of potential storm water impacts and the effectiveness of the facility's SWPPP.

Total Recoverable Iron - There are no limits for this parameter, only monitoring. This is a BPJ determination based on the Agency's VPDES general permit for storm water associated with industrial activity (steam electric) and is carried over from the previous permit. The monitoring frequency is once per year and the sample type is grab. This monitoring frequency and sample type should be adequate for assessment of potential storm water impacts and the effectiveness of the facility's SWPPP.

Outfall 003 - Backsliding

Deletion of effluent limitations and monitoring requirements for ammonia-nitrogen, sulfate, total recoverable selenium and total recoverable manganese.

The Stage I and II landfill has been capped which allows only uncontaminated storm water runoff to go to the associated landfill runoff holding pond for outfall 003 (the leachate has be permanently diverted to outfall 009). The holding pond was subsequently cleaned. These actions have resulted in a change in effluent characteristics. The entire discharge has been rerouted to outfall 009; however, it may be returned to Black Walnut Creek in the future (strictly as storm water from a closed and capped landfill). In that regard, outfall 003 will be handled like any other storm water outfall from a landfill activity (e.g., as EPA's multi-sector storm water permit and DEQ's general permit for storm water associated with industrial activity). The one exception is that the permit will require a complete analysis of water quality standard parameters on this outfall to insure that there are no additional issues/needs for limits.

Outfall 009

The Company previously obtained the services of Golder Associates, Inc. (GAI) to conduct a hydrodynamic mixing model for the proposed relocation of this outfall. The purpose of the study was to look at acute toxicity of ammonia and selenium using three different discharge locations within the Roanoke River and varying diffuser designs. However, one site (site 3) was preferred from the start and, also, one diffuser configuration was finally selected as the best (design case 3). Site 3 and design case 3 are the bases for the permit limit determinations. GAI used the CORMIX model for the analyses.

The study utilized 1Q10 flows slightly higher than DEQ's flow determinations (176 and 219 MGD vs. 154.86). The results of the model runs for site 3, with a selected diffuser configuration (design case 3), indicated zones of initial dilutions of about 24, 28 and 37 times. GAI also gave consideration to a one-hour travel time and at that point

downstream, the dilution ratio would range between 54 and 118, depending on the effluent flow, river flow and effluent concentration.

However, DEQ only considers the zone of initial dilution and not the one-hour travel time. CORMIX was rerun considering the proper stream flows (accounting for the water intake withdrawal), an effluent flow of 0.576 MGD and GAI's selected diffuser configuration. The resulting **zone of initial dilution for acute consideration was 33 times.** The **zone of dilution for chronic consideration was 213 times.** [See attached memorandum of April 17, 2003 from Allan Brockenbrough of DEQ's Central Office.] The waste load allocations for outfall 009 (to the Roanoke River) were developed and used for assessment of permit limit determination during the last modification. [See the attached waste load allocation spreadsheet (tier 1), based on zones of initial dilution of 33 (acute) and 213 (chronic).] Further assessments on the need for limits on new parameters will use the same mix values; however; tier 2 will be utilized.

FLOW – There is no limit on flow. The monitoring frequency is estimated once per day. This monitoring frequency and sample type should be appropriate for proper assessment of the facility's flow regime and potential discharge impacts.

pH – The limits of 6.0 S.U. (minimum) to 9.0 S.U. (maximum) are based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], are carried over from the previous permit and are protective of water quality standards. The monitoring frequency is 2/month and the sample type is grab (required for pH). This should provide enough data for proper assessment of compliance with the effluent limits and water quality standards.

TSS - The limit of 50 mg/l (daily maximum) is a BPJ determination based on technology [40 CFR 423.15 (new source performance standards for the steam electric power generating point source category)], is carried over from the previous permit and is protective of water quality standards. The monitoring frequency is 2/month and the sample type is grab. This sample type and monitoring frequency should be adequate for assessment of compliance with the effluent limit and potential discharge impacts.

Total Recoverable
Manganese - The limit of 50 µg/l (daily maximum) is based on water quality standards. This limit has been added to insure compliance with water quality standards. The receiving stream exceeds the current water quality standard; therefore, the limit must equal the standard. The monitoring frequency is 1/month and the sample type is grab. This monitoring frequency and sample type should be adequate for assessment of compliance with the effluent limit and water quality standards. In addition, a schedule of compliance has been added to the permit to provide the permittee time to achieve the new limit.

The following parameters were evaluated based on tier 2 conditions; however, no limits were necessary. See WLA printout for outfall 009 (tier 2) and STATS.EXE analyses: Ammonia, Barium, Chloride, Iron, Nickel, Selenium, Sulfate, Thalium and Zinc. No limits are needed for Ammonia, Chloride, Nickel, Selenium, Sulfide, and Zinc based on STATS.EXE analysis. No limits are needed for Barium, Iron, Sulfate and Thalium because the results are below the Most Limiting Allocations (Human Health), as follows:

Chemical	Result, µg/l	WLA (HH), µg/l
Barium	192	180,000
Iron	260	27,000
Sulfate	1,376,800	23,000,000
Thalium	0.5	22

Reduced Monitoring

In accordance with the VPDES permit manual, facilities having exemplary operations that consistently meet permit requirements are eligible for reduced permit monitoring. With this reissuance, an evaluation was completed to determine if the facility was eligible.

In accordance with agency guidance outfalls 001, 101, 103, 002 & 009 were assessed for reduced monitoring. The monitoring frequencies for TSS (outfalls 001 and 103), Oil & Grease (outfall 001), BOD5 (outfall 103), Total Chromium

(outfall 101), Total Zinc (outfall 101) and 126 Priority Pollutants (outfall 101) in the current permit are already based on a reduced monitoring frequency that was established in the last reissuance in 2006. Since that time, the limits for Flow, TSS, Oil & Grease, BOD5, Total Chromium, Total Zinc and 126 Priority Pollutants have not been exceeded. Therefore, all parameters will remain at the same reduced monitoring level of 1/3 Months or 1/6 Months for this facility. Special condition I.C.12. specifies that monitoring frequencies for these parameters will revert back to 1/Month should the facility be issued a Notice of Violation (NOV) at any point during the permit term.

New Combine Outfall (002/009)

Dominion has been working to come into compliance with the 50 ug/L manganese limit on Outfall 009 and has hired a contractor, Golder Associates, to assist with the design and construction of a wastewater treatment plant to achieve this goal. During 2010 Dominion's effort was expanded to include manganese removal from Outfall 002. in light of elevated manganese concentrations that have been measured in this discharge. With their permit application Dominion submitted a Conceptual Design Report (CDR) for manganese removal, which includes a conceptual wastewater treatment plant (WWTP) design for treating the combined wastewater from Outfalls 002 and 009. Since submittal of the permit application Dominion has continued to work with Golder Associates to complete the design of the treatment plant, which is now scheduled to become operational in late 2011. The combined Outfall 002/009 will be discharged through the existing diffuser for Outfall 009 as described in section 4.2.4.5 of the CDR, and will be permitted in this permit as Outfall 009.

Facility Name Old Dominion Electric Cooperative Clover
Permit No VA0083097

Outfall No 001

Received Date	pH Minimum	pH Maximum	Temperature (° C)
Feb-06	7.48	8.2	25.39
Mar-06	7.82	8.28	26.12
Apr-06	7.62	8.49	29.02
May-06	7.39	8.39	29.57
Jun-06	7.29	8.62	32.13
Jul-06	7.18	8.85	36.68
Aug-06	7.31	8.24	35.93
Oct-06	7.17	8.36	36.2
Oct-06	6.71	7.87	32.02
Nov-06	7.34	7.81	31.12
Dec-06	7.17	7.94	29.98
Jan-07	7.21	7.82	28.43
Feb-07	7.19	7.91	26.48
Mar-07	7.26	8.03	23.72
Apr-07	7.32	7.9	27.59
May-07	6.94	8.83	32.84
Jun-07	7.32	8.53	31.44
Jul-07	7.43	8.58	33.25
Aug-07	7.7	8.82	33.43
Sep-07	7.73	8.45	34.96
Oct-07	7.23	8.36	33.02
Nov-07	6.68	7.98	31.48
Dec-07	7.51	8.14	26.8
Jan-08	7.07	7.83	24.81
Feb-08	7.4	8.44	23.1
Mar-08	6.98	8.36	26.17
Apr-08	6.45	8.23	26.26
May-08	7.54	9.34	24.92
Jun-08	7.15	8.62	29.7
Jul-08	7.81	8.7	34.18
Aug-08	6.67	8.72	33.86
Sep-08	7.4	8.58	33.47
Oct-08	7.59	8.56	32.74
Nov-08	7.47	8.32	30.42
Dec-08	7.33	8	28.53
Jan-09	7.22	7.76	28.51
Feb-09	7.34	7.9	24.2
Mar-09	7.08	8.08	25.99
Apr-09	6.88	8.26	25.66
May-09	7.26	8.8	28
Jun-09	7.43	8.35	33.04
Jul-09	7.04	8.65	33.15
Aug-09	7.74	8.56	32.88
Sep-09	7.29	8.54	34.51
Oct-09	7.29	8.62	31.89
Nov-09	6.81	8.7	27.11
Dec-09	6.77	8.65	27.88
Jan-10	7.03	7.85	24.54

Outfall No 002

Received Date	pH Minimum	pH Maximum
Feb-06	7	8.57
Mar-06	6.85	7.22
Apr-06	NULL	NULL
May-06	NULL	NULL
Jun-06	7.56	7.62
Jul-06	NULL	NULL
Aug-06	7.56	7.86
Oct-06	X	X
Oct-06	6.86	7.34
Nov-06	8.02	8.56
Dec-06	6.58	8.73
Jan-07	6.41	6.52
Feb-07	6.79	8.05
Mar-07	6.18	7.32
Apr-07	7.06	7.41
May-07	6.27	7.09
Jun-07	7.43	7.47
Jul-07	NULL	NULL
Aug-07	NULL	NULL
Sep-07	6.46	6.91
Oct-07	NULL	NULL
Nov-07	NULL	NULL
Dec-07	7.29	8.71
Jan-08	NULL	NULL
Feb-08	NULL	NULL
Mar-08	NULL	NULL
Apr-08	NULL	NULL
May-08	6.65	7.16
Jun-08	6.5	7.12
Jul-08	NULL	NULL
Aug-08	NULL	NULL
Sep-08	NULL	NULL
Oct-08	NULL	NULL
Nov-08	NULL	NULL
Dec-08	NULL	NULL
Jan-09	6.1	6.35
Feb-09	NULL	NULL
Mar-09	NULL	NULL
Apr-09	NULL	NULL
May-09	NULL	NULL
Jun-09	NULL	NULL
Jul-09	NULL	NULL
Aug-09	6.9	7.25
Sep-09	6.2	8.88
Oct-09	NULL	NULL
Nov-09	NULL	NULL
Dec-09	8.2	8.65
Jan-10	NULL	NULL

Feb-10	7.02	7.61	23.15		Feb-10	NULL	NULL
Mar-10	7.21	7.71	23.86		Mar-10	NULL	NULL
Apr-10	7.25	7.55	26.85		Apr-10	NULL	NULL
May-10	7.39	8.43	29.41		May-10	NULL	NULL
Jun-10	7.25	8.68	32.15		Jun-10	NULL	NULL
Jul-10	7.33	8.02	34.26		Jul-10	NULL	NULL
Aug-10	7.01	8.71	35.22		Aug-10	NULL	NULL
Sep-10	7.33	8.59	36.06		Sep-10	NULL	NULL

90th percentile:	8.7	34.7		8.7
10th percentile:	7.8			6.9
90th percentile (wet):		29.3		

Outfall No 003

Received	PH	PH	IRON, TOTAL RECOVERABLE	
Date	Minimu	Maximum	Minimum	Maximum
Feb-06	NULL	NULL		
Jan-08	7.67	7.67	NULL	820
Jan-09	8.11	8.11	NULL	<QL
Jan-10	6.8	6.8	NULL	520

Outfall No 004

Received	PH	PH	IRON, TOTAL RECOVERABLE	
Date	Minimu	Maximum	Minimum	Maximum
Jan-08	7.32	7.32	NULL	1170
Jan-09	7.62	7.62	NULL	1050
Jan-10	7.47	7.47	NULL	6530

Outfall No 005

Received	PH	PH	IRON, TOTAL RECOVERABLE	
Date	Minimu	Maximum	Minimum	Maximum
Jan-08	7.04	7.04	NULL	<QL
Jan-09	6.2	6.2	NULL	370
Jan-10	7.95	7.95	NULL	680

Outfall No 006

Received	PH	PH	IRON, TOTAL RECOVERABLE	
Date	Minimu	Maximum	Minimum	Maximum
Jan-08	7.21	7.21	NULL	1450
Jan-09	7.37	7.37	NULL	7830
Jan-10	7.91	7.91	NULL	1220

Outfall No 007

Received Date	PH Minimum	PH Maximum	IRON, TOTAL RECOVERABLE Minimum	Maximum
Jan-08	7.21	7.21	NULL	1450
Jan-09	7.37	7.37	NULL	7830
Jan-10	7.91	7.91	NULL	1220

Outfall No 008

Received Date	PH Minimum	PH Maximum	IRON, TOTAL RECOVERABLE Minimum	Maximum
Jan-08	7.21	7.21	NULL	1450
Jan-09	7.37	7.37	NULL	7830
Jan-10	7.91	7.91	NULL	1220

Outfall No 009

Received Date	PH Minimum	PH Maximum	MANGANESE, TOTAL RECOVERABLE Minimum	Maximum
Feb-06	6.82	6.89		
Mar-06	8.47	8.73		
Apr-06	7.93	8.04		
May-06	6.89	7.04		
Jun-06	6.63	6.85		
Jul-06	6.82	6.92		
Aug-06	7.06	7.11		
Oct-06	6.82	6.89		
Oct-06	6.91	7.11		
Nov-06	7.09	7.21		
Dec-06	6.76	6.87		
Jan-07	7.23	7.44		
Feb-07	6.64	6.73		
Mar-07	6.64	6.78		
Apr-07	6.68	6.83		
May-07	6.54	6.84		
Jun-07	6.44	6.62		
Jul-07	6.81	7.38		
Aug-07	6.61	6.87		
Sep-07	6.42	6.73		
Oct-07	6.26	6.56		
Nov-07	NULL	NULL		
Dec-07	6.43	6.67		
Jan-08	6.94	7.13		
Feb-08	6.38	7.14		
Mar-08	6.94	7.09		
Apr-08	6.85	7.51		
May-08	6.49	6.86		
Jun-08	6.82	6.9		
Jul-08	6.85	6.9		
Aug-08	6.66	6.69		
Sep-08	6.73	6.79		
Oct-08	6.67	6.99		

Nov-08	NULL	NULL		
Dec-08	6.84	6.97		
Jan-09	6.67	7.29		
Feb-09	7.03	7.27		
Mar-09	NULL	NULL		
Apr-09	6.32	7.08		
May-09	7.04	7.1		
Jun-09	7.01	7.03		
Jul-09	6.58	6.93		
Aug-09	6.65	6.69		
Sep-09	6.53	6.64		
Oct-09	6.9	7		
Nov-09	NULL	NULL		
Dec-09	6.82	6.92		
Jan-10	6.65	7.07		
Feb-10	6.48	6.86		
Mar-10	6.86	7.08		
Apr-10	6.91	6.98		
May-10	6.59	6.98		
Jun-10	6.86	6.99		
Jul-10	6.83	6.89		
Aug-10	7.91	7.96		
Sep-10	8.03	8.08		
Mar-06			NULL	3290

90th percentile: 7.4
10th percentile: 6.7
90th percentile (wet):

Outfall No 011

Received	PH	PH	IRON, DISSOLVED		IRON, TOTAL RECOVERABLE
Date	Minimui	Maximum	Average	Maximum	Maximum
Feb-06	7.54	7.54	<0.25	<0.25	
Jan-08	6.83	6.83			800
Jan-09	7.35	7.35			49470
Jan-10	8.16	8.16			6830

Outfall No 012

Received	PH	PH	IRON, TOTAL RECOVERABLE	
Date	Minimui	Maximum	Minimum	Maximum
Jan-08	6.83	6.83	NULL	800
Jan-09	7.35	7.35	NULL	49470
Jan-10	8.16	8.16	NULL	6830

Outfall No 013

Received	PH	PH	IRON, TOTAL RECOVERABLE	
Date	Minimui	Maximum	Minimum	Maximum
Jan-08	6.83	6.83	NULL	800
Jan-09	7.35	7.35	NULL	49470

Jan-10	8.16	8.16	NULL	6830

Outfall No 101

Received	CHROM	CHROMIU	ZINC, TOTAL (AS ZN)	
Date	Averag	Maximum	Average	Maximum
Feb-06	<0.200	<0.2000	<1.0000	<1.0000
Apr-06	<QL	<QL	<QL	<QL
Jul-06	<QL	<QL	<QL	<QL
Oct-06	<QL	<QL	<QL	<QL
Jan-07	<QL	<QL	<QL	<QL
Apr-07	<QL	<QL	<QL	<QL
Jul-07	<QL	<QL	<QL	<QL
Oct-07	<QL	<QL	<QL	<QL
Jan-08	<QL	<QL	<QL	<QL
Apr-08	<QL	<QL	<QL	<QL
Jul-08	<QL	<QL	<QL	<QL
Oct-08	<QL	<QL	<QL	<QL
Jan-09	<QL	<QL	<QL	<QL
Apr-09	<QL	<QL	<QL	<QL
Jul-09	<QL	<QL	<QL	<QL
Oct-09	<QL	<QL	<QL	<QL
Jan-10	<QL	<QL	<QL	<QL
Apr-10	<QL	<QL	<QL	<QL
Jul-10	<QL	<QL	<QL	<QL

Received	CL2, FF	CL2, FREE
Date	Averag	Maximum
Feb-06	0.04	0.04
Mar-06	<QL	<QL
Apr-06	<QL	<QL
May-06	0.05	0.09
Jun-06	0.12	0.2
Jul-06	0.11	0.15
Aug-06	0.11	0.14
Oct-06	0.1	0.1
Oct-06	0.14	0.15
Nov-06	0.18	0.23
Dec-06	0.17	0.19
Jan-07	0.08	0.16
Feb-07	<QL	<QL
Mar-07	0.06	0.06
Apr-07	0.09	0.12
May-07	0.08	0.18
Jun-07	0.13	0.18
Jul-07	0.06	0.06
Aug-07	0.06	0.12
Sep-07	0.04	0.07
Oct-07	0.08	0.15
Nov-07	0.16	0.22
Dec-07	0.03	0.06
Jan-08	0.06	0.12
Feb-08	<QL	<QL
Mar-08	0.13	0.17

Apr-08	0.04	0.08
May-08	0.02	0.08
Jun-08	0.04	0.14
Jul-08	<QL	<QL
Aug-08	0.03	0.1
Sep-08	<QL	<QL
Oct-08	<QL	<QL
Nov-08	<QL	0.05
Dec-08	0.14	0.27
Jan-09	<QL	<QL
Feb-09	<QL	<QL
Mar-09	<QL	<QL
Apr-09	0.11	0.17
May-09	<QL	<QL
Jun-09	0.07	0.21
Jul-09	<QL	<QL
Aug-09	0.09	0.18
Sep-09	0.15	0.18
Oct-09	<0.03	<0.05
Nov-09	<QL	<QL
Dec-09	<QL	<QL
Jan-10	0.17	0.32
Feb-10	<QL	<QL
Mar-10	<QL	<QL
Apr-10	<QL	<QL
May-10	<QL	<QL
Jun-10	<QL	<QL
Jul-10	<QL	<QL
Aug-10	<0.06	<0.12
Sep-10	0.15	0.18

Outfall I 103

Received Date		CL2, TOT/	CL2, INST TECH MIN LIMIT
Date		Minimum	Minimum
Feb-06	157	2.2	2.2
Mar-06	157	2.6	2.6
Apr-06	157	2.1	2.1
May-06	157	1.6	1.6
Jun-06	157	1.6	1.6
Jul-06	157	2.2	2.2
Aug-06	157	1.8	1.8
Oct-06	157	1.8	1.8
Oct-06	157	1	1
Nov-06	157	1.6	1.6
Dec-06	157	1.8	1.8
Jan-07	157	1.6	1.6
Feb-07	157	0.8	0.8
Mar-07	157	0.8	0.8
Apr-07	157	2.2	2.2
May-07	157	2.2	2.2
Jun-07	157	1	1
Jul-07	157	1.2	1.2
Aug-07	157	1	1

Sep-07	157	0.8	0.8
Oct-07	157	1.6	1.6
Nov-07	157	0.8	0.8
Dec-07	157	0.8	0.8
Jan-08	157	1.8	1.8
Feb-08	157	0.8	0.8
Mar-08	157	0.8	0.8
Apr-08	157	0.8	0.8
May-08	157	1.3	1.3
Jun-08	157	1.5	1.5
Jul-08	157	1.2	1.2
Aug-08	157	1.5	1.5
Sep-08	157	1.5	1.5
Oct-08	157	2.8	2.8
Nov-08	157	1.6	1.6
Dec-08	157	1.6	1.6
Jan-09	157	1.6	1.6
Feb-09	157	1.3	1.3
Mar-09	157	1.9	1.9
Apr-09	157	1.6	1.6
May-09	157	1.6	1.6
Jun-09	157	1.5	1.5
Jul-09	157	6	6
Aug-09	157	10.6	10.6
Sep-09	157	7.2	7.2
Oct-09	157	6.2	6.2
Nov-09	157	3.4	3.4
Dec-09	157	2	2
Jan-10	157	1.8	1.8
Feb-10	157	2.9	2.9
Mar-10	157	2	2
Apr-10	157	1.8	1.8
May-10	157	2.3	2.3
Jun-10	157	4	4
Jul-10	157	2.9	2.9
Aug-10	157	3.2	3.2
Sep-10	157	2.4	2.4

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Clover Power Station - 001 Permit No.: VA0083097

Receiving Stream: Roanoke River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	47.5	mg/L
90% Temperature (Annual) =	26.5	deg C
90% Temperature (Wet season) =	16.9	deg C
90% Maximum pH =	7.6	SU
10% Maximum pH =	6.9	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	Y	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows

1Q10 (Annual) =	200	MGD
7Q10 (Annual) =	437	MGD
30Q10 (Annual) =	485	MGD
1Q10 (Wet season) =	406	MGD
30Q10 (Wet season)	789	MGD
30Q5 =	572	MGD
Harmonic Mean =	1110	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) =	235.98	mg/L
90% Temp (Annual) =	34.7	deg C
90% Temp (Wet season) =	29.3	deg C
90% Maximum pH =	8.7	SU
10% Maximum pH =	7.8	SU
Discharge Flow =	1.79	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	--	--	6.7E+02	9.9E+02	--	--	2.1E+05	3.2E+05	--	--	6.7E+01	9.9E+01	--	--	2.1E+04	3.2E+04	--	--	**2.1E+04**	**3.2E+04**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	2.0E+03	3.0E+03	--	--	6.1E-01	9.3E-01	--	--	2.0E+02	3.0E+02	--	--	**2.0E+02**	**3.0E+02**
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	3.2E+02	1.6E+03	--	--	5.1E-02	2.5E-01	--	--	3.2E+01	1.6E+02	--	--	**3.2E+01**	**1.6E+02**
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	3.4E+02	--	3.0E-01	3.1E-01	7.5E-01	--	4.9E-05	5.0E-05	8.5E+01	--	3.0E-02	3.1E-02	**8.5E+01**	--	**3.0E-02**	**3.1E-02**
Ammonia-N (mg/l) (Yearly)	0	1.69E+01	1.83E+00	--	--	1.9E+03	5.0E+02	--	--	4.23E+00	4.58E-01	--	--	4.8E+02	1.2E+02	--	--	**4.8E+02**	**1.2E+02**	--	--
Ammonia-N (mg/l) (High Flow)	0	1.70E+01	3.40E+00	--	--	3.9E+03	1.5E+03	--	--	4.25E+00	8.50E-01	--	--	9.7E+02	3.8E+02	--	--	**9.7E+02**	**3.8E+02**	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	2.7E+06	1.3E+07	--	--	8.3E+02	4.0E+03	--	--	2.7E+05	1.3E+06	--	--	**2.7E+05**	**1.3E+06**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	1.8E+03	2.1E+05	--	--	5.6E-01	6.4E+01	--	--	1.8E+02	2.1E+04	--	--	**1.8E+02**	**2.1E+04**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	3.8E+04	3.7E+04	3.2E+03	--	8.5E+01	3.8E+01	1.0E+00	--	9.6E+03	9.2E+03	3.2E+02	--	**9.6E+03**	**9.2E+03**	**3.2E+02**	--
Barium	0	--	--	2.0E+03	--	--	--	6.4E+05	--	--	--	2.0E+02	--	--	--	6.4E+04	--	--	--	**6.4E+04**	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	1.4E+04	3.2E+05	--	--	2.2E+00	5.1E+01	--	--	1.4E+03	3.2E+04	--	--	**1.4E+03**	**3.2E+04**
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	5.3E-01	1.2E+00	--	--	8.6E-05	2.0E-04	--	--	5.3E-02	1.2E-01	--	--	**5.3E-02**	**1.2E-01**
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.4E+01	1.1E+02	--	--	3.8E-03	1.8E-02	--	--	2.4E+00	1.1E+01	--	--	**2.4E+00**	**1.1E+01**
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.4E+01	1.1E+02	--	--	3.8E-03	1.8E-02	--	--	2.4E+00	1.1E+01	--	--	**2.4E+00**	**1.1E+01**
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.4E+01	1.1E+02	--	--	3.8E-03	1.8E-02	--	--	2.4E+00	1.1E+01	--	--	**2.4E+00**	**1.1E+01**
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.4E+01	1.1E+02	--	--	3.8E-03	1.8E-02	--	--	2.4E+00	1.1E+01	--	--	**2.4E+00**	**1.1E+01**
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	1.9E+02	3.3E+03	--	--	3.0E-02	5.3E-01	--	--	1.9E+01	3.3E+02	--	--	**1.9E+01**	**3.3E+02**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	4.5E+05	2.1E+07	--	--	1.4E+02	6.5E+03	--	--	4.5E+04	2.1E+06	--	--	**4.5E+04**	**2.1E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	7.5E+03	1.4E+04	--	--	1.2E+00	2.2E+00	--	--	7.5E+02	1.4E+03	--	--	**7.5E+02**	**1.4E+03**
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	2.7E+04	8.7E+05	--	--	4.3E+00	1.4E+02	--	--	2.7E+03	8.7E+04	--	--	**2.7E+03**	**8.7E+04**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	4.8E+05	6.1E+05	--	--	1.5E+02	1.9E+02	--	--	4.8E+04	6.1E+04	--	--	**4.8E+04**	**6.1E+04**
Cadmium	0	1.8E+00	6.4E-01	5.0E+00	--	2.0E+02	1.6E+02	1.6E+03	--	4.4E-01	1.6E-01	5.0E-01	--	5.0E+01	3.9E+01	1.6E+02	--	**5.0E+01**	**3.9E+01**	**1.6E+02**	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	1.4E+03	9.9E+03	--	--	2.3E-01	1.6E+00	--	--	1.4E+02	9.9E+02	--	--	**1.4E+02**	**9.9E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.7E+02	1.1E+00	5.0E+00	5.0E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	6.8E+01	2.6E-01	5.0E-01	5.0E-01	**6.8E+01**	**2.6E-01**	**5.0E-01**	**5.0E-01**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	9.7E+07	5.6E+07	8.0E+07	--	2.2E+05	5.8E+04	2.5E+04	--	2.4E+07	1.4E+07	8.0E+06	--	**2.4E+07**	**1.4E+07**	**8.0E+06**	--
TRC	0	1.9E+01	1.1E+01	--	--	2.1E+03	2.7E+03	--	--	4.8E+00	2.8E+00	--	--	5.4E+02	6.7E+02	--	--	**5.4E+02**	**6.7E+02**	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	4.2E+04	5.1E+05	--	--	1.3E+01	1.6E+02	--	--	4.2E+03	5.1E+04	--	--	**4.2E+03**	**5.1E+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	--	--	4.0E+00	1.3E+02	--	--	2.5E+03	8.1E+04	--	--	4.0E-01	1.3E+01	--	--	2.5E+02	8.1E+03	--	--	2.5E+02	8.1E+03
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	1.1E+05	3.5E+06	--	--	3.4E+01	1.1E+03	--	--	1.1E+04	3.5E+05	--	--	1.1E+04	3.5E+05
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	3.2E+05	5.1E+05	--	--	1.0E+02	1.6E+02	--	--	3.2E+04	5.1E+04	--	--	3.2E+04	5.1E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	2.6E+04	4.8E+04	--	--	8.1E+00	1.5E+01	--	--	2.6E+03	4.8E+03	--	--	2.6E+03	4.8E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	9.4E+00	1.0E+01	--	--	2.1E-02	1.0E-02	--	--	2.3E+00	2.5E+00	--	--	2.3E+00	2.5E+00	--	--
Chromium III	0	3.2E+02	4.1E+01	--	--	3.6E+04	1.0E+04	--	--	8.0E+01	1.0E+01	--	--	9.0E+03	2.5E+03	--	--	9.0E+03	2.5E+03	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.8E+03	2.7E+03	--	--	4.0E+00	2.8E+00	--	--	4.5E+02	6.7E+02	--	--	4.5E+02	6.7E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	3.2E+04	--	--	--	1.0E+01	--	--	--	3.2E+03	--	--	--	3.2E+03	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	2.4E+00	1.1E+01	--	--	3.8E-04	1.8E-03	--	--	2.4E-01	1.1E+00	--	--	2.4E-01	1.1E+00
Copper	0	6.9E+00	4.8E+00	1.3E+03	--	7.8E+02	1.2E+03	4.2E+05	--	1.7E+00	1.2E+00	1.3E+02	--	1.9E+02	2.9E+02	4.2E+04	--	1.9E+02	2.9E+02	4.2E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.5E+03	1.3E+03	4.5E+04	5.1E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	6.2E+02	3.2E+02	4.5E+03	5.1E+05	6.2E+02	3.2E+02	4.5E+03	5.1E+05
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	1.9E+00	1.9E+00	--	--	3.1E-04	3.1E-04	--	--	1.9E-01	1.9E-01	--	--	1.9E-01	1.9E-01
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	1.4E+00	1.4E+00	--	--	2.2E-04	2.2E-04	--	--	1.4E-01	1.4E-01	--	--	1.4E-01	1.4E-01
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.2E+02	2.5E-01	1.4E+00	1.4E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	3.1E+01	6.1E-02	1.4E-01	1.4E-01	3.1E+01	6.1E-02	1.4E-01	1.4E-01
Demeton	0	--	1.0E-01	--	--	--	2.5E+01	--	--	--	2.5E-02	--	--	--	6.1E+00	--	--	--	6.1E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	1.9E+01	4.2E+01	--	--	4.3E-02	4.3E-02	--	--	4.8E+00	1.0E+01	--	--	4.8E+00	1.0E+01	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.4E+01	1.1E+02	--	--	3.8E-03	1.8E-02	--	--	2.4E+00	1.1E+01	--	--	2.4E+00	1.1E+01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	1.3E+05	4.2E+05	--	--	4.2E+01	1.3E+02	--	--	1.3E+04	4.2E+04	--	--	1.3E+04	4.2E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	1.0E+05	3.1E+05	--	--	3.2E+01	9.6E+01	--	--	1.0E+04	3.1E+04	--	--	1.0E+04	3.1E+04
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	2.0E+04	6.1E+04	--	--	6.3E+00	1.9E+01	--	--	2.0E+03	6.1E+03	--	--	2.0E+03	6.1E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	1.3E+02	1.7E+02	--	--	2.1E-02	2.8E-02	--	--	1.3E+01	1.7E+01	--	--	1.3E+01	1.7E+01
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	3.4E+03	1.1E+05	--	--	5.5E-01	1.7E+01	--	--	3.4E+02	1.1E+04	--	--	3.4E+02	1.1E+04
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	2.4E+03	2.3E+05	--	--	3.8E-01	3.7E+01	--	--	2.4E+02	2.3E+04	--	--	2.4E+02	2.3E+04
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	1.1E+05	2.3E+06	--	--	3.3E+01	7.1E+02	--	--	1.1E+04	2.3E+05	--	--	1.1E+04	2.3E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	4.5E+04	3.2E+06	--	--	1.4E+01	1.0E+03	--	--	4.5E+03	3.2E+05	--	--	4.5E+03	3.2E+05
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	2.5E+04	9.3E+04	--	--	7.7E+00	2.9E+01	--	--	2.5E+03	9.3E+03	--	--	2.5E+03	9.3E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	3.2E+04	--	--	--	1.0E+01	--	--	--	3.2E+03	--	--	--	3.2E+03	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	3.1E+03	9.3E+04	--	--	5.0E-01	1.5E+01	--	--	3.1E+02	9.3E+03	--	--	3.1E+02	9.3E+03
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	2.1E+03	1.3E+05	--	--	3.4E-01	2.1E+01	--	--	2.1E+02	1.3E+04	--	--	2.1E+02	1.3E+04
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.7E+01	1.4E+01	3.2E-01	3.4E-01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	6.8E+00	3.4E+00	3.2E-02	3.4E-02	6.8E+00	3.4E+00	3.2E-02	3.4E-02
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	5.4E+06	1.4E+07	--	--	1.7E+03	4.4E+03	--	--	5.4E+05	1.4E+06	--	--	5.4E+05	1.4E+06
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	1.2E+05	2.7E+05	--	--	3.8E+01	8.5E+01	--	--	1.2E+04	2.7E+04	--	--	1.2E+04	2.7E+04
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	8.7E+07	3.5E+08	--	--	2.7E+04	1.1E+05	--	--	8.7E+06	3.5E+07	--	--	8.7E+06	3.5E+07
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	6.4E+05	1.4E+06	--	--	2.0E+02	4.5E+02	--	--	6.4E+04	1.4E+05	--	--	6.4E+04	1.4E+05
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	2.2E+04	1.7E+06	--	--	6.9E+00	5.3E+02	--	--	2.2E+03	1.7E+05	--	--	2.2E+03	1.7E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	4.2E+03	9.0E+04	--	--	1.3E+00	2.8E+01	--	--	4.2E+02	9.0E+03	--	--	4.2E+02	9.0E+03
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	6.8E+02	2.1E+04	--	--	1.1E-01	3.4E+00	--	--	6.8E+01	2.1E+03	--	--	6.8E+01	2.1E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	1.6E-05	1.6E-05	--	--	5.0E-09	5.1E-09	--	--	1.6E-06	1.6E-06	--	--	1.6E-06	1.6E-06
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	2.2E+02	1.2E+03	--	--	3.6E-02	2.0E-01	--	--	2.2E+01	1.2E+02	--	--	2.2E+01	1.2E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.5E+01	1.4E+01	2.0E+04	2.9E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.2E+00	3.4E+00	2.0E+03	2.9E+03	6.2E+00	3.4E+00	2.0E+03	2.9E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.5E+01	1.4E+01	2.0E+04	2.9E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.2E+00	3.4E+00	2.0E+03	2.9E+03	6.2E+00	3.4E+00	2.0E+03	2.9E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.5E+01	1.4E+01	--	--	5.5E-02	1.4E-02	--	--	6.2E+00	3.4E+00	--	--	6.2E+00	3.4E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	2.0E+04	2.9E+04	--	--	6.2E+00	8.9E+00	--	--	2.0E+03	2.9E+03	--	--	2.0E+03	2.9E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	9.7E+00	8.8E+00	1.9E+01	1.9E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.4E+00	2.2E+00	1.9E+00	1.9E+00	2.4E+00	2.2E+00	1.9E+00	1.9E+00
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	9.3E+01	9.6E+01	--	--	2.9E-02	3.0E-02	--	--	9.3E+00	9.6E+00	--	--	9.3E+00	9.6E+00

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	--	--	5.3E+02	2.1E+03	--	--	1.7E+05	6.7E+05	--	--	5.3E+01	2.1E+02	--	--	1.7E+04	6.7E+04	--	--	1.7E+04	6.7E+04
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	4.2E+04	4.5E+04	--	--	1.3E+01	1.4E+01	--	--	4.2E+03	4.5E+03	--	--	4.2E+03	4.5E+03
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	3.5E+05	1.7E+06	--	--	1.1E+02	5.3E+02	--	--	3.5E+04	1.7E+05	--	--	3.5E+04	1.7E+05
Foaming Agents	0	--	--	5.0E+02	--	--	--	1.6E+05	--	--	--	5.0E+01	--	--	--	1.6E+04	--	--	--	1.6E+04	--
Guthion	0	--	1.0E-02	--	--	--	2.5E+00	--	--	--	2.5E-03	--	--	--	6.1E-01	--	--	--	6.1E-01	--	--
Heptachlor [c]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	5.9E+01	9.3E-01	4.9E-01	4.9E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.5E+01	2.3E-01	4.9E-02	4.9E-02	1.5E+01	2.3E-01	4.9E-02	4.9E-02
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	5.9E+01	9.3E-01	2.4E-01	2.4E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.5E+01	2.3E-01	2.4E-02	2.4E-02	1.5E+01	2.3E-01	2.4E-02	2.4E-02
Hexachlorobenzene[c]	0	--	--	2.8E-03	2.9E-03	--	--	1.7E+00	1.8E+00	--	--	2.8E-04	2.9E-04	--	--	1.7E-01	1.8E-01	--	--	1.7E-01	1.8E-01
Hexachlorobutadiene[c]	0	--	--	4.4E+00	1.8E+02	--	--	2.7E+03	1.1E+05	--	--	4.4E-01	1.8E+01	--	--	2.7E+02	1.1E+04	--	--	2.7E+02	1.1E+04
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	2.6E-02	4.9E-02	--	--	1.6E+01	3.0E+01	--	--	2.6E-03	4.9E-03	--	--	1.6E+00	3.0E+00	--	--	1.6E+00	3.0E+00
Hexachlorocyclohexane Beta BHC[c]	0	--	--	9.1E-02	1.7E-01	--	--	5.7E+01	1.1E+02	--	--	9.1E-03	1.7E-02	--	--	5.7E+00	1.1E+01	--	--	5.7E+00	1.1E+01
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.1E+02	--	6.1E+02	1.1E+03	2.4E-01	--	9.8E-02	1.8E-01	2.7E+01	--	6.1E+01	1.1E+02	2.7E+01	--	6.1E+01	1.1E+02
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	1.3E+04	3.5E+05	--	--	4.0E+00	1.1E+02	--	--	1.3E+03	3.5E+04	--	--	1.3E+03	3.5E+04
Hexachloroethane[c]	0	--	--	1.4E+01	3.3E+01	--	--	8.7E+03	2.0E+04	--	--	1.4E+00	3.3E+00	--	--	8.7E+02	2.0E+03	--	--	8.7E+02	2.0E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	4.9E+02	--	--	--	5.0E-01	--	--	--	1.2E+02	--	--	--	1.2E+02	--	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	2.4E+01	1.1E+02	--	--	3.8E-03	1.8E-02	--	--	2.4E+00	1.1E+01	--	--	2.4E+00	1.1E+01
Iron	0	--	--	3.0E+02	--	--	--	9.6E+04	--	--	--	3.0E+01	--	--	--	9.6E+03	--	--	--	9.6E+03	--
Isophorone[c]	0	--	--	3.5E+02	9.6E+03	--	--	2.2E+05	6.0E+06	--	--	3.5E+01	9.6E+02	--	--	2.2E+04	6.0E+05	--	--	2.2E+04	6.0E+05
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	4.8E+01	5.3E+00	1.5E+01	--	5.4E+03	1.3E+03	4.8E+03	--	1.2E+01	1.3E+00	1.5E+00	--	1.4E+03	3.3E+02	4.8E+02	--	1.4E+03	3.3E+02	4.8E+02	--
Malathion	0	--	1.0E-01	--	--	--	2.5E+01	--	--	--	2.5E-02	--	--	--	6.1E+00	--	--	--	6.1E+00	--	--
Manganese	0	--	--	5.0E+01	--	--	--	1.6E+04	--	--	--	5.0E+00	--	--	--	1.6E+03	--	--	--	1.6E+03	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.6E+02	1.9E+02	--	--	3.5E-01	1.9E-01	--	--	3.9E+01	4.7E+01	--	--	3.9E+01	4.7E+01	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	1.5E+04	4.8E+05	--	--	4.7E+00	1.5E+02	--	--	1.5E+03	4.8E+04	--	--	1.5E+03	4.8E+04
Methylene Chloride [c]	0	--	--	4.6E+01	5.9E+03	--	--	2.9E+04	3.7E+06	--	--	4.6E+00	5.9E+02	--	--	2.9E+03	3.7E+05	--	--	2.9E+03	3.7E+05
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	7.4E+00	3.2E+04	--	--	7.5E-03	1.0E+01	--	--	1.8E+00	3.2E+03	--	--	1.8E+00	3.2E+03	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.0E+02	1.1E+01	6.1E+02	4.6E+03	1.1E+04	2.7E+03	2.0E+05	1.5E+06	2.5E+01	2.7E+00	6.1E+01	4.6E+02	2.8E+03	6.7E+02	2.0E+04	1.5E+05	2.8E+03	6.7E+02	2.0E+04	1.5E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	3.2E+06	--	--	--	1.0E+03	--	--	--	3.2E+05	--	--	--	3.2E+05	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	5.4E+03	2.2E+05	--	--	1.7E+00	6.9E+01	--	--	5.4E+02	2.2E+04	--	--	5.4E+02	2.2E+04
N-Nitrosodimethylamine[c]	0	--	--	6.9E-03	3.0E+01	--	--	4.3E+00	1.9E+04	--	--	6.9E-04	3.0E+00	--	--	4.3E-01	1.9E+03	--	--	4.3E-01	1.9E+03
N-Nitrosodiphenylamine[c]	0	--	--	3.3E+01	6.0E+01	--	--	2.0E+04	3.7E+04	--	--	3.3E+00	6.0E+00	--	--	2.0E+03	3.7E+03	--	--	2.0E+03	3.7E+03
N-Nitrosodi-n-propylamine[c]	0	--	--	5.0E-02	5.1E+00	--	--	3.1E+01	3.2E+03	--	--	5.0E-03	5.1E-01	--	--	3.1E+00	3.2E+02	--	--	3.1E+00	3.2E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	3.2E+03	1.6E+03	--	--	7.0E+00	1.7E+00	--	--	7.9E+02	4.0E+02	--	--	7.9E+02	4.0E+02	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	7.3E+00	3.2E+00	--	--	1.6E-02	3.3E-03	--	--	1.8E+00	8.0E-01	--	--	1.8E+00	8.0E-01	--	--
PCB Total[c]	0	--	1.4E-02	6.4E-04	6.4E-04	--	3.4E+00	4.0E-01	4.0E-01	--	3.5E-03	6.4E-05	6.4E-05	--	8.6E-01	4.0E-02	4.0E-02	--	8.6E-01	4.0E-02	4.0E-02
Pentachlorophenol [c]	0	7.9E+00	6.1E+00	2.7E+00	3.0E+01	8.9E+02	1.5E+03	1.7E+03	1.9E+04	2.0E+00	1.5E+00	2.7E-01	3.0E+00	2.2E+02	3.7E+02	1.7E+02	1.9E+03	2.2E+02	3.7E+02	1.7E+02	1.9E+03
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	3.2E+06	2.8E+08	--	--	1.0E+03	8.6E+04	--	--	3.2E+05	2.8E+07	--	--	3.2E+05	2.8E+07
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	2.7E+05	1.3E+06	--	--	8.3E+01	4.0E+02	--	--	2.7E+04	1.3E+05	--	--	2.7E+04	1.3E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	4.8E+03	--	--	--	1.5E+00	--	--	--	4.8E+02	--	--	--	4.8E+02	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	4.0E+00	--	--	1.3E+03	1.3E+03	--	--	4.0E-01	4.0E-01	--	--	1.3E+02	1.3E+02	--	--	1.3E+02	1.3E+02
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	1.6E+03	--	--	--	5.0E-01	--	--	--	1.6E+02	--	--	--	1.6E+02	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	9.6E+03	--	--	--	3.0E+00	--	--	--	9.6E+02	--	--	--	9.6E+02	--

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**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.3E+03	1.2E+03	5.4E+04	1.3E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	5.6E+02	3.1E+02	5.4E+03	1.3E+05	**5.6E+02**	**3.1E+02**	**5.4E+03**	**1.3E+05**
Silver	0	1.0E+00	--	--	--	1.1E+02	--	--	--	2.5E-01	--	--	--	2.9E+01	--	--	--	**2.9E+01**	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	8.0E+07	--	--	--	2.5E+04	--	--	--	8.0E+06	--	--	--	**8.0E+06**	--
1,1,2,2-Tetrachloroethane[c]	0	--	--	1.7E+00	4.0E+01	--	--	1.1E+03	2.5E+04	--	--	1.7E-01	4.0E+00	--	--	1.1E+02	2.5E+03	--	--	**1.1E+02**	**2.5E+03**
Tetrachloroethylene[c]	0	--	--	6.9E+00	3.3E+01	--	--	4.3E+03	2.0E+04	--	--	6.9E-01	3.3E+00	--	--	4.3E+02	2.0E+03	--	--	**4.3E+02**	**2.0E+03**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	7.7E+01	1.5E+02	--	--	2.4E-02	4.7E-02	--	--	7.7E+00	1.5E+01	--	--	**7.7E+00**	**1.5E+01**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	1.6E+05	1.9E+06	--	--	5.1E+01	6.0E+02	--	--	1.6E+04	1.9E+05	--	--	**1.6E+04**	**1.9E+05**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	1.6E+08	--	--	--	5.0E+04	--	--	--	1.6E+07	--	--	--	**1.6E+07**	--
Toxaphene [c]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	8.2E+01	4.9E-02	1.7E+00	1.7E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	2.1E+01	1.2E-02	1.7E-01	1.7E-01	**2.1E+01**	**1.2E-02**	**1.7E-01**	**1.7E-01**
Tributyltin	0	4.6E-01	7.2E-02	--	--	5.2E+01	1.8E+01	--	--	1.2E-01	1.8E-02	--	--	1.3E+01	4.4E+00	--	--	**1.3E+01**	**4.4E+00**	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	1.1E+04	2.2E+04	--	--	3.5E+00	7.0E+00	--	--	1.1E+03	2.2E+03	--	--	**1.1E+03**	**2.2E+03**
1,1,2-Trichloroethane[c]	0	--	--	5.9E+00	1.6E+02	--	--	3.7E+03	9.9E+04	--	--	5.9E-01	1.6E+01	--	--	3.7E+02	9.9E+03	--	--	**3.7E+02**	**9.9E+03**
Trichloroethylene [c]	0	--	--	2.5E+01	3.0E+02	--	--	1.6E+04	1.9E+05	--	--	2.5E+00	3.0E+01	--	--	1.6E+03	1.9E+04	--	--	**1.6E+03**	**1.9E+04**
2,4,6-Trichlorophenol [c]	0	--	--	1.4E+01	2.4E+01	--	--	8.7E+03	1.5E+04	--	--	1.4E+00	2.4E+00	--	--	8.7E+02	1.5E+03	--	--	**8.7E+02**	**1.5E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	1.6E+04	--	--	--	5.0E+00	--	--	--	1.6E+03	--	--	--	**1.6E+03**	--
Vinyl Chloride[c]	0	--	--	2.5E-01	2.4E+01	--	--	1.6E+02	1.5E+04	--	--	2.5E-02	2.4E+00	--	--	1.6E+01	1.5E+03	--	--	**1.6E+01**	**1.5E+03**
Zinc	0	6.4E+01	6.4E+01	7.4E+03	2.6E+04	7.2E+03	1.6E+04	2.4E+06	8.3E+06	1.6E+01	1.6E+01	7.4E+02	2.6E+03	1.8E+03	3.9E+03	2.4E+05	8.3E+05	**1.8E+03**	**3.9E+03**	**2.4E+05**	**8.3E+05**

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 and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.8E+02
Arsenic	3.2E+02
Barium	6.4E+04
Cadmium	2.0E+01
Chromium III	1.5E+03
Chromium VI	1.8E+02
Copper	7.8E+01
Iron	9.6E+03
Lead	2.0E+02
Manganese	1.6E+03
Mercury	1.6E+01
Nickel	4.0E+02
Selenium	1.8E+02
Silver	1.1E+01
Zinc	7.2E+02

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

Mixing Zone Predictions for Clover Power Station

Effluent Flow = 1.79 MGD
Stream 7Q10 = 437 MGD
Stream 30Q10 = 488 MGD
Stream 1Q10 = 200 MGD
Stream slope = 0.0006 ft/ft
Stream width = 80 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 6.1176 ft
Length = 1689.36 ft
Velocity = 1.3879 ft/sec
Residence Time = .0141 days

Recommendation:

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

Mixing Zone Predictions @ 30Q10

Depth = 6.5597 ft
Length = 1583.81 ft
Velocity = 1.4448 ft/sec
Residence Time = .0127 days

Recommendation:

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

Mixing Zone Predictions @ 1Q10

Depth = 3.7587 ft
Length = 2625.47 ft
Velocity = 1.0388 ft/sec
Residence Time = .7021 hours

Recommendation:

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

11/23/2010 3:25:05 PM

Facility = Clover Power Station
Chemical = arsenic
Chronic averaging period = 4
WLAa = 9600
WLAc = 9200
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 11
Variance = 43.56
C.V. = 0.6
97th percentile daily values = 26.7675
97th percentile 4 day average = 18.3016
97th percentile 30 day average= 13.2665
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

11

11/23/2010 3:26:14 PM

Facility = Clover Power Station
Chemical = chlorine
Chronic averaging period = 4
WLAa = 540
WLAc = 670
Q.L. = 0.1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 150
Variance = 8100
C.V. = 0.6
97th percentile daily values = 365.012
97th percentile 4 day average = 249.568
97th percentile 30 day average= 180.907
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

150

11/23/2010 3:33:04 PM

Facility = Clover Power Station
Chemical = copper
Chronic averaging period = 4
WLAa = 190
WLAc = 290
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 8
Variance = 23.04
C.V. = 0.6
97th percentile daily values = 19.4673
97th percentile 4 day average = 13.3103
97th percentile 30 day average= 9.64842
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

8

Mixing Zone Predictions for Clover Power Station-002

Effluent Flow = 0.162 MGD
Stream 7Q10 = 437 MGD
Stream 30Q10 = 488 MGD
Stream 1Q10 = 200 MGD
Stream slope = 0.0006 ft/ft
Stream width = 80 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 6.1032 ft
Length = 1693.03 ft
Velocity = 1.386 ft/sec
Residence Time = .0141 days

Recommendation:

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

Mixing Zone Predictions @ 30Q10

Depth = 6.5458 ft
Length = 1586.94 ft
Velocity = 1.443 ft/sec
Residence Time = .0127 days

Recommendation:

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

Mixing Zone Predictions @ 1Q10

Depth = 3.7398 ft
Length = 2637.38 ft
Velocity = 1.0356 ft/sec
Residence Time = .7074 hours

Recommendation:

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

11/29/2010 2:14:12 PM

Facility = Clover Power Station - 002
Chemical = ammonia
Chronic averaging period = 30
WLAa = 5300
WLAc = 1400
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = .69
Variance = .171396
C.V. = 0.6
97th percentile daily values = 1.67905
97th percentile 4 day average = 1.14801
97th percentile 30 day average= .832176
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.69

11/29/2010 2:17:04 PM

Facility = Clover Power Station - 002
Chemical = chloride
Chronic averaging period = 4
WLAa = 270000000
WLAc = 16000000
Q.L. = 0.1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 80860
Variance = 2353802
C.V. = 0.6
97th percentile daily values = 196766.
97th percentile 4 day average = 134534.
97th percentile 30 day average= 97521.4
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

80860

11/29/2010 2:19:51 PM

Facility = Clover Power Station - 002
Chemical = copper
Chronic averaging period = 4
WLAa = 2100
WLAc = 3200
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 4
Variance = 5.76
C.V. = 0.6
97th percentile daily values = 9.73367
97th percentile 4 day average = 6.65516
97th percentile 30 day average= 4.82421
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4

11/29/2010 2:25:01 PM

Facility = Clover Power Station - 002
Chemical = cyanide
Chronic averaging period = 4
WLAa = 6800
WLAc = 3500
Q.L. = 10
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 16
Variance = 92.16
C.V. = 0.6
97th percentile daily values = 38.9346
97th percentile 4 day average = 26.6206
97th percentile 30 day average= 19.2968
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

16

11/29/2010 2:33:12 PM

Facility = Clover Power Station - 002
Chemical = nickel
Chronic averaging period = 4
WLAa = 30000
WLAc = 7300
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 38
Variance = 519.84
C.V. = 0.6
97th percentile daily values = 92.4698
97th percentile 4 day average = 63.2240
97th percentile 30 day average= 45.8300
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

38

11/29/2010 2:35:53 PM

Facility = Clover Power Station - 002
Chemical = selenium
Chronic averaging period = 4
WLAa = 6200
WLAc = 3400
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 5
Variance = 9
C.V. = 0.6
97th percentile daily values = 12.1670
97th percentile 4 day average = 8.31895
97th percentile 30 day average= 6.03026
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5

11/29/2010 2:37:44 PM

Facility = Clover Power Station - 002
Chemical = zinc
Chronic averaging period = 4
WLAa = 20000
WLAc = 43000
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 32
Variance = 368.64
C.V. = 0.6
97th percentile daily values = 77.8693
97th percentile 4 day average = 53.2412
97th percentile 30 day average= 38.5937
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

32

11/29/2010 4:30:24 PM

Facility = Clover Power Station - 009
Chemical = ammonia
Chronic averaging period = 30
WLAa = 130
WLAc = 350
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 22.8
Variance = 187.142
C.V. = 0.6
97th percentile daily values = 55.4819
97th percentile 4 day average = 37.9344
97th percentile 30 day average= 27.4980
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

22.8

11/29/2010 4:51:35 PM

Facility = Clover Power Station - 009
Chemical = chloride
Chronic averaging period = 4
WLAa = 640000
WLAc = 10000000
Q.L. = 0.1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 3484840
Variance = 4371879
C.V. = 0.6
97th percentile daily values = 8480070
97th percentile 4 day average = 5798042
97th percentile 30 day average= 4202902
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 640000
Average Weekly limit = 640000.000000001
Average Monthly LImit = 640000.000000001

The data are:

3484840

11/29/2010 4:54:43 PM

Facility = Clover Power Station - 009
Chemical = nickel
Chronic averaging period = 4
WLAa = 2900
WLAc = 740
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 98
Variance = 3457.44
C.V. = 0.6
97th percentile daily values = 238.474
97th percentile 4 day average = 163.051
97th percentile 30 day average= 118.193
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

98

11/29/2010 4:55:44 PM

Facility = Clover Power Station - 009
Chemical = selenium
Chronic averaging period = 4
WLAa = 150
WLAc = 220
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

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

No Limit is required for this material

The data are:

9

11/29/2010 4:59:03 PM

Facility = Clover Power Station - 009
Chemical = zinc
Chronic averaging period = 4
WLAa = 1800
WLAc = 4300
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 155
Variance = 8649
C.V. = 0.6
97th percentile daily values = 377.179
97th percentile 4 day average = 257.887
97th percentile 30 day average= 186.938
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

155

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Clover Power Station (002) Permit No.: VA0083097

Receiving Stream: Roanoke River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	47.5	mg/L
90% Temperature (Annual) =	26.5	deg C
90% Temperature (Wet season) =	16.9	deg C
90% Maximum pH =	7.6	SU
10% Maximum pH =	6.9	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	Y	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows

1Q10 (Annual) =	200	MGD
7Q10 (Annual) =	437	MGD
30Q10 (Annual) =	485	MGD
1Q10 (Wet season) =	408	MGD
30Q10 (Wet season)	789	MGD
30Q5 =	572	MGD
Harmonic Mean =	1110	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) =	983.25	mg/L
90% Temp (Annual) =	25.65	deg C
90% Temp (Wet season) =	23.5	deg C
90% Maximum pH =	8.7	SU
10% Maximum pH =	6.9	SU
Discharge Flow =	0.162	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	--	--	6.7E+02	9.9E+02	--	--	2.4E+06	3.5E+06	--	--	6.7E+01	9.9E+01	--	--	2.4E+05	3.5E+05	--	--	**2.4E+05**	**3.5E+05**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	2.2E+04	3.3E+04	--	--	6.1E-01	9.3E-01	--	--	2.2E+03	3.3E+03	--	--	**2.2E+03**	**3.3E+03**
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	3.5E+03	1.7E+04	--	--	5.1E-02	2.5E-01	--	--	3.5E+02	1.7E+03	--	--	**3.5E+02**	**1.7E+03**
Aldrin [c]	0	3.0E+00	--	4.9E-04	5.0E-04	3.7E+03	--	3.4E+00	3.4E+00	7.5E-01	--	4.9E-05	5.0E-05	9.3E+02	--	3.4E-01	3.4E-01	**9.3E+02**	--	**3.4E-01**	**3.4E-01**
Ammonia-N (mg/l) (Yearly)	0	1.70E+01	1.84E+00	--	--	2.1E+04	5.5E+03	--	--	4.26E+00	4.59E-01	--	--	5.3E+03	1.4E+03	--	--	**5.3E+03**	**1.4E+03**	--	--
Ammonia-N (mg/l) (High Flow)	0	1.70E+01	3.41E+00	--	--	4.3E+04	1.7E+04	--	--	4.26E+00	8.52E-01	--	--	1.1E+04	4.2E+03	--	--	**1.1E+04**	**4.2E+03**	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	2.9E+07	1.4E+08	--	--	8.3E+02	4.0E+03	--	--	2.9E+06	1.4E+07	--	--	**2.9E+06**	**1.4E+07**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	2.0E+04	2.3E+06	--	--	5.6E-01	6.4E+01	--	--	2.0E+03	2.3E+05	--	--	**2.0E+03**	**2.3E+05**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	4.2E+05	4.0E+05	3.5E+04	--	8.5E+01	3.8E+01	1.0E+00	--	1.1E+05	1.0E+05	3.5E+03	--	**1.1E+05**	**1.0E+05**	**3.5E+03**	--
Barium	0	--	--	2.0E+03	--	--	--	7.1E+06	--	--	--	2.0E+02	--	--	--	7.1E+05	--	--	--	**7.1E+05**	--
Benzene [c]	0	--	--	2.2E+01	5.1E+02	--	--	1.5E+05	3.5E+06	--	--	2.2E+00	5.1E+01	--	--	1.5E+04	3.5E+05	--	--	**1.5E+04**	**3.5E+05**
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	5.9E+00	1.4E+01	--	--	8.6E-05	2.0E-04	--	--	5.9E-01	1.4E+00	--	--	**5.9E-01**	**1.4E+00**
Benzo (a) anthracene [c]	0	--	--	3.8E-02	1.8E-01	--	--	2.6E+02	1.2E+03	--	--	3.8E-03	1.8E-02	--	--	2.6E+01	1.2E+02	--	--	**2.6E+01**	**1.2E+02**
Benzo (b) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	2.6E+02	1.2E+03	--	--	3.8E-03	1.8E-02	--	--	2.6E+01	1.2E+02	--	--	**2.6E+01**	**1.2E+02**
Benzo (k) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	2.6E+02	1.2E+03	--	--	3.8E-03	1.8E-02	--	--	2.6E+01	1.2E+02	--	--	**2.6E+01**	**1.2E+02**
Benzo (a) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	2.6E+02	1.2E+03	--	--	3.8E-03	1.8E-02	--	--	2.6E+01	1.2E+02	--	--	**2.6E+01**	**1.2E+02**
Bis2-Chloroethyl Ether [c]	0	--	--	3.0E-01	5.3E+00	--	--	2.1E+03	3.6E+04	--	--	3.0E-02	5.3E-01	--	--	2.1E+02	3.6E+03	--	--	**2.1E+02**	**3.6E+03**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	4.9E+06	2.3E+08	--	--	1.4E+02	6.5E+03	--	--	4.9E+05	2.3E+07	--	--	**4.9E+05**	**2.3E+07**
Bis 2-Ethylhexyl Phthalate [c]	0	--	--	1.2E+01	2.2E+01	--	--	8.2E+04	1.5E+05	--	--	1.2E+00	2.2E+00	--	--	8.2E+03	1.5E+04	--	--	**8.2E+03**	**1.5E+04**
Bromoform [c]	0	--	--	4.3E+01	1.4E+03	--	--	2.9E+05	9.6E+06	--	--	4.3E+00	1.4E+02	--	--	2.9E+04	9.6E+05	--	--	**2.9E+04**	**9.6E+05**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	5.3E+06	6.7E+06	--	--	1.5E+02	1.9E+02	--	--	5.3E+05	6.7E+05	--	--	**5.3E+05**	**6.7E+05**
Cadmium	0	1.7E+00	6.4E-01	5.0E+00	--	2.1E+03	1.7E+03	1.8E+04	--	4.3E-01	1.6E-01	5.0E-01	--	5.3E+02	4.3E+02	1.8E+03	--	**5.3E+02**	**4.3E+02**	**1.8E+03**	--
Carbon Tetrachloride [c]	0	--	--	2.3E+00	1.6E+01	--	--	1.6E+04	1.1E+05	--	--	2.3E-01	1.6E+00	--	--	1.6E+03	1.1E+04	--	--	**1.6E+03**	**1.1E+04**
Chlordane [c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	3.0E+03	1.2E+01	5.5E+01	5.6E+01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	7.4E+02	2.9E+00	5.5E+00	5.6E+00	**7.4E+02**	**2.9E+00**	**5.5E+00**	**5.6E+00**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	1.1E+09	6.2E+08	8.8E+08	--	2.2E+05	5.8E+04	2.5E+04	--	2.7E+08	1.6E+08	8.8E+07	--	**2.7E+08**	**1.6E+08**	**8.8E+07**	--
TRC	0	1.9E+01	1.1E+01	--	--	2.3E+04	3.0E+04	--	--	4.8E+00	2.8E+00	--	--	5.9E+03	7.4E+03	--	--	**5.9E+03**	**7.4E+03**	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	4.6E+05	5.7E+06	--	--	1.3E+01	1.6E+02	--	--	4.6E+04	5.7E+05	--	--	**4.6E+04**	**5.7E+05**

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	--	--	4.0E+00	1.3E+02	--	--	2.7E+04	8.9E+05	--	--	4.0E-01	1.3E+01	--	--	2.7E+03	8.9E+04	--	--	2.7E+03	8.9E+04
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	1.2E+06	3.9E+07	--	--	3.4E+01	1.1E+03	--	--	1.2E+05	3.9E+06	--	--	1.2E+05	3.9E+06
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	3.5E+06	5.7E+06	--	--	1.0E+02	1.6E+02	--	--	3.5E+05	5.7E+05	--	--	3.5E+05	5.7E+05
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	2.9E+05	5.3E+05	--	--	8.1E+00	1.5E+01	--	--	2.9E+04	5.3E+04	--	--	2.9E+04	5.3E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.0E+02	1.1E+02	--	--	2.1E-02	1.0E-02	--	--	2.6E+01	2.8E+01	--	--	2.6E+01	2.8E+01	--	--
Chromium III	0	3.1E+02	4.1E+01	--	--	3.9E+05	1.1E+05	--	--	7.8E+01	1.0E+01	--	--	9.7E+04	2.7E+04	--	--	9.7E+04	2.7E+04	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	2.0E+04	3.0E+04	--	--	4.0E+00	2.8E+00	--	--	4.9E+03	7.4E+03	--	--	4.9E+03	7.4E+03	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	3.5E+05	--	--	--	1.0E+01	--	--	--	3.5E+04	--	--	--	3.5E+04	--
Chrysene[c]	0	--	--	3.8E-03	1.8E-02	--	--	2.6E+01	1.2E+02	--	--	3.8E-04	1.8E-03	--	--	2.6E+00	1.2E+01	--	--	2.6E+00	1.2E+01
Copper	0	6.8E+00	4.8E+00	1.3E+03	--	8.4E+03	1.3E+04	4.6E+06	--	1.7E+00	1.2E+00	1.3E+02	--	2.1E+03	3.2E+03	4.6E+05	--	2.1E+03	3.2E+03	4.6E+05	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.7E+04	1.4E+04	4.9E+05	5.7E+07	5.5E+00	1.3E+00	1.4E+01	1.6E+03	6.8E+03	3.5E+03	4.9E+04	5.7E+06	6.8E+03	3.5E+03	4.9E+04	5.7E+06
DDD[c]	0	--	--	3.1E-03	3.1E-03	--	--	2.1E+01	2.1E+01	--	--	3.1E-04	3.1E-04	--	--	2.1E+00	2.1E+00	--	--	2.1E+00	2.1E+00
DDE[c]	0	--	--	2.2E-03	2.2E-03	--	--	1.5E+01	1.5E+01	--	--	2.2E-04	2.2E-04	--	--	1.5E+00	1.5E+00	--	--	1.5E+00	1.5E+00
DDT[c]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.4E+03	2.7E+00	1.5E+01	1.5E+01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	3.4E+02	6.7E-01	1.5E+00	1.5E+00	3.4E+02	6.7E-01	1.5E+00	1.5E+00
Demeton	0	--	1.0E-01	--	--	--	2.7E+02	--	--	--	2.5E-02	--	--	--	6.7E+01	--	--	--	6.7E+01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	2.1E+02	4.6E+02	--	--	4.3E-02	4.3E-02	--	--	5.3E+01	1.1E+02	--	--	5.3E+01	1.1E+02	--	--
Dibenz(a,h)anthracene[c]	0	--	--	3.8E-02	1.8E-01	--	--	2.6E+02	1.2E+03	--	--	3.8E-03	1.8E-02	--	--	2.6E+01	1.2E+02	--	--	2.6E+01	1.2E+02
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	1.5E+06	4.6E+06	--	--	4.2E+01	1.3E+02	--	--	1.5E+05	4.6E+05	--	--	1.5E+05	4.6E+05
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	1.1E+06	3.4E+06	--	--	3.2E+01	9.6E+01	--	--	1.1E+05	3.4E+05	--	--	1.1E+05	3.4E+05
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	2.2E+05	6.7E+05	--	--	6.3E+00	1.9E+01	--	--	2.2E+04	6.7E+04	--	--	2.2E+04	6.7E+04
3,3-Dichlorobenzidine[c]	0	--	--	2.1E-01	2.8E-01	--	--	1.4E+03	1.9E+03	--	--	2.1E-02	2.8E-02	--	--	1.4E+02	1.9E+02	--	--	1.4E+02	1.9E+02
Dichlorobromomethane[c]	0	--	--	5.5E+00	1.7E+02	--	--	3.8E+04	1.2E+06	--	--	5.5E-01	1.7E+01	--	--	3.8E+03	1.2E+05	--	--	3.8E+03	1.2E+05
1,2-Dichloroethane[c]	0	--	--	3.8E+00	3.7E+02	--	--	2.6E+04	2.5E+06	--	--	3.8E-01	3.7E+01	--	--	2.6E+03	2.5E+05	--	--	2.6E+03	2.5E+05
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	1.2E+06	2.5E+07	--	--	3.3E+01	7.1E+02	--	--	1.2E+05	2.5E+06	--	--	1.2E+05	2.5E+06
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	4.9E+05	3.5E+07	--	--	1.4E+01	1.0E+03	--	--	4.9E+04	3.5E+06	--	--	4.9E+04	3.5E+06
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	2.7E+05	1.0E+06	--	--	7.7E+00	2.9E+01	--	--	2.7E+04	1.0E+05	--	--	2.7E+04	1.0E+05
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	3.5E+05	--	--	--	1.0E+01	--	--	--	3.5E+04	--	--	--	3.5E+04	--
1,2-Dichloropropane[c]	0	--	--	5.0E+00	1.5E+02	--	--	3.4E+04	1.0E+06	--	--	5.0E-01	1.5E+01	--	--	3.4E+03	1.0E+05	--	--	3.4E+03	1.0E+05
1,3-Dichloropropene[c]	0	--	--	3.4E+00	2.1E+02	--	--	2.3E+04	1.4E+06	--	--	3.4E-01	2.1E+01	--	--	2.3E+03	1.4E+05	--	--	2.3E+03	1.4E+05
Dieldrin[c]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	3.0E+02	1.5E+02	3.6E+00	3.7E+00	6.0E-02	1.4E-02	5.2E-05	5.4E-05	7.4E+01	3.8E+01	3.6E-01	3.7E-01	7.4E+01	3.8E+01	3.6E-01	3.7E-01
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	6.0E+07	1.6E+08	--	--	1.7E+03	4.4E+03	--	--	6.0E+06	1.6E+07	--	--	6.0E+06	1.6E+07
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	1.3E+06	3.0E+06	--	--	3.8E+01	8.5E+01	--	--	1.3E+05	3.0E+05	--	--	1.3E+05	3.0E+05
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	9.5E+08	3.9E+09	--	--	2.7E+04	1.1E+05	--	--	9.5E+07	3.9E+08	--	--	9.5E+07	3.9E+08
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	7.1E+06	1.6E+07	--	--	2.0E+02	4.5E+02	--	--	7.1E+05	1.6E+06	--	--	7.1E+05	1.6E+06
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	2.4E+05	1.9E+07	--	--	6.9E+00	5.3E+02	--	--	2.4E+04	1.9E+06	--	--	2.4E+04	1.9E+06
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	4.6E+04	9.9E+05	--	--	1.3E+00	2.8E+01	--	--	4.6E+03	9.9E+04	--	--	4.6E+03	9.9E+04
2,4-Dinitrotoluene[c]	0	--	--	1.1E+00	3.4E+01	--	--	7.5E+03	2.3E+05	--	--	1.1E-01	3.4E+00	--	--	7.5E+02	2.3E+04	--	--	7.5E+02	2.3E+04
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	1.8E-04	1.8E-04	--	--	5.0E-09	5.1E-09	--	--	1.8E-05	1.8E-05	--	--	1.8E-05	1.8E-05
1,2-Diphenylhydrazine[c]	0	--	--	3.6E-01	2.0E+00	--	--	2.5E+03	1.4E+04	--	--	3.6E-02	2.0E-01	--	--	2.5E+02	1.4E+03	--	--	2.5E+02	1.4E+03
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.7E+02	1.5E+02	2.2E+05	3.1E+05	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.8E+01	3.8E+01	2.2E+04	3.1E+04	6.8E+01	3.8E+01	2.2E+04	3.1E+04
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.7E+02	1.5E+02	2.2E+05	3.1E+05	5.5E-02	1.4E-02	6.2E+00	8.9E+00	6.8E+01	3.8E+01	2.2E+04	3.1E+04	6.8E+01	3.8E+01	2.2E+04	3.1E+04
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.7E+02	1.5E+02	--	--	5.5E-02	1.4E-02	--	--	6.8E+01	3.8E+01	--	--	6.8E+01	3.8E+01	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	2.2E+05	3.1E+05	--	--	6.2E+00	8.9E+00	--	--	2.2E+04	3.1E+04	--	--	2.2E+04	3.1E+04
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.1E+02	9.7E+01	2.1E+02	2.1E+02	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.7E+01	2.4E+01	2.1E+01	2.1E+01	2.7E+01	2.4E+01	2.1E+01	2.1E+01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	1.0E+03	1.1E+03	--	--	2.9E-02	3.0E-02	--	--	1.0E+02	1.1E+02	--	--	1.0E+02	1.1E+02

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	--	--	5.3E+02	2.1E+03	--	--	1.9E+06	7.4E+06	--	--	5.3E+01	2.1E+02	--	--	1.9E+05	7.4E+05	--	--	1.9E+05	7.4E+05
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	4.6E+05	4.9E+05	--	--	1.3E+01	1.4E+01	--	--	4.6E+04	4.9E+04	--	--	4.6E+04	4.9E+04
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	3.9E+06	1.9E+07	--	--	1.1E+02	5.3E+02	--	--	3.9E+05	1.9E+06	--	--	3.9E+05	1.9E+06
Foaming Agents	0	--	--	5.0E+02	--	--	--	1.8E+06	--	--	--	5.0E+01	--	--	--	1.8E+05	--	--	--	1.8E+05	--
Guthion	0	--	1.0E-02	--	--	--	2.7E+01	--	--	--	2.5E-03	--	--	--	6.7E+00	--	--	--	6.7E+00	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	6.4E+02	1.0E+01	5.4E+00	5.4E+00	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.6E+02	2.6E+00	5.4E-01	5.4E-01	1.6E+02	2.6E+00	5.4E-01	5.4E-01
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	6.4E+02	1.0E+01	2.7E+00	2.7E+00	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.6E+02	2.6E+00	2.7E-01	2.7E-01	1.6E+02	2.6E+00	2.7E-01	2.7E-01
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	1.9E+01	2.0E+01	--	--	2.8E-04	2.9E-04	--	--	1.9E+00	2.0E+00	--	--	1.9E+00	2.0E+00
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	3.0E+04	1.2E+06	--	--	4.4E-01	1.8E+01	--	--	3.0E+03	1.2E+05	--	--	3.0E+03	1.2E+05
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	1.8E+02	3.4E+02	--	--	2.6E-03	4.9E-03	--	--	1.8E+01	3.4E+01	--	--	1.8E+01	3.4E+01
Hexachlorocyclohexane Beta BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	6.2E+02	1.2E+03	--	--	9.1E-03	1.7E-02	--	--	6.2E+01	1.2E+02	--	--	6.2E+01	1.2E+02
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.2E+03	--	6.7E+03	1.2E+04	2.4E-01	--	9.8E-02	1.8E-01	2.9E+02	--	6.7E+02	1.2E+03	2.9E+02	--	6.7E+02	1.2E+03
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	1.4E+05	3.9E+06	--	--	4.0E+00	1.1E+02	--	--	1.4E+04	3.9E+05	--	--	1.4E+04	3.9E+05
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	9.6E+04	2.3E+05	--	--	1.4E+00	3.3E+00	--	--	9.6E+03	2.3E+04	--	--	9.6E+03	2.3E+04
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	5.4E+03	--	--	--	5.0E-01	--	--	--	1.3E+03	--	--	--	1.3E+03	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	2.6E+02	1.2E+03	--	--	3.8E-03	1.8E-02	--	--	2.6E+01	1.2E+02	--	--	2.6E+01	1.2E+02
Iron	0	--	--	3.0E+02	--	--	--	1.1E+06	--	--	--	3.0E+01	--	--	--	1.1E+05	--	--	--	1.1E+05	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	2.4E+06	6.6E+07	--	--	3.5E+01	9.6E+02	--	--	2.4E+05	6.6E+06	--	--	2.4E+05	6.6E+06
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	4.7E+01	5.3E+00	1.5E+01	--	5.8E+04	1.4E+04	5.3E+04	--	1.2E+01	1.3E+00	1.5E+00	--	1.5E+04	3.6E+03	5.3E+03	--	1.5E+04	3.6E+03	5.3E+03	--
Malathion	0	--	1.0E-01	--	--	--	2.7E+02	--	--	--	2.5E-02	--	--	--	6.7E+01	--	--	--	6.7E+01	--	--
Manganese	0	--	--	5.0E+01	--	--	--	1.8E+05	--	--	--	5.0E+00	--	--	--	1.8E+04	--	--	--	1.8E+04	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.7E+03	2.1E+03	--	--	3.5E-01	1.9E-01	--	--	4.3E+02	5.2E+02	--	--	4.3E+02	5.2E+02	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	1.7E+05	5.3E+06	--	--	4.7E+00	1.5E+02	--	--	1.7E+04	5.3E+05	--	--	1.7E+04	5.3E+05
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	3.2E+05	4.0E+07	--	--	4.6E+00	5.9E+02	--	--	3.2E+04	4.0E+06	--	--	3.2E+04	4.0E+06
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	8.1E+01	3.5E+05	--	--	7.5E-03	1.0E+01	--	--	2.0E+01	3.5E+04	--	--	2.0E+01	3.5E+04	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	9.8E+01	1.1E+01	6.1E+02	4.6E+03	1.2E+05	2.9E+04	2.2E+06	1.6E+07	2.5E+01	2.7E+00	6.1E+01	4.6E+02	3.0E+04	7.3E+03	2.2E+05	1.6E+06	3.0E+04	7.3E+03	2.2E+05	1.6E+06
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	3.5E+07	--	--	--	1.0E+03	--	--	--	3.5E+06	--	--	--	3.5E+06	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	6.0E+04	2.4E+06	--	--	1.7E+00	6.9E+01	--	--	6.0E+03	2.4E+05	--	--	6.0E+03	2.4E+05
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	4.7E+01	2.1E+05	--	--	6.9E-04	3.0E+00	--	--	4.7E+00	2.1E+04	--	--	4.7E+00	2.1E+04
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	2.3E+05	4.1E+05	--	--	3.3E+00	6.0E+00	--	--	2.3E+04	4.1E+04	--	--	2.3E+04	4.1E+04
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	3.4E+02	3.5E+04	--	--	5.0E-03	5.1E-01	--	--	3.4E+01	3.5E+03	--	--	3.4E+01	3.5E+03
Nonylphenol	0	2.8E+01	6.6E+00	--	--	3.5E+04	1.8E+04	--	--	7.0E+00	1.7E+00	--	--	8.6E+03	4.5E+03	--	--	8.6E+03	4.5E+03	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	8.0E+01	3.5E+01	--	--	1.6E-02	3.3E-03	--	--	2.0E+01	8.8E+00	--	--	2.0E+01	8.8E+00	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	3.8E+01	4.4E+00	4.4E+00	--	3.5E-03	6.4E-05	6.4E-05	--	9.4E+00	4.4E-01	4.4E-01	--	9.4E+00	4.4E-01	4.4E-01
Pentachlorophenol [C]	0	7.9E+00	6.1E+00	2.7E+00	3.0E+01	9.7E+03	1.6E+04	1.9E+04	2.1E+05	2.0E+00	1.5E+00	2.7E-01	3.0E+00	2.4E+03	4.1E+03	1.9E+03	2.1E+04	2.4E+03	4.1E+03	1.9E+03	2.1E+04
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	3.5E+07	3.0E+09	--	--	1.0E+03	8.6E+04	--	--	3.5E+06	3.0E+08	--	--	3.5E+06	3.0E+08
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	2.9E+06	1.4E+07	--	--	8.3E+01	4.0E+02	--	--	2.9E+05	1.4E+06	--	--	2.9E+05	1.4E+06
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	5.3E+04	--	--	--	1.5E+00	--	--	--	5.3E+03	--	--	--	5.3E+03	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	4.0E+00	--	--	1.4E+04	1.4E+04	--	--	4.0E-01	4.0E-01	--	--	1.4E+03	1.4E+03	--	--	1.4E+03	1.4E+03
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	1.8E+04	--	--	--	5.0E-01	--	--	--	1.8E+03	--	--	--	1.8E+03	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	1.1E+05	--	--	--	3.0E+00	--	--	--	1.1E+04	--	--	--	1.1E+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**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.5E+04	1.3E+04	6.0E+05	1.5E+07	5.0E+00	1.3E+00	1.7E+01	4.2E+02	6.2E+03	3.4E+03	6.0E+04	1.5E+06	**6.2E+03**	**3.4E+03**	**6.0E+04**	**1.5E+06**
Silver	0	9.9E-01	--	--	--	1.2E+03	--	--	--	2.5E-01	--	--	--	3.0E+02	--	--	--	**3.0E+02**	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	8.8E+08	--	--	--	2.5E+04	--	--	--	8.8E+07	--	--	--	**8.8E+07**	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	1.2E+04	2.7E+05	--	--	1.7E-01	4.0E+00	--	--	1.2E+03	2.7E+04	--	--	**1.2E+03**	**2.7E+04**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	4.7E+04	2.3E+05	--	--	6.9E-01	3.3E+00	--	--	4.7E+03	2.3E+04	--	--	**4.7E+03**	**2.3E+04**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	8.5E+02	1.7E+03	--	--	2.4E-02	4.7E-02	--	--	8.5E+01	1.7E+02	--	--	**8.5E+01**	**1.7E+02**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	1.8E+06	2.1E+07	--	--	5.1E+01	6.0E+02	--	--	1.8E+05	2.1E+06	--	--	**1.8E+05**	**2.1E+06**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	1.8E+09	--	--	--	5.0E+04	--	--	--	1.8E+08	--	--	--	**1.8E+08**	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	9.0E+02	5.4E-01	1.9E+01	1.9E+01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	2.3E+02	1.3E-01	1.9E+00	1.9E+00	**2.3E+02**	**1.3E-01**	**1.9E+00**	**1.9E+00**
Tributyltin	0	4.6E-01	7.2E-02	--	--	5.7E+02	1.9E+02	--	--	1.2E-01	1.8E-02	--	--	1.4E+02	4.9E+01	--	--	**1.4E+02**	**4.9E+01**	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	1.2E+05	2.5E+05	--	--	3.5E+00	7.0E+00	--	--	1.2E+04	2.5E+04	--	--	**1.2E+04**	**2.5E+04**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	4.0E+04	1.1E+06	--	--	5.9E-01	1.6E+01	--	--	4.0E+03	1.1E+05	--	--	**4.0E+03**	**1.1E+05**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	1.7E+05	2.1E+06	--	--	2.5E+00	3.0E+01	--	--	1.7E+04	2.1E+05	--	--	**1.7E+04**	**2.1E+05**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	9.6E+04	1.6E+05	--	--	1.4E+00	2.4E+00	--	--	9.6E+03	1.6E+04	--	--	**9.6E+03**	**1.6E+04**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	1.8E+05	--	--	--	5.0E+00	--	--	--	1.8E+04	--	--	--	**1.8E+04**	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	1.7E+03	1.6E+05	--	--	2.5E-02	2.4E+00	--	--	1.7E+02	1.6E+04	--	--	**1.7E+02**	**1.6E+04**
Zinc	0	6.3E+01	6.3E+01	7.4E+03	2.6E+04	7.8E+04	1.7E+05	2.6E+07	9.2E+07	1.6E+01	1.6E+01	7.4E+02	2.6E+03	2.0E+04	4.3E+04	2.6E+06	9.2E+06	**2.0E+04**	**4.3E+04**	**2.6E+06**	**9.2E+06**

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 and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.0E+03
Arsenic	3.5E+03
Barium	7.1E+05
Cadmium	2.1E+02
Chromium III	1.6E+04
Chromium VI	2.0E+03
Copper	8.4E+02
Iron	1.1E+05
Lead	2.1E+03
Manganese	1.8E+04
Mercury	1.7E+02
Nickel	4.4E+03
Selenium	2.0E+03
Silver	1.2E+02
Zinc	7.8E+03

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

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Clover Power Station (009) Permit No.: VA0083097

Receiving Stream: Roanoke River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	47.5	mg/L
90% Temperature (Annual) =	26.5	deg C
90% Temperature (Wet season) =	16.9	deg C
90% Maximum pH =	7.6	SU
10% Maximum pH =	6.9	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	Y	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows

1Q10 (Annual) =	18.2	MGD
7Q10 (Annual) =	111.6	MGD
30Q10 (Annual) =	485	MGD
1Q10 (Wet season) =	408	MGD
30Q10 (Wet season)	789	MGD
30Q5 =	572	MGD
Harmonic Mean =	1110	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) =	5814	mg/L
90% Temp (Annual) =	27.2	deg C
90% Temp (Wet season) =	7.2	deg C
90% Maximum pH =	7.4	SU
10% Maximum pH =	6.7	SU
Discharge Flow =	0.634	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	--	--	6.7E+02	9.9E+02	--	--	6.1E+05	8.9E+05	--	--	6.7E+01	9.9E+01	--	--	6.1E+04	8.9E+04	--	--	**6.1E+04**	**8.9E+04**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	5.5E+03	8.4E+03	--	--	6.1E-01	9.3E-01	--	--	5.5E+02	8.4E+02	--	--	**5.5E+02**	**8.4E+02**
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	8.9E+02	4.4E+03	--	--	5.1E-02	2.5E-01	--	--	8.9E+01	4.4E+02	--	--	**8.9E+01**	**4.4E+02**
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	8.9E+01	--	8.6E-01	8.8E-01	7.5E-01	--	4.9E-05	5.0E-05	2.2E+01	--	8.6E-02	8.8E-02	**2.2E+01**	--	**8.6E-02**	**8.8E-02**
Ammonia-N (mg/l) (Yearly)	0	1.73E+01	1.84E+00	--	--	5.1E+02	1.4E+03	--	--	4.32E+00	4.59E-01	--	--	1.3E+02	3.5E+02	--	--	**1.3E+02**	**3.5E+02**	--	--
Ammonia-N (mg/l) (High Flow)	0	1.70E+01	3.41E+00	--	--	1.1E+04	4.2E+03	--	--	4.26E+00	8.53E-01	--	--	2.7E+03	1.1E+03	--	--	**2.7E+03**	**1.1E+03**	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	7.5E+06	3.6E+07	--	--	8.3E+02	4.0E+03	--	--	7.5E+05	3.6E+06	--	--	**7.5E+05**	**3.6E+06**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.1E+03	5.8E+05	--	--	5.6E-01	6.4E+01	--	--	5.1E+02	5.8E+04	--	--	**5.1E+02**	**5.8E+04**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.0E+04	2.7E+04	9.0E+03	--	8.5E+01	3.8E+01	1.0E+00	--	2.5E+03	6.6E+03	9.0E+02	--	**2.5E+03**	**6.6E+03**	**9.0E+02**	--
Barium	0	--	--	2.0E+03	--	--	--	1.8E+06	--	--	--	2.0E+02	--	--	--	1.8E+05	--	--	--	**1.8E+05**	--
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	3.9E+04	8.9E+05	--	--	2.2E+00	5.1E+01	--	--	3.9E+03	8.9E+04	--	--	**3.9E+03**	**8.9E+04**
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	1.5E+00	3.5E+00	--	--	8.6E-05	2.0E-04	--	--	1.5E-01	3.5E-01	--	--	**1.5E-01**	**3.5E-01**
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	3.8E-03	1.8E-02	--	--	6.7E+00	3.2E+01	--	--	**6.7E+00**	**3.2E+01**
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	3.8E-03	1.8E-02	--	--	6.7E+00	3.2E+01	--	--	**6.7E+00**	**3.2E+01**
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	3.8E-03	1.8E-02	--	--	6.7E+00	3.2E+01	--	--	**6.7E+00**	**3.2E+01**
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	3.8E-03	1.8E-02	--	--	6.7E+00	3.2E+01	--	--	**6.7E+00**	**3.2E+01**
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	5.3E+02	9.3E+03	--	--	3.0E-02	5.3E-01	--	--	5.3E+01	9.3E+02	--	--	**5.3E+01**	**9.3E+02**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.3E+06	5.9E+07	--	--	1.4E+02	6.5E+03	--	--	1.3E+05	5.9E+06	--	--	**1.3E+05**	**5.9E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	2.1E+04	3.9E+04	--	--	1.2E+00	2.2E+00	--	--	2.1E+03	3.9E+03	--	--	**2.1E+03**	**3.9E+03**
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	7.5E+04	2.5E+06	--	--	4.3E+00	1.4E+02	--	--	7.5E+03	2.5E+05	--	--	**7.5E+03**	**2.5E+05**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.4E+06	1.7E+06	--	--	1.5E+02	1.9E+02	--	--	1.4E+05	1.7E+05	--	--	**1.4E+05**	**1.7E+05**
Cadmium	0	1.1E+01	9.5E-01	5.0E+00	--	3.2E+02	1.7E+02	4.5E+03	--	2.7E+00	2.4E-01	5.0E-01	--	7.9E+01	4.2E+01	4.5E+02	--	**7.9E+01**	**4.2E+01**	**4.5E+02**	--
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	4.0E+03	2.8E+04	--	--	2.3E-01	1.6E+00	--	--	4.0E+02	2.8E+03	--	--	**4.0E+02**	**2.8E+03**
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	7.1E+01	7.6E-01	1.4E+01	1.4E+01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	1.8E+01	1.9E-01	1.4E+00	1.4E+00	**1.8E+01**	**1.9E-01**	**1.4E+00**	**1.4E+00**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	2.6E+07	4.1E+07	2.3E+08	--	2.2E+05	5.8E+04	2.5E+04	--	6.4E+06	1.0E+07	2.3E+07	--	**6.4E+06**	**1.0E+07**	**2.3E+07**	--
TRC	0	1.9E+01	1.1E+01	--	--	5.6E+02	1.9E+03	--	--	4.8E+00	2.8E+00	--	--	1.4E+02	4.9E+02	--	--	**1.4E+02**	**4.9E+02**	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.2E+05	1.4E+06	--	--	1.3E+01	1.6E+02	--	--	1.2E+04	1.4E+05	--	--	**1.2E+04**	**1.4E+05**

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	–	–	4.0E+00	1.3E+02	–	–	7.0E+03	2.3E+05	–	–	4.0E-01	1.3E+01	–	–	7.0E+02	2.3E+04	–	–	7.0E+02	2.3E+04
Chloroform	0	–	–	3.4E+02	1.1E+04	–	–	3.1E+05	9.9E+06	–	–	3.4E+01	1.1E+03	–	–	3.1E+04	9.9E+05	–	–	3.1E+04	9.9E+05
2-Chloronaphthalene	0	–	–	1.0E+03	1.6E+03	–	–	9.0E+05	1.4E+06	–	–	1.0E+02	1.6E+02	–	–	9.0E+04	1.4E+05	–	–	9.0E+04	1.4E+05
2-Chlorophenol	0	–	–	8.1E+01	1.5E+02	–	–	7.3E+04	1.4E+05	–	–	8.1E+00	1.5E+01	–	–	7.3E+03	1.4E+04	–	–	7.3E+03	1.4E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	–	–	2.5E+00	7.3E+00	–	–	2.1E-02	1.0E-02	–	–	6.2E-01	1.8E+00	–	–	6.2E-01	1.8E+00	–	–
Chromium III	0	1.2E+03	6.2E+01	–	–	3.5E+04	1.1E+04	–	–	2.9E+02	1.5E+01	–	–	8.7E+03	2.7E+03	–	–	8.7E+03	2.7E+03	–	–
Chromium VI	0	1.6E+01	1.1E+01	–	–	4.8E+02	1.9E+03	–	–	4.0E+00	2.8E+00	–	–	1.2E+02	4.9E+02	–	–	1.2E+02	4.9E+02	–	–
Chromium, Total	0	–	–	1.0E+02	–	–	–	9.0E+04	–	–	–	1.0E+01	–	–	–	9.0E+03	–	–	–	9.0E+03	–
Chrysene [C]	0	–	–	3.8E-03	1.8E-02	–	–	6.7E+00	3.2E+01	–	–	3.8E-04	1.8E-03	–	–	6.7E-01	3.2E+00	–	–	6.7E-01	3.2E+00
Copper	0	3.1E+01	7.4E+00	1.3E+03	–	9.2E+02	1.3E+03	1.2E+06	–	7.7E+00	1.9E+00	1.3E+02	–	2.3E+02	3.3E+02	1.2E+05	–	2.3E+02	3.3E+02	1.2E+05	–
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	6.5E+02	9.2E+02	1.3E+05	1.4E+07	5.5E+00	1.3E+00	1.4E+01	1.6E+03	1.6E+02	2.3E+02	1.3E+04	1.4E+06	1.6E+02	2.3E+02	1.3E+04	1.4E+06
DDD [C]	0	–	–	3.1E-03	3.1E-03	–	–	5.4E+00	5.4E+00	–	–	3.1E-04	3.1E-04	–	–	5.4E-01	5.4E-01	–	–	5.4E-01	5.4E-01
DDE [C]	0	–	–	2.2E-03	2.2E-03	–	–	3.9E+00	3.9E+00	–	–	2.2E-04	2.2E-04	–	–	3.9E-01	3.9E-01	–	–	3.9E-01	3.9E-01
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	3.3E+01	1.8E-01	3.9E+00	3.9E+00	2.8E-01	2.5E-04	2.2E-04	2.2E-04	8.2E+00	4.4E-02	3.9E-01	3.9E-01	8.2E+00	4.4E-02	3.9E-01	3.9E-01
Demeton	0	–	1.0E-01	–	–	–	1.8E+01	–	–	–	2.5E-02	–	–	–	4.4E+00	–	–	–	4.4E+00	–	–
Diazinon	0	1.7E-01	1.7E-01	–	–	5.1E+00	3.0E+01	–	–	4.3E-02	4.3E-02	–	–	1.3E+00	7.5E+00	–	–	1.3E+00	7.5E+00	–	–
Dibenz(a,h)anthracene [C]	0	–	–	3.8E-02	1.8E-01	–	–	6.7E+01	3.2E+02	–	–	3.8E-03	1.8E-02	–	–	6.7E+00	3.2E+01	–	–	6.7E+00	3.2E+01
1,2-Dichlorobenzene	0	–	–	4.2E+02	1.3E+03	–	–	3.8E+05	1.2E+06	–	–	4.2E+01	1.3E+02	–	–	3.8E+04	1.2E+05	–	–	3.8E+04	1.2E+05
1,3-Dichlorobenzene	0	–	–	3.2E+02	9.6E+02	–	–	2.9E+05	8.7E+05	–	–	3.2E+01	9.6E+01	–	–	2.9E+04	8.7E+04	–	–	2.9E+04	8.7E+04
1,4-Dichlorobenzene	0	–	–	6.3E+01	1.9E+02	–	–	5.7E+04	1.7E+05	–	–	6.3E+00	1.9E+01	–	–	5.7E+03	1.7E+04	–	–	5.7E+03	1.7E+04
3,3-Dichlorobenzidine[C]	0	–	–	2.1E-01	2.8E-01	–	–	3.7E+02	4.9E+02	–	–	2.1E-02	2.8E-02	–	–	3.7E+01	4.9E+01	–	–	3.7E+01	4.9E+01
Dichlorobromomethane [C]	0	–	–	5.5E+00	1.7E+02	–	–	9.6E+03	3.0E+05	–	–	5.5E-01	1.7E+01	–	–	9.6E+02	3.0E+04	–	–	9.6E+02	3.0E+04
1,2-Dichloroethane [C]	0	–	–	3.8E+00	3.7E+02	–	–	6.7E+03	6.5E+05	–	–	3.8E-01	3.7E+01	–	–	6.7E+02	6.5E+04	–	–	6.7E+02	6.5E+04
1,1-Dichloroethylene	0	–	–	3.3E+02	7.1E+03	–	–	3.0E+05	6.4E+06	–	–	3.3E+01	7.1E+02	–	–	3.0E+04	6.4E+05	–	–	3.0E+04	6.4E+05
1,2-trans-dichloroethylene	0	–	–	1.4E+02	1.0E+04	–	–	1.3E+05	9.0E+06	–	–	1.4E+01	1.0E+03	–	–	1.3E+04	9.0E+05	–	–	1.3E+04	9.0E+05
2,4-Dichlorophenol	0	–	–	7.7E+01	2.9E+02	–	–	7.0E+04	2.6E+05	–	–	7.7E+00	2.9E+01	–	–	7.0E+03	2.6E+04	–	–	7.0E+03	2.6E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	–	–	1.0E+02	–	–	–	9.0E+04	–	–	–	1.0E+01	–	–	–	9.0E+03	–	–	–	9.0E+03	–
1,2-Dichloropropane[C]	0	–	–	5.0E+00	1.5E+02	–	–	8.8E+03	2.6E+05	–	–	5.0E-01	1.5E+01	–	–	8.8E+02	2.6E+04	–	–	8.8E+02	2.6E+04
1,3-Dichloropropene [C]	0	–	–	3.4E+00	2.1E+02	–	–	6.0E+03	3.7E+05	–	–	3.4E-01	2.1E+01	–	–	6.0E+02	3.7E+04	–	–	6.0E+02	3.7E+04
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	7.1E+00	9.9E+00	9.1E-01	9.5E-01	6.0E-02	1.4E-02	5.2E-05	5.4E-05	1.8E+00	2.5E+00	9.1E-02	9.5E-02	1.8E+00	2.5E+00	9.1E-02	9.5E-02
Diethyl Phthalate	0	–	–	1.7E+04	4.4E+04	–	–	1.5E+07	4.0E+07	–	–	1.7E+03	4.4E+03	–	–	1.5E+06	4.0E+06	–	–	1.5E+06	4.0E+06
2,4-Dimethylphenol	0	–	–	3.8E+02	8.5E+02	–	–	3.4E+05	7.7E+05	–	–	3.8E+01	8.5E+01	–	–	3.4E+04	7.7E+04	–	–	3.4E+04	7.7E+04
Dimethyl Phthalate	0	–	–	2.7E+05	1.1E+06	–	–	2.4E+08	9.9E+08	–	–	2.7E+04	1.1E+05	–	–	2.4E+07	9.9E+07	–	–	2.4E+07	9.9E+07
Di-n-Butyl Phthalate	0	–	–	2.0E+03	4.5E+03	–	–	1.8E+06	4.1E+06	–	–	2.0E+02	4.5E+02	–	–	1.8E+05	4.1E+05	–	–	1.8E+05	4.1E+05
2,4 Dinitrophenol	0	–	–	6.9E+01	5.3E+03	–	–	6.2E+04	4.8E+06	–	–	6.9E+00	5.3E+02	–	–	6.2E+03	4.8E+05	–	–	6.2E+03	4.8E+05
2-Methyl-4,6-Dinitrophenol	0	–	–	1.3E+01	2.8E+02	–	–	1.2E+04	2.5E+05	–	–	1.3E+00	2.8E+01	–	–	1.2E+03	2.5E+04	–	–	1.2E+03	2.5E+04
2,4-Dinitrotoluene [C]	0	–	–	1.1E+00	3.4E+01	–	–	1.9E+03	6.0E+04	–	–	1.1E-01	3.4E+00	–	–	1.9E+02	6.0E+03	–	–	1.9E+02	6.0E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	–	–	5.0E-08	5.1E-08	–	–	4.5E-05	4.6E-05	–	–	5.0E-09	5.1E-09	–	–	4.5E-06	4.6E-06	–	–	4.5E-06	4.6E-06
1,2-Diphenylhydrazine[C]	0	–	–	3.6E-01	2.0E+00	–	–	6.3E+02	3.5E+03	–	–	3.6E-02	2.0E-01	–	–	6.3E+01	3.5E+02	–	–	6.3E+01	3.5E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	6.5E+00	9.9E+00	5.6E+04	8.0E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.6E+00	2.5E+00	5.6E+03	8.0E+03	1.6E+00	2.5E+00	5.6E+03	8.0E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	6.5E+00	9.9E+00	5.6E+04	8.0E+04	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.6E+00	2.5E+00	5.6E+03	8.0E+03	1.6E+00	2.5E+00	5.6E+03	8.0E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	–	–	6.5E+00	9.9E+00	–	–	5.5E-02	1.4E-02	–	–	1.6E+00	2.5E+00	–	–	1.6E+00	2.5E+00	–	–
Endosulfan Sulfate	0	–	–	6.2E+01	8.9E+01	–	–	5.6E+04	8.0E+04	–	–	6.2E+00	8.9E+00	–	–	5.6E+03	8.0E+03	–	–	5.6E+03	8.0E+03
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.6E+00	6.4E+00	5.3E+01	5.4E+01	2.2E-02	9.0E-03	5.9E-03	6.0E-03	6.4E-01	1.6E+00	5.3E+00	5.4E+00	6.4E-01	1.6E+00	5.3E+00	5.4E+00
Endrin Aldehyde	0	–	–	2.9E-01	3.0E-01	–	–	2.6E+02	2.7E+02	–	–	2.9E-02	3.0E-02	–	–	2.6E+01	2.7E+01	–	–	2.6E+01	2.7E+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	--	--	5.3E+02	2.1E+03	--	--	4.8E+05	1.9E+06	--	--	5.3E+01	2.1E+02	--	--	4.8E+04	1.9E+05	--	--	**4.8E+04**	**1.9E+05**
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.2E+05	1.3E+05	--	--	1.3E+01	1.4E+01	--	--	1.2E+04	1.3E+04	--	--	**1.2E+04**	**1.3E+04**
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	9.9E+05	4.8E+06	--	--	1.1E+02	5.3E+02	--	--	9.9E+04	4.8E+05	--	--	**9.9E+04**	**4.8E+05**
Foaming Agents	0	--	--	5.0E+02	--	--	--	4.5E+05	--	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	**4.5E+04**	--
Guthion	0	--	1.0E-02	--	--	--	1.8E+00	--	--	--	2.5E-03	--	--	--	4.4E-01	--	--	--	**4.4E-01**	--	--
Heptachlor [c]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.5E+01	6.7E-01	1.4E+00	1.4E+00	1.3E-01	9.5E-04	7.9E-05	7.9E-05	3.9E+00	1.7E-01	1.4E-01	1.4E-01	**3.9E+00**	**1.7E-01**	**1.4E-01**	**1.4E-01**
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.5E+01	6.7E-01	6.8E-01	6.8E-01	1.3E-01	9.5E-04	3.9E-05	3.9E-05	3.9E+00	1.7E-01	6.8E-02	6.8E-02	**3.9E+00**	**1.7E-01**	**6.8E-02**	**6.8E-02**
Hexachlorobenzene[c]	0	--	--	2.8E-03	2.9E-03	--	--	4.9E+00	5.1E+00	--	--	2.8E-04	2.9E-04	--	--	4.9E-01	5.1E-01	--	--	**4.9E-01**	**5.1E-01**
Hexachlorobutadiene[c]	0	--	--	4.4E+00	1.8E+02	--	--	7.7E+03	3.2E+05	--	--	4.4E-01	1.8E+01	--	--	7.7E+02	3.2E+04	--	--	**7.7E+02**	**3.2E+04**
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	2.6E-02	4.9E-02	--	--	4.6E+01	8.6E+01	--	--	2.6E-03	4.9E-03	--	--	4.6E+00	8.6E+00	--	--	**4.6E+00**	**8.6E+00**
Hexachlorocyclohexane Beta BHC[c]	0	--	--	9.1E-02	1.7E-01	--	--	1.6E+02	3.0E+02	--	--	9.1E-03	1.7E-02	--	--	1.6E+01	3.0E+01	--	--	**1.6E+01**	**3.0E+01**
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	2.8E+01	--	1.7E+03	3.2E+03	2.4E-01	--	9.8E-02	1.8E-01	7.1E+00	--	1.7E+02	3.2E+02	**7.1E+00**	--	**1.7E+02**	**3.2E+02**
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	3.6E+04	9.9E+05	--	--	4.0E+00	1.1E+02	--	--	3.6E+03	9.9E+04	--	--	**3.6E+03**	**9.9E+04**
Hexachloroethane[c]	0	--	--	1.4E+01	3.3E+01	--	--	2.5E+04	5.8E+04	--	--	1.4E+00	3.3E+00	--	--	2.5E+03	5.8E+03	--	--	**2.5E+03**	**5.8E+03**
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	3.5E+02	--	--	--	5.0E-01	--	--	--	8.9E+01	--	--	--	**8.9E+01**	--	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	3.8E-03	1.8E-02	--	--	6.7E+00	3.2E+01	--	--	**6.7E+00**	**3.2E+01**
Iron	0	--	--	3.0E+02	--	--	--	2.7E+05	--	--	--	3.0E+01	--	--	--	2.7E+04	--	--	--	**2.7E+04**	--
Isophorone[c]	0	--	--	3.5E+02	9.6E+03	--	--	6.1E+05	1.7E+07	--	--	3.5E+01	9.6E+02	--	--	6.1E+04	1.7E+06	--	--	**6.1E+04**	**1.7E+06**
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	--	--
Lead	0	3.7E+02	1.0E+01	1.5E+01	--	1.1E+04	1.8E+03	1.4E+04	--	9.1E+01	2.5E+00	1.5E+00	--	2.7E+03	4.5E+02	1.4E+03	--	**2.7E+03**	**4.5E+02**	**1.4E+03**	--
Malathion	0	--	1.0E-01	--	--	--	1.8E+01	--	--	--	2.5E-02	--	--	--	4.4E+00	--	--	--	**4.4E+00**	--	--
Manganese	0	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	5.0E+00	--	--	--	4.5E+03	--	--	--	**4.5E+03**	--
Mercury	0	1.4E+00	7.7E-01	--	--	4.2E+01	1.4E+02	--	--	3.5E-01	1.9E-01	--	--	1.0E+01	3.4E+01	--	--	**1.0E+01**	**3.4E+01**	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	4.2E+04	1.4E+06	--	--	4.7E+00	1.5E+02	--	--	4.2E+03	1.4E+05	--	--	**4.2E+03**	**1.4E+05**
Methylene Chloride [c]	0	--	--	4.6E+01	5.9E+03	--	--	8.1E+04	1.0E+07	--	--	4.6E+00	5.9E+02	--	--	8.1E+03	1.0E+06	--	--	**8.1E+03**	**1.0E+06**
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	5.3E+00	9.0E+04	--	--	7.5E-03	1.0E+01	--	--	1.3E+00	9.0E+03	--	--	**1.3E+00**	**9.0E+03**	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	**0.0E+00**	--	--
Nickel	0	3.8E+02	1.7E+01	6.1E+02	4.6E+03	1.1E+04	3.0E+03	5.5E+05	4.2E+06	9.6E+01	4.2E+00	6.1E+01	4.6E+02	2.9E+03	7.4E+02	5.5E+04	4.2E+05	**2.9E+03**	**7.4E+02**	**5.5E+04**	**4.2E+05**
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	9.0E+06	--	--	--	1.0E+03	--	--	--	9.0E+05	--	--	--	**9.0E+05**	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.5E+04	6.2E+05	--	--	1.7E+00	6.9E+01	--	--	1.5E+03	6.2E+04	--	--	**1.5E+03**	**6.2E+04**
N-Nitrosodimethylamine[c]	0	--	--	6.9E-03	3.0E+01	--	--	1.2E+01	5.3E+04	--	--	6.9E-04	3.0E+00	--	--	1.2E+00	5.3E+03	--	--	**1.2E+00**	**5.3E+03**
N-Nitrosodiphenylamine[c]	0	--	--	3.3E+01	6.0E+01	--	--	5.8E+04	1.1E+05	--	--	3.3E+00	6.0E+00	--	--	5.8E+03	1.1E+04	--	--	**5.8E+03**	**1.1E+04**
N-Nitrosodi-n-propylamine[c]	0	--	--	5.0E-02	5.1E+00	--	--	8.8E+01	8.9E+03	--	--	5.0E-03	5.1E-01	--	--	8.8E+00	8.9E+02	--	--	**8.8E+00**	**8.9E+02**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	8.3E+02	1.2E+03	--	--	7.0E+00	1.7E+00	--	--	2.1E+02	2.9E+02	--	--	**2.1E+02**	**2.9E+02**	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.9E+00	2.3E+00	--	--	1.6E-02	3.3E-03	--	--	4.8E-01	5.8E-01	--	--	**4.8E-01**	**5.8E-01**	--	--
PCB Total[c]	0	--	1.4E-02	6.4E-04	6.4E-04	--	2.5E+00	1.1E+00	1.1E+00	--	3.5E-03	6.4E-05	6.4E-05	--	6.2E-01	1.1E-01	1.1E-01	--	**6.2E-01**	**1.1E-01**	**1.1E-01**
Pentachlorophenol [c]	0	7.8E+00	6.0E+00	2.7E+00	3.0E+01	2.3E+02	1.1E+03	4.7E+03	5.3E+04	2.0E+00	1.5E+00	2.7E-01	3.0E+00	5.8E+01	2.7E+02	4.7E+02	5.3E+03	**5.8E+01**	**2.7E+02**	**4.7E+02**	**5.3E+03**
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	9.0E+06	7.8E+08	--	--	1.0E+03	8.6E+04	--	--	9.0E+05	7.8E+07	--	--	**9.0E+05**	**7.8E+07**
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	7.5E+05	3.6E+06	--	--	8.3E+01	4.0E+02	--	--	7.5E+04	3.6E+05	--	--	**7.5E+04**	**3.6E+05**
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.4E+04	--	--	--	1.5E+00	--	--	--	1.4E+03	--	--	--	**1.4E+03**	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	4.0E+00	--	--	3.6E+03	3.6E+03	--	--	4.0E-01	4.0E-01	--	--	3.6E+02	3.6E+02	--	--	**3.6E+02**	**3.6E+02**
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	4.5E+03	--	--	--	5.0E-01	--	--	--	4.5E+02	--	--	--	**4.5E+02**	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.7E+04	--	--	--	3.0E+00	--	--	--	2.7E+03	--	--	--	**2.7E+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**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	5.9E+02	8.9E+02	1.5E+05	3.8E+06	5.0E+00	1.3E+00	1.7E+01	4.2E+02	1.5E+02	2.2E+02	1.5E+04	3.8E+05	**1.5E+02**	**2.2E+02**	**1.5E+04**	**3.8E+05**
Silver	0	1.6E+01	--	--	--	4.7E+02	--	--	--	3.9E+00	--	--	--	1.2E+02	--	--	--	**1.2E+02**	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	2.3E+08	--	--	--	2.5E+04	--	--	--	2.3E+07	--	--	--	**2.3E+07**	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	3.0E+03	7.0E+04	--	--	1.7E-01	4.0E+00	--	--	3.0E+02	7.0E+03	--	--	**3.0E+02**	**7.0E+03**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	1.2E+04	5.8E+04	--	--	6.9E-01	3.3E+00	--	--	1.2E+03	5.8E+03	--	--	**1.2E+03**	**5.8E+03**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.2E+02	4.2E+02	--	--	2.4E-02	4.7E-02	--	--	2.2E+01	4.2E+01	--	--	**2.2E+01**	**4.2E+01**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	4.6E+05	5.4E+06	--	--	5.1E+01	6.0E+02	--	--	4.6E+04	5.4E+05	--	--	**4.6E+04**	**5.4E+05**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	4.5E+08	--	--	--	5.0E+04	--	--	--	4.5E+07	--	--	--	**4.5E+07**	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	2.2E+01	3.5E-02	4.9E+00	4.9E+00	1.8E-01	5.0E-05	2.8E-04	2.8E-04	5.4E+00	8.9E-03	4.9E-01	4.9E-01	**5.4E+00**	**8.9E-03**	**4.9E-01**	**4.9E-01**
Tributyltin	0	4.6E-01	7.2E-02	--	--	1.4E+01	1.3E+01	--	--	1.2E-01	1.8E-02	--	--	3.4E+00	3.2E+00	--	--	**3.4E+00**	**3.2E+00**	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.2E+04	6.3E+04	--	--	3.5E+00	7.0E+00	--	--	3.2E+03	6.3E+03	--	--	**3.2E+03**	**6.3E+03**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	1.0E+04	2.8E+05	--	--	5.9E-01	1.6E+01	--	--	1.0E+03	2.8E+04	--	--	**1.0E+03**	**2.8E+04**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	4.4E+04	5.3E+05	--	--	2.5E+00	3.0E+01	--	--	4.4E+03	5.3E+04	--	--	**4.4E+03**	**5.3E+04**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	2.5E+04	4.2E+04	--	--	1.4E+00	2.4E+00	--	--	2.5E+03	4.2E+03	--	--	**2.5E+03**	**4.2E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	5.0E+00	--	--	--	4.5E+03	--	--	--	**4.5E+03**	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	4.4E+02	4.2E+04	--	--	2.5E-02	2.4E+00	--	--	4.4E+01	4.2E+03	--	--	**4.4E+01**	**4.2E+03**
Zinc	0	2.5E+02	9.8E+01	7.4E+03	2.6E+04	7.4E+03	1.7E+04	6.7E+06	2.3E+07	6.2E+01	2.4E+01	7.4E+02	2.6E+03	1.8E+03	4.3E+03	6.7E+05	2.3E+06	**1.8E+03**	**4.3E+03**	**6.7E+05**	**2.3E+06**

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 and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	5.1E+02
Arsenic	9.0E+02
Barium	1.8E+05
Cadmium	2.5E+01
Chromium III	1.6E+03
Chromium VI	4.8E+01
Copper	9.2E+01
Iron	2.7E+04
Lead	2.7E+02
Manganese	4.5E+03
Mercury	4.2E+00
Nickel	4.5E+02
Selenium	5.9E+01
Silver	4.7E+01
Zinc	7.4E+02

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

ATTACHMENT 8

SPECIAL CONDITIONS RATIONALE

B. ADDITIONAL TOTAL RESIDUAL CHLORINE (TRC) LIMITATIONS AND MONITORING REQUIREMENTS

Rationale: The State Water Quality Standards, 9 VAC 25-260-160 (Fecal coliform bacteria; shellfish waters) and 9 VAC 25-260-170 (Bacteria; other waters) address bacterial standards in surface waters and sewage discharges. These internal limitations and monitoring requirements are designed to achieve those water quality standards. In addition, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) in order to achieve compliance with the permit (includes laboratory controls and QA/QC). This requirement will also insure both continued proper operation of the chlorination facilities and maintenance of a minimum level of chlorine in order to achieve adequate disinfection.

C. SCHEDULE OF COMPLIANCE

Rationale: In accordance with the VPDES Permit Regulation, 9 VAC 25-31-250, and 40 CFR 122.47, the permit may, when appropriate, specify a schedule of compliance leading to compliance with the Clean Water Act, laws and regulations. The federal requirement that allows the ability to extend a schedule of compliance beyond the term of an existing permit was acknowledged in a 1992 EPA Environmental Appeals Board decision (re Star-Kist Caribe, Inc. NPDES Appeal No. 88-5 (May 26, 1992)).

D. OTHER REQUIREMENTS OR SPECIAL CONDITIONS

1. Permit Reopeners

a. Sludge Reopener

Rationale: Required by the VPDES Permit Regulation, 9 VAC 25-31-220 C., and 40 CFR 122.44(c)(4), which note that all permits for domestic sewage treatment plants (including sludge-only facilities) include any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Clean Water Act.

b. Water Quality Criteria Reopener

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-220 D., Water Quality Standards and State Requirements, requires that the permit include limits to achieve water quality standards, including the narrative criteria. 40 CFR Part 131, Water Quality Standards, requires the state to adopt water quality criteria to protect designated water uses (subpart 131.11), and review, modify and adopt water quality standards periodically (subpart 131.20). Section 302 of the Clean Water Act authorizes effluent limitations to be established which will contribute to the attainment or maintenance of the water quality.

c. Total Maximum Daily Load (TMDL)] Reopener

Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired in order that they achieve the applicable water quality standards. This condition allows for the permit to be either modified or, alternatively, revoked and reissued to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to section 402(o)(l) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan or other waste load allocation prepared under section 303 of the Act.

2. Licensed Wastewater Operator Requirement

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 D., requires the permittee to employ or contract at least one wastewater works operator who holds a current wastewater license for the permitted facility. The Code of Virginia 54.1-2300 et seq., Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.) requires licensure of operators. In addition, the Sewerage Collection and Treatment Regulations (12 VAC 5-581-10 et seq.), recommends a manning and classification schedule for domestic wastewater treatment plant operators, based on plant capacity and specific treatment types.

3. Operations & Maintenance (O & M) Manual

Rationale: The State Water Control Law, Section 62.1-44.16 requires the submittal of pertinent plans, specifications, maps and such other relevant information as may be required and Section 62.1-44.21 allows requests for any information necessary to determine the effect of the discharge on state waters. Required by the VPDES Permit Regulation, 9 VAC 25-31-190 E. Section 401 of the Clean Water Act requires the permittee to provide opportunity for the state to review the proposed operations of the facility. In addition, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) in order to achieve compliance with the permit (includes laboratory controls and QA/QC).

4. 95% Design Capacity Notification

Rationale: Required by the VPDES Permit Regulation, 9 VAC 25-31-200 B.2., for all POTWs and PVOTWs in order to insure continued compliance with the terms of the permit.

5. Notification Levels

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 A. and 40 CFR 122.42 (a) require notification of the discharge of certain parameters at or above specific concentrations for all manufacturing, commercial, mining and silvicultural discharges.

6. Compliance Reporting Under Part I.A.

Rationale: Authorized by the VPDES Permit Regulation, 9 VAC 25-31-190 J.4. and 220 I. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

7. Effluent Monitoring Frequencies

Rationale: The permittee is granted a reduction in monitoring frequency based on a history of permit compliance. To remain eligible for the reduction, the permittee should not have violations that result in enforcement actions. If the permittee fails to maintain the previous level of performance, the baseline monitoring frequencies should be reinstated. The incentive for reduced monitoring is an effort to reduce the cost of environmental compliance and to provide incentives to facilities which demonstrate outstanding performance and consistent compliance with their permits. Facilities which cannot comply with specific effluent parameters or have other related violations will not be eligible for this benefit. This is in conformance with Guidance Memorandum No. 98-2005 - Reduced Monitoring and EPA's proposed "Interim Guidance For Performance-Based Reduction of NPDES Permit Monitoring Frequencies" (EPA 833-B-96-001) published in April 1996.

8. Water Quality Monitoring

Rationale: The State Water Control Law, Section 62.1-44.21, authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To insure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of the permit.

9. Ground Water Monitoring Plan

Rationale: The State Water Control Law, Section 62.1-44.21, authorizes the Board to request information needed to determine the discharge's impact on State waters. Ground water monitoring for parameters of concern will indicate whether the system integrity is being maintained and will determine if activities at the site are resulting in violations of the State Water Control Board's Ground Water Standards.

10. Sludge Use and Disposal

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-100 P., 220 B.2. and 420 through 720, and 40 CFR 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal. The VPDES sewage sludge permit application form and its attachments constitute the sludge management plan and will be considered for approval with the VPDES permit. Technical requirements may be derived from the Department of Health's Biosolids Use Regulation, 12 VAC 5-585-10 et seq. and sections 330 and 340 of that regulation specify the general purpose and control requirements for an O&M manual in order to facilitate proper O&M of the facilities to meet the requirements of the regulation.

11. PCB Discharge Prohibition

Rationale: Required by 40 CFR Part 423.15 for steam electric plants.

12. Metals Cleaning Waters Discharge Prohibition

Rationale: Best Professional Judgment as an alternative to the discharge limits established by 40 CFR Part 423.15 for chemical metal cleaning operations.

13. PCB Monitoring

Rationale: This special condition requires the permittee to monitor and report PCB concentrations in dry weather and wet weather effluent samples consistent with 9 VAC 25-260-280. The results from this monitoring shall be used to implement the PCB TMDL that is being developed for the Roanoke River.

14. Permit Application Requirement

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-100 D. and 40 CFR 122.21 (d)(1) require a new application at least 180 days prior to expiration of the existing permit. In addition, the VPDES Permit Regulation, 9 VAC 25-31-100 E.1. and 40 CFR 122.21 (e)(1) note that a permit shall not be issued before receiving a complete application.

D. TOXICS MANAGEMENT PROGRAM (TMP)

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I., and 40 CFR 122.44(d) require monitoring in the permit to provide for and assure compliance with all applicable requirements of the Clean Water Act and the State Water Control Law. See additional justification included in this attachment.

E. STORM WATER MANAGEMENT CONDITIONS

Rationale: Required by the VPDES Permit Regulation. Section 9 VAC 25-31-10 defines discharges of storm water from industrial activity and includes 11 industrial categories [9 of which are covered by the VPDES general permit for discharges of storm water associated with industrial activity (9 VAC 25-151-10 et seq.)] Included in the covered categories are municipal treatment plants with a design flow of 1.0 MGD or more, or plants with approved pretreatment programs, as discharges of storm water associated with industrial activity. Section 9 VAC 25-31-120 requires a permit for all these discharges associated with an industrial activity. The storm water pollution prevention plan requirements are derived from the VPDES general permit 9 VAC 25-151-10 et seq., which is based on the EPA storm water multi-sector general permit for industrial activities.

1. General Storm Water Conditions

a. Sample Type

Rationale: This stipulates the proper sampling methodology for qualifying rain events from regulated storm water outfalls. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

b. Storm Event Data

Rationale: This sets forth the information which must be recorded and reported for each storm event sampling (ie. date and duration event, rainfall measurement, and duration between qualifying events). It requires the maintenance of daily rainfall logs which are to be reported. It also provides guidance for when there is no effluent to sample during a given period. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

c. Monitoring Waivers

Rationale: This condition allows the permittee to collect substitute samples of qualifying storm events in the event of adverse climatic conditions. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

d. Representative Outfalls

Rationale: This condition allows the permittee to submit the results of sampling from one outfall as representative of other similar outfalls, provided the permittee can demonstrate that the outfalls are substantially identical. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

e. Quarterly Visual Monitoring of Storm Water Quality

Rationale: This condition requires that visual examinations of storm water outfalls take place at a specified frequency and sets forth what information needs to be checked and documented. These examinations assist with the evaluation of the pollution prevention plan by providing a simple, low cost means of assessing the quality of storm water discharge with immediate feedback. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

f. Allowable Non-storm Water Discharges

Rationale: This condition requires that the storm water pollution prevention plan identify specified non-storm water discharges and ensure the implementation of appropriate pollution prevention measures for each of the non-storm water components of the discharge. Where these classes of non-storm water discharges are identified in the plan and where appropriate pollution prevention measures are evaluated, identified and implemented, they generally pose low risks to the environment. Also, identification of these discharges in the plan negates the need to cover them under a separate VPDES permit. Flows from fire fighting activities do not need to be identified in the plan due to the emergency nature of such discharges coupled with their low probability and the unpredictability of their occurrence. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

g. Releases of Hazardous Substances or Oil in Excess of Reportable Quantities

Rationale: This condition requires that the discharge of hazardous substances or oil from a facility be eliminated or minimized in accordance with the facility's storm water pollution prevention plan. If there is a discharge of a material in excess of a reportable quantity, it establishes the reporting requirements in accordance with state laws and federal regulations. In addition, the pollution prevention plan for the facility must be reviewed and revised as necessary to prevent a reoccurrence of the spill. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

h. Additional Requirements for Salt Storage

Rationale: This condition requires that storage piles of salt be covered except during those times when salt is either being added or removed. This is to prevent exposure to precipitation that could result in a brine discharge to surface waters which would be detrimental to the aquatic environment. If the runoff is collected and not discharged to surface waters, the facility is exempt from this requirement. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

i. Water Quality Protection

Rationale: This condition requires the permittee to select, install, implement and maintain BMPs in order to minimize pollutants in the storm water discharges to a point where applicable water quality standards are met. If there is evidence in that the discharge is creating water quality problems, DEQ may require the implementation of additional BMPs to correct the problem or take appropriate enforcement action. Use of this condition is a BPJ determination and is based on the VPDES general permit for discharges of storm water associated with industrial activity, 9 VAC 25-151-10 et seq.

2. Storm Water Pollution Prevention Plan

Rationale: The Clean Water Act 402(p)(2)(B) requires permits for storm water discharges associated with industrial activity. VPDES permits for storm water discharges must establish BAT/BCT requirements in accordance with 402(p)(3) of the Act. The Storm Water Pollution Prevention Plan is the vehicle proposed by EPA in the NPDES Baseline Industrial Storm Water General Permit (published in the Federal Register September 9, 1992) to meet the requirements of the Act. Additionally, the VPDES Permit Regulation, 9 VAC 25-31-220 K., and 40 CFR 122.44 (k) allow BMPs for the control of pollutants where numeric limits are infeasible or BMPs are needed to accomplish the purpose/intent of the law.

ATTACHMENT 9

MATERIAL STORED

Clover Power Station may also use a number of other chemicals, or products containing, the following chemicals. Potential use of these chemicals is based upon their use at other similar Dominion facilities.

Ammonium hydroxide	Ammonium biflouride
EDTA	Potassium hydroxide
Sodium phosphate (dibasic)	Sodium Phosphate (tribasic)
Hydrochloric acid	Toluene
Sodium nitrite	Ethylene Glycol
Naphthalene	Acetic Acid
Naphtha	Polydimethylsiloxane emulsion

The above chemicals and chemical types have the potential to appear in discharges from the Clover Power Station at very low concentrations (i.e., below the level of detection).

Table 1. The following is a list of chemicals that may be used, are being used, or have been used in the past at the Clover Power Station.

CHEMICAL NAME OR BRAND	DESCRIPTION OF CHEMICAL	TYPCIAL USE OF CHEMICAL	OUTFALLS POTENTIALLY AFFECTED
50% Sodium Hydroxide		Water treatment (ponds, demin, service water)	001, 002, 009, 102
AD 20	Acidic RO cleaner	Water treatment (RO)	101, 102
Adipic acid		Used in scrubber to improve efficiency	Traces in CCBs to landfill
AK 110	Alkaline RO cleaner	Water treatment (RO)	101, 102
Alum	aluminum sulfate	Water treatment (raw water)	001, 102
Anhydrous ammonia	Refrigerant grade, gaseous	Boiler water treatment	001, 102
Citric acid	pH adjustment	Wastewater treatment (holding pond, coal pile runoff pond, landfill ponds)	001, 002, , 009
Crusting agent	Latex based	Coal pile	002
BETZ AF1440	Oil-based defoamer	Scrubber	Traces in CCBs to landfill
BETZ DK9470	Silicone-based defoamer	Scrubber	Traces in CCBs to landfill
BETZ BL5305	HEDP inhibitor/dispersant	Water treatment (cooling tower)	001,101
Hydrogen peroxide		Used in cooling towers for cleanings	001, 101
Klaraid PC 1192	Flocculent	Wastewater treatment (STP, coal pile runoff pond,).	001, 002, 011, 012, 013, 014, 015, 016, 102
Klaraid CDP1346	Flocculent	Same as Alum	001, 101, 102
Polyfloc AP 1120	Anionic polymer	Water treatment (raw water)	001, 101, 102
Polyfloc 2685	Anionic polymer	Flyash	Traces in CCBs to landfill
Sanuril 115	Calcium hypochlorite	Wastewater treatment (STP)	001, 103

CHEMICAL NAME OR BRAND	DESCRIPTION OF CHEMICAL	TYPCIAL USE OF CHEMICAL	OUTFALLS POTENTIALLY AFFECTED
Polyfloc AE 1115/ AE 1120/ AE 1125	Polymer for settling solids	Scrubber (thickener) and wastewater (landfill pond)	001, 003, 009, 011, 012, 013, 014, 015, 016, 102
Soda ash	Technical grade	Wastewater treatment (STP and coal pile runoff pond)	001, 002, 009, 102
Sodium Bromide	Bromine-based biocide	Water treatment (cooling tower)	001, 101, 102
Sodium Hypochlorite	>12%	Water treatment (cooling tower, service water)	001, 101, 102
Sodium Metabisulfite	Technical grade	Water treatment (demineralizer)	001, 102
Sulfuric Acid	> 93%	Water treatment (cooling tower, RO, demineralizer)	001, 101, 102
Urea		Used for NOx control	001, 102, possibly in CCBs headed for landfill (009).

ATTACHMENT 10

RECEIVING WATERS INFO./
TIER DETERMINATION/STORET DATA

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Clover Power Station (009) Permit No.: VA0083097

Receiving Stream: Roanoke River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	47.5	mg/L
90% Temperature (Annual) =	26.5	deg C
90% Temperature (Wet season) =	16.9	deg C
90% Maximum pH =	7.6	SU
10% Maximum pH =	6.9	SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	Y	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows

1Q10 (Annual) =	18.2	MGD
7Q10 (Annual) =	111.6	MGD
30Q10 (Annual) =	485	MGD
1Q10 (Wet season) =	408	MGD
30Q10 (Wet season)	789	MGD
30Q5 =	572	MGD
Harmonic Mean =	1110	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) =	5814	mg/L
90% Temp (Annual) =	27.2	deg C
90% Temp (Wet season) =	7.2	deg C
90% Maximum pH =	7.4	SU
10% Maximum pH =	6.7	SU
Discharge Flow =	0.634	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	--	--	6.7E+02	9.9E+02	--	--	6.1E+05	8.9E+05	--	--	--	--	--	--	--	--	--	--	6.1E+05	8.9E+05
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	5.5E+03	8.4E+03	--	--	--	--	--	--	--	--	--	--	5.5E+03	8.4E+03
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	8.9E+02	4.4E+03	--	--	--	--	--	--	--	--	--	--	8.9E+02	4.4E+03
Aldrin [c]	0	3.0E+00	--	4.9E-04	5.0E-04	8.9E+01	--	8.6E-01	8.8E-01	--	--	--	--	--	--	--	--	8.9E+01	--	8.6E-01	8.8E-01
Ammonia-N (mg/l) (Yearly)	0	1.73E+01	1.84E+00	--	--	5.1E+02	1.4E+03	--	--	--	--	--	--	--	--	--	--	5.1E+02	1.4E+03	--	--
Ammonia-N (mg/l) (High Flow)	0	1.70E+01	3.41E+00	--	--	1.1E+04	4.2E+03	--	--	--	--	--	--	--	--	--	--	1.1E+04	4.2E+03	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	7.5E+06	3.6E+07	--	--	--	--	--	--	--	--	--	--	7.5E+06	3.6E+07
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.1E+03	5.8E+05	--	--	--	--	--	--	--	--	--	--	5.1E+03	5.8E+05
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.0E+04	2.7E+04	9.0E+03	--	--	--	--	--	--	--	--	--	1.0E+04	2.7E+04	9.0E+03	--
Barium	0	--	--	2.0E+03	--	--	--	1.8E+06	--	--	--	--	--	--	--	--	--	--	--	1.8E+06	--
Benzene [c]	0	--	--	2.2E+01	5.1E+02	--	--	3.9E+04	8.9E+05	--	--	--	--	--	--	--	--	--	--	3.9E+04	8.9E+05
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	1.5E+00	3.5E+00	--	--	--	--	--	--	--	--	--	--	1.5E+00	3.5E+00
Benzo (a) anthracene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	--	--	--	--	--	--	--	--	6.7E+01	3.2E+02
Benzo (b) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	--	--	--	--	--	--	--	--	6.7E+01	3.2E+02
Benzo (k) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	--	--	--	--	--	--	--	--	6.7E+01	3.2E+02
Benzo (a) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	--	--	--	--	--	--	--	--	6.7E+01	3.2E+02
Bis2-Chloroethyl Ether [c]	0	--	--	3.0E-01	5.3E+00	--	--	5.3E+02	9.3E+03	--	--	--	--	--	--	--	--	--	--	5.3E+02	9.3E+03
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.3E+06	5.9E+07	--	--	--	--	--	--	--	--	--	--	1.3E+06	5.9E+07
Bis 2-Ethylhexyl Phthalate [c]	0	--	--	1.2E+01	2.2E+01	--	--	2.1E+04	3.9E+04	--	--	--	--	--	--	--	--	--	--	2.1E+04	3.9E+04
Bromoform [c]	0	--	--	4.3E+01	1.4E+03	--	--	7.5E+04	2.5E+06	--	--	--	--	--	--	--	--	--	--	7.5E+04	2.5E+06
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.4E+06	1.7E+06	--	--	--	--	--	--	--	--	--	--	1.4E+06	1.7E+06
Cadmium	0	1.1E+01	9.5E-01	5.0E+00	--	3.2E+02	1.7E+02	4.5E+03	--	--	--	--	--	--	--	--	--	3.2E+02	1.7E+02	4.5E+03	--
Carbon Tetrachloride [c]	0	--	--	2.3E+00	1.6E+01	--	--	4.0E+03	2.8E+04	--	--	--	--	--	--	--	--	--	--	4.0E+03	2.8E+04
Chlordane [c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	7.1E+01	7.6E-01	1.4E+01	1.4E+01	--	--	--	--	--	--	--	--	7.1E+01	7.6E-01	1.4E+01	1.4E+01
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	2.6E+07	4.1E+07	2.3E+08	--	--	--	--	--	--	--	--	--	2.6E+07	4.1E+07	2.3E+08	--
TRC	0	1.9E+01	1.1E+01	--	--	5.6E+02	1.9E+03	--	--	--	--	--	--	--	--	--	--	5.6E+02	1.9E+03	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.2E+05	1.4E+06	--	--	--	--	--	--	--	--	--	--	1.2E+05	1.4E+06

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	--	--	4.0E+00	1.3E+02	--	--	7.0E+03	2.3E+05	--	--	--	--	--	--	--	--	--	--	7.0E+03	2.3E+05
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	3.1E+05	9.9E+06	--	--	--	--	--	--	--	--	--	--	3.1E+05	9.9E+06
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	9.0E+05	1.4E+06	--	--	--	--	--	--	--	--	--	--	9.0E+05	1.4E+06
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	7.3E+04	1.4E+05	--	--	--	--	--	--	--	--	--	--	7.3E+04	1.4E+05
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	2.5E+00	7.3E+00	--	--	--	--	--	--	--	--	--	--	2.5E+00	7.3E+00	--	--
Chromium III	0	1.2E+03	6.2E+01	--	--	3.5E+04	1.1E+04	--	--	--	--	--	--	--	--	--	--	3.5E+04	1.1E+04	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	4.8E+02	1.9E+03	--	--	--	--	--	--	--	--	--	--	4.8E+02	1.9E+03	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	9.0E+04	--	--	--	--	--	--	--	--	--	--	--	9.0E+04	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	6.7E+00	3.2E+01	--	--	--	--	--	--	--	--	--	--	6.7E+00	3.2E+01
Copper	0	3.1E+01	7.4E+00	1.3E+03	--	9.2E+02	1.3E+03	1.2E+06	--	--	--	--	--	--	--	--	--	9.2E+02	1.3E+03	1.2E+06	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	6.5E+02	9.2E+02	1.3E+05	1.4E+07	--	--	--	--	--	--	--	--	6.5E+02	9.2E+02	1.3E+05	1.4E+07
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	5.4E+00	5.4E+00	--	--	--	--	--	--	--	--	--	--	5.4E+00	5.4E+00
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	3.9E+00	3.9E+00	--	--	--	--	--	--	--	--	--	--	3.9E+00	3.9E+00
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	3.3E+01	1.8E-01	3.9E+00	3.9E+00	--	--	--	--	--	--	--	--	3.3E+01	1.8E-01	3.9E+00	3.9E+00
Demeton	0	--	1.0E-01	--	--	--	1.8E+01	--	--	--	--	--	--	--	--	--	--	--	1.8E+01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	5.1E+00	3.0E+01	--	--	--	--	--	--	--	--	--	--	5.1E+00	3.0E+01	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	--	--	--	--	--	--	--	--	6.7E+01	3.2E+02
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	3.8E+05	1.2E+06	--	--	--	--	--	--	--	--	--	--	3.8E+05	1.2E+06
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.9E+05	8.7E+05	--	--	--	--	--	--	--	--	--	--	2.9E+05	8.7E+05
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	5.7E+04	1.7E+05	--	--	--	--	--	--	--	--	--	--	5.7E+04	1.7E+05
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	3.7E+02	4.9E+02	--	--	--	--	--	--	--	--	--	--	3.7E+02	4.9E+02
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	9.6E+03	3.0E+05	--	--	--	--	--	--	--	--	--	--	9.6E+03	3.0E+05
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	6.7E+03	6.5E+05	--	--	--	--	--	--	--	--	--	--	6.7E+03	6.5E+05
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	3.0E+05	6.4E+06	--	--	--	--	--	--	--	--	--	--	3.0E+05	6.4E+06
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.3E+05	9.0E+06	--	--	--	--	--	--	--	--	--	--	1.3E+05	9.0E+06
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	7.0E+04	2.6E+05	--	--	--	--	--	--	--	--	--	--	7.0E+04	2.6E+05
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	9.0E+04	--	--	--	--	--	--	--	--	--	--	--	9.0E+04	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	8.8E+03	2.6E+05	--	--	--	--	--	--	--	--	--	--	8.8E+03	2.6E+05
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	6.0E+03	3.7E+05	--	--	--	--	--	--	--	--	--	--	6.0E+03	3.7E+05
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	7.1E+00	9.9E+00	9.1E-01	9.5E-01	--	--	--	--	--	--	--	--	7.1E+00	9.9E+00	9.1E-01	9.5E-01
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.5E+07	4.0E+07	--	--	--	--	--	--	--	--	--	--	1.5E+07	4.0E+07
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.4E+05	7.7E+05	--	--	--	--	--	--	--	--	--	--	3.4E+05	7.7E+05
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.4E+08	9.9E+08	--	--	--	--	--	--	--	--	--	--	2.4E+08	9.9E+08
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.8E+06	4.1E+06	--	--	--	--	--	--	--	--	--	--	1.8E+06	4.1E+06
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	6.2E+04	4.8E+06	--	--	--	--	--	--	--	--	--	--	6.2E+04	4.8E+06
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.2E+04	2.5E+05	--	--	--	--	--	--	--	--	--	--	1.2E+04	2.5E+05
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	1.9E+03	6.0E+04	--	--	--	--	--	--	--	--	--	--	1.9E+03	6.0E+04
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	4.5E-05	4.6E-05	--	--	--	--	--	--	--	--	--	--	4.5E-05	4.6E-05
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	6.3E+02	3.5E+03	--	--	--	--	--	--	--	--	--	--	6.3E+02	3.5E+03
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	6.5E+00	9.9E+00	5.6E+04	8.0E+04	--	--	--	--	--	--	--	--	6.5E+00	9.9E+00	5.6E+04	8.0E+04
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	6.5E+00	9.9E+00	5.6E+04	8.0E+04	--	--	--	--	--	--	--	--	6.5E+00	9.9E+00	5.6E+04	8.0E+04
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	6.5E+00	9.9E+00	--	--	--	--	--	--	--	--	--	--	6.5E+00	9.9E+00	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	5.6E+04	8.0E+04	--	--	--	--	--	--	--	--	--	--	5.6E+04	8.0E+04
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.6E+00	6.4E+00	5.3E+01	5.4E+01	--	--	--	--	--	--	--	--	2.6E+00	6.4E+00	5.3E+01	5.4E+01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.6E+02	2.7E+02	--	--	--	--	--	--	--	--	--	--	2.6E+02	2.7E+02

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	--	--	5.3E+02	2.1E+03	--	--	4.8E+05	1.9E+06	--	--	--	--	--	--	--	--	--	--	4.8E+05	1.9E+06
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.2E+05	1.3E+05	--	--	--	--	--	--	--	--	--	--	1.2E+05	1.3E+05
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	9.9E+05	4.8E+06	--	--	--	--	--	--	--	--	--	--	9.9E+05	4.8E+06
Foaming Agents	0	--	--	5.0E+02	--	--	--	4.5E+05	--	--	--	--	--	--	--	--	--	--	--	4.5E+05	--
Guthion	0	--	1.0E-02	--	--	--	1.8E+00	--	--	--	--	--	--	--	--	--	--	--	1.8E+00	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.5E+01	6.7E-01	1.4E+00	1.4E+00	--	--	--	--	--	--	--	--	1.5E+01	6.7E-01	1.4E+00	1.4E+00
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.5E+01	6.7E-01	6.8E-01	6.8E-01	--	--	--	--	--	--	--	--	1.5E+01	6.7E-01	6.8E-01	6.8E-01
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	4.9E+00	5.1E+00	--	--	--	--	--	--	--	--	--	--	4.9E+00	5.1E+00
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	7.7E+03	3.2E+05	--	--	--	--	--	--	--	--	--	--	7.7E+03	3.2E+05
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	4.6E+01	8.6E+01	--	--	--	--	--	--	--	--	--	--	4.6E+01	8.6E+01
Hexachlorocyclohexane Beta BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	1.6E+02	3.0E+02	--	--	--	--	--	--	--	--	--	--	1.6E+02	3.0E+02
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	2.8E+01	--	1.7E+03	3.2E+03	--	--	--	--	--	--	--	--	2.8E+01	--	1.7E+03	3.2E+03
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	3.6E+04	9.9E+05	--	--	--	--	--	--	--	--	--	--	3.6E+04	9.9E+05
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	2.5E+04	5.8E+04	--	--	--	--	--	--	--	--	--	--	2.5E+04	5.8E+04
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	3.5E+02	--	--	--	--	--	--	--	--	--	--	--	3.5E+02	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.7E+01	3.2E+02	--	--	--	--	--	--	--	--	--	--	6.7E+01	3.2E+02
Iron	0	--	--	3.0E+02	--	--	--	2.7E+05	--	--	--	--	--	--	--	--	--	--	--	2.7E+05	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	6.1E+05	1.7E+07	--	--	--	--	--	--	--	--	--	--	6.1E+05	1.7E+07
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	--	--
Lead	0	3.7E+02	1.0E+01	1.5E+01	--	1.1E+04	1.8E+03	1.4E+04	--	--	--	--	--	--	--	--	--	1.1E+04	1.8E+03	1.4E+04	--
Malathion	0	--	1.0E-01	--	--	--	1.8E+01	--	--	--	--	--	--	--	--	--	--	--	1.8E+01	--	--
Manganese	0	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	--	--	--	--	--	--	--	--	4.5E+04	--
Mercury	0	1.4E+00	7.7E-01	--	--	4.2E+01	1.4E+02	--	--	--	--	--	--	--	--	--	--	4.2E+01	1.4E+02	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	4.2E+04	1.4E+06	--	--	--	--	--	--	--	--	--	--	4.2E+04	1.4E+06
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	8.1E+04	1.0E+07	--	--	--	--	--	--	--	--	--	--	8.1E+04	1.0E+07
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	5.3E+00	9.0E+04	--	--	--	--	--	--	--	--	--	--	5.3E+00	9.0E+04	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	--	--
Nickel	0	3.8E+02	1.7E+01	6.1E+02	4.6E+03	1.1E+04	3.0E+03	5.5E+05	4.2E+06	--	--	--	--	--	--	--	--	1.1E+04	3.0E+03	5.5E+05	4.2E+06
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	9.0E+06	--	--	--	--	--	--	--	--	--	--	--	9.0E+06	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.5E+04	6.2E+05	--	--	--	--	--	--	--	--	--	--	1.5E+04	6.2E+05
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	1.2E+01	5.3E+04	--	--	--	--	--	--	--	--	--	--	1.2E+01	5.3E+04
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	5.8E+04	1.1E+05	--	--	--	--	--	--	--	--	--	--	5.8E+04	1.1E+05
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	8.8E+01	8.9E+03	--	--	--	--	--	--	--	--	--	--	8.8E+01	8.9E+03
Nonylphenol	0	2.8E+01	6.6E+00	--	--	8.3E+02	1.2E+03	--	--	--	--	--	--	--	--	--	--	8.3E+02	1.2E+03	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.9E+00	2.3E+00	--	--	--	--	--	--	--	--	--	--	1.9E+00	2.3E+00	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	2.5E+00	1.1E+00	1.1E+00	--	--	--	--	--	--	--	--	--	2.5E+00	1.1E+00	1.1E+00
Pentachlorophenol [C]	0	7.8E+00	6.0E+00	2.7E+00	3.0E+01	2.3E+02	1.1E+03	4.7E+03	5.3E+04	--	--	--	--	--	--	--	--	2.3E+02	1.1E+03	4.7E+03	5.3E+04
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	9.0E+06	7.8E+08	--	--	--	--	--	--	--	--	--	--	9.0E+06	7.8E+08
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	7.5E+05	3.6E+06	--	--	--	--	--	--	--	--	--	--	7.5E+05	3.6E+06
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.4E+04	--	--	--	--	--	--	--	--	--	--	--	1.4E+04	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	4.0E+00	--	--	3.6E+03	3.6E+03	--	--	--	--	--	--	--	--	--	--	3.6E+03	3.6E+03
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	4.5E+03	--	--	--	--	--	--	--	--	--	--	--	4.5E+03	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.7E+04	--	--	--	--	--	--	--	--	--	--	--	2.7E+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**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	5.9E+02	8.9E+02	1.5E+05	3.8E+06	--	--	--	--	--	--	--	--	**5.9E+02**	**8.9E+02**	**1.5E+05**	**3.8E+06**
Silver	0	1.6E+01	--	--	--	4.7E+02	--	--	--	--	--	--	--	--	--	--	--	**4.7E+02**	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	2.3E+08	--	--	--	--	--	--	--	--	--	--	--	**2.3E+08**	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	3.0E+03	7.0E+04	--	--	--	--	--	--	--	--	--	--	**3.0E+03**	**7.0E+04**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	1.2E+04	5.8E+04	--	--	--	--	--	--	--	--	--	--	**1.2E+04**	**5.8E+04**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.2E+02	4.2E+02	--	--	--	--	--	--	--	--	--	--	**2.2E+02**	**4.2E+02**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	4.6E+05	5.4E+06	--	--	--	--	--	--	--	--	--	--	**4.6E+05**	**5.4E+06**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	4.5E+08	--	--	--	--	--	--	--	--	--	--	--	**4.5E+08**	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	2.2E+01	3.5E-02	4.9E+00	4.9E+00	--	--	--	--	--	--	--	--	**2.2E+01**	**3.5E-02**	**4.9E+00**	**4.9E+00**
Tributyltin	0	4.6E-01	7.2E-02	--	--	1.4E+01	1.3E+01	--	--	--	--	--	--	--	--	--	--	**1.4E+01**	**1.3E+01**	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.2E+04	6.3E+04	--	--	--	--	--	--	--	--	--	--	**3.2E+04**	**6.3E+04**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	1.0E+04	2.8E+05	--	--	--	--	--	--	--	--	--	--	**1.0E+04**	**2.8E+05**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	4.4E+04	5.3E+05	--	--	--	--	--	--	--	--	--	--	**4.4E+04**	**5.3E+05**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	2.5E+04	4.2E+04	--	--	--	--	--	--	--	--	--	--	**2.5E+04**	**4.2E+04**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	4.5E+04	--	--	--	--	--	--	--	--	--	--	--	**4.5E+04**	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	4.4E+02	4.2E+04	--	--	--	--	--	--	--	--	--	--	**4.4E+02**	**4.2E+04**
Zinc	0	2.5E+02	9.8E+01	7.4E+03	2.6E+04	7.4E+03	1.7E+04	6.7E+06	2.3E+07	--	--	--	--	--	--	--	--	**7.4E+03**	**1.7E+04**	**6.7E+06**	**2.3E+07**

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 and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	5.1E+03
Arsenic	4.0E+03
Barium	1.8E+06
Cadmium	1.0E+02
Chromium III	6.6E+03
Chromium VI	1.9E+02
Copper	3.7E+02
Iron	2.7E+05
Lead	1.1E+03
Manganese	4.5E+04
Mercury	1.7E+01
Nickel	1.8E+03
Selenium	2.4E+02
Silver	1.9E+02
Zinc	2.9E+03

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

12/2/2010 9:55:26 AM

Facility = Clover Power Station - 009
Chemical = chloride
Chronic averaging period = 4
WLAa = 26000000
WLAc = 41000000
Q.L. = 0.1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 3484840
Variance = 4371879
C.V. = 0.6
97th percentile daily values = 8480070
97th percentile 4 day average = 5798042
97th percentile 30 day average= 4202902
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3484840

12/2/2010 11:41:56 AM

Facility = Clover Power Station - 009
Chemical = ammonia
Chronic averaging period = 30
WLAa = 510
WLAc = 1400
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 22.8
Variance = 187.142
C.V. = 0.6
97th percentile daily values = 55.4819
97th percentile 4 day average = 37.9344
97th percentile 30 day average= 27.4980
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

22.8

12/3/2010 12:34:40 PM

Facility = Clover Power Station -009
Chemical = chloride
Chronic averaging period = 4
WLAa = 26000000
WLAc = 41000000
Q.L. = 0.1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 3484840
Variance = 4371879
C.V. = 0.6
97th percentile daily values = 8480070
97th percentile 4 day average = 5798042
97th percentile 30 day average= 4202902
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3484840

12/3/2010 12:34:48 PM

Facility = Clover Power Station -009
Chemical = chloride
Chronic averaging period = 4
WLAa = 26000000
WLAc = 41000000
Q.L. = 100
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 3484840
Variance = 4371879
C.V. = 0.6
97th percentile daily values = 8480070
97th percentile 4 day average = 5798042
97th percentile 30 day average= 4202902
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3484840

Wqm Water Shed Code	L38
Station ID	4ABWC001.00
Station Description	RTE 600
Lab Seq Num	1
Depth	0.3
Mrs Container Id Desc	R

Collection Date Time	Depth Des	Temp Celc	Do Probe	Field Ph
7/29/2003 12:35	S	25.96	4.28	6.81
8/19/2003 11:10	S	23.91	3.65	6.57
9/30/2003 13:40	S	16.82	6.21	6.31
10/28/2003 14:00	S	12.51	6.93	6.8
11/20/2003 12:50	S	12.31	7.32	6.55
12/30/2003 13:30	S	7.53	10.48	7.43
1/13/2004 12:40	S	2.97	10.64	6.95
2/18/2004 13:20	S	4.29	11.75	6.97
4/5/2004 13:55	S	13.07	11.18	7.28
4/27/2004 14:10	S	18.92	8.12	7.12
5/18/2004 13:00	S	23.82	7.96	6.48
6/22/2004 12:50	S	23.62	8.15	7.01
8/10/2005 13:25	S	25.64	9.29	7.4
12/13/2005 13:00	S	4.23	10.81	6.85
1/4/2006 11:55	S	6.9	10.21	6.75
2/2/2006 12:20	S	5.6	11.13	7.07
4/20/2006 14:40	S	21.3	8.3	7
6/14/2006 13:15	S	21.2	4.7	6.6
10/18/2006 11:00	S	14.2	5.5	6.9
12/5/2006 13:55	S	5.1	9.8	7.1
8/29/2007 11:40	D			
2/13/2008 12:30	S	4.2	8.9	6.4

Station_ID	4AROA067.91			LV2_Code	AMBNT
Station_De	RT.746 bridge (Watkins Bridge) near Rand			LV3_Code	ATRND
FIC_Count	83			Stream_Name	ROANOKE RIVER
FIC_State	51			HUC_Code	3010102
Rec_Code	SCRO			Basin_Code	4A
Latitude_D	36	54	55	Watershed_Code	VAC-L38R
Longitude_	-78	44	26	Station_Comment	Gage# 02066000
LV1_Code	STREAM			Percent_FRB	50

Collection Date_Time	Depth	Field pH	Temp ° C	Tot Hard CaCO3 MC	PH LAB SU
7/2/90	0.3	--	26.4	46	
8/2/90	1	--	--		
9/12/90	1	--	--		
10/3/90	1	7.01	19.6	58	
11/1/90	1	--	--		
12/10/90	1	--	--		
1/10/91	0.3	--	--	44	
4/9/91	0.09	7	17.81	44	7.02
7/8/91	0.3	6.8	26.85		
10/17/91	0.3	7.42	14.53		
1/14/92	0.3	7	8.2	46	7.71
4/14/92	0.3	6.7	15.44	56	7.17
7/8/92	0.3	6.64	23.83	60	7.74
7/30/92	0.6	--	--		
10/7/92	0.3	7.38	14.86	60	7.21
1/7/93	0.3	7.14	8.42	46	7.93
4/13/93	0.3	6.94	12.55	26	7.08
7/15/93	0.3	6.96	29.13	54	7.19
10/18/93	0.3	7.69	16.98	60	6.94
1/25/94	0.3	6.9	3.45	40	6.85
4/25/94	0.3	7.35	17.31	46	7.41
9/29/94	0.3	7.3	19.78	46	6.84
12/19/94	0.3	7.44	7.25	50	6.99
3/16/95	0.3	7.34	11.6	44	6.98
6/29/95	0.3	6.7	21.21	44	7.12
9/28/95	0.3	7.53	18.79	58	7.36
12/18/95	0.3	7.29	4.11	46	7.11
3/27/96	0.3	7.18	10.39	56	7.27
6/18/96	0.3	7.33	24.68	52	7.83
9/17/96	0.3	6.97	19.83	42	7.12
12/10/96	0.3	6.79	6.4	43.9	7.64
3/13/97	0.3	7.04	9.86	47	7.28
6/9/97	0.3	7.16	17.21	52.2	7.24
8/14/97	0.3	7.51	26.58	55.8	7.48
10/6/97	0.3	7.55	19.92	50.2	7.17
12/1/97	0.3	7.64	9.79	48.5	6.8
2/2/98	0.3	6.99	5.74	53	6.75
4/1/98	0.3	7.34	17.06	40.9	6.95
6/1/98	0.3	7.4	24.13	22	7.03
8/3/98	0.3	7.54	23.72	47.2	6.83

10/1/98	0.3	7.55	24.06	50.5	6.97
12/10/98	0.3	7.33	11.56	52	6.75
2/10/99	0.3	7.16	8.11	42	6.91
4/14/99	0.3	7.17	13.44	20	7.06
6/14/99	0.3	7.37	24.64	54	6.93
8/19/99	0.3	7.42	27.16	68	7.5
10/6/99	0.3	6.98	17.6	32.4	6.11
12/6/99	0.3	7.11	10.04	51	6.11
2/2/00	0.3	6.99	1.13	42.6	5.96
4/5/00	0.3	7.38	13.32	42	5.89
6/29/00	0.3	7.35	25.75	50.4	5.96
8/14/00	0.3	7.36	24.8	51.6	6.02
10/19/00	0.3	8.74	16.66	58.1	5.89
12/19/00	0.3	7.93	3.13	52	5.87
2/27/01	0.3	7.22	8.17	39.3	
4/19/01	0.3	7.44	11.71	20.1	5.71
8/28/01	0.3	7.7	27.55	45.3	
10/11/01	0.3	7.95	15.25	83.4	
12/10/01	0.3	7.61	9.38	49.1	
2/14/02	0.3	7.59	5.77	27.3	
4/9/02	0.3	7.4	15.72	42	
6/25/02	0.3	7.64	29.45	68.3	
8/12/02	0.3	7.85	28.88	15.3	
10/17/02	0.3	7.57	15.88	54.2	
12/10/02	0.3	7.21	2.67	45	
3/4/03	0.3	7.34	7.92	51.1	
4/24/03	0.3	7.36	14.49	55.3	
6/3/03	0.3	7.36	17.58	49	
2/11/08	0.3	7.5	6.5		

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Clover Power Station (003)

Permit No.: VA0083097

Receiving Stream: Black Walnut Creek

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =		mg/L
90% Temperature (Annual) =	23.9	deg C
90% Temperature (Wet season) =		deg C
90% Maximum pH =	7.3	SU
10% Maximum pH =	6.5	SU
Tier Designation (1 or 2) =		
Public Water Supply (PWS) Y/N? =	y	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	0.03	MGD
7Q10 (Annual) =	0.05	MGD
30Q10 (Annual) =	0.13	MGD
1Q10 (Wet season) =	0.78	MGD
30Q10 (Wet season) =		MGD
30Q5 =	0.23	MGD
Harmonic Mean =	0.82	MGD

Mixing Information

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

Effluent Information

Mean Hardness (as CaCO3) =		mg/L
90% Temp (Annual) =		deg C
90% Temp (Wet season) =		deg C
90% Maximum pH =		SU
10% Maximum pH =		SU
Discharge Flow =		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	--	--	6.7E+02	9.9E+02	--	--	#DIV/0!	#DIV/0!	--	--	6.7E+01	9.9E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	#DIV/0!	#DIV/0!	--	--	6.1E-01	9.3E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	#DIV/0!	#DIV/0!	--	--	5.1E-02	2.5E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Aldrin [c]	0	3.0E+00	--	4.9E-04	5.0E-04	#DIV/0!	--	#DIV/0!	#DIV/0!	7.5E-01	--	4.9E-05	5.0E-05	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
Ammonia-N (mg/l) (Yearly)	0	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--	6.55E+00	6.93E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Ammonia-N (mg/l) (High Flow)	0	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--	6.55E+00	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	#DIV/0!	#DIV/0!	--	--	8.3E+02	4.0E+03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	#DIV/0!	#DIV/0!	--	--	5.6E-01	6.4E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	#DIV/0!	#DIV/0!	#DIV/0!	--	8.5E+01	3.8E+01	1.0E+00	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!	--
Barium	0	--	--	2.0E+03	--	--	--	#DIV/0!	--	--	--	2.0E+02	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Benzene [c]	0	--	--	2.2E+01	5.1E+02	--	--	#DIV/0!	#DIV/0!	--	--	2.2E+00	5.1E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	#DIV/0!	#DIV/0!	--	--	8.6E-05	2.0E-04	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Benzo (a) anthracene [c]	0	--	--	3.8E-02	1.8E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-03	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Benzo (b) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-03	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Benzo (k) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-03	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Benzo (a) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-03	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Bis2-Chloroethyl Ether[c]	0	--	--	3.0E-01	5.3E+00	--	--	#DIV/0!	#DIV/0!	--	--	3.0E-02	5.3E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	#DIV/0!	#DIV/0!	--	--	1.4E+02	6.5E+03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Bis 2-Ethylhexyl Phthalate [c]	0	--	--	1.2E+01	2.2E+01	--	--	#DIV/0!	#DIV/0!	--	--	1.2E+00	2.2E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Bromoform [c]	0	--	--	4.3E+01	1.4E+03	--	--	#DIV/0!	#DIV/0!	--	--	4.3E+00	1.4E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	#DIV/0!	#DIV/0!	--	--	1.5E+02	1.9E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Cadmium	0	#DIV/0!	#DIV/0!	5.0E+00	--	#DIV/0!	#DIV/0!	#DIV/0!	--	2.1E-01	9.5E-02	5.0E-01	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!	--
Carbon Tetrachloride [c]	0	--	--	2.3E+00	1.6E+01	--	--	#DIV/0!	#DIV/0!	--	--	2.3E-01	1.6E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Chlordane [c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6.0E-01	1.1E-03	8.0E-04	8.1E-04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	#DIV/0!	#DIV/0!	#DIV/0!	--	2.2E+05	5.8E+04	2.5E+04	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!	--
TRC	0	1.9E+01	1.1E+01	--	--	#DIV/0!	#DIV/0!	--	--	4.8E+00	2.8E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	#DIV/0!	#DIV/0!	--	--	1.3E+01	1.6E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!

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	--	--	4.0E+00	1.3E+02	--	--	#DIV/0!	#DIV/0!	--	--	4.0E-01	1.3E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	#DIV/0!	#DIV/0!	--	--	3.4E+01	1.1E+03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	#DIV/0!	#DIV/0!	--	--	1.0E+02	1.6E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	#DIV/0!	#DIV/0!	--	--	8.1E+00	1.5E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	#DIV/0!	#DIV/0!	--	--	2.1E-02	1.0E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Chromium III	0	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--	4.6E+01	6.0E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	#DIV/0!	#DIV/0!	--	--	4.0E+00	2.8E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	#DIV/0!	--	--	--	1.0E+01	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-04	1.8E-03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Copper	0	#DIV/0!	#DIV/0!	1.3E+03	--	#DIV/0!	#DIV/0!	#DIV/0!	--	9.1E-01	6.8E-01	1.3E+02	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5.5E+00	1.3E+00	1.4E+01	1.6E+03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	#DIV/0!	#DIV/0!	--	--	3.1E-04	3.1E-04	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	#DIV/0!	#DIV/0!	--	--	2.2E-04	2.2E-04	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.8E-01	2.5E-04	2.2E-04	2.2E-04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Demeton	0	--	1.0E-01	--	--	--	#DIV/0!	--	--	--	2.5E-02	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	#DIV/0!	#DIV/0!	--	--	4.3E-02	4.3E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-03	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	#DIV/0!	#DIV/0!	--	--	4.2E+01	1.3E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	#DIV/0!	#DIV/0!	--	--	3.2E+01	9.6E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	#DIV/0!	#DIV/0!	--	--	6.3E+00	1.9E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	#DIV/0!	#DIV/0!	--	--	2.1E-02	2.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	#DIV/0!	#DIV/0!	--	--	5.5E-01	1.7E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-01	3.7E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	#DIV/0!	#DIV/0!	--	--	3.3E+01	7.1E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	#DIV/0!	#DIV/0!	--	--	1.4E+01	1.0E+03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	#DIV/0!	#DIV/0!	--	--	7.7E+00	2.9E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	#DIV/0!	--	--	--	1.0E+01	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	#DIV/0!	#DIV/0!	--	--	5.0E-01	1.5E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	#DIV/0!	#DIV/0!	--	--	3.4E-01	2.1E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6.0E-02	1.4E-02	5.2E-05	5.4E-05	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	#DIV/0!	#DIV/0!	--	--	1.7E+03	4.4E+03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	#DIV/0!	#DIV/0!	--	--	3.8E+01	8.5E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	#DIV/0!	#DIV/0!	--	--	2.7E+04	1.1E+05	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	#DIV/0!	#DIV/0!	--	--	2.0E+02	4.5E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	#DIV/0!	#DIV/0!	--	--	6.9E+00	5.3E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	#DIV/0!	#DIV/0!	--	--	1.3E+00	2.8E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	#DIV/0!	#DIV/0!	--	--	1.1E-01	3.4E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	#DIV/0!	#DIV/0!	--	--	5.0E-09	5.1E-09	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	#DIV/0!	#DIV/0!	--	--	3.6E-02	2.0E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5.5E-02	1.4E-02	6.2E+00	8.9E+00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5.5E-02	1.4E-02	6.2E+00	8.9E+00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	#DIV/0!	#DIV/0!	--	--	5.5E-02	1.4E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	#DIV/0!	#DIV/0!	--	--	6.2E+00	8.9E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.2E-02	9.0E-03	5.9E-03	6.0E-03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	#DIV/0!	#DIV/0!	--	--	2.9E-02	3.0E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		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	--	--	5.3E+02	2.1E+03	--	--	#DIV/0!	#DIV/0!	--	--	5.3E+01	2.1E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	#DIV/0!	#DIV/0!	--	--	1.3E+01	1.4E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	#DIV/0!	#DIV/0!	--	--	1.1E+02	5.3E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Foaming Agents	0	--	--	5.0E+02	--	--	--	#DIV/0!	--	--	--	5.0E+01	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Guthion	0	--	1.0E-02	--	--	--	#DIV/0!	--	--	--	2.5E-03	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--	--
Heptachlor [c]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.3E-01	9.5E-04	7.9E-05	7.9E-05	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.3E-01	9.5E-04	3.9E-05	3.9E-05	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Hexachlorobenzene[c]	0	--	--	2.8E-03	2.9E-03	--	--	#DIV/0!	#DIV/0!	--	--	2.8E-04	2.9E-04	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Hexachlorobutadiene[c]	0	--	--	4.4E+00	1.8E+02	--	--	#DIV/0!	#DIV/0!	--	--	4.4E-01	1.8E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	2.6E-02	4.9E-02	--	--	#DIV/0!	#DIV/0!	--	--	2.6E-03	4.9E-03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Hexachlorocyclohexane Beta BHC[c]	0	--	--	9.1E-02	1.7E-01	--	--	#DIV/0!	#DIV/0!	--	--	9.1E-03	1.7E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	#DIV/0!	--	#DIV/0!	#DIV/0!	2.4E-01	--	9.8E-02	1.8E-01	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	#DIV/0!	#DIV/0!	--	--	4.0E+00	1.1E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Hexachloroethane[c]	0	--	--	1.4E+01	3.3E+01	--	--	#DIV/0!	#DIV/0!	--	--	1.4E+00	3.3E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	#DIV/0!	--	--	--	5.0E-01	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.8E-03	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Iron	0	--	--	3.0E+02	--	--	--	#DIV/0!	--	--	--	3.0E+01	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Isophorone[c]	0	--	--	3.5E+02	9.6E+03	--	--	#DIV/0!	#DIV/0!	--	--	3.5E+01	9.6E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Kepone	0	--	0.0E+00	--	--	--	#DIV/0!	--	--	--	0.0E+00	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--	--
Lead	0	#DIV/0!	#DIV/0!	1.5E+01	--	#DIV/0!	#DIV/0!	#DIV/0!	--	5.1E+00	5.8E-01	1.5E+00	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!	--
Malathion	0	--	1.0E-01	--	--	--	#DIV/0!	--	--	--	2.5E-02	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--	--
Manganese	0	--	--	5.0E+01	--	--	--	#DIV/0!	--	--	--	5.0E+00	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Mercury	0	1.4E+00	7.7E-01	--	--	#DIV/0!	#DIV/0!	--	--	3.5E-01	1.9E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	#DIV/0!	#DIV/0!	--	--	4.7E+00	1.5E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Methylene Chloride [c]	0	--	--	4.6E+01	5.9E+03	--	--	#DIV/0!	#DIV/0!	--	--	4.6E+00	5.9E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	#DIV/0!	#DIV/0!	--	--	7.5E-03	1.0E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--
Mirex	0	--	0.0E+00	--	--	--	#DIV/0!	--	--	--	0.0E+00	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--	--
Nickel	0	#DIV/0!	#DIV/0!	6.1E+02	4.6E+03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.4E+01	1.6E+00	6.1E+01	4.6E+02	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	#DIV/0!	--	--	--	1.0E+03	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	#DIV/0!	#DIV/0!	--	--	1.7E+00	6.9E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
N-Nitrosodimethylamine[c]	0	--	--	6.9E-03	3.0E+01	--	--	#DIV/0!	#DIV/0!	--	--	6.9E-04	3.0E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
N-Nitrosodiphenylamine[c]	0	--	--	3.3E+01	6.0E+01	--	--	#DIV/0!	#DIV/0!	--	--	3.3E+00	6.0E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
N-Nitrosodi-n-propylamine[c]	0	--	--	5.0E-02	5.1E+00	--	--	#DIV/0!	#DIV/0!	--	--	5.0E-03	5.1E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Nonylphenol	0	2.8E+01	6.6E+00	--	--	#DIV/0!	#DIV/0!	--	--	7.0E+00	1.7E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	#DIV/0!	#DIV/0!	--	--	1.6E-02	3.3E-03	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
PCB Total[c]	0	--	1.4E-02	6.4E-04	6.4E-04	--	#DIV/0!	#DIV/0!	#DIV/0!	--	3.5E-03	6.4E-05	6.4E-05	--	#DIV/0!	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	#DIV/0!
Pentachlorophenol [c]	0	#DIV/0!	#DIV/0!	2.7E+00	3.0E+01	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.3E+00	1.0E+00	2.7E-01	3.0E+00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	#DIV/0!	#DIV/0!	--	--	1.0E+03	8.6E+04	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	#DIV/0!	#DIV/0!	--	--	8.3E+01	4.0E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	#DIV/0!	--	--	--	1.5E+00	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	4.0E+00	--	--	#DIV/0!	#DIV/0!	--	--	4.0E-01	4.0E-01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	#DIV/0!	--	--	--	5.0E-01	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	#DIV/0!	--	--	--	3.0E+00	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--

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
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5.0E+00	1.3E+00	1.7E+01	4.2E+02	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Silver	0	#DIV/0!	--	--	--	#DIV/0!	--	--	--	7.9E-02	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	#DIV/0!	--	--	--	2.5E+04	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	#DIV/0!	#DIV/0!	--	--	1.7E-01	4.0E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	#DIV/0!	#DIV/0!	--	--	6.9E-01	3.3E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	#DIV/0!	#DIV/0!	--	--	2.4E-02	4.7E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	#DIV/0!	#DIV/0!	--	--	5.1E+01	6.0E+02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Total dissolved solids	0	--	--	5.0E+05	--	--	--	#DIV/0!	--	--	--	5.0E+04	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.8E-01	5.0E-05	2.8E-04	2.8E-04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Tributyltin	0	4.6E-01	7.2E-02	--	--	#DIV/0!	#DIV/0!	--	--	1.2E-01	1.8E-02	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	#DIV/0!	#DIV/0!	--	--	3.5E+00	7.0E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	#DIV/0!	#DIV/0!	--	--	5.9E-01	1.6E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	#DIV/0!	#DIV/0!	--	--	2.5E+00	3.0E+01	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	#DIV/0!	#DIV/0!	--	--	1.4E+00	2.4E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	#DIV/0!	--	--	--	5.0E+00	--	--	--	#DIV/0!	--	--	--	#DIV/0!	--
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	#DIV/0!	#DIV/0!	--	--	2.5E-02	2.4E+00	--	--	#DIV/0!	#DIV/0!	--	--	#DIV/0!	#DIV/0!
Zinc	0	#DIV/0!	#DIV/0!	7.4E+03	2.6E+04	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	9.1E+00	9.1E+00	7.4E+02	2.6E+03	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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 and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	#DIV/0!
Arsenic	#DIV/0!
Barium	#DIV/0!
Cadmium	#DIV/0!
Chromium III	#DIV/0!
Chromium VI	#DIV/0!
Copper	#DIV/0!
Iron	#DIV/0!
Lead	#DIV/0!
Manganese	#DIV/0!
Mercury	#DIV/0!
Nickel	#DIV/0!
Selenium	#DIV/0!
Silver	#DIV/0!
Zinc	#DIV/0!

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

Planning Statement for VPDES Permit Application Processing
DEQ-SCRO

VPDES	OwnerName	Facility	County
VA0083097	Old Dominion Electric Cooperative - Clover	Old Dominion Electric Cooperative - Clover	Halifax

Outfall #: 001

River Basin: Roanoke River **Receiving Stream:** Roanoke River

Subbasin: Roanoke River

Watershed Code: L40R **River Mile:** 63.68

	MGD		MGD
1Q10	200	**HF 1Q10**	406
7Q10	437	**HF7Q10**	674
30Q5	572	**HF30Q10**	789
30Q10	485	**HM**	1110

Modeling Notes

WQMP Name No Plan

Statement No statement

TMDL ID L19R-01-HG/L19R-01-PCB/L19R-01-BAC

Impairment Cause Hg in FT/PCBs in FT/E. coli

TMDL Due Date 2020/2010/2010

Completed TMDL Information Should ~~be~~ approved ~~Summer~~ 2012.

Roanoke River Bacteria TMDL Approved 4/9/2010 PBN

TMDL Approval Dates EPA Approved - 6/22/06 & SWCB

Amanda B Gray 2/11/16

Amanda B. Gray, Water Planning Engineer or **Date**
Paula Nash, TMDL Coordinator

Planning Statement for VPDES Permit Application Processing DEQ-SCRO

VPDES	OwnerName	Facility	County
VA0083097	Old Dominion Electric Cooperative - Clover	Old Dominion Electric Cooperative - Clover	Halifax

Outfall #: 003

River Basin: Roanoke River

Receiving Stream: Black Walnut Creek

Subbasin: Roanoke River

Watershed Code: L40R

River Mile: 2.2

	MGD		MGD
1Q10	0.03	**HF 1Q10**	0.78
7Q10	0.05	**HF7Q10**	0.92
30Q5	0.23	**HF30Q10**	1.29
30Q10	0.13	**HM**	0.82

Modeling Notes

WQMP Name No Plan

Statement No statement

TMDL ID Category 4B

Impairment Cause Manganese

TMDL Due Date 1/1/2011

Completed TMDL Information

TMDL Approval Dates

Amanda B. Gray

Amanda B. Gray, Water Planning Engineer or
Paula Nash, TMDL Coordinator

2/11/10

Date

MEMORANDUM
Department of Environmental Quality
Blue Ridge Regional Office-Lynchburg

7705 Timberlake Road **Lynchburg, Virginia 24502**

Subject: Planning and TMDL Service Requests for VPDES Permits

To: Amanda Gray, Water Planning Engineer to
Paula Nash, TMDL Coordinator

From: Frank Bowman

Date: February 3, 2010

Copies: Planning File

The request for information is to be made at the following times:

Planning: Upon sending the reissuance reminder letter to the facility or, for an issuance or modification, at the time of application/modification request receipt.

TMDL: Same as above. For VPDES general permits, at the time of registration statement receipt.

FACILITY NAME: Old Dominion Electric Cooperative Clover

VPDES PERMIT NO. VA0083097 EXPIRATION DATE: January 23, 2011

FACILITY PHYSICAL LOCATION: Intersection of Routes 600 and 778, Clover, Halifax County

INDIVIDUAL PERMIT ACTION: Issuance **Reissuance** Modification

GENERAL PERMIT ACTION: New Coverage Previously Covered

PERMIT TYPE: **Major** Minor General Municipal **Industrial** **Storm Water** **TMP** TRE

If a VPDES General Permit, which type: _____

PERMIT WRITERS: ATTACH THE FOLLOWING

- **Topo map with facility location and outfall locations clearly marked (include any proposed outfalls)**
- **Site diagram for facilities with multiple outfalls**
- **Description or map showing effluent flow path if not apparent on topo map**
- **The outfall numbers, latitude, longitude, receiving stream and topo name in the table below (use an additional sheet if there are more outfalls)**

Outfall No.	Latitude	Longitude	Receiving Stream	Topo Name
001	36° 52' 07"	78° 41' 40"	Roanoke River	Clover
002	36° 52' 07"	78° 41' 40"	Roanoke River	Clover
003	36° 52' 11"	78° 43' 41"	Black Walnut Creek	Clover
004	36° 51' 07"	78° 41' 27"	Roanoke River	Clover

005	36° 52' 59"	78° 41' 1"	Roanoke River	Clover
006	36° 52' 33"	78° 42' 01"	Black Walnut Creek	Clover
007	36° 52' 38"	78° 42' 41"	Black Walnut Creek	Clover
008	36° 51' 10"	78° 42' 41"	Black Walnut Creek	Clover
009	36° 52' 19"	78° 41' 52"	Roanoke River	Clover
011	36° 52' 49"	78° 43' 20"	Black Walnut Creek	Clover
012	36° 52' 42"	78° 43' 15"	Black Walnut Creek	Clover
013	36° 52' 53"	78° 42' 46"	Black Walnut Creek	Clover
014	36° 52' 47"	78° 43' 12"	Black Walnut Creek	Clover
015	36° 52' 44"	78° 43' 17"	Black Walnut Creek	Clover
016	36° 52' 41"	78° 43' 21"	Black Walnut Creek	Clover

DATE INFORMATION NEEDED: July 23, 2010

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
South Central Regional Office - Water Planning
7705 Timberlake Road Lynchburg, VA 24502 434/582-5120

SUBJECT: Flow Frequency Determination
Old Dominion Electric Cooperative -- Clover VA#0083097

TO: Frank Bowman

FROM: Amanda Gray

DATE: February 11, 2010

This memo supersedes my January 18, 2005 memo concerning the subject VPDES permit. The Old Dominion Electric Cooperative (ODEC) discharges via outfalls to the Roanoke River and via outfalls to Black Walnut Creek near Clover, VA. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

The flow frequency analysis for the Roanoke River utilized the USGS continuous record gage on the Roanoke River at Randolph, VA (#02066000) which has been in operation since 1902. The flow frequencies for the gage are based on the regulated period of record which began in 1966. The flow frequencies for the gage and outfalls to the Roanoke River are presented below. The flow frequencies for the gage and discharge point were determined by drainage are proportions and do not address any withdrawals, discharges, or springs lying upstream.

Roanoke River at Randolph, VA (#02066000):

Drainage Area: 2977 mi^2

1Q10 = 287 cfs	High Flow 1Q10 = 581 cfs
7Q10 = 626 cfs	High Flow 7Q10 = 965 cfs
30Q5 = 819 cfs	High Flow 30Q10 = 1130 cfs
30Q10 = 695 cfs	Harmonic Mean = 1590 cfs

Roanoke River at ODEC outfalls:

Drainage Area: 3217 mi^2

1Q10 = 310 cfs (200 MGD)	High Flow 1Q10 = 628 cfs (406 MGD)
7Q10 = 676 cfs (437 MGD)	High Flow 7Q10 = 1043 cfs (674 MGD)
30Q5 = 885 cfs (572 MGD)	High Flow 30Q10 = 1221 cfs (789 MGD)
30Q10 = 751 cfs (485 MGD)	Harmonic Mean = 1718 cfs (1110 MGD)

The high flow months are January through May. If there are any questions concerning this analysis, please let me know.

The flow frequency analysis for outfalls to Black Walnut Creek utilized the USGS continuous record gage on the Roanoke Creek near Saxe, VA (#02066500) which was in operation for 1946-1972. The gage is located at the Route 612 bridge, which is approximately 4.5 miles northeast of the outfalls. The flow frequencies for the gage and outfalls 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.

Roanoke Creek at Saxe, VA (#02066500):

Drainage Area: 135 mi^2

1Q10 = 1.0 cfs	HF1Q10 = 23 cfs
7Q10 = 1.3 cfs	HF7Q10 = 27 cfs
30Q5 = 6.9 cfs	HF30Q10 = 38 cfs
30Q10 = 3.8 cfs	Harmonic Mean = 24 cfs

Black Walnut Creek at ODEC outfall 003:

Drainage Area: 7.12 mi^2

1Q10 = 0.05 cfs (0.03 MGD)	HF1Q10 = 1.21 cfs (0.78 MGD)
7Q10 = 0.07 cfs (0.05 MGD)	HF7Q10 = 1.42 cfs (0.92 MGD)
30Q5 = 0.36 cfs (0.23 MGD)	HF30Q10 = 2.00 cfs (1.29 MGD)
30Q10 = 0.2 cfs (0.13 MGD)	Harmonic Mean = 1.27 cfs (0.82 MGD)

The high flow months for outfall 003 are December through April. If you have any questions concerning this analysis, please let me know.

Electronic Code of Federal Regulations
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THIS DATA CURRENT AS OF THE FEDERAL REGISTER DATED JULY 28, 2003

40 CFR
Protection of Environment
CHAPTER I
ENVIRONMENTAL PROTECTION AGENCY (CONTINUED)

SUBCHAPTER N -- EFFLUENT GUIDELINES AND STANDARDS

PART 423 -- STEAM ELECTRIC POWER GENERATING POINT SOURCE CATEGORY

Sec.

423.10 Applicability.
423.11 Specialized definitions.
423.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).
423.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).
423.14 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]
423.15 New source performance standards (NSPS).
423.16 Pretreatment standards for existing sources (PSES).
423.17 Pretreatment standards for new sources (PSNS).

Appendix A to Part 423 -- 126 Priority Pollutants

Authority: Secs. 301; 304(b), (c), (e), and (g); 306(b) and (c); 307(b) and (c); and 501, Clean Water Act (Federal Water Pollution Control Act Amendments of 1972, as amended by Clean Water Act of 1977) (the "Act"; 33 U.S.C. 1311; 1314(b), (c), (e), and (g); 1316(b) and (c); 1317(b) and (c); and 1361; 86 Stat. 816, Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217), unless otherwise noted.

Source: 47 FR 52304, Nov. 19, 1982, unless otherwise noted.

[TOP]

§423.10 Applicability.

The provisions of this part are applicable to discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium.

[TOP]

§423.11 Specialized definitions.

In addition to the definitions set forth in 40 CFR part 401, the following definitions apply to this part:

(a) The term *total residual chlorine* (or total residual oxidants for intake water with bromides) means the value obtained using the amperometric method for total residual chlorine described in 40 CFR part 136.

(b) The term *low volume waste sources* means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations are otherwise established in this part. Low volume wastes sources include, but are not limited to: wastewaters from wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, and recirculating house service water systems. Sanitary and air conditioning wastes are not included.

(c) The term *chemical metal cleaning waste* means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning.

(d) The term *metal cleaning waste* means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

(e) The term *fly ash* means the ash that is carried out of the furnace by the gas stream and collected by mechanical precipitators, electrostatic precipitators, and/or fabric filters. Economizer ash is included when it is collected with fly ash.

(f) The term *bottom ash* means the ash that drops out of the furnace gas stream in the furnace and in the economizer sections. Economizer ash is included when it is collected with bottom ash.

(g) The term *once through cooling water* means water passed through the main cooling condensers in one or two passes for the purpose of removing waste heat.

(h) The term *recirculated cooling water* means water which is passed through the main condensers for the purpose of removing waste heat, passed through a cooling device for the purpose of removing such heat from the water and then passed again, except for blowdown, through the main condenser.

(i) The term *10 year, 24/hour rainfall event* means a rainfall event with a probable recurrence interval of once in ten years as defined by the National Weather Service in Technical Paper No. 40. *Rainfall Frequency Atlas of the United States,* May 1961 or equivalent regional rainfall probability information developed therefrom.

(j) The term *blowdown* means the minimum discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts exceeding limits established by best engineering practices.

(k) The term *average concentration* as it relates to chlorine discharge means the average of analyses made over a single period of chlorine release which does not exceed two hours.

(l) The term *free available chlorine* shall mean the value obtained using the amperometric titration method for free available chlorine described in *Standard Methods for the Examination of Water and Wastewater,* page 112 (13th edition).

(m) The term *coal pile runoff* means the rainfall runoff from or through any coal storage pile.

[TOP]

§423.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) In establishing the limitations set forth in this section, EPA took into account all information it was able to collect, develop and solicit with respect to factors (such as age and size of plant, utilization of facilities, raw materials, manufacturing processes, non-water quality environmental impacts, control and treatment technology available, energy requirements and costs) which can affect the industry subcategorization and effluent levels established. It is, however, possible that data which would affect these limitations have not been available and, as a result, these limitations should be adjusted for certain plants in this industry. An individual discharger or other interested person may submit evidence to the Regional Administrator (or to the State, if the State has the authority to issue NPDES permits) that factors relating to the equipment or facilities involved, the process applied, or other such factors related to such discharger are fundamentally

[TOP]

§423.15 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards:

(a) The pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0.

(b) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(c) The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0

(d) The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0
Copper, total	1.0	1.0
Iron, total	1.0	1.0

(e) [Reserved -- Nonchemical Metal Cleaning Wastes].

(f) The quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of the bottom ash transport water times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive

	(mg/l)	days shall not exceed (mg/l)
TSS.....	100.0	30.0
Oil and grease.....	20.0	15.0

(g) There shall be no discharge of wastewater pollutants from fly ash transport water.

(h)(1) For any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

Pollutant or pollutant property	NSPS effluent limitations Maximum concentration (mg/l)
Total residual chlorine.....	0.20

(2) Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.

(i)(1) For any plant with a total rated generating capacity of less than 25 megawatts, the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

Pollutant of pollutant property	NSPS effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine.....	0.5	0.2

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(j)(1) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the concentration listed below:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine.....	0.5	0.2

Pollutant or pollutant property	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall

	not exceed (mg/l)
The 126 priority pollutants (Appendix A) (\1\)	(\1\)
contained in chemicals added for cooling tower maintenance, except:	
Chromium, total	0.2
Zinc, total	1.0

\1\ No detectable amount.

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(3) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (j)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(k) Subject to the provisions of §423.15(l), the quantity or quality of pollutants or pollutant parameters discharged in coal pile runoff shall not exceed the limitations specified below:

Pollutant or pollutant property	NSPS effluent limitations for any time
TSS	Not to exceed 50 mg/l.

(l) Any untreated overflow from facilities designed, constructed, and operated to treat the coal pile runoff which results from a 10 year, 24 hour rainfall event shall not be subject to the limitations in §423.15(k).

(m) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitation specified in paragraphs (c) through (j) of this section. Concentration limits shall be based on the concentrations specified in this section.

(n) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (m) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

(The information collection requirements contained in paragraphs (h)(2), (i)(2), and (j)(2) were approved by the Office of Management and Budget under control number 2040-0040. The information collection requirements contained in paragraph (j)(3) were approved under control number 2040-0033.)

[47 FR 52304, Nov. 19, 1982, as amended at 48 FR 31404, July 8, 1983]

[TOP]

§423.16 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES) by July 1, 1984:

(a) There shall be no discharge of polychlorinated biphenol compounds such as those used for transformer fluid.

(b) The pollutants discharged in chemical metal cleaning wastes shall not exceed the concentration listed in the following table:

Pollutant or pollutant property	PSES pretreatment standards
	Maximum for 1 day (mg/1)
Copper, total	1.0

(c) [Reserved -- Nonchemical Metal Cleaning Wastes].

	Maximum for 1 day (mg/l)
Copper, total	1.0

(c) [Reserved -- Nonchemical Metal Cleaning Wastes].

(d)(1) The pollutants discharged in cooling tower blowdown shall not exceed the concentration listed in the following table:

Pollutant or pollutant property	PSNS pretreatment standards: Maximum for any time (mg/l)
The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:	
Chromium, total	0.2
Zinc, total	1.0

(2) At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

(e) There shall be no discharge of wastewater pollutants from fly ash transport water.

Appendix A to Part 423 -- 126 Priority Pollutants

001 Acenaphthene

002 Acrolein

003 Acrylonitrile

004 Benzene

005 Benzidine

006 Carbon tetrachloride (tetrachloromethane)

007 Chlorobenzene

008 1,2,4-trichlorobenzene

009 Hexachlorobenzene

010 1,2-dichloroethane

011 1,1,1-trichloreothane

012 Hexachloroethane

013 1,1-dichloroethane

014 1,1,2-trichloroethane

015 1,1,2,2-tetrachloroethane

016 Chloroethane

018 Bis(2-chloroethyl) ether

019 2-chloroethyl vinyl ether (mixed)

020 2-chloronaphthalene

021 2,4, 6-trichlorophenol

022 Parachlorometa cresol

023 Chloroform (trichloromethane)

024 2-chlorophenol

025 1,2-dichlorobenzene

026 1,3-dichlorobenzene

027 1,4-dichlorobenzene

028 3,3-dichlorobenzidine

029 1,1-dichloroethylene

030 1,2-trans-dichloroethylene

031 2,4-dichlorophenol

032 1,2-dichloropropane

033 1,2-dichloropropylene (1,3-dichloropropene)

034 2,4-dimethylphenol

035 2,4-dinitrotoluene

036 2,6-dinitrotoluene

037 1,2-diphenylhydrazine

038 Ethylbenzene

039 Fluoranthene

040 4-chlorophenyl phenyl ether

041 4-bromophenyl phenyl ether

042 Bis(2-chloroisopropyl) ether

043 Bis(2-chloroethoxy) methane

044 Methylene chloride (dichloromethane)

045 Methyl chloride (dichloromethane)

046 Methyl bromide (bromomethane)

047 Bromoform (tribromomethane)

048 Dichlorobromomethane

051 Chlorodibromomethane

052 Hexachlorobutadiene

053 Hexachloromyclopentadiene

054 Isophorone

055 Naphthalene

056 Nitrobenzene

057 2-nitrophenol

058 4-nitrophenol

059 2,4-dinitrophenol

060 4,6-dinitro-o-cresol

061 N-nitrosodimethylamine

062 N-nitrosodiphenylamine

063 N-nitrosodi-n-propylamin

064 Pentachlorophenol

065 Phenol

066 Bis(2-ethylhexyl) phthalate

067 Butyl benzyl phthalate

068 Di-N-Butyl Phthalate

069 Di-n-octyl phthalate

070 Diethyl Phthalate

071 Dimethyl phthalate

072 1,2-benzanthracene (benzo(a) anthracene

073 Benzo(a)pyrene (3,4-benzo-pyrene)

074 3,4-Benzofluoranthene (benzo(b) fluoranthene)

075 11,12-benzofluoranthene (benzo(b) fluoranthene)

076 Chrysene

077 Acenaphthylene

078 Anthracene

079 1,12-benzoperylene (benzo(ghi) perylene)

080 Fluorene

081 Phenanthrene

082 1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)

083 Indeno (,1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)

084 Pyrene

085 Tetrachloroethylene

086 Toluene

087 Trichloroethylene

088 Vinyl chloride (chloroethylene)

089 Aldrin

090 Dieldrin

091 Chlordane (technical mixture and metabolites)

092 4,4-DDT

093 4,4-DDE (p,p-DDX)

094 4,4-DDD (p,p-TDE)

095 Alpha-endosulfan

096 Beta-endosulfan

097 Endosulfan sulfate

098 Endrin

099 Endrin aldehyde

100 Heptachlor

101 Heptachlor epoxide (BHC-hexachlorocyclohexane)

102 Alpha-BHC

103 Beta-BHC

104 Gamma-BHC (lindane)

105 Delta-BHC (PCB-polychlorinated biphenyls)

106 PCB-1242 (Arochlor 1242)

107 PCB-1254 (Arochlor 1254)

108 PCB-1221 (Arochlor 1221)

109 PCB-1232 (Arochlor 1232)

110 PCB-1248 (Arochlor 1248)

111 PCB-1260 (Arochlor 1260)

112 PCB-1016 (Arochlor 1016)

113 Toxaphene

114 Antimony

115 Arsenic

116 Asbestos

117 Beryllium

118 Cadmium

119 Chromium

120 Copper

121 Cyanide, Total

122 Lead

123 Mercury

124 Nickel

125 Selenium

126 Silver

127 Thallium

126 Silver

128 Zinc

129 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

COMMONWEALTH OF VIRGIN
Department of Environmental Quality
Office of Water Permit Programs

RECEIVED
MAY 1 9 2003
DEQ SCRO

Subject: **Dominion VA Power Clover Power Station – VA0083097**

To: **Bob Goode - SCRO**

From: **Allan Brockenbrough - OWPP** ABII

Date: **April 17, 2003**

I have reviewed the report entitled *Hydrodynamic Mixing Study, Clover Power Station, Coal Combustion By-Products Landfill, Clover, Virginia.* The report is dated June 23, 2002 and was prepared by Golder Associates for Dominion Power.

The report provides CORMIX modeling runs for a proposed relocation of outfall 009 to "Site No. 3" on the Roanoke River. No map was included with the report. The supplemental map provided by Ken Roller shows an outfall location below the power station's water intake. I have therefore subtracted the facility's maximum withdrawal rate (21.6 mgd) from the flow frequency determinations provided by Paul Herman on 12/19/94. Please note that the report makes reference to an alternative 1Q10 of 219 mgd "based on VDEQ calculations assuming 200 cubic feet per second (cfs) release from Leesville dam for drought release". I have checked with DEQ staff in the stream gauging and VWP permitting programs and can find no information on this calculation and have therefore used the adjustment mentioned in the report.

The report requests that the modeling be used to establish acute wasteload allocations only. It has been our practice to use CORMIX to model discharges from diffusers and to use the results to establish multipliers for acute and chronic wasteload allocations. For free flowing streams, the near field mixing at 1Q10 is used to establish the acute wla. Chronic wla's are established at 7Q10 flow and the most restrictive of the mixing zone spatial requirements in the Water Quality Standards (ie. 5 times the stream width downstream, ½ the stream width or ⅓ the cross sectional area). In this particular case, the mixing zone length of 5 times the stream width is the most limiting condition.

Attached are CORMIX runs for a 400 gpm discharge (one pump running) under 1Q10 and 7Q10 flow conditions. The resulting wla multipliers are as follows:

WQS	WLA Multiplier	Flow Condition	Basis
Acute	33	1Q10 of 154.86 mgd	near field mixing
Chronic	213	7Q10 of 426.97 mgd	5 x river width

Please give me a call if we need to discuss further.

AB/

Acute

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                        CORMIX MIXING ZONE EXPERT SYSTEM
                            CORMIX-GI Version 4.2GT
                        HYDRO2:Version-4.2  August,2002
SITE NAME/LABEL:                Clover Power Station Outfall 009 - proposed site #3
  DESIGN CASE:                  400 gpm discharge and 154.86 mgd (1Q10 - 21.6 mgd)
  FILE NAME:                    D:\Cormix\MyFiles\Clover Power Station at 1Q10.prd
Using subsystem CORMIX2:        Submerged Multiport Diffuser Discharges
  Start of session:             04/17/2003--15:03:09
*****************************************************************************
SUMMARY OF INPUT DATA:
-----------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                         = bounded
  Width                         BS      = 54 m
  Channel regularity            ICHREG  = 2
  Ambient flowrate              QA      = 6.78 m^3/s
  Average depth                 HA      = 0.6 m
  Depth at discharge            HD      = 0.78 m
  Ambient velocity              UA      = 0.2094 m/s
  Darcy-Weisbach friction factor F      = 0.0581
    Calculated from Manning's n         = 0.025
  Wind velocity                 UW      = 0 m/s
Stratification Type             STRCND  = U
  Surface density               RHOAS   = 998.2050 kg/m^3
  Bottom density                RHOAB   = 998.2050 kg/m^3
-----------------------------------------------------------------------------
DISCHARGE PARAMETERS:           Submerged Multiport Diffuser Discharge
  Diffuser type                 DITYPE  = alternating perpendicular
  Diffuser length               LD      = 4.6 m
  Nearest bank                          = left
  Diffuser endpoints            YB1     = 10.20 m;    YB2 = 14.80 m
  Number of openings            NOPEN   = 69
  Spacing between risers/openings SPAC  = 0.07 m
  Port/Nozzle diameter          D0      = 0.0508 m
    with contraction ratio              = 1
  Equivalent slot width         B0      = 0.0304 m
  Total area of openings        TA0     = 0.1399 m^2
  Discharge velocity            U0      = 0.18 m/s
  Total discharge flowrate      Q0      = 0.025236 m^3/s
  Discharge port height         H0      = 0.08 m
  Nozzle arrangement            BETYPE  = alternating with fanning
  Diffuser alignment angle      GAMMA   = 90 deg
  Vertical discharge angle      THETA   = 90 deg
  Horizontal discharge angle    SIGMA   = 0 deg
  Relative orientation angle    BETA    = 90 deg
  Discharge density             RHO0    = 998.2050 kg/m^3
  Density difference            DRHO    = 0 kg/m^3
  Buoyant acceleration          GP0     = 0 m/s^2
  Discharge concentration       C0      = 100 mg/l
  Surface heat exchange coeff.  KS      = 0 m/s
  Coefficient of decay          KD      = 0 /s
-----------------------------------------------------------------------------
FLUX VARIABLES PER UNIT DIFFUSER LENGTH:
  Discharge (volume flux)       q0      = 0.005486 m^2/s
  Momentum flux                 m0      = 0.000990 m^3/s^2
  Buoyancy flux                 j0      = 0 m^3/s^3
-----------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 0.03 m        Lm  = 0.02 m        LM  = 99999 m
  lm' = 99999 m       Lb' = 99999 m       La  = 99999 m
  (These refer to the actual discharge/environment length scales.)
-----------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
```

```
Slot Froude number                FR0     = 99999
  Port/nozzle Froude number         FRD0    = 99999
  Velocity ratio                    R       = 0.86
-----------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                           = no
  Water quality standard specified          = no
  Regulatory mixing zone                    = no
  Region of interest                        = 865 m downstream
*****************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *------------------------*
  | FLOW CLASS    = MU8 |
  *------------------------*
  This flow configuration applies to a layer corresponding to the full water
  depth at the discharge site.
  Applicable layer depth = water depth = 0.78 m
*****************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-----------------------------------------------------------------------------
X-Y-Z Coordinate system:
  Origin is located at the bottom below the port center:
    12.5 m from the left bank/shore.
  Number of display steps NSTEP = 100 per module.
-----------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at edge of NFR = 3.0534 mg/l
  Dilution at edge of NFR                = 32.87
  NFR Location:                          x = 3.94 m
    (centerline coordinates)             y = 0 m
                                         z = 0.78 m
  NFR plume dimensions:          half-width = 2.53 m
                                   thickness = 0.78 m
-----------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is equal or about about equal to the surrounding
  ambient water density at the discharge level.
  Therefore, the effluent behaves essentially as NEUTRALLY BUOYANT.
-----------------------------------------------------------------------------
Near-field instability behavior:
  The diffuser flow will experience instabilities with full vertical mixing
  in the near-field.
  There may be benthic impact of high pollutant concentrations.
-----------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume becomes vertically fully mixed ALREADY IN NEAR-FIELD at 3.94 m
  downstream and continues as vertically mixed into the far-field.
-----------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section does not contact bank.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
********************** REGULATORY MIXING ZONE SUMMARY ***********************
No RMZ and no ambient water quality standard have been specified.
********************* FINAL DESIGN ADVICE AND COMMENTS **********************
CORMIX2 uses the TWO-DIMENSIONAL SLOT DIFFUSER CONCEPT to represent
  the actual three-dimensional diffuser geometry.  Thus, it approximates
  the details of the merging process of the individual jets from each
  port/nozzle.
In the present design, the spacing between adjacent ports/nozzles
```

(or riser assemblies) is of the order of, or less than, the local water depth so that the slot diffuser approximation holds well.

Nevertheless, if this is a final design, the user is advised to use a final CORMIX1 (single port discharge) analysis, with discharge data for an individual diffuser jet/plume, in order to compare to the present near-field prediction.

DIFFUSER DESIGN DETAILS: Because of the alternating arrangement of the opposing nozzles/ports, the AVERAGE VERTICAL ANGLE (THETA) has been set to 90 deg. This represents a ZERO NET HORIZONTAL MOMENTUM FLUX for the entire diffuser.

REMINDER: The user must take note that HYDRODYNAMIC MODELING by any known technique is NOT AN EXACT SCIENCE.

Extensive comparison with field and laboratory data has shown that the CORMIX predictions on dilutions and concentrations (with associated plume geometries) are reliable for the majority of cases and are accurate to within about +-50% (standard deviation).

As a further safeguard, CORMIX will not give predictions whenever it judges the design configuration as highly complex and uncertain for prediction.

```
CORMIX2 PREDICTION FILE:
2222222222222222222222222222222222222222222222222222222222222222222222222222222
                        CORMIX MIXING ZONE EXPERT SYSTEM
        Subsystem CORMIX2:  Submerged Multiport Diffuser Discharges
                          CORMIX-GI Version 4.2GT
                        HYDRO2 Version 4.2 August 2002
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------
CASE DESCRIPTION
 Site name/label:   Clover Power Station Outfall 009 - proposed site #3
 Design case:       400 gpm discharge and 154.86 mgd (1Q10 - 21.6 mgd)
 FILE NAME:         D:\Cormix\MyFiles\Clover Power Station at 1Q10.prd
 Time stamp:        Thu Apr 17 15:03:10 2003

ENVIRONMENT PARAMETERS (metric units)
 Bounded section
 BS     =      54.00  AS     =      32.40  QA     =       6.78  ICHREG= 2
 HA     =       0.60  HD     =       0.78
 UA     =      0.209  F      =      0.058  USTAR =0.1785E-01
 UW     =      0.000  UWSTAR=0.0000E+00
 Uniform density environment
 STRCND=  U          RHOAM =  998.2050

DIFFUSER DISCHARGE PARAMETERS (metric units)
 Diffuser type:     DITYPE= alternating_perpendicular
 BANK   =  LEFT     DISTB =      12.50  YB1    =      10.20  YB2    =      14.80
 LD     =       4.60  NOPEN =   69      SPAC   =       0.07
 D0     =      0.051  A0     =      0.002  H0     =       0.08
 Nozzle/port arrangement:   alternating_with_fanning
 GAMMA =      90.00  THETA =      90.00  SIGMA =       0.00  BETA   =      90.00
 U0     =      0.180  Q0     =      0.025         =0.2524E-01
 RHO0   =  998.2050  DRHO0 =0.0000E+00  GP0    =0.0000E+00
 C0     =0.1000E+03  CUNITS=  mg/l
 IPOLL =  1          KS     =0.0000E+00  KD     =0.0000E+00

FLUX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
 q0     =0.5486E-02  m0     =0.9900E-03  j0     =0.0000E+00  SIGNJ0=       1.0
 Associated 2-d length scales (meters)
 lQ=B   =      0.030  lM     =  99999.00  lm     =       0.02
 lmp    =  99999.00  lbp    =  99999.00  la     =  99999.00

FLUX VARIABLES - ENTIRE DIFFUSER (metric units)
 Q0     =0.2524E-01  M0     =0.4554E-02  J0     =0.0000E+00
 Associated 3-d length scales (meters)
 LQ     =      0.37  LM     =  99999.00  Lm     =       0.32  Lb     =       0.00
                                          Lmp    =  99999.00  Lbp    =  99999.00

NON-DIMENSIONAL PARAMETERS
 FR0    =  99999.00  FRD0   =  99999.00  R      =       0.86
 (slot)              (port/nozzle)

FLOW CLASSIFICATION
 2222222222222222222222222222222222222222222
 2  Flow class (CORMIX2)       =     MU8    2
 2  Applicable layer depth HS =      0.78  2
 2222222222222222222222222222222222222222222

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0     =0.1000E+03  CUNITS=  mg/l
 NTOX   =  0
 NSTD   =  0
 REGMZ  =  0
 XINT   =     865.00  XMAX   =     865.00

X-Y-Z COORDINATE SYSTEM:
```

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Dominion-Clover power Station (009) Permit No.: VA0083097

Receiving Stream: Roanoke River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	48.2	mg/L
90% Temperature (Annual) =	25.5	deg C
90% Temperature (Wet season) =	12	deg C
90% Maximum pH =	7.7	SU
10% Maximum pH =	6.79	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	y	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	18.432	MGD
7Q10 (Annual) =	122.11	MGD
30Q10 (Annual) =	529.4	MGD
1Q10 (Wet season) =	384.4	MGD
30Q10 (Wet season)	840	MGD
30Q5 =	598.4	MGD
Harmonic Mean =	1119.4	MGD
Annual Average =	na	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) =	2704	mg/L
90% Temp (Annual) =	20	deg C
90% Temp (Wet season) =	14	deg C
90% Maximum pH =	8.8	SU
10% Maximum pH =	7	SU
Discharge Flow =	0.576	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	--	--	1.2E+03	2.7E+03	--	--	1.2E+06	2.8E+06	--	--	1.2E+02	2.7E+02	--	--	1.2E+05	2.8E+05	**--**	**--**	**1.2E+05**	**2.8E+05**
Acrolein	0	--	--	3.2E+02	7.8E+02	--	--	3.3E+05	8.1E+05	--	--	3.2E+01	7.8E+01	--	--	3.3E+04	8.1E+04	**--**	**--**	**3.3E+04**	**8.1E+04**
Acrylonitrile[c]	0	--	--	5.9E-01	6.6E+00	--	--	1.1E+03	1.3E+04	--	--	5.9E-02	6.6E-01	--	--	1.1E+02	1.3E+03	**--**	**--**	**1.1E+02**	**1.3E+03**
Aldrin [c]	0	3.0E+00	--	1.3E-03	1.4E-03	9.9E+01	--	2.5E+00	2.7E+00	7.5E-01	--	1.3E-04	1.4E-04	2.5E+01	--	2.5E-01	2.7E-01	**2.5E+01**	**--**	**2.5E-01**	**2.7E-01**
Ammonia-N (mg/l) (Yearly)	0	1.41E+01	1.76E+00	--	--	4.7E+02	1.6E+03	--	--	3.54E+00	4.41E-01	--	--	1.2E+02	4.1E+02	--	--	**1.2E+02**	**4.1E+02**	**--**	**--**
Ammonia-N (mg/l) (High Flow)	0	1.44E+01	3.58E+00	--	--	9.6E+03	5.2E+03	--	--	3.61E+00	8.94E-01	--	--	2.4E+03	1.3E+03	--	--	**2.4E+03**	**1.3E+03**	**--**	**--**
Anthracene	0	--	--	9.6E+03	1.1E+05	--	--	1.0E+07	1.1E+08	--	--	9.6E+02	1.1E+04	--	--	1.0E+06	1.1E+07	**--**	**--**	**1.0E+06**	**1.1E+07**
Antimony	0	--	--	1.4E+01	4.3E+03	--	--	1.5E+04	4.5E+06	--	--	1.4E+00	4.3E+02	--	--	1.5E+03	4.5E+05	**--**	**--**	**1.5E+03**	**4.5E+05**
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.1E+04	3.2E+04	1.0E+04	--	8.5E+01	3.8E+01	1.0E+00	--	2.8E+03	8.0E+03	1.0E+03	--	**2.8E+03**	**8.0E+03**	**1.0E+03**	**--**
Barium	0	--	--	2.0E+03	--	--	--	2.1E+06	--	--	--	2.0E+02	--	--	--	2.1E+05	--	**--**	**--**	**2.1E+05**	**--**
Benzene [c]	0	--	--	1.2E+01	7.1E+02	--	--	2.3E+04	1.4E+06	--	--	1.2E+00	7.1E+01	--	--	2.3E+03	1.4E+05	**--**	**--**	**2.3E+03**	**1.4E+05**
Benzidine[c]	0	--	--	1.2E-03	5.4E-03	--	--	2.3E+00	1.0E+01	--	--	1.2E-04	5.4E-04	--	--	2.3E-01	1.0E+00	**--**	**--**	**2.3E-01**	**1.0E+00**
Benzo (a) anthracene [c]	0	--	--	4.4E-02	4.9E-01	--	--	8.6E+01	9.5E+02	--	--	4.4E-03	4.9E-02	--	--	8.6E+00	9.5E+01	**--**	**--**	**8.6E+00**	**9.5E+01**
Benzo (b) fluoranthene [c]	0	--	--	4.4E-02	4.9E-01	--	--	8.6E+01	9.5E+02	--	--	4.4E-03	4.9E-02	--	--	8.6E+00	9.5E+01	**--**	**--**	**8.6E+00**	**9**
Benzo (k) fluoranthene [c]	0	--	--	4.4E-02	4.9E-01	--	--	8.6E+01	9.5E+02	--	--	4.4E-03	4.9E-02	--	--	8.6E+00	9.5E+01	**--**	**--**	**8.6E+00**	**9.5E+01**
Benzo (a) pyrene [c]	0	--	--	4.4E-02	4.9E-01	--	--	8.6E+01	9.5E+02	--	--	4.4E-03	4.9E-02	--	--	8.6E+00	9.5E+01	**--**	**--**	**8.6E+00**	**9.5E+01**
Bis2-Chloroethyl Ether	0	--	--	3.1E-01	1.4E+01	--	--	3.2E+02	1.5E+04	--	--	3.1E-02	1.4E+00	--	--	3.2E+01	1.5E+03	**--**	**--**	**3.2E+01**	**1.5E+03**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	1.7E+05	--	--	1.5E+06	1.8E+08	--	--	1.4E+02	1.7E+04	--	--	1.5E+05	1.8E+07	**--**	**--**	**1.5E+05**	**1.8E+07**
Bromoform [c]	0	--	--	4.4E+01	3.6E+03	--	--	8.6E+04	7.0E+06	--	--	4.4E+00	3.6E+02	--	--	8.6E+03	7.0E+05	**--**	**--**	**8.6E+03**	**7.0E+05**
Butylbenzylphthalate	0	--	--	3.0E+03	5.2E+03	--	--	3.1E+06	5.4E+06	--	--	3.0E+02	5.2E+02	--	--	3.1E+05	5.4E+05	**--**	**--**	**3.1E+05**	**5.4E+05**
Cadmium	0	5.2E+00	7.7E-01	5.0E+00	--	1.7E+02	1.6E+02	5.2E+03	--	1.3E+00	1.9E-01	5.0E-01	--	4.3E+01	4.1E+01	5.2E+02	--	**4.3E+01**	**4.1E+01**	**5.2E+02**	**--**
Carbon Tetrachloride [c]	0	--	--	2.5E+00	4.4E+01	--	--	4.9E+03	8.6E+04	--	--	2.5E-01	4.4E+00	--	--	4.9E+02	8.6E+03	**--**	**--**	**4.9E+02**	**8.6E+03**
Chlordane [c]	0	2.4E+00	4.3E-03	2.1E-02	2.2E-02	7.9E+01	9.2E-01	4.1E+01	4.3E+01	6.0E-01	1.1E-03	2.1E-03	2.2E-03	2.0E+01	2.3E-01	4.1E+00	4.3E+00	**2.0E+01**	**2.3E-01**	**4.1E+00**	**4.3E+00**
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	2.8E+07	4.9E+07	2.6E+08	--	2.2E+05	5.8E+04	2.5E+04	--	7.1E+06	1.2E+07	2.6E+07	--	**7.1E+06**	**1.2E+07**	**2.6E+07**	**--**
TRC	0	1.9E+01	1.1E+01	--	--	6.3E+02	2.3E+03	--	--	4.8E+00	2.8E+00	--	--	1.6E+02	5.9E+02	--	--	**1.6E+02**	**5.9E+02**	**--**	**--**
Chlorobenzene	0	--	--	6.8E+02	2.1E+04	--	--	7.1E+05	2.2E+07	--	--	6.8E+01	2.1E+03	--	--	7.1E+04	2.2E+06	**--**	**--**	**7.1E+04**	**2.2E+06**

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	--	--	4.1E+00	3.4E+02	--	--	8.0E+03	6.6E+05	--	--	4.1E-01	3.4E+01	--	--	8.0E+02	6.6E+04	--	--	8.0E+02	6.6E+04
Chloroform [C]	0	--	--	3.5E+02	2.9E+04	--	--	6.8E+05	5.6E+07	--	--	3.5E+01	2.9E+03	--	--	6.8E+04	5.6E+06	--	--	6.8E+04	5.6E+06
2-Chloronaphthalene	0	--	--	1.7E+03	4.3E+03	--	--	1.8E+06	4.5E+06	--	--	1.7E+02	4.3E+02	--	--	1.8E+05	4.5E+05	--	--	1.8E+05	4.5E+05
2-Chlorophenol	0	--	--	1.2E+02	4.0E+02	--	--	1.2E+05	4.2E+05	--	--	1.2E+01	4.0E+01	--	--	1.2E+04	4.2E+04	--	--	1.2E+04	4.2E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	2.7E+00	8.7E+00	--	--	2.1E-02	1.0E-02	--	--	6.8E-01	2.2E+00	--	--	6.8E-01	2.2E+00	--	--
Chromium III	0	7.0E+02	4.9E+01	--	--	2.3E+04	1.0E+04	--	--	1.8E+02	1.2E+01	--	--	5.8E+03	2.6E+03	--	--	5.8E+03	2.6E+03	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	5.3E+02	2.3E+03	--	--	4.0E+00	2.8E+00	--	--	1.3E+02	5.9E+02	--	--	1.3E+02	5.9E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.0E+05	--	--	--	1.0E+01	--	--	--	1.0E+04	--	--	--	1.0E+04	--
Chrysene [C]	0	--	--	4.4E-02	4.9E-01	--	--	8.6E+01	9.5E+02	--	--	4.4E-03	4.9E-02	--	--	8.6E+00	9.5E+01	--	--	8.6E+00	9.5E+01
Copper	0	1.7E+01	5.8E+00	1.3E+03	--	5.6E+02	1.2E+03	1.4E+06	--	4.3E+00	1.5E+00	1.3E+02	--	1.4E+02	3.1E+02	1.4E+05	--	1.4E+02	3.1E+02	1.4E+05	--
Cyanide	0	2.2E+01	5.2E+00	7.0E+02	2.2E+05	7.3E+02	1.1E+03	7.3E+05	2.2E+08	5.5E+00	1.3E+00	7.0E+01	2.2E+04	1.8E+02	2.8E+02	7.3E+04	2.2E+07	1.8E+02	2.8E+02	7.3E+04	2.2E+07
DDD [C]	0	--	--	8.3E-03	8.4E-03	--	--	1.6E+01	1.6E+01	--	--	8.3E-04	8.4E-04	--	--	1.6E+00	1.6E+00	--	--	1.6E+00	1.6E+00
DDE [C]	0	--	--	5.9E-03	5.9E-03	--	--	1.1E+01	1.1E+01	--	--	5.9E-04	5.9E-04	--	--	1.1E+00	1.1E+00	--	--	1.1E+00	1.1E+00
DDT [C]	0	1.1E+00	1.0E-03	5.9E-03	5.9E-03	3.6E+01	2.1E-01	1.1E+01	1.1E+01	2.8E-01	2.5E-04	5.9E-04	5.9E-04	9.1E+00	5.3E-02	1.1E+00	1.1E+00	9.1E+00	5.3E-02	1.1E+00	1.1E+00
Demeton	0	--	1.0E-01	--	--	--	2.1E+01	--	--	--	2.5E-02	--	--	--	5.3E+00	--	--	--	5.3E+00	--	--
Dibenz(a,h)anthracene [C]	0	--	--	4.4E-02	4.9E-01	--	--	8.6E+01	9.5E+02	--	--	4.4E-03	4.9E-02	--	--	8.6E+00	9.5E+01	--	--	8.6E+00	9.[illegible]1
Dibutyl phthalate	0	--	--	2.7E+03	1.2E+04	--	--	2.8E+06	1.2E+07	--	--	2.7E+02	1.2E+03	--	--	2.8E+05	1.2E+06	--	--	2.8E+05	1.[illegible]
Dichloromethane (Methylene Chloride) [C]	0	--	--	4.7E+01	1.6E+04	--	--	9.1E+04	3.1E+07	--	--	4.7E+00	1.6E+03	--	--	9.1E+03	3.1E+06	--	--	9.1E+03	3.1E+06
1,2-Dichlorobenzene	0	--	--	2.7E+03	1.7E+04	--	--	2.8E+06	1.8E+07	--	--	2.7E+02	1.7E+03	--	--	2.8E+05	1.8E+06	--	--	2.8E+05	1.8E+06
1,3-Dichlorobenzene	0	--	--	4.0E+02	2.6E+03	--	--	4.2E+05	2.7E+06	--	--	4.0E+01	2.6E+02	--	--	4.2E+04	2.7E+05	--	--	4.2E+04	2.7E+05
1,4-Dichlorobenzene	0	--	--	4.0E+02	2.6E+03	--	--	4.2E+05	2.7E+06	--	--	4.0E+01	2.6E+02	--	--	4.2E+04	2.7E+05	--	--	4.2E+04	2.7E+05
3,3-Dichlorobenzidine[C]	0	--	--	4.0E-01	7.7E-01	--	--	7.8E+02	1.5E+03	--	--	4.0E-02	7.7E-02	--	--	7.8E+01	1.5E+02	--	--	7.8E+01	1.5E+02
Dichlorobromomethane [C]	0	--	--	5.6E+00	4.6E+02	--	--	1.1E+04	8.9E+05	--	--	5.6E-01	4.6E+01	--	--	1.1E+03	8.9E+04	--	--	1.1E+03	8.9E+04
1,2-Dichloroethane [C]	0	--	--	3.8E+00	9.9E+02	--	--	7.4E+03	1.9E+06	--	--	3.8E-01	9.9E+01	--	--	7.4E+02	1.9E+05	--	--	7.4E+02	1.9E+05
1,1-Dichloroethylene	0	--	--	3.1E+02	1.7E+04	--	--	3.2E+05	1.8E+07	--	--	3.1E+01	1.7E+03	--	--	3.2E+04	1.8E+06	--	--	3.2E+04	1.8E+06
1,2-trans-dichloroethylene	0	--	--	7.0E+02	1.4E+05	--	--	7.3E+05	1.5E+08	--	--	7.0E+01	1.4E+04	--	--	7.3E+04	1.5E+07	--	--	7.3E+04	1.5E+07
2,4-Dichlorophenol	0	--	--	9.3E+01	7.9E+02	--	--	9.7E+04	8.2E+05	--	--	9.3E+00	7.9E+01	--	--	9.7E+03	8.2E+04	--	--	9.7E+03	8.2E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.0E+05	--	--	--	1.0E+01	--	--	--	1.0E+04	--	--	--	1.0E+04	--
1,2-Dichloropropane[C]	0	--	--	5.2E+00	3.9E+02	--	--	1.0E+04	7.6E+05	--	--	5.2E-01	3.9E+01	--	--	1.0E+03	7.6E+04	--	--	1.0E+03	7.6E+04
1,3-Dichloropropene	0	--	--	1.0E+01	1.7E+03	--	--	1.0E+04	1.8E+06	--	--	1.0E+00	1.7E+02	--	--	1.0E+03	1.8E+05	--	--	1.0E+03	1.8E+05
Dieldrin [C]	0	2.4E-01	5.6E-02	1.4E-03	1.4E-03	7.9E+00	1.2E+01	2.7E+00	2.7E+00	6.0E-02	1.4E-02	1.4E-04	1.4E-04	2.0E+00	3.0E+00	2.7E-01	2.7E-01	2.0E+00	3.0E+00	2.7E-01	2.7E-01
Diethyl Phthalate	0	--	--	2.3E+04	1.2E+05	--	--	2.4E+07	1.2E+08	--	--	2.3E+03	1.2E+04	--	--	2.4E+06	1.2E+07	--	--	2.4E+06	1.2E+07
Di-2-Ethylhexyl Phthalate [C]	0	--	--	1.8E+01	5.9E+01	--	--	3.5E+04	1.1E+05	--	--	1.8E+00	5.9E+00	--	--	3.5E+03	1.1E+04	--	--	3.5E+03	1.[illegible]4
2,4-Dimethylphenol	0	--	--	5.4E+02	2.3E+03	--	--	5.6E+05	2.4E+06	--	--	5.4E+01	2.3E+02	--	--	5.6E+04	2.4E+05	--	--	5.6E+04	2.[illegible]5
Dimethyl Phthalate	0	--	--	3.1E+05	2.9E+06	--	--	3.3E+08	3.0E+09	--	--	3.1E+04	2.9E+05	--	--	3.3E+07	3.0E+08	--	--	3.3E+07	3.0E+08
Di-n-Butyl Phthalate	0	--	--	2.7E+03	1.2E+04	--	--	2.8E+06	1.2E+07	--	--	2.7E+02	1.2E+03	--	--	2.8E+05	1.2E+06	--	--	2.8E+05	1.2E+06
2,4 Dinitrophenol	0	--	--	7.0E+01	1.4E+04	--	--	7.3E+04	1.5E+07	--	--	7.0E+00	1.4E+03	--	--	7.3E+03	1.5E+06	--	--	7.3E+03	1.5E+06
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	7.65E+02	--	--	1.4E+04	8.0E+05	--	--	1.3E+00	7.7E+01	--	--	1.4E+03	8.0E+04	--	--	1.4E+03	8.0E+04
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	9.1E+01	--	--	2.1E+03	1.8E+05	--	--	1.1E-01	9.1E+00	--	--	2.1E+02	1.8E+04	--	--	2.1E+02	1.8E+04
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	1.2E-06	1.2E-06	--	--	1.2E-06	1.2E-06	--	--	1.2E-07	1.2E-07	--	--	1.2E-07	1.2E-07	--	--	1.2E-07	1.2E-07
1,2-Diphenylhydrazine[C]	0	--	--	4.0E-01	5.4E+00	--	--	7.8E+02	1.0E+04	--	--	4.0E-02	5.4E-01	--	--	7.8E+01	1.0E+03	--	--	7.8E+01	1.0E+03
Alpha-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	7.3E+00	1.2E+01	1.1E+05	2.5E+05	5.5E-02	1.4E-02	1.1E+01	2.4E+01	1.8E+00	3.0E+00	1.1E+04	2.5E+04	1.8E+00	3.0E+00	1.1E+04	2.5E+04
Beta-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	7.3E+00	1.2E+01	1.1E+05	2.5E+05	5.5E-02	1.4E-02	1.1E+01	2.4E+01	1.8E+00	3.0E+00	1.1E+04	2.5E+04	1.8E+00	3.0E+00	1.1E+04	2.5E+04
Endosulfan Sulfate	0	--	--	1.1E+02	2.4E+02	--	--	1.1E+05	2.5E+05	--	--	1.1E+01	2.4E+01	--	--	1.1E+04	2.5E+04	--	--	1.1E+04	2.5E+04
Endrin	0	8.6E-02	3.6E-02	7.6E-01	8.1E-01	2.8E+00	7.7E+00	7.9E+02	8.4E+02	2.2E-02	9.0E-03	7.6E-02	8.1E-02	7.1E-01	1.9E+00	7.9E+01	8.4E+01	7.1E-01	1.9E+00	7.9E+01	8.4E+01
Endrin Aldehyde	0	--	--	7.6E-01	8.1E-01	--	--	7.9E+02	8.4E+02	--	--	7.6E-02	8.1E-02	--	--	7.9E+01	8.4E+01	--	--	7.9E+01	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	--	--	3.1E+03	2.9E+04	--	--	3.2E+06	3.0E+07	--	--	3.1E+02	2.9E+03	--	--	3.2E+05	3.0E+06	--	--	3.2E+05	3.0E+06
Fluoranthene	0	--	--	3.0E+02	3.7E+02	--	--	3.1E+05	3.8E+05	--	--	3.0E+01	3.7E+01	--	--	3.1E+04	3.8E+04	--	--	3.1E+04	3.8E+04
Fluorene	0	--	--	1.3E+03	1.4E+04	--	--	1.4E+06	1.5E+07	--	--	1.3E+02	1.4E+03	--	--	1.4E+05	1.5E+06	--	--	1.4E+05	1.5E+06
Foaming Agents	0	--	--	5.0E+02	--	--	--	5.2E+05	--	--	--	5.0E+01	--	--	--	5.2E+04	--	--	--	5.2E+04	--
Guthion	0	--	1.0E-02	--	--	--	2.1E+00	--	--	--	2.5E-03	--	--	--	5.3E-01	--	--	--	5.3E-01	--	--
Heptachlor [c]	0	5.2E-01	3.8E-03	2.1E-03	2.1E-03	1.7E+01	8.1E-01	4.1E+00	4.1E+00	1.3E-01	9.5E-04	2.1E-04	2.1E-04	4.3E+00	2.0E-01	4.1E-01	4.1E-01	4.3E+00	2.0E-01	4.1E-01	4.1E-01
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	1.0E-03	1.1E-03	1.7E+01	8.1E-01	1.9E+00	2.1E+00	1.3E-01	9.5E-04	1.0E-04	1.1E-04	4.3E+00	2.0E-01	1.9E-01	2.1E-01	4.3E+00	2.0E-01	1.9E-01	2.1E-01
Hexachlorobenzene[c]	0	--	--	7.5E-03	7.7E-03	--	--	1.5E+01	1.5E+01	--	--	7.5E-04	7.7E-04	--	--	1.5E+00	1.5E+00	--	--	1.5E+00	1.5E+00
Hexachlorobutadiene[c]	0	--	--	4.4E+00	5.0E+02	--	--	8.6E+03	9.7E+05	--	--	4.4E-01	5.0E+01	--	--	8.6E+02	9.7E+04	--	--	8.6E+02	9.7E+04
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	3.9E-02	1.3E-01	--	--	7.6E+01	2.5E+02	--	--	3.9E-03	1.3E-02	--	--	7.6E+00	2.5E+01	--	--	7.6E+00	2.5E+01
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	1.4E-01	4.6E-01	--	--	2.7E+02	8.9E+02	--	--	1.4E-02	4.6E-02	--	--	2.7E+01	8.9E+01	--	--	2.7E+01	8.9E+01
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	--	1.9E-01	6.3E-01	3.1E+01	--	3.7E+02	1.2E+03	2.4E-01	--	1.9E-02	6.3E-02	7.8E+00	--	3.7E+01	1.2E+02	7.8E+00	--	3.7E+01	1.2E+02
Hexachlorocyclopentadiene	0	--	--	2.4E+02	1.7E+04	--	--	2.5E+05	1.8E+07	--	--	2.4E+01	1.7E+03	--	--	2.5E+04	1.8E+06	--	--	2.5E+04	1.8E+06
Hexachloroethane[c]	0	--	--	1.9E+01	8.9E+01	--	--	3.7E+04	1.7E+05	--	--	1.9E+00	8.9E+00	--	--	3.7E+03	1.7E+04	--	--	3.7E+03	[illegible]
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	4.3E+02	--	--	--	5.0E-01	--	--	--	1.1E+02	--	--	--	1.1E+02	--	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	4.4E-02	4.9E-01	--	--	8.6E+01	9.5E+02	--	--	4.4E-03	4.9E-02	--	--	8.6E+00	9.5E+01	--	--	8.6E+00	9.5E+01
Iron	0	--	--	3.0E+02	--	--	--	3.1E+05	--	--	--	3.0E+01	--	--	--	3.1E+04	--	--	--	3.1E+04	--
Isophorone[c]	0	--	--	3.6E+02	2.6E+04	--	--	7.0E+05	5.1E+07	--	--	3.6E+01	2.6E+03	--	--	7.0E+04	5.1E+06	--	--	7.0E+04	5.1E+06
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	1.6E+02	7.2E+00	1.5E+01	--	5.4E+03	1.5E+03	1.6E+04	--	4.1E+01	1.8E+00	1.5E+00	--	1.4E+03	3.8E+02	1.6E+03	--	1.4E+03	3.8E+02	1.6E+03	--
Malathion	0	--	1.0E-01	--	--	--	2.1E+01	--	--	--	2.5E-02	--	--	--	5.3E+00	--	--	--	5.3E+00	--	--
Manganese	0	--	--	5.0E+01	--	--	--	5.2E+04	--	--	--	5.0E+00	--	--	--	5.2E+03	--	--	--	5.2E+03	--
Mercury	0	1.4E+00	7.7E-01	5.0E-02	5.1E-02	4.6E+01	1.6E+02	5.2E+01	5.3E+01	3.5E-01	1.9E-01	5.0E-03	5.1E-03	1.2E+01	4.1E+01	5.2E+00	5.3E+00	1.2E+01	4.1E+01	5.2E+00	5.3E+00
Methyl Bromide	0	--	--	4.8E+01	4.0E+03	--	--	5.0E+04	4.2E+06	--	--	4.8E+00	4.0E+02	--	--	5.0E+03	4.2E+05	--	--	5.0E+03	4.2E+05
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	6.4E+00	1.0E+05	--	--	7.5E-03	1.0E+01	--	--	1.6E+00	1.0E+04	--	--	1.6E+00	1.0E+04	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Monochlorobenzene	0	--	--	6.8E+02	2.1E+04	--	--	7.1E+05	2.2E+07	--	--	6.8E+01	2.1E+03	--	--	7.1E+04	2.2E+06	--	--	7.1E+04	2.2E+06
Nickel	0	2.3E+02	1.3E+01	6.1E+02	4.6E+03	7.4E+03	2.8E+03	6.3E+05	4.8E+06	5.6E+01	3.3E+00	6.1E+01	4.6E+02	1.9E+03	7.1E+02	6.3E+04	4.8E+05	1.9E+03	7.1E+02	6.3E+04	4.8E+05
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.0E+07	--	--	--	1.0E+03	--	--	--	1.0E+06	--	--	--	1.0E+06	--
Nitrobenzene	0	--	--	1.7E+01	1.9E+03	--	--	1.8E+04	2.0E+06	--	--	1.7E+00	1.9E+02	--	--	1.8E+03	2.0E+05	--	--	1.8E+03	2.0E+05
N-Nitrosodimethylamine[c]	0	--	--	6.9E-03	8.1E+01	--	--	1.3E+01	1.6E+05	--	--	6.9E-04	8.1E+00	--	--	1.3E+00	1.6E+04	--	--	1.3E+00	1.6E+04
N-Nitrosodiphenylamine[c]	0	--	--	5.0E+01	1.6E+02	--	--	9.7E+04	3.1E+05	--	--	5.0E+00	1.6E+01	--	--	9.7E+03	3.1E+04	--	--	9.7E+03	[illegible]
N-Nitrosodi-n-propylamine[c]	0	--	--	5.0E-02	1.4E+01	--	--	9.7E+01	2.7E+04	--	--	5.0E-03	1.4E+00	--	--	9.7E+00	2.7E+03	--	--	9.7E+00	2.7E+03
Parathion	0	6.5E-02	1.3E-02	--	--	2.1E+00	2.8E+00	--	--	1.6E-02	3.3E-03	--	--	5.4E-01	6.9E-01	--	--	5.4E-01	6.9E-01	--	--
PCB-1016	0	--	1.4E-02	--	--	--	3.0E+00	--	--	--	3.5E-03	--	--	--	7.5E-01	--	--	--	7.5E-01	--	--
PCB-1221	0	--	1.4E-02	--	--	--	3.0E+00	--	--	--	3.5E-03	--	--	--	7.5E-01	--	--	--	7.5E-01	--	--
PCB-1232	0	--	1.4E-02	--	--	--	3.0E+00	--	--	--	3.5E-03	--	--	--	7.5E-01	--	--	--	7.5E-01	--	--
PCB-1242	0	--	1.4E-02	--	--	--	3.0E+00	--	--	--	3.5E-03	--	--	--	7.5E-01	--	--	--	7.5E-01	--	--
PCB-1248	0	--	1.4E-02	--	--	--	3.0E+00	--	--	--	3.5E-03	--	--	--	7.5E-01	--	--	--	7.5E-01	--	--
PCB-1254	0	--	1.4E-02	--	--	--	3.0E+00	--	--	--	3.5E-03	--	--	--	7.5E-01	--	--	--	7.5E-01	--	--
PCB-1260	0	--	1.4E-02	--	--	--	3.0E+00	--	--	--	3.5E-03	--	--	--	7.5E-01	--	--	--	7.5E-01	--	--
PCB Total[c]	0	--	--	1.7E-03	1.7E-03	--	--	3.3E+00	3.3E+00	--	--	1.7E-04	1.7E-04	--	--	3.3E-01	3.3E-01	--	--	3.3E-01	3.3E-01

Chronic

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CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                        CORMIX MIXING ZONE EXPERT SYSTEM
                            CORMIX-GI Version 4.2GT
                         HYDRO2:Version-4.2  August,2002
SITE NAME/LABEL:                Clover Power Station Outfall 009 - proposed site #3
  DESIGN CASE:                  400 gpm discharge and 426.97 mgd (7Q10 - 21.6 mgd)
  FILE NAME:                    D:\Cormix\MyFiles\Clover Power Station at 7Q10.prd
Using subsystem CORMIX2:        Submerged Multiport Diffuser Discharges
  Start of session:             04/17/2003--15:07:26
*****************************************************************************
SUMMARY OF INPUT DATA:
-----------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                         = bounded
  Width                         BS      = 54 m
  Channel regularity            ICHREG  = 2
  Ambient flowrate              QA      = 18.71 m^3/s
  Average depth                 HA      = 0.81 m
  Depth at discharge            HD      = 0.99 m
  Ambient velocity              UA      = 0.4289 m/s
  Darcy-Weisbach friction factor F      = 0.0526
    Calculated from Manning's n         = 0.025
  Wind velocity                 UW      = 0 m/s
Stratification Type             STRCND  = U
  Surface density               RHOAS   = 998.2050 kg/m^3
  Bottom density                RHOAB   = 998.2050 kg/m^3
-----------------------------------------------------------------------------
DISCHARGE PARAMETERS:           Submerged Multiport Diffuser Discharge
  Diffuser type                 DITYPE  = alternating perpendicular
  Diffuser length               LD      = 4.6 m
  Nearest bank                          = left
  Diffuser endpoints            YB1     = 10.20 m;    YB2 = 14.80 m
  Number of openings            NOPEN   = 69
  Spacing between risers/openings SPAC  = 0.21 m
  Port/Nozzle diameter          D0      = 0.0508 m
    with contraction ratio              = 1
  Equivalent slot width         B0      = 0.0304 m
  Total area of openings        TA0      = 0.1399 m^2
  Discharge velocity            U0      = 0.18 m/s
  Total discharge flowrate      Q0      = 0.025236 m^3/s
  Discharge port height         H0      = 0.25 m
  Nozzle arrangement            BETYPE  = alternating with fanning
  Diffuser alignment angle      GAMMA   = 90 deg
  Vertical discharge angle      THETA   = 90 deg
  Horizontal discharge angle    SIGMA   = 0 deg
  Relative orientation angle    BETA    = 90 deg
  Discharge density             RHO0    = 998.2050 kg/m^3
  Density difference            DRHO    = 0 kg/m^3
  Buoyant acceleration          GP0     = 0 m/s^2
  Discharge concentration       C0      = 100 mg/l
  Surface heat exchange coeff.  KS      = 0 m/s
  Coefficient of decay          KD      = 0 /s
-----------------------------------------------------------------------------
FLUX VARIABLES PER UNIT DIFFUSER LENGTH:
  Discharge (volume flux)       q0      = 0.005486 m^2/s
  Momentum flux                 m0      = 0.000990 m^3/s^2
  Buoyancy flux                 j0      = 0 m^3/s^3
-----------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 0.03 m        Lm  = 0.01 m        LM  = 99999 m
  lm' = 99999 m       Lb' = 99999 m       La  = 99999 m
  (These refer to the actual discharge/environment length scales.)
-----------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
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Slot Froude number                FR0     = 99999
  Port/nozzle Froude number         FRD0    = 99999
  Velocity ratio                    R       = 0.42
-----------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                           = no
  Water quality standard specified          = no
  Regulatory mixing zone                    = no
  Region of interest                        = 865 m downstream
*****************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *------------------------*
  | FLOW CLASS    = MU8 |
  *------------------------*
  This flow configuration applies to a layer corresponding to the full water
  depth at the discharge site.
  Applicable layer depth = water depth = 0.99 m
*****************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-----------------------------------------------------------------------------
X-Y-Z Coordinate system:
  Origin is located at the bottom below the port center:
    12.5 m from the left bank/shore.
  Number of display steps NSTEP = 100 per module.
-----------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at edge of NFR = 1.1739 mg/l
  Dilution at edge of NFR                = 85.2
  NFR Location:                        x = 5.00 m
    (centerline coordinates)           y = 0 m
                                       z = 0.99 m
  NFR plume dimensions:        half-width = 2.53 m
                                 thickness = 0.99 m
-----------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is equal or about about equal to the surrounding
  ambient water density at the discharge level.
  Therefore, the effluent behaves essentially as NEUTRALLY BUOYANT.
-----------------------------------------------------------------------------
Near-field instability behavior:
  The diffuser flow will experience instabilities with full vertical mixing
  in the near-field.
  There may be benthic impact of high pollutant concentrations.
-----------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume becomes vertically fully mixed ALREADY IN NEAR-FIELD at 5.00 m
  downstream and continues as vertically mixed into the far-field.
-----------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section does not contact bank.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
********************** REGULATORY MIXING ZONE SUMMARY **********************
No RMZ and no ambient water quality standard have been specified.
******************** FINAL DESIGN ADVICE AND COMMENTS **********************
CORMIX2 uses the TWO-DIMENSIONAL SLOT DIFFUSER CONCEPT to represent
  the actual three-dimensional diffuser geometry.  Thus, it approximates
  the details of the merging process of the individual jets from each
  port/nozzle.
In the present design, the spacing between adjacent ports/nozzles
```

(or riser assemblies) is of the order of, or less than, the local water depth so that the slot diffuser approximation holds well.

Nevertheless, if this is a final design, the user is advised to use a final CORMIX1 (single port discharge) analysis, with discharge data for an individual diffuser jet/plume, in order to compare to the present near-field prediction.

DIFFUSER DESIGN DETAILS: Because of the circular arrangement of the nozzles/ports at each riser, the AVERAGE VERTICAL ANGLE (THETA) has been set to 90 deg. This represents a ZERO NET HORIZONTAL MOMENTUM FLUX for the entire diffuser.

REMINDER: The user must take note that HYDRODYNAMIC MODELING by any known technique is NOT AN EXACT SCIENCE.

Extensive comparison with field and laboratory data has shown that the CORMIX predictions on dilutions and concentrations (with associated plume geometries) are reliable for the majority of cases and are accurate to within about +-50% (standard deviation).

As a further safeguard, CORMIX will not give predictions whenever it judges the design configuration as highly complex and uncertain for prediction.

```
CORMIX2 PREDICTION FILE:
2222222222222222222222222222222222222222222222222222222222222222222222222222222
                    CORMIX MIXING ZONE EXPERT SYSTEM
         Subsystem CORMIX2:  Submerged Multiport Diffuser Discharges
                      CORMIX-GI Version 4.2GT
                    HYDRO2 Version 4.2 August 2002
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------
CASE DESCRIPTION
 Site name/label:   Clover Power Station Outfall 009 - proposed site #3
 Design case:       400 gpm discharge and 426.97 mgd (7Q10 - 21.6 mgd)
 FILE NAME:         D:\Cormix\MyFiles\Clover Power Station at 7Q10.prd
 Time stamp:        Thu Apr 17 15:07:26 2003

ENVIRONMENT PARAMETERS (metric units)
 Bounded section
 BS     =      54.00  AS     =      43.62  QA     =      18.71  ICHREG= 2
 HA     =       0.81  HD     =       0.99
 UA     =      0.429  F      =      0.053  USTAR =0.3479E-01
 UW     =      0.000  UWSTAR=0.0000E+00
 Uniform density environment
 STRCND=  U           RHOAM =  998.2050

DIFFUSER DISCHARGE PARAMETERS (metric units)
 Diffuser type:      DITYPE= alternating_perpendicular
 BANK   =  LEFT      DISTB =      12.50  YB1    =      10.20  YB2    =      14.80
 LD     =       4.60  NOPEN =   69       SPAC   =       0.21
 D0     =      0.051  A0     =      0.002  H0     =       0.25
 Nozzle/port arrangement:   alternating_with_fanning
 GAMMA =      90.00  THETA =      90.00  SIGMA =       0.00  BETA   =      90.00
 U0     =      0.180  Q0     =      0.025        =0.2524E-01
 RHO0   =  998.2050  DRHO0 =0.0000E+00  GP0    =0.0000E+00
 C0     =0.1000E+03  CUNITS=  mg/l
 IPOLL =  1          KS     =0.0000E+00  KD     =0.0000E+00

FLUX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
 q0     =0.5486E-02  m0     =0.9900E-03  j0     =0.0000E+00  SIGNJ0=       1.0
 Associated 2-d length scales (meters)
 lQ=B   =      0.030  lM     =  99999.00  lm     =       0.01
 lmp    =  99999.00  lbp    =  99999.00  la     =  99999.00

FLUX VARIABLES - ENTIRE DIFFUSER (metric units)
 Q0     =0.2524E-01  M0     =0.4554E-02  J0     =0.0000E+00
 Associated 3-d length scales (meters)
 LQ     =       0.37  LM     =  99999.00  Lm     =       0.16  Lb     =       0.00
                                           Lmp    =  99999.00  Lbp    =  99999.00

NON-DIMENSIONAL PARAMETERS
 FR0    =  99999.00  FRD0   =  99999.00  R      =       0.42
 (slot)              (port/nozzle)

FLOW CLASSIFICATION
 22222222222222222222222222222222222222222
 2  Flow class (CORMIX2)       =     MU8    2
 2  Applicable layer depth HS =      0.99  2
 22222222222222222222222222222222222222222

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0     =0.1000E+03  CUNITS=  mg/l
 NTOX   =  0
 NSTD   =  0
 REGMZ  =  0
 XINT   =     865.00  XMAX   =     865.00

X-Y-Z COORDINATE SYSTEM:
```

ORIGIN is located at the bottom and the diffuser mid-point:
12.50 m from the LEFT bank/shore.
X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP =100 display intervals per module

BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:
BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
BH = top-hat half-width, in horizontal plane normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
0.00	0.00	0.25	1.0	0.100E+03	0.02	2.30

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

Because of the FANNED-OUT HORIZONTAL ORIENTATION of the diffuser jets, the near-field dilution is slightly improved.

Because of the strong ambient current the diffuser plume of this crossflowing discharge gets RAPIDLY DEFLECTED.
A near-field zone is formed that is VERTICALLY FULLY MIXED over the entire layer depth. Full mixing is achieved at a downstream distance of about five (5) layer depths.

Profile definitions:
BV = layer depth (vertically mixed)
BH = top-hat half-width, measured horizontally in Y-direction
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
0.00	0.00	0.25	1.0	0.100E+03	0.02	2.30
0.05	0.00	0.25	9.4	0.106E+02	0.03	2.30
0.10	0.00	0.25	12.9	0.775E+01	0.04	2.30
0.15	0.00	0.26	15.6	0.642E+01	0.05	2.31
0.20	0.00	0.26	17.8	0.561E+01	0.06	2.31
0.25	0.00	0.26	19.8	0.504E+01	0.07	2.31
0.30	0.00	0.26	21.6	0.463E+01	0.08	2.31
0.35	0.00	0.27	23.3	0.430E+01	0.09	2.32
0.40	0.00	0.27	24.8	0.403E+01	0.10	2.32
0.45	0.00	0.27	26.3	0.381E+01	0.11	2.32
0.50	0.00	0.27	27.6	0.362E+01	0.12	2.32
0.54	0.00	0.28	28.9	0.346E+01	0.13	2.33
0.59	0.00	0.28	30.2	0.332E+01	0.14	2.33
0.64	0.00	0.28	31.4	0.319E+01	0.15	2.33
0.69	0.00	0.28	32.5	0.308E+01	0.16	2.33
0.74	0.00	0.29	33.6	0.298E+01	0.17	2.33
0.79	0.00	0.29	34.7	0.288E+01	0.18	2.34
0.84	0.00	0.29	35.7	0.280E+01	0.19	2.34
0.89	0.00	0.29	36.7	0.272E+01	0.20	2.34
0.94	0.00	0.30	37.7	0.265E+01	0.21	2.34
0.99	0.00	0.30	38.6	0.259E+01	0.22	2.35
1.04	0.00	0.30	39.6	0.253E+01	0.23	2.35
1.09	0.00	0.30	40.5	0.247E+01	0.24	2.35
1.14	0.00	0.31	41.4	0.242E+01	0.25	2.35
1.19	0.00	0.31	42.2	0.237E+01	0.26	2.36

ORIGIN is located at the bottom and the diffuser mid-point:
12.50 m from the LEFT bank/shore.
X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP =100 display intervals per module

BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:
BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
BH = top-hat half-width, in horizontal plane normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
0.00	0.00	0.08	1.0	0.100E+03	0.02	2.30

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

Because of the FANNED-OUT HORIZONTAL ORIENTATION of the diffuser jets, the near-field dilution is slightly improved.

Because of the strong ambient current the diffuser plume of this crossflowing discharge gets RAPIDLY DEFLECTED.
A near-field zone is formed that is VERTICALLY FULLY MIXED over the entire layer depth. Full mixing is achieved at a downstream distance of about five (5) layer depths.

Profile definitions:
BV = layer depth (vertically mixed)
BH = top-hat half-width, measured horizontally in Y-direction
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
0.00	0.00	0.08	1.0	0.100E+03	0.02	2.30
0.04	0.00	0.08	4.2	0.240E+02	0.03	2.30
0.08	0.00	0.08	5.5	0.182E+02	0.04	2.30
0.12	0.00	0.09	6.5	0.154E+02	0.05	2.31
0.16	0.00	0.09	7.4	0.136E+02	0.05	2.31
0.19	0.00	0.09	8.1	0.123E+02	0.06	2.31
0.23	0.00	0.10	8.8	0.114E+02	0.07	2.31
0.27	0.00	0.10	9.4	0.106E+02	0.08	2.32
0.31	0.00	0.10	10.0	0.100E+02	0.08	2.32
0.35	0.00	0.10	10.5	0.950E+01	0.09	2.32
0.39	0.00	0.11	11.0	0.906E+01	0.10	2.32
0.43	0.00	0.11	11.5	0.867E+01	0.11	2.33
0.47	0.00	0.11	12.0	0.833E+01	0.11	2.33
0.51	0.00	0.12	12.4	0.803E+01	0.12	2.33
0.55	0.00	0.12	12.9	0.776E+01	0.13	2.33
0.58	0.00	0.12	13.3	0.752E+01	0.14	2.33
0.62	0.00	0.13	13.7	0.730E+01	0.15	2.34
0.66	0.00	0.13	14.1	0.710E+01	0.15	2.34
0.70	0.00	0.13	14.5	0.691E+01	0.16	2.34
0.74	0.00	0.14	14.8	0.674E+01	0.17	2.34
0.78	0.00	0.14	15.2	0.658E+01	0.18	2.35
0.82	0.00	0.14	15.5	0.643E+01	0.18	2.35
0.86	0.00	0.15	15.9	0.629E+01	0.19	2.35
0.90	0.00	0.15	16.2	0.616E+01	0.20	2.35
0.94	0.00	0.15	16.6	0.604E+01	0.21	2.36

0.97	0.00	0.15	16.9	0.593E+01	0.21	2.36
1.01	0.00	0.16	17.2	0.582E+01	0.22	2.36
1.05	0.00	0.16	17.5	0.571E+01	0.23	2.36
1.09	0.00	0.16	17.8	0.562E+01	0.24	2.36
1.13	0.00	0.17	18.1	0.553E+01	0.24	2.37
1.17	0.00	0.17	18.4	0.544E+01	0.25	2.37
1.21	0.00	0.17	18.7	0.535E+01	0.26	2.37
1.25	0.00	0.18	19.0	0.527E+01	0.27	2.37
1.29	0.00	0.18	19.2	0.520E+01	0.27	2.38
1.33	0.00	0.18	19.5	0.512E+01	0.28	2.38
1.37	0.00	0.19	19.8	0.505E+01	0.29	2.38
1.40	0.00	0.19	20.1	0.499E+01	0.30	2.38
1.44	0.00	0.19	20.3	0.492E+01	0.30	2.39
1.48	0.00	0.20	20.6	0.486E+01	0.31	2.39
1.52	0.00	0.20	20.8	0.480E+01	0.32	2.39
1.56	0.00	0.20	21.1	0.474E+01	0.33	2.39
1.60	0.00	0.20	21.3	0.469E+01	0.33	2.39
1.64	0.00	0.21	21.6	0.463E+01	0.34	2.40
1.68	0.00	0.21	21.8	0.458E+01	0.35	2.40
1.72	0.00	0.21	22.1	0.453E+01	0.36	2.40
1.76	0.00	0.22	22.3	0.448E+01	0.36	2.40
1.79	0.00	0.22	22.5	0.444E+01	0.37	2.41
1.83	0.00	0.22	22.8	0.439E+01	0.38	2.41
1.87	0.00	0.23	23.0	0.435E+01	0.39	2.41
1.91	0.00	0.23	23.2	0.431E+01	0.39	2.41
1.95	0.00	0.23	23.5	0.426E+01	0.40	2.41
1.99	0.00	0.24	23.7	0.422E+01	0.41	2.42
2.03	0.00	0.24	23.9	0.418E+01	0.42	2.42
2.07	0.00	0.24	24.1	0.415E+01	0.42	2.42
2.11	0.00	0.25	24.3	0.411E+01	0.43	2.42
2.15	0.00	0.25	24.5	0.407E+01	0.44	2.43
2.18	0.00	0.25	24.8	0.404E+01	0.45	2.43
2.22	0.00	0.26	25.0	0.400E+01	0.46	2.43
2.26	0.00	0.26	25.2	0.397E+01	0.46	2.43
2.30	0.00	0.26	25.4	0.394E+01	0.47	2.44
2.34	0.00	0.26	25.6	0.391E+01	0.48	2.44
2.38	0.00	0.27	25.8	0.388E+01	0.49	2.44
2.42	0.00	0.27	26.0	0.385E+01	0.49	2.44
2.46	0.00	0.27	26.2	0.382E+01	0.50	2.44
2.50	0.00	0.28	26.4	0.379E+01	0.51	2.45
2.54	0.00	0.28	26.6	0.376E+01	0.52	2.45
2.57	0.00	0.28	26.8	0.373E+01	0.52	2.45
2.61	0.00	0.29	27.0	0.371E+01	0.53	2.45
2.65	0.00	0.29	27.2	0.368E+01	0.54	2.46
2.69	0.00	0.29	27.4	0.365E+01	0.55	2.46
2.73	0.00	0.30	27.6	0.363E+01	0.55	2.46
2.77	0.00	0.30	27.8	0.360E+01	0.56	2.46
2.81	0.00	0.30	27.9	0.358E+01	0.57	2.47
2.85	0.00	0.31	28.1	0.356E+01	0.58	2.47
2.89	0.00	0.31	28.3	0.353E+01	0.58	2.47
2.93	0.00	0.31	28.5	0.351E+01	0.59	2.47
2.96	0.00	0.31	28.7	0.349E+01	0.60	2.47
3.00	0.00	0.32	28.9	0.346E+01	0.61	2.48
3.04	0.00	0.32	29.0	0.344E+01	0.61	2.48
3.08	0.00	0.32	29.2	0.342E+01	0.62	2.48
3.12	0.00	0.33	29.4	0.340E+01	0.63	2.48
3.16	0.00	0.33	29.6	0.338E+01	0.64	2.49
3.20	0.00	0.33	29.8	0.336E+01	0.64	2.49
3.24	0.00	0.34	29.9	0.334E+01	0.65	2.49
3.28	0.00	0.34	30.1	0.332E+01	0.66	2.49
3.32	0.00	0.34	30.3	0.330E+01	0.67	2.50
3.35	0.00	0.35	30.4	0.328E+01	0.67	2.50
3.39	0.00	0.35	30.6	0.327E+01	0.68	2.50
3.43	0.00	0.35	30.8	0.325E+01	0.69	2.50
3.47	0.00	0.36	31.0	0.323E+01	0.70	2.50

3.51	0.00	0.36	31.1	0.321E+01	0.70	2.51
3.55	0.00	0.36	31.3	0.320E+01	0.71	2.51
3.59	0.00	0.36	31.5	0.318E+01	0.72	2.51
3.63	0.00	0.37	31.6	0.316E+01	0.73	2.51
3.67	0.00	0.37	31.8	0.315E+01	0.73	2.52
3.71	0.00	0.37	31.9	0.313E+01	0.74	2.52
3.74	0.00	0.38	32.1	0.311E+01	0.75	2.52
3.78	0.00	0.38	32.3	0.310E+01	0.76	2.52
3.82	0.00	0.38	32.4	0.308E+01	0.76	2.53
3.86	0.00	0.39	32.6	0.307E+01	0.77	2.53
3.90	0.00	0.39	32.8	0.305E+01	0.78	2.53

Cumulative travel time = 34. sec

Plume centerline may exhibit slight discontinuities in transition to subsequent far-field module.

END OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

** End of NEAR-FIELD REGION (NFR) **

BEGIN MOD241: BUOYANT AMBIENT SPREADING

Discharge is non-buoyant or weakly buoyant.
Therefore BUOYANT SPREADING REGIME is ABSENT.

END OF MOD241: BUOYANT AMBIENT SPREADING

Due to the attachment or proximity of the plume tothe bottom, the bottom coordinate for the FAR-FIELD differs from the ambient depth, ZFB = 0 m.
In a subsequent analysis set "depth at discharge" equal to "ambient depth".

BEGIN MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

Vertical diffusivity (initial value) = 0.279E-02 m^2/s
Horizontal diffusivity (initial value) = 0.696E-02 m^2/s

The passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

Profile definitions:
BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
= or equal to layer depth, if fully mixed
BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width, measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
3.94	0.00	0.78	32.8	0.305E+01	0.78	2.53	0.78	0.00
12.55	0.00	0.78	35.0	0.286E+01	0.78	2.70	0.78	0.00
21.16	0.00	0.78	37.1	0.270E+01	0.78	2.86	0.78	0.00
29.77	0.00	0.78	39.0	0.256E+01	0.78	3.01	0.78	0.00
38.38	0.00	0.78	40.9	0.244E+01	0.78	3.16	0.78	0.00
46.99	0.00	0.78	42.7	0.234E+01	0.78	3.30	0.78	0.00
55.60	0.00	0.78	44.4	0.225E+01	0.78	3.43	0.78	0.00
64.21	0.00	0.78	46.1	0.217E+01	0.78	3.56	0.78	0.00
72.82	0.00	0.78	47.7	0.210E+01	0.78	3.68	0.78	0.00
81.43	0.00	0.78	49.2	0.203E+01	0.78	3.80	0.78	0.00
90.05	0.00	0.78	50.7	0.197E+01	0.78	3.92	0.78	0.00
98.66	0.00	0.78	52.2	0.192E+01	0.78	4.03	0.78	0.00
107.27	0.00	0.78	53.6	0.187E+01	0.78	4.14	0.78	0.00
115.88	0.00	0.78	55.0	0.182E+01	0.78	4.25	0.78	0.00
124.49	0.00	0.78	56.3	0.177E+01	0.78	4.35	0.78	0.00
133.10	0.00	0.78	57.7	0.173E+01	0.78	4.45	0.78	0.00

1.24	0.00	0.31	43.1	0.232E+01	0.27	2.36
1.29	0.00	0.31	43.9	0.228E+01	0.28	2.36
1.34	0.00	0.32	44.7	0.223E+01	0.29	2.36
1.39	0.00	0.32	45.5	0.220E+01	0.29	2.36
1.44	0.00	0.32	46.3	0.216E+01	0.30	2.37
1.49	0.00	0.32	47.1	0.212E+01	0.31	2.37
1.54	0.00	0.33	47.9	0.209E+01	0.32	2.37
1.58	0.00	0.33	48.6	0.206E+01	0.33	2.37
1.63	0.00	0.33	49.4	0.203E+01	0.34	2.38
1.68	0.00	0.33	50.1	0.200E+01	0.35	2.38
1.73	0.00	0.34	50.8	0.197E+01	0.36	2.38
1.78	0.00	0.34	51.5	0.194E+01	0.37	2.38
1.83	0.00	0.34	52.2	0.192E+01	0.38	2.39
1.88	0.00	0.34	52.9	0.189E+01	0.39	2.39
1.93	0.00	0.35	53.6	0.187E+01	0.40	2.39
1.98	0.00	0.35	54.2	0.184E+01	0.41	2.39
2.03	0.00	0.35	54.9	0.182E+01	0.42	2.39
2.08	0.00	0.35	55.6	0.180E+01	0.43	2.40
2.13	0.00	0.36	56.2	0.178E+01	0.44	2.40
2.18	0.00	0.36	56.8	0.176E+01	0.45	2.40
2.23	0.00	0.36	57.5	0.174E+01	0.46	2.40
2.28	0.00	0.36	58.1	0.172E+01	0.47	2.41
2.33	0.00	0.37	58.7	0.170E+01	0.48	2.41
2.38	0.00	0.37	59.3	0.169E+01	0.49	2.41
2.43	0.00	0.37	59.9	0.167E+01	0.50	2.41
2.48	0.00	0.37	60.5	0.165E+01	0.51	2.41
2.53	0.00	0.38	61.1	0.164E+01	0.52	2.42
2.58	0.00	0.38	61.7	0.162E+01	0.53	2.42
2.63	0.00	0.38	62.3	0.161E+01	0.54	2.42
2.67	0.00	0.38	62.9	0.159E+01	0.55	2.42
2.72	0.00	0.38	63.4	0.158E+01	0.56	2.43
2.77	0.00	0.39	64.0	0.156E+01	0.57	2.43
2.82	0.00	0.39	64.6	0.155E+01	0.58	2.43
2.87	0.00	0.39	65.1	0.154E+01	0.58	2.43
2.92	0.00	0.39	65.7	0.152E+01	0.59	2.44
2.97	0.00	0.40	66.2	0.151E+01	0.60	2.44
3.02	0.00	0.40	66.8	0.150E+01	0.61	2.44
3.07	0.00	0.40	67.3	0.149E+01	0.62	2.44
3.12	0.00	0.40	67.8	0.147E+01	0.63	2.44
3.17	0.00	0.41	68.3	0.146E+01	0.64	2.45
3.22	0.00	0.41	68.9	0.145E+01	0.65	2.45
3.27	0.00	0.41	69.4	0.144E+01	0.66	2.45
3.32	0.00	0.41	69.9	0.143E+01	0.67	2.45
3.37	0.00	0.42	70.4	0.142E+01	0.68	2.46
3.42	0.00	0.42	70.9	0.141E+01	0.69	2.46
3.47	0.00	0.42	71.4	0.140E+01	0.70	2.46
3.52	0.00	0.42	71.9	0.139E+01	0.71	2.46
3.57	0.00	0.43	72.4	0.138E+01	0.72	2.47
3.62	0.00	0.43	72.9	0.137E+01	0.73	2.47
3.67	0.00	0.43	73.4	0.136E+01	0.74	2.47
3.71	0.00	0.43	73.9	0.135E+01	0.75	2.47
3.76	0.00	0.44	74.4	0.134E+01	0.76	2.47
3.81	0.00	0.44	74.9	0.134E+01	0.77	2.48
3.86	0.00	0.44	75.4	0.133E+01	0.78	2.48
3.91	0.00	0.44	75.8	0.132E+01	0.79	2.48
3.96	0.00	0.45	76.3	0.131E+01	0.80	2.48
4.01	0.00	0.45	76.8	0.130E+01	0.81	2.49
4.06	0.00	0.45	77.2	0.129E+01	0.82	2.49
4.11	0.00	0.45	77.7	0.129E+01	0.83	2.49
4.16	0.00	0.46	78.2	0.128E+01	0.84	2.49
4.21	0.00	0.46	78.6	0.127E+01	0.85	2.50
4.26	0.00	0.46	79.1	0.126E+01	0.86	2.50
4.31	0.00	0.46	79.5	0.126E+01	0.86	2.50
4.36	0.00	0.47	80.0	0.125E+01	0.87	2.50
4.41	0.00	0.47	80.4	0.124E+01	0.88	2.50

4.46	0.00	0.47	80.9	0.124E+01	0.89	2.51
4.51	0.00	0.47	81.3	0.123E+01	0.90	2.51
4.56	0.00	0.48	81.7	0.122E+01	0.91	2.51
4.61	0.00	0.48	82.2	0.122E+01	0.92	2.51
4.66	0.00	0.48	82.6	0.121E+01	0.93	2.52
4.71	0.00	0.48	83.1	0.120E+01	0.94	2.52
4.75	0.00	0.49	83.5	0.120E+01	0.95	2.52
4.80	0.00	0.49	83.9	0.119E+01	0.96	2.52
4.85	0.00	0.49	84.3	0.119E+01	0.97	2.53
4.90	0.00	0.49	84.8	0.118E+01	0.98	2.53
4.95	0.00	0.50	85.2	0.117E+01	0.99	2.53

Cumulative travel time = 21. sec

Plume centerline may exhibit slight discontinuities in transition to subsequent far-field module.

END OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

** End of NEAR-FIELD REGION (NFR) **

BEGIN MOD241: BUOYANT AMBIENT SPREADING

Discharge is non-buoyant or weakly buoyant.
Therefore BUOYANT SPREADING REGIME is ABSENT.

END OF MOD241: BUOYANT AMBIENT SPREADING

Due to the attachment or proximity of the plume tothe bottom, the bottom coordinate for the FAR-FIELD differs from the ambient depth, ZFB = 0 m.
In a subsequent analysis set "depth at discharge" equal to "ambient depth".

BEGIN MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

Vertical diffusivity (initial value) = 0.690E-02 m^2/s
Horizontal diffusivity (initial value) = 0.172E-01 m^2/s

The passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

Profile definitions:

BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
= or equal to layer depth, if fully mixed
BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width, measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
5.00	0.00	0.99	85.2	0.117E+01	0.99	2.53	0.99	0.00
13.60	0.00	0.99	92.1	0.109E+01	0.99	2.74	0.99	0.00
22.20	0.00	0.99	98.6	0.101E+01	0.99	2.93	0.99	0.00
30.80	0.00	0.99	104.6	0.956E+00	0.99	3.11	0.99	0.00
39.40	0.00	0.99	110.3	0.906E+00	0.99	3.28	0.99	0.00
48.00	0.00	0.99	115.8	0.864E+00	0.99	3.44	0.99	0.00
56.60	0.00	0.99	121.0	0.827E+00	0.99	3.59	0.99	0.00
65.20	0.00	0.99	125.9	0.794E+00	0.99	3.74	0.99	0.00
73.80	0.00	0.99	130.7	0.765E+00	0.99	3.88	0.99	0.00
82.40	0.00	0.99	135.4	0.739E+00	0.99	4.02	0.99	0.00
91.00	0.00	0.99	139.8	0.715E+00	0.99	4.15	0.99	0.00
99.60	0.00	0.99	144.2	0.694E+00	0.99	4.28	0.99	0.00
108.20	0.00	0.99	148.4	0.674E+00	0.99	4.41	0.99	0.00
116.80	0.00	0.99	152.4	0.656E+00	0.99	4.53	0.99	0.00
125.40	0.00	0.99	156.4	0.639E+00	0.99	4.65	0.99	0.00
134.00	0.00	0.99	160.3	0.624E+00	0.99	4.76	0.99	0.00

141.71	0.00	0.78	59.0	0.170E+01	0.78	4.55	0.78	0.00
150.32	0.00	0.78	60.2	0.166E+01	0.78	4.65	0.78	0.00
158.93	0.00	0.78	61.4	0.163E+01	0.78	4.75	0.78	0.00
167.54	0.00	0.78	62.7	0.160E+01	0.78	4.84	0.78	0.00
176.15	0.00	0.78	63.8	0.157E+01	0.78	4.93	0.78	0.00
184.76	0.00	0.78	65.0	0.154E+01	0.78	5.02	0.78	0.00
193.37	0.00	0.78	66.2	0.151E+01	0.78	5.11	0.78	0.00
201.98	0.00	0.78	67.3	0.149E+01	0.78	5.20	0.78	0.00
210.59	0.00	0.78	68.4	0.146E+01	0.78	5.28	0.78	0.00
219.20	0.00	0.78	69.5	0.144E+01	0.78	5.37	0.78	0.00
227.81	0.00	0.78	70.6	0.142E+01	0.78	5.45	0.78	0.00
236.43	0.00	0.78	71.6	0.140E+01	0.78	5.53	0.78	0.00
245.04	0.00	0.78	72.6	0.138E+01	0.78	5.61	0.78	0.00
253.65	0.00	0.78	73.7	0.136E+01	0.78	5.69	0.78	0.00
262.26	0.00	0.78	74.7	0.134E+01	0.78	5.77	0.78	0.00
270.87	0.00	0.78	75.7	0.132E+01	0.78	5.85	0.78	0.00
279.48	0.00	0.78	76.7	0.130E+01	0.78	5.92	0.78	0.00
288.09	0.00	0.78	77.6	0.129E+01	0.78	6.00	0.78	0.00
296.70	0.00	0.78	78.6	0.127E+01	0.78	6.07	0.78	0.00
305.31	0.00	0.78	79.6	0.126E+01	0.78	6.15	0.78	0.00
313.92	0.00	0.78	80.5	0.124E+01	0.78	6.22	0.78	0.00
322.53	0.00	0.78	81.4	0.123E+01	0.78	6.29	0.78	0.00
331.14	0.00	0.78	82.3	0.121E+01	0.78	6.36	0.78	0.00
339.75	0.00	0.78	83.2	0.120E+01	0.78	6.43	0.78	0.00
348.36	0.00	0.78	84.1	0.119E+01	0.78	6.50	0.78	0.00
356.97	0.00	0.78	85.0	0.118E+01	0.78	6.57	0.78	0.00
365.58	0.00	0.78	85.9	0.116E+01	0.78	6.64	0.78	0.00
374.20	0.00	0.78	86.8	0.115E+01	0.78	6.70	0.78	0.00
382.81	0.00	0.78	87.6	0.114E+01	0.78	6.77	0.78	0.00
391.42	0.00	0.78	88.5	0.113E+01	0.78	6.84	0.78	0.00
400.03	0.00	0.78	89.3	0.112E+01	0.78	6.90	0.78	0.00
408.64	0.00	0.78	90.2	0.111E+01	0.78	6.97	0.78	0.00
417.25	0.00	0.78	91.0	0.110E+01	0.78	7.03	0.78	0.00
425.86	0.00	0.78	91.8	0.109E+01	0.78	7.09	0.78	0.00
434.47	0.00	0.78	92.6	0.108E+01	0.78	7.16	0.78	0.00
443.08	0.00	0.78	93.4	0.107E+01	0.78	7.22	0.78	0.00
451.69	0.00	0.78	94.2	0.106E+01	0.78	7.28	0.78	0.00
460.30	0.00	0.78	95.0	0.105E+01	0.78	7.34	0.78	0.00
468.91	0.00	0.78	95.8	0.104E+01	0.78	7.40	0.78	0.00
477.52	0.00	0.78	96.6	0.104E+01	0.78	7.46	0.78	0.00
486.13	0.00	0.78	97.4	0.103E+01	0.78	7.52	0.78	0.00
494.74	0.00	0.78	98.1	0.102E+01	0.78	7.58	0.78	0.00
503.35	0.00	0.78	98.9	0.101E+01	0.78	7.64	0.78	0.00
511.96	0.00	0.78	99.7	0.100E+01	0.78	7.70	0.78	0.00
520.58	0.00	0.78	100.4	0.996E+00	0.78	7.76	0.78	0.00
529.19	0.00	0.78	101.2	0.988E+00	0.78	7.82	0.78	0.00
537.80	0.00	0.78	101.9	0.981E+00	0.78	7.87	0.78	0.00
546.41	0.00	0.78	102.6	0.974E+00	0.78	7.93	0.78	0.00
555.02	0.00	0.78	103.4	0.967E+00	0.78	7.99	0.78	0.00
563.63	0.00	0.78	104.1	0.961E+00	0.78	8.04	0.78	0.00
572.24	0.00	0.78	104.8	0.954E+00	0.78	8.10	0.78	0.00
580.85	0.00	0.78	105.5	0.948E+00	0.78	8.15	0.78	0.00
589.46	0.00	0.78	106.2	0.941E+00	0.78	8.21	0.78	0.00
598.07	0.00	0.78	106.9	0.935E+00	0.78	8.26	0.78	0.00
606.68	0.00	0.78	107.6	0.929E+00	0.78	8.32	0.78	0.00
615.29	0.00	0.78	108.3	0.923E+00	0.78	8.37	0.78	0.00
623.90	0.00	0.78	109.0	0.917E+00	0.78	8.42	0.78	0.00
632.51	0.00	0.78	109.7	0.911E+00	0.78	8.48	0.78	0.00
641.12	0.00	0.78	110.4	0.906E+00	0.78	8.53	0.78	0.00
649.73	0.00	0.78	111.1	0.900E+00	0.78	8.58	0.78	0.00
658.34	0.00	0.78	111.7	0.895E+00	0.78	8.63	0.78	0.00
666.96	0.00	0.78	112.4	0.890E+00	0.78	8.68	0.78	0.00
675.57	0.00	0.78	113.1	0.884E+00	0.78	8.74	0.78	0.00
684.18	0.00	0.78	113.7	0.879E+00	0.78	8.79	0.78	0.00
692.79	0.00	0.78	114.4	0.874E+00	0.78	8.84	0.78	0.00

142.60	0.00	0.99	164.1	0.609E+00	0.99	4.87	0.99	0.00
151.20	0.00	0.99	167.8	0.596E+00	0.99	4.98	0.99	0.00
159.80	0.00	0.99	171.4	0.583E+00	0.99	5.09	0.99	0.00
168.40	0.00	0.99	175.0	0.572E+00	0.99	5.20	0.99	0.00
177.00	0.00	0.99	178.5	0.560E+00	0.99	5.30	0.99	0.00
185.60	0.00	0.99	181.9	0.550E+00	0.99	5.40	0.99	0.00
194.20	0.00	0.99	185.2	0.540E+00	0.99	5.50	0.99	0.00
202.80	0.00	0.99	188.5	0.530E+00	0.99	5.60	0.99	0.00
211.40	0.00	0.99	191.7	0.522E+00	0.99	5.69	0.99	0.00
220.00	0.00	0.99	194.9	0.513E+00	0.99	5.79	0.99	0.00
228.60	0.00	0.99	198.0	0.505E+00	0.99	5.88	0.99	0.00
237.20	0.00	0.99	201.1	0.497E+00	0.99	5.97	0.99	0.00
245.80	0.00	0.99	204.2	0.490E+00	0.99	6.06	0.99	0.00
254.40	0.00	0.99	207.1	0.483E+00	0.99	6.15	0.99	0.00
263.00	0.00	0.99	210.1	0.476E+00	0.99	6.24	0.99	0.00
271.60	0.00	0.99	213.0	0.469E+00	0.99	6.33	0.99	0.00 ← 5 x width = 270,
280.20	0.00	0.99	215.9	0.463E+00	0.99	6.41	0.99	0.00
288.80	0.00	0.99	218.7	0.457E+00	0.99	6.50	0.99	0.00
297.40	0.00	0.99	221.5	0.451E+00	0.99	6.58	0.99	0.00
306.00	0.00	0.99	224.2	0.446E+00	0.99	6.66	0.99	0.00
314.60	0.00	0.99	227.0	0.441E+00	0.99	6.74	0.99	0.00
323.20	0.00	0.99	229.7	0.435E+00	0.99	6.82	0.99	0.00
331.80	0.00	0.99	232.3	0.430E+00	0.99	6.90	0.99	0.00
340.40	0.00	0.99	235.0	0.426E+00	0.99	6.98	0.99	0.00
349.00	0.00	0.99	237.6	0.421E+00	0.99	7.06	0.99	0.00
357.60	0.00	0.99	240.1	0.416E+00	0.99	7.13	0.99	0.00
366.20	0.00	0.99	242.7	0.412E+00	0.99	7.21	0.99	0.00
374.80	0.00	0.99	245.2	0.408E+00	0.99	7.28	0.99	0.00
383.40	0.00	0.99	247.7	0.404E+00	0.99	7.36	0.99	0.00
392.00	0.00	0.99	250.2	0.400E+00	0.99	7.43	0.99	0.00
400.60	0.00	0.99	252.6	0.396E+00	0.99	7.50	0.99	0.00
409.20	0.00	0.99	255.0	0.392E+00	0.99	7.57	0.99	0.00
417.80	0.00	0.99	257.4	0.388E+00	0.99	7.65	0.99	0.00
426.40	0.00	0.99	259.8	0.385E+00	0.99	7.72	0.99	0.00
435.00	0.00	0.99	262.2	0.381E+00	0.99	7.79	0.99	0.00
443.60	0.00	0.99	264.5	0.378E+00	0.99	7.86	0.99	0.00
452.20	0.00	0.99	266.8	0.375E+00	0.99	7.92	0.99	0.00
460.80	0.00	0.99	269.1	0.372E+00	0.99	7.99	0.99	0.00
469.40	0.00	0.99	271.4	0.368E+00	0.99	8.06	0.99	0.00
478.00	0.00	0.99	273.6	0.365E+00	0.99	8.13	0.99	0.00
486.60	0.00	0.99	275.9	0.362E+00	0.99	8.19	0.99	0.00
495.20	0.00	0.99	278.1	0.360E+00	0.99	8.26	0.99	0.00
503.80	0.00	0.99	280.3	0.357E+00	0.99	8.32	0.99	0.00
512.40	0.00	0.99	282.5	0.354E+00	0.99	8.39	0.99	0.00
521.00	0.00	0.99	284.6	0.351E+00	0.99	8.45	0.99	0.00
529.60	0.00	0.99	286.8	0.349E+00	0.99	8.52	0.99	0.00
538.20	0.00	0.99	288.9	0.346E+00	0.99	8.58	0.99	0.00
546.80	0.00	0.99	291.1	0.344E+00	0.99	8.64	0.99	0.00
555.40	0.00	0.99	293.2	0.341E+00	0.99	8.71	0.99	0.00
564.00	0.00	0.99	295.2	0.339E+00	0.99	8.77	0.99	0.00
572.60	0.00	0.99	297.3	0.336E+00	0.99	8.83	0.99	0.00
581.20	0.00	0.99	299.4	0.334E+00	0.99	8.89	0.99	0.00
589.80	0.00	0.99	301.4	0.332E+00	0.99	8.95	0.99	0.00
598.40	0.00	0.99	303.5	0.330E+00	0.99	9.01	0.99	0.00
607.00	0.00	0.99	305.5	0.327E+00	0.99	9.07	0.99	0.00
615.60	0.00	0.99	307.5	0.325E+00	0.99	9.13	0.99	0.00
624.20	0.00	0.99	309.5	0.323E+00	0.99	9.19	0.99	0.00
632.80	0.00	0.99	311.5	0.321E+00	0.99	9.25	0.99	0.00
641.40	0.00	0.99	313.4	0.319E+00	0.99	9.31	0.99	0.00
650.00	0.00	0.99	315.4	0.317E+00	0.99	9.37	0.99	0.00
658.60	0.00	0.99	317.3	0.315E+00	0.99	9.42	0.99	0.00
667.20	0.00	0.99	319.3	0.313E+00	0.99	9.48	0.99	0.00
675.80	0.00	0.99	321.2	0.311E+00	0.99	9.54	0.99	0.00
684.40	0.00	0.99	323.1	0.310E+00	0.99	9.60	0.99	0.00
693.00	0.00	0.99	325.0	0.308E+00	0.99	9.65	0.99	0.00

701.60	0.00	0.99	326.9	0.306E+00	0.99	9.71	0.99	0.00
710.20	0.00	0.99	328.7	0.304E+00	0.99	9.76	0.99	0.00
718.80	0.00	0.99	330.6	0.302E+00	0.99	9.82	0.99	0.00
727.40	0.00	0.99	332.5	0.301E+00	0.99	9.87	0.99	0.00
736.00	0.00	0.99	334.3	0.299E+00	0.99	9.93	0.99	0.00
744.60	0.00	0.99	336.1	0.297E+00	0.99	9.98	0.99	0.00
753.20	0.00	0.99	338.0	0.296E+00	0.99	10.04	0.99	0.00
761.80	0.00	0.99	339.8	0.294E+00	0.99	10.09	0.99	0.00
770.40	0.00	0.99	341.6	0.293E+00	0.99	10.14	0.99	0.00
779.00	0.00	0.99	343.4	0.291E+00	0.99	10.20	0.99	0.00
787.60	0.00	0.99	345.2	0.290E+00	0.99	10.25	0.99	0.00
796.20	0.00	0.99	346.9	0.288E+00	0.99	10.30	0.99	0.00
804.80	0.00	0.99	348.7	0.287E+00	0.99	10.36	0.99	0.00
813.40	0.00	0.99	350.5	0.285E+00	0.99	10.41	0.99	0.00
822.00	0.00	0.99	352.2	0.284E+00	0.99	10.46	0.99	0.00
830.60	0.00	0.99	354.0	0.283E+00	0.99	10.51	0.99	0.00
839.20	0.00	0.99	355.7	0.281E+00	0.99	10.56	0.99	0.00
847.80	0.00	0.99	357.4	0.280E+00	0.99	10.62	0.99	0.00
856.40	0.00	0.99	359.1	0.278E+00	0.99	10.67	0.99	0.00
865.00	0.00	0.99	360.8	0.277E+00	0.99	10.72	0.99	0.00

Cumulative travel time = 2023. sec

Simulation limit based on maximum specified distance = 865.00 m.
This is the REGION OF INTEREST limitation.

END OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

CORMIX2: Submerged Multiport Diffuser Discharges End of Prediction File

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701.40	0.00	0.78	115.1	0.869E+00	0.78	8.89	0.78	0.00
710.01	0.00	0.78	115.7	0.864E+00	0.78	8.94	0.78	0.00
718.62	0.00	0.78	116.4	0.859E+00	0.78	8.99	0.78	0.00
727.23	0.00	0.78	117.0	0.855E+00	0.78	9.04	0.78	0.00
735.84	0.00	0.78	117.6	0.850E+00	0.78	9.09	0.78	0.00
744.45	0.00	0.78	118.3	0.845E+00	0.78	9.14	0.78	0.00
753.06	0.00	0.78	118.9	0.841E+00	0.78	9.19	0.78	0.00
761.67	0.00	0.78	119.5	0.837E+00	0.78	9.23	0.78	0.00
770.28	0.00	0.78	120.2	0.832E+00	0.78	9.28	0.78	0.00
778.89	0.00	0.78	120.8	0.828E+00	0.78	9.33	0.78	0.00
787.50	0.00	0.78	121.4	0.824E+00	0.78	9.38	0.78	0.00
796.11	0.00	0.78	122.0	0.820E+00	0.78	9.43	0.78	0.00
804.72	0.00	0.78	122.6	0.815E+00	0.78	9.47	0.78	0.00
813.34	0.00	0.78	123.2	0.811E+00	0.78	9.52	0.78	0.00
821.95	0.00	0.78	123.9	0.807E+00	0.78	9.57	0.78	0.00
830.56	0.00	0.78	124.5	0.803E+00	0.78	9.61	0.78	0.00
839.17	0.00	0.78	125.1	0.800E+00	0.78	9.66	0.78	0.00
847.78	0.00	0.78	125.7	0.796E+00	0.78	9.71	0.78	0.00
856.39	0.00	0.78	126.3	0.792E+00	0.78	9.75	0.78	0.00
865.00	0.00	0.78	126.9	0.788E+00	0.78	9.80	0.78	0.00

Cumulative travel time = 4131. sec

Simulation limit based on maximum specified distance = 865.00 m.
This is the REGION OF INTEREST limitation.

END OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

CORMIX2: Submerged Multiport Diffuser Discharges End of Prediction File

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HYDRODYNAMIC MIXING STUDY

Clover Power Station
Coal Combustion By-Products Landfill
Clover, Virginia

Prepared for:

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INTRODUCTION

General

Virginia Electric and Power Company and Old Dominion Electric Cooperative (ODEC) hereafter referred to as "Dominion" own, and Dominion operates, the Clover Power Station a coal-fired steam electric generating facility located in Halifax County, Virginia. This summary describes the engineering activities that are being undertaken by Dominion to achieve compliance with effluent limits on wastewater discharges from the Clover Power Station's Industrial Waste Landfill facility (Site).

Site Description

Clover Power Station's 300-acre ash landfill area, including the approximately 100-acre Stage 3 ash landfill area, is located south of State Route 600, north of Black Walnut Creek and west of State Route 778, approximately three miles north of Clover, Virginia. This area has gentle to moderate topographic relief and consists of predominantly pine and deciduous wooded uplands, with some inactive farmland/pasture. The topographic elevation of the Site ranges from 325 ft along Black Walnut Creek to 425 ft (National Geodetic Vertical Datum, NGVD). The Site is dissected by several swales and water courses that drain towards Black Walnut Creek.

Discussion of Project

During 1999 the Solid Waste Permit for the Clover Power Station's landfill was modified to add approximately 2.8 acres to the landfill boundary in order to facilitate development of two dual wastewater collection basins for Phase 1 and Phase 2 of Stage 3 facility. Subsequent to the 1999 modification, and during the construction of the Phase 1 leachate basins, the VPDES Permit for the Clover Power Station was reissued with effluent limitations restricting the discharge of pollutants from the Site into Black Walnut Creek. Based on the consideration and evaluation of many compliance alternatives, Dominion has selected the option of rerouting the landfill discharges to the Roanoke River.

Phase 1 of the Stage III landfill has been constructed as designed and the station recently began active utilization of this landfill. Wastewaters from the Stage III landfill will discharge into Black Walnut Creek until no later than December 27, 2004 as agreed to under an April 1, 2002 Consent Special Order between Dominion and the State Water Control Board (Consent Order). During the Consent Order period the existing wastewater collection basins will be permitted for expansion and a pump station/pipe line will be constructed to pump the wastewater from the landfill collection ponds to approximately 175 feet downstream of the existing river water intake structure on the Roanoke River.

The revised wastewater management operations consist of the enlargement of the existing Phase I secondary wastewater collection basin and the proposed secondary wastewater collection basin within Phase 2, the construction of a valved gravity line discharging into a pump station, and the construction of a 2.34-mile force main terminating at the Roanoke River. The discharge to Black Walnut Creek from the existing Outfall 009 (and future Phase 2 landfill discharge) will be eliminated by increasing the Stage III landfill area by an additional 7.1 acres. As part of this expansion, the secondary collection basins for Phase 1 and Phase 2 of Stage 3 will be enlarged to accommodate wastewaters generated by a 25-year, 24-hour storm event and the daily leachate generated by Stages 1 and 2.

Wastewaters from each Phase of the Stage 3 Ash Disposal Landfill will discharge by gravity into the upper primary collection basin. During normal operations, the valve between the primary and secondary basins will remain closed. Once the wastewater has filled the primary collection basin to the elevation of the recessed spillway located in the berm between the primary and secondary basins, the leachate will flow over the spillway into the secondary basin. Based on the design grades for the leachate sumps within the landfill and the elevations of the recessed spillways, the wastewater level within the primary collection ponds will not rise to an elevation greater than the elevation of the 60-mil geomembrane liner within the landfill's sumps.

The wastewater flowing from the primary collection basin will then flow into the lower secondary basin. During the post-closure period for the Stages 1 and 2 Ash Disposal Landfill, wastewaters from this facility may be pumped into either the secondary collection basin within Phase 1 of the Stage 3 Landfill or directly into the pumping station that is located adjacent to the Phase 1 secondary leachate basin. The combined capacity of the Phase 1 primary and secondary basins are sized to contain the leachate from a 25-year 24-hour storm event within the Phase 1 drainage area in addition to a constant flow rate of 40 gallons per minute (gpm) of wastewater from the Stages 1 and 2 Landfill. The combined capacity of the yet-to-be-constructed Phase 2 primary and secondary collection basins are designed to contain the wastewaters produced by a 25- year 24- hour storm event within the Phase 2 drainage area.

Discharge Flow Rates

Wastewaters from the landfill will be pumped to the river using three identical pumps that will operate in cycles. The pumping rate for each individual pump will be 400 gpm (0.576 mgd). The wastewater collection basins are sized such that under periods of normal rainfall a single pump can adequately handle the volume of wastewater produced by the Stage III landfill plus an additional 40 gpm from the post-closure Stage I and II landfill. Consequently, the average flow rate for the relocated Outfall 009 should approximate 0.576 mgd .

During periods of extreme rainfall (i.e., 25-year 24-hour rain event) it will be necessary to operate two pumps concurrently in order to remove accumulated wastewaters. The pumping rate for two pumps operating simultaneously is estimated to be 640 gpm (0.9216 mgd), which is considered the maximum daily pumping rate. Since operation of two discharge pumps simultaneously will occur only during periods of extreme rainfall, it is anticipated that the maximum 30-day average flow would be much closer to the long-term average flow of 0.576 mgd than to the maximum daily flow of 0.9216 mgd.

Multiport Diffuser Mixing Study

It is our understanding that the major chemical constituents of concern in the coal ash leachate will be ammonia (as N) and Selenium. The diffuser has been designed to meet the requirements by the Virginia Department of Environment Quality (VDEQ) on the mixing zone induced by the proposed discharge. The diffuser design and hydrodynamic mixing study was performed using the Cornell Mixing Zone Expert Model System (CORMIX).

The mixing study and diffuser design are based on the following information provided by Dominion:

- Cross-sections of the Roanoke River for three sites referred as Sites 1, 2, and 3;
- A summary of water quality criteria applicable to Roanoke River; and,
- A summary of the VDEQ mixing zone requirements.

Additionally, Golder was asked to use following key parameters in the mixing zone study:

- Two flow rates for base flow in the river – 176 and 219 million gallons per day (mgd).
  - It is our understanding that the base flow rate (1Q10) is 176 mgd from the fact sheet used to develop the current permit, and that the flow rate of 219 mgd is based on VDEQ calculations assuming 200 cubic feet per second (cfs) release from Leesville dam for drought release;
- Effluent flow rates of 400, 600, and 640 gallons per minute (gpm)
  - Based on the discussion presented in the previous section, the minimum and maximum effluent flow rates from the facility were estimated to be 400 and 640 gpm, respectively;
- Ammonia (as N) concentrations of 11.16 and 18.43 milligram per liter (mg/L) in the effluent, based on current VDEQ and EPA standards for acute conditions (based on 1Q10 flow), respectively; and,
- Selenium concentration of 0.02 mg/L in the effluent based on the acute condition (1Q10 flow).

OBJECTIVE AND SCOPE OF WORK

The objectives of this study are to perform a hydrodynamic mixing study to evaluate the impact of the proposed discharge and to provide a design of a multi-port river diffuser. Golder reviewed the information provided by Dominion to establish input parameters for the hydrodynamic model. Golder then performed a total of 30 simulations to evaluate the performance of the proposed diffuser designs under various discharge scenarios. Finally Golder prepared this summary report.

This study was based on preliminary data provided by Dominion on the concentrations of ammonia and selenium. If updated data on these constituents develops prior to construction or the diffuser design needs to be revised, Golder recommends additional modeling to determine if this mixing study and its conclusions remain valid.

CORMIX MODELS

The Cornell Mixing Zone Expert Model System (CORMIX) used in this study is a hydrodynamic model developed by Cornell University for the U.S. EPA between 1985 and 1996. CORMIX consists of a series of software subsystems for analysis, prediction, and design of aqueous toxic or conventional pollutant discharges into diverse water bodies. It is a recommended analysis tool for permitting of industrial, municipal, thermal, and other point source discharges to receiving waters. In addition to predicting plume geometry and dilution characteristics within receiving water's initial mixing zone for compliance to regulatory constraints, the system is also capable of predicting the behavior of the discharge plume at large distances.

Version 4.1GT (CORMIX-GI, V.4.1) of CORMIX was used in the analyses for the Clover diffuser mixing zone project. CORMIX has three different subsystem modules for diverse discharge conditions. These subsystems are CORMIX1, CORMIX2, and CORMIX3, for analysis of submerged single port, submerged multi-port, and buoyant surface discharge configurations, respectively. CORMIX2 applies to three commonly used types of submerged multi-port diffuser discharges under the same general effluent and ambient conditions as CORMIX1. It analyzes unidirectional, staged, and alternating designs of multi-port diffusers and allows for arbitrary alignment of the diffuser structure within the ambient water body, and for arbitrary arrangement and orientation of the individual ports. CORMIX3 models discharge at the water surface through channels or pipes.

The CORMIX system represents a robust and versatile computerized methodology for predicting both the qualitative features (i.e., flow classifications) and quantitative features (i.e., dilution ratio, plume trajectory) of the hydrodynamic mixing processes resulting from different discharge configurations and in all types of ambient water bodies, including small streams, large rivers, lakes,

reservoirs, estuaries, and coastal waters. The model is equally applicable to a wide range of problems from a simple single submerged pipe discharge into a small stream with rapid cross-sectional mixing to a complicated multi-port diffuser installation in deeply stratified coastal waters. All CORMIX systems can predict mixing for both conservative and first-order decay processes, and can simulate chemical dispersion and heat transfer from thermal plumes.

Impact from the discharge structure depends on geometry of the structure, characteristics of the effluent, geometry of the receiving water body, and characteristics of the ambient water in the receiving water body. For a multi-port diffuser the arrangement of the individual ports along the diffuser line, the orientation of diffuser line, and other construction details represent geometric features of the diffuser. Important characteristics of effluent include flow rate, type and concentration of chemical constituent in the effluent, momentum flux, and buoyancy flux.

CORMIX model is used to establish the mixing zone. A mixing zone is a limited area or volume where the initial dilution of a discharge occurs. The mixing zone is defined as "allocated impact zone" where numeric water quality criteria can be exceeded as long as acutely toxic conditions were prevented. Therefore, water quality standards apply at the boundary of the mixing zone. Furthermore, water quality standards stipulated frequently limit the size and cross-section of the plume.

In the Clover mixing study, CORMIX2 was used for analysis of the proposed diffuser design using multiple discharge ports. The diffuser pipe will be placed on the riverbed, representing a submerged discharge condition.

INPUT PARAMETERS

Hydrodynamic mixing of the effluent and ambient water depending on: (1) ambient environment, (2) effluent property, and (3) geometry of the discharge structure. These parameters are summarized in Table 1 and are briefly discussed below.

Ambient Water

In CORMIX model, ambient conditions in the receiving water body are described by the water body's geometric and dynamics characteristics. Important geometric parameters include plan shape, vertical cross-sections, and bathymetry, especially in the discharge vicinity. Ambient water bodies have vertical and horizontal boundaries. The vertical boundaries include the water surface and the bottom. The horizontal boundaries include bank(s) or shoreline(s). Additionally, "internal boundaries" may exist at pycnoclines. Pycnoclines are layers of rapid density change.

In CORMIX input parameters for the geometry of the receiving water body include width, average water depth, and water depth at the location of discharge. While water depth at the discharge location controls the near-field behavior of the plume, it has no effect on far-field behavior of the plume. On the contrary, the average water depth in the receiving water body controls the behavior of the plume in the far-field region which is relatively far way from the discharge location, and it has no influence on behavior of the plume in the near-field region around the discharge pipe(s).

Golder evaluated three sites on the bank of Roanoke River, Site 1, 2, and 3, that are under consideration for the construction of the diffuser. Golder further understands that Site 3 is preferred by Dominion since it is the closest site to the facility and that the force main alignment leading to Site 3 has the least impact to wetlands. Based on the survey of the cross-sections provided to Golder, the 1Q10 base flow water level geometrical cross-sections of the three sites are approximately represented using the following parameters in the CORMIX models:

SITE NUMBER	CROSS-SECTIONS OF ROANOKE RIVER			
	Cross-Section Area (m^2)	Width (m)	Avg. Depth (m)	Depth at Discharge (m)
1	24.76	41	0.60	0.70
2	21.66	62	0.35	0.40
3	32.34	54	0.60	0.80

Water depths and width presented in the above table correspond to the geometric conditions of the river under 1Q10 flow, representing a worst-case (low flow) scenario. Water depths in and width of the river are expected to be greater than the values presented in the table during most time of the year.

According to the proposed design for the diffuser (Figure 1), the discharge pipe for the diffuser will be placed perpendicular to the bank of the river. Water depth in the river is non-uniform and varies with distance from the bank. The average water depths for the sites are computed using the cross-section areas surveyed at the sites divided by the widths of the rivers. The water depth at discharge represents water depth at the location of the discharge ports (nozzles) for the diffuser. The diffuser is to be placed at where the water depth is relatively deep while it is reasonably close to the bank of the river.

Golder has been instructed to use two flow rates for base flow in the river to simulate the 1Q10 flow condition. It is our understanding that from the fact sheet used to develop the current permit, base flow in the Roanoke River under 1Q10 condition is 176 mgd. We further understand that the

flow rate is estimated to be 219 mgd based on VDEQ calculations assuming 200 cfs release from Leesville Dam (drought release).

Based on these two flow rates, stream velocities and one-hour travel distances in the river are computed for each site. Flow velocity values are computed using the flow rates divided by cross-section areas in the river. The one-hour travel distances are computed as the flow velocities multiplied by 3600 seconds per hour. The results are presented below:

SITE NUMBER	BASE FLOW IN ROANOKE RIVER					
	Flow Rate (mgd)	Flow Velocity (m/s)	1 Hour Travel Distance (m)	Flow Rate (mgd)	Flow Velocity (m/s)	1 Hour Travel Distance (m)
1	176	0.3114	1121	219	0.3875	1395
2	176	0.3559	1281	219	0.4429	1594
3	176	0.2390	860	219	0.2970	1069

No further data have been provided to Golder regarding the ambient conditions in the river. In our study, we have made following additional assumptions regarding the ambient conditions:

- Direction of ambient water flow direction in the river is parallel to the bank;
- The wave impact is ignored;
- The effect of wind speed is ignored; and
- The temperature and density difference across water depth in the river and the difference between ambient and effluent waters are ignored.

Effluent Properties

Golder understands that detailed water quality data of the effluent are not available at this stage of the project. However, we understand that water quality criteria applicable to Roanoke River for the constituents of concern in the current study are as the following:

- Ammonia (as N) less than or equal to 11.16 mg/L based on current Virginia ammonia criteria for acute condition;
- Ammonia (as N) less than or equal to 18.43 mg/L based on EPA 1999 Ammonia criteria, which is currently being proposed for adoption by Virginia; and
- Selenium less than or equal to 0.02 mg/L.

The above concentrations were used in the simulations to represent the effluent. As discussed in the introduction section of the report, the minimum and maximum flow quantities from the facility were estimated to be 400 and 640 gpm (gallon per minute), respectively. No further data have been provided to Golder regarding the effluent. We have assumed that temperature in and density of the effluent are the same as those in the ambient water.

Diffuser Design

Three design cases were considered in the current study. For all the three cases the discharge pipe will be placed on the riverbed and perpendicular to the bank of the river. A discharge pipe with a diameter of 18 inches will be employed to transport effluent from the plant to the river.

The 1st design case will employ a 10-meter long discharge pipe (distance from the bank of the river to the end of the pipe is 10 m). The effluent will be discharged through a total of five (5) risers (sets of discharge ports). The risers will be distributed on the discharge pipe at a horizontal distance interval of one (1) meter per riser between 5 and 9 m from the bank. On each riser a total of 14 discharge ports with a diameter of 2 inches will be installed, leading to a total of 70, 2-inch ports for the entire diffuser. Since water depths are relatively deep between the distance interval of 5 and 10 m from the bank for Sites 1 and 2, this design is suitable for these two sites.

For Site 3, water depth is relatively deep around 15 m from the bank. The discharge pipe with a length of 15.5 m is thus recommended. Two design cases are considered in the current study for Site 3. The first case employs a total of five (5) risers with 14, 2-inch-diameter discharge ports on each riser. In the second case the discharge ports are distributed on the top of the discharge pipe between northwest and northeast 30 degrees from the centerline of the discharge pipe. The discharge ports are distributed uniformly on the diffuser. On the diffuser (between the distances of 10 and 15.5 meters from the bank) there are five (5) discharge ports on every 8.6 inches of the pipe with four ports at the four corners and one at the center of the area. The profile view of the "second-case" diffuser is presented on Figure 1. Plan-view and cross-sections of the "second-case" diffuser are presented on Figure 2. Although performance of these two design cases are expected to be similar, the second case is considered superior since: (1) in the first case the discharge ports are relatively concentrated at a certain locations on the discharge pie, leading to significantly weakening of the discharge pipe structurally; and (2) in the first case some discharge ports are pointing toward the riverbed which will results in significant interaction between the riverbed and the effluent, leading to erosion on the riverbed and less efficiency of mixing.

Characteristics of the diffuser under the three design cases are summarized in the following tables. The parameters presented in the table are used in the CORMIX simulations to represent the diffuser. In CORMIX simulations, the last design case is approximately represented using a total of 23 risers with three (3), 2-inch diameter discharge ports per riser.

Design Case	Suitable Site	DIFFUSER CONFIGURATION					
		Distance from the Bank (m)		No. of Risers	No. of Discharge Ports per Riser	Discharge Port Diameter (in)	Port Height (in)
		1st Riser	Last Riser				
1	Sites 1 and 2	5	9	5	14	2	5
2	Site 3	10	14	5	14	2	5
3	Site 3	10.2	14.8	23	3	2	10

In the last design case, the actual port height, defined as the vertical distance between the center of the discharge port to the riverbed, is approximately 17.4 inches, but CORMIX does not allow port height to exceed 1/3 of the water depth, which is about 10 inches.

Mixing Zone Requirements

It is our understanding that the current Virginia Department of Environment Quality (VDEQ) regulations specify following requirements on the mixing zone sizing:

MIXING ZONE	SIZING REQUIREMENT
Acute	Effluent must be completely mixed with 1Q10 within 1 hour following discharge assuming 1Q10 flow.
Chronic	Complete mixing with 7Q10 flow if it can be demonstrated, using the VDEQ's mixing program MIX.EXE, that the discharge is completely mixed within 2 days following discharge.
Human Health	Use complete mix with 30Q5

Golder has been requested considering the acute case only. It is our understanding that demonstration for the chronic case has been made.

It is our understanding that the VDEQ is assuming no background concentration of ammonia in the river and at the edge of the mixing zone ammonia concentration must be less than or equal to 25% of the criteria. Specifically, for cases using current Virginia criteria ammonia concentration at the edge of the mixing zone must be less than or equal to 2.9 mg/L, and the ammonia concentration must be less than or equal to 4.6 mg/L if the EPA standard is used.

RESULTS AND DISCUSSION

A total of 30 simulations were performed in the current study using CORMIX2 to consider combination of following variables:

- Three sites - Sites 1, 2, and 3;
- Two flow rates in the river - 176 and 219 mgd;
- Three effluent flow rates – 400, 600, and 640 gpm;
- Three cases of effluent water quality – N=11.16 mg/L, N=18.43 mg/L, and Se=0.02 mg/L; and
- Three diffuser designs.

The simulation results are summarized in Table 1 in terms of plume profile at one-hour travel distance following discharge. The input parameters are also summarized in the table. It can be observed in the table that regulatory requirement on concentration at the edge of the mixing zone will be met for all the cases. It is our understanding that Site 3 is preferred by Dominion. Simulation cases 19 through 30 were performed for Site 3. Simulation results in terms of chemical plumes and variation of concentration and dilution with distance are presented on Figures 3 through 14 for Cases 19 through 30, respectively. Output files from CORMIX simulations for Cases 19 through 30 are attached in Appendix A.

The simulation results indicate that the proposed design (Design Case 3) will meet the regulatory requirements. For the Site 3, at the one-hour travel distance the dilution ratio will range between 54 and 118 depending on the effluent quantity and flow rate in the river. At the edge of the mixing zone, ammonia concentration will range between 0.13 mg/L and 0.34 mg/L depending on concentration in the effluent, flow rate of the effluent, and flow rate in the river. Concentration of Selenium at the edge of the mixing zone was simulated to be on the order of 0.0002 mg/L.

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Director

Thomas L. Henderson
Regional Director

October 27, 2004

Ms. Pamela F. Faggert
Vice President and Chief Environmental Officer
Dominion Electric Environmental Services
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

RE: VPDES Permit No. VA0083097 - Permit Application Waiver Requests
Old Dominion Electric Cooperative and Virginia Electric and Power Company - Clover Power Station

Dear Ms. Faggert:

Thank you for your letter of October 20, 2004, which requested waivers to various sampling and analyses to the permit application for reissuance of the above referenced VPDES permit. We have reviewed the request and have the following comments.

1. **Waiver from composite sampling on outfalls 004, 005, 006, 007, 010, 011, 012 and 013**

   As the flows from these outfalls originate from sedimentation basins, we agree that effluent variability would be dampened. In that regard, a flow-weighted composite sample as described in the instructions for the EPA Form 2F application would, in all likelihood, not produce beneficial data. Therefore, we agree with the use of only grab samples on these outfalls.

   Please note, however, that we believe it would be appropriate to include outfall 008 in the above listing, with this same waiver applying. See the response to number 5.

2. **Request to use EPA Form 2F for outfall 003 with a waiver from the composite sampling**

   In September 2002, the Stage I and II landfill closing and capping was completed. All leachate that previously went to outfall 003 was totally diverted to another sedimentation basin serving outfall 009. In March 2003, the sedimentation pond for outfall 003 was cleaned. Currently, outfall 003 receives only non-contaminated storm water from the closed and capped landfill. We believe the use of EPA Form 2F would be appropriate. For the same reason noted in number 1 above, we believe the use of grab samples would be appropriate and that the composite sampling may be waived.

3. **Waiver from composite sampling on outfall 009**

Based on the design of the sedimentation basin for outfall 009 (sized to contain a 25-year, 24-hour storm event), we believe the use of only a grab sample for EPA Form 2C would be appropriate.

4. **Sample outfall 007 as representative of outfall 006 as these outfalls were previously determined to be substantially identical**

Based on the previous information submitted for these outfalls, the fact that the information remains the same and that DEQ previously agreed that these outfalls could be considered substantially identical (and noted such in the existing VPDES permit), we agree with the request to utilize outfall 007 sampling as representative of 006.

5. **Perform no sampling of outfall 008**

The original determination of "substantially identical" for outfalls 006 and 007 also included outfall 008. Based on the new drainage descriptions provided, we believe outfall 008 is still substantially identical to outfalls 006 and 007 (woodlands and gravel haul road). In that regard, we believe it should be reflected in number 1 and included in number 4 above (007 may still be sampled as representative).

6. **Consider outfalls 010, 011, 012 and 013 as substantially identical and sample one outfall (preferably 011) as representative**

Based on the information submitted for these outfalls, we agree that these outfalls can be considered substantially identical. In that regard, sampling of outfall 011 as representative should be acceptable.

7. **Waiver from sampling sulfite for all outfalls**

Part B, with reference to sulfite, is specifically in reference to EPA Form 2C and, therefore, the waiver would apply to those outfalls requiring EPA Form 2C. This part of the application notes that for any parameter believed to be present, an analysis of that parameter is required. The analysis would also be required if sulfite was required by an effluent guideline for your facility or contained within the VPDES permit, neither of which is the case. In that regard, if you believe sulfite is not present in the applicable effluents, no analysis is required.

8. **Waiver from submitting summer temperature data for outfalls 002, 003 and 009**

As these outfalls do not include thermal discharges and the permit does not require temperature monitoring on either of these outfalls, the requirement to provide summer temperature data on EPA Form 2C may be waived.

9. **Waiver from providing analytical data for internal outfalls 101, 102 and 103**

Outfalls 101, 102 and 103 are internal outfalls that commingle in a large holding basin that subsequently discharges as outfall 001 (to surface waters). These internal outfalls have no direct discharge to surface waters. In addition, the VPDES permit requires specific monitoring for each of these internal outfalls. Parameters that are required by the VPDES permit and that coincide with EPA Form 2C parameters need to be reported on the application for these internal outfalls. The remainder of them may be waived. Outfall 001, which is a direct discharge to

surface waters, will have all appropriate analyses completed. That will allow for making a determination on the need for any limits necessary for the protection of water quality.

If you should have any questions with regard to this response, please give me a call at 434-582-5120, extension 6017.

Sincerely,

Robert P. Goode

Robert P. Goode
Water Permit Manager

pc. SCRO File

Pamela F. Faggert
Vice President and Chief Environmental Officer

5000 Dominion Boulevard, Glen Allen, VA 23060
Phone: 804-273-3467

Dominion

Certified Mail
Return Receipt Requested

RECEIVED
OCT 22 2004
DEQ SCRO

October 20, 2004

Mr. Robert Goode
Virginia Department of Environmental Quality
South Central Regional Office
7705 Timberlake Road
Lynchburg, VA 23502

RE: VPDES Permit No. VA0083097 Reissuance Sampling Wavier Request
Old Dominion Electric Cooperative and Virginia Electric and Power Company – Clover Power Station

Dear Mr. Goode:

This letter is regarding Clover Power Station's VPDES permit # VA0083097 sampling requirements for permit reissuance. The above permit will expire on December 27, 2005, and we are currently preparing for the sampling and analyses of station discharges that will be necessary for preparation of the permit application. To facilitate this effort we ask for your approval of the following requests.

1. A number of outfalls will be sampled according to EPA's Form 2F, which applies to stormwater discharges. We request a wavier from the Form 2F composite sample requirements for the following Stormwater Outfalls: 004, 005, 006, 007, 010, 011, 012, and 013. Each of these discharges results from a sedimentation basin, which minimizes effluent variability over the sample collection period. Consequently, composite sampling adds considerable effort that Dominion does not believe is necessary to characterize these discharges. See Attachment A for outfall locations. DEQ TRO staff recently granted a similar request for our Yorktown Power Station and Chesapeake Energy Center.

2. We expect to sample Outfall 003 early in 2005 following completion of the landfill discharge relocation project. The Stage I & II landfill has been capped and closed, and the leachate from this landfill will be collected and routed to Outfall 009 as part of the discharge relocation effort. As a result, the only remaining source of water to Outfall 003 will be uncontaminated storm water runoff. Consequently, we request to characterize Outfall 003 using EPA Form 2F and grab samples as requested for other storm water discharges in 1 above. Also, because the discharge from Outfall 003 is not directly tied to the size or timing of a particular storm event, we request relief from the qualifying storm event requirements of Form 2F.

3. We also expect to sample Outfall 009 early in 2005 following its relocation to the Roanoke River. The wastewater basins that will be associated with this discharge have been sized to contain the 25-year 24-hour storm event. As a result, there will be considerable retention time in the basins during periods of typical rainfall and the quality of the effluent should not vary substantially over a 24-hour period. Therefore, we request approval to use grab samples to

characterize this discharge for Form 2C.

4. Outfalls 006 and 007 are "substantially identical". Consequently, we request approval to sample 007 as representative of 006. This request was approved previously (please see Attachment B for approval letter and for details on outfall drainage areas), and the outfalls are recognized as "substantially identical" in Part I, A, 24 of the current permit.

5. The closure of the Stage I & II Landfill has been completed. With the closure complete, Outfall 008 no longer receives contaminated industrial stormwater runoff and therefore, the effluent is not impacted. We are requesting to have this change in status recognized in the permit and, with your concurrence, do not anticipate sampling of this discharge for the permit application.

6. Stormwater Outfalls: 010, 011, 012, and 013 are located around Clover Power Station's Stage III Landfill (see Attachment A for design location). The drainage areas for these discharges are contiguous, and the contaminants associated with each discharge are similar. Consequently, we believe these outfalls are substantially identical, and we request to sample only one of these outfalls (preferably 011) and report the quantitative data as representative of the other outfalls. The drainage basin details for Outfalls 010, 011, 012, and 013 are provided in Attachment C.

7. For all outfalls we request a waiver from the Part B requirement to sample for sulfite (SO_3). Our reasons for requesting the waiver are twofold: the extremely short holding time required for the sample prior to analysis, and the unlikely presence of sulfite in the discharges as it rapidly coverts to sulfate (SO_4) in the presence of oxygen.

8. For outfalls 002, 003, and 009, we request a waiver from the requirement to submit summer temperature data. All three of these discharges originate from holding ponds that receive no thermally enriched effluents. Consequently, the temperature of these effluents should reflect seasonal ambient air temperatures.

9. Outfalls 101, 102 and 103 are all internal discharges, and there is no direct discharge of pollutants from these internal sources to surface waters. In addition, three effluents have an excellent compliance record under the requirements of Clover's existing permit. Therefore, it is our understanding that characterization of these outfalls is not necessary for the permit application.

We would be pleased to discuss our request in more detail, or meet with you to resolve any questions. For additional information, please contact Rick Woolard of my staff at (804) 273-2991.

Sincerely,

Pamela F. Faggert

Enclosures:

ATTACHMENT 11

303(d) LISTED SEGMENTS

Roanoke (Staunton) River, Cub Creek, Kerr Reservoir Cause Group Code: **L19R-01-HG**

Location: Roanoke (Staunton) River from Leesville Dam to the John H. Kerr Dam including Kerr Reservoir, its tributaries Eastland Creek and Nutbush Creek (within the state of Virginia) and Cub Creek from its mouth to the crossing of Rough Creek Roac near Rough Creek.

City / County: Campbell Co. Charlotte Co. Halifax Co. Mecklenburg Co. Pittsylvania Co.

Use(s): Fish Consumption

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

Station IDs:
Near Route 29 - Altavista
4AROA129.55 (2006 FT/Sediment) - 2 species exceed VDH level of concern
Near Brookneal
4AROA097.07 (2006 FT/Sediment) - 1 species exceeded VDH level of concern
Near Route 746 - Randolph
4AROA067.91 (2006 FT/Sediment) - 1 species exceeded VDH level of concern
Near Route 360 - Clover
4AROA059.12 (2006 FT/Sediment) - 4 species exceed VDH level of concern
Near Clarksville
4AROA036.59 (2006 FT/Sediment) - 1 species exceeded VDH level of concern
Kerr Reservoir near Ivy Hill
4AROA028.04 (2006 FT/Sediment) - 2 species exceed VDH level of concern
Lake Gaston near State Line
4AROA004.54 (2006 FT/Sediment) - 1 species exceeded VDH level of concern
CUb Creek near Route 40 Gaging Station
4ACUB010.96 (2006 FT/Sediment) - 1 species exceeded VDH level of concern

VDH Fish Advisory - Issued 8/31/07
Roanoke (Staunton) River from below Leesville Dam downstream ~ 98 miles to the confluence of Dan River including its tributary Cub Creek up to Rough Creek Road (State Route 695) near Rough Creek.
VDH recommends the following precautions to reduce any potential harmful effects from eating contaminated fish:

Eat smaller, younger fish (within the legal limits). Younger fish are less likely to contain harmful levels of contaminants than larger, older fish.
Eat fewer or smaller servings of fish.
Try to eat different species of fish from various sources (i.e., different creeks, rivers and streams).
Cleaning or cooking contaminated fish does not eliminate or reduce mercury. However, levels of PCBs in fish can be reduced by taking the following precautions:
Remove the skin, the fat from the belly and top and internal organs before cooking the fish.
Bake, broil or grill on an open rack to allow fats to drain away from the meat.
Discard the fats that cook out of the fish.
Avoid or reduce the amount of fish drippings or broth that is used to flavor the meal.
Eat less deep-fried fish, since frying seals contaminants into the fatty tissue.
For more information about fish consumption advisories, including frequently asked questions go to www.vdh.virginia.gov.

Roanoke (Staunton) River, Cub Creek, Kerr Reservoir **Fish Consumption**	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Mercury in Fish Tissue - Total Impaired Size by Water Type:		**31,635.92**	**102.44**

TMDL Due Date: 2020

Sources:

Source Unknown

Roanoke (Staunton) River, Cub Creek, Kerr Reservoir Cause Group Code: L19R-01-PCB

Location: Roanoke (Staunton) River from Leesville Dam to the John H. Kerr Dam including Kerr Reservoir, its tributaries Eastland Creek and Nutbush Creek (within the state of Virginia) and Cub Creek from its mouth to the crossing of Rough Creek Roac near Rough Creek.

City / County: Campbell Co. Charlotte Co. Halifax Co. Mecklenburg Co. Pittsylvania Co.

Use(s): Fish Consumption

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

Station IDs:
Near Route 29 - Altavista
4AROA129.55 (2006 FT/Sediment) - 1 species exceeded VDH upper level of concern
Near Long Island
4AROA108.09 (2006 FT/Sediment) - 1 species exceeded VDH upper level of concern
Near Brookneal
4AROA097.07 (2006 FT/Sediment) - 1 species exceeded VDH upper level of concern
Near Route 746 - Randolph
4AROA067.91 (2006 FT/Sediment) - 2 species exceed VDH upper level of concern
Near Route 360 - Clover
4AROA059.12 (2006 FT/Sediment) - 2 species exceed VDH upper level of concern
Near Clarksville
4AROA036.59 (2006 FT/Sediment) - 2 species exceeded VDH lower level of concern
Kerr Reservoir near Ivy Hill
4AROA028.04 (2006 FT/Sediment) - 2 species exceed VDH lower level of concern
Lake Gaston near State Line
4AROA004.54 (2006 FT/Sediment) - 1 species exceeded VDH lower level of concern
Cub Creek near Route 40 Gaging Station
4ACUB010.96 (2006 FT/Sediment) - 1 species exceeded VDH upper level of concern

VDH Fish Advisory - Issued 7/24/98, revised 8/31/07
Roanoke (Staunton) River from below Leesville Dam downstream ~ 98 miles to the confluence of Dan River including its tributary Cub Creek up to Rough Creek Road (State Route 695) near Rough Creek.
VDH recommends the following precautions to reduce any potential harmful effects from eating contaminated fish:

Eat smaller, younger fish (within the legal limits). Younger fish are less likely to contain harmful levels of contaminants than larger, older fish.
Eat fewer or smaller servings of fish.
Try to eat different species of fish from various sources (i.e., different creeks, rivers and streams).
Cleaning or cooking contaminated fish does not eliminate or reduce mercury. However, levels of PCBs in fish can be reduced by taking the following precautions:
Remove the skin, the fat from the belly and top and internal organs before cooking the fish.
Bake, broil or grill on an open rack to allow fats to drain away from the meat.
Discard the fats that cook out of the fish.
Avoid or reduce the amount of fish drippings or broth that is used to flavor the meal.
Eat less deep-fried fish, since frying seals contaminants into the fatty tissue.
For more information about fish consumption advisories, including frequently asked questions go to www.vdh.virginia.gov.

Roanoke (Staunton) River, Cub Creek, Kerr Reservoir **Fish Consumption**	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
PCB in Fish Tissue - Total Impaired Size by Water Type:		**31,635.92**	**102.44**

TMDL Due Date: 2010

Sources:

Source Unknown

Roanoke (Staunton) River Cause Group Code: **L19R-01-BAC**

Location: Roanoke (Staunton) River from the former Dan River, Inc. discharge to the backwaters of Kerr Reservoir.

City / County: Campbell Co. Charlotte Co. Halifax Co.

Use(s): Recreation

Cause(s) /
VA Category: Escherichia coli/ 4A

Station ID: 4AROA097.46 4/33 violation rate for e coli
4AROA067.91 7/32 violation rate for e coli
4AROA059.12 6/33 violation rate for e coli

Roanoke (Staunton) River **Recreation**	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Escherichia coli - Total Impaired Size by Water Type:			**47.02**

TMDL Due Date: 2010

Sources:

Livestock (Grazing or Feeding Operations)	Unspecified Domestic Waste	Wastes from Pets	Wildlife Other than Waterfowl

ATTACHMENT 12

TABLE A AND TABLE B - CHANGE SHEETS

TABLE A

VPDES PERMIT PROGRAM
Permit Processing Change Sheet

1. Effluent Limits and Monitoring Schedule: (List any changes MADE DURING PERMIT PROCESS and give a brief rationale for the changes).

OUTFALL NUMBER	PARAMETER CHANGED	MONITORING LIMITS CHANGED FROM / TO	EFFLUENT LIMITS CHANGED FROM / TO	RATIONALE	DATE & INITIAL
001, 002 & 009	Total PCBs	None to 2 analyses per listed outfall	N/A	In accordance with the TMDL Guidance Memo No. 09-2001, PCB monitoring using EPA method 1668, has been added with this reissuance. The results from this monitoring shall be used to implement the PCB TMDL that is being developed for the Roanoke River.	GFB, 11/29/10

OTHER CHANGES FROM:	CHANGED TO:	DATE & INITIAL
Storm Water Management Conditions	Updated to current language	GFB, 11/29/10

VPDES PERMIT PROGRAM
Permit Processing Change Sheet

2. Effluent Limits and Monitoring Schedule: (List any changes MADE DURING PERMIT PROCESS and give a brief rationale for the changes).

OUTFALL NUMBER	PARAMETER	MONITORING CHANGED FROM / TO	EFFLUENT LIMITS CHANGED FROM / TO	RATIONALE	DATE & INITIAL

OTHER CHANGES FROM:	CHANGED TO:	DATE & INITIAL

ATTACHMENT 13

NPDES INDUSTRIAL PERMIT RATING WORKSHEET

NPDES Permit Rating Work Sheet

___ Regular Addition
___ Discretionary Addition
___ Score change, but no status change
___ Deletion

NPDES NO: |V|A|0|0|8|3|0|9|7|

Facility Name:

|C|L|O|V|E|R| |P|O|W|E|R| |S|T|A|T|I|O|N|

City: |C|L|O|V|E|R| |V|I|R|G|I|N|I|A|

Receiving Water: |R|O|A|N|O|K|E| |R|I|V|E|R|

Reach Number: |___|___|___|___|___|___|___|___|___|___|

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

_X_ YES: score is 600 (stop here) ___ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

___ YES; score is 700 (stop here)
___ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: |___|___|___|___| Primary SIC Code: |___|___|___|___|

Other SIC Codes: |___|___|___|___| |___|___|___|___| |___|___|___|___| |___|___|___|___|

Industrial Subcategory Code: |___|___|___| (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
___ No process waste streams	0	0	___ 3.	3	15	___ 7.	7	35
___ 1.	1	5	___ 4.	4	20	___ 8.	8	40
___ 2.	2	10	___ 5.	5	25	___ 9.	9	45
			___ 6.	6	30	___ 10.	10	50

Code Number Checked: |___|___|

Total Points Factor 1: |___|___|

FACTOR 2: Flow/Stream Flow Volume *(Complete Either Section A or Section B; check only one)*

Section A--Wastewater Flow Only Considered

Wastewater Type (See Instructions)			Code	Points
Type I:	Flow < 5 MGD	___	11	0
	Flow 5 to 10 MGD	___	12	10
	Flow > 10 to 50 MGD	___	13	20
	Flow > 50 MGD	___	14	30
Type II:	Flow < 1 MGD	___	21	10
	Flow 1 to 5 MGD	___	22	20
	Flow > 5 to 10 MGD	___	23	30
	Flow > 10 MGD	___	24	50
Type III:	Flow < 1 MGD	___	31	0
	Flow 1 to 5 MGD	___	32	10
	Flow > 5 to 10 MGD	___	33	20
	Flow > 10 MGD	___	34	30

Section B--Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10%	___	41	0
	> 10% to < 50%	___	42	10
	> 50%	___	43	20
Type II:	<10%	___	51	0
	> 10% to < 50%	___	52	20
	> 50%	___	53	30

Code Checked from Section A or B: |___|___|

Total Points Factor 2: |___|___|

NPDES Permit Rating Work Sheet

NPDES No.: |V|A|0|0|8|3|0|9|7|

FACTOR 3: Conventional Pollutants

(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) ___ BOD ___ COD ___ Other:_____

Permit Limits: (check one)		Code	Points
___	< 100 lbs/day	1	0
___	100 to 1000 lbs/day	2	5
___	>1000 to 3000 lbs/day	3	15
___	>3000 lbs/day	4	20

Code Checked: |___|

Points Scored: |___|___|

B. Total Suspended Solids (TSS)

Permit Limits: (check one)		Code	Points
___	< 100 lbs/day	1	0
___	100 to 1000 lbs/day	2	5
___	>1000 to 5000 lbs/day	3	15
___	>5000 lbs/day	4	20

Code Checked: |___|

Points Scored: |___|___|

C. Nitrogen Pollutant: (check one) ___ Ammonia ___ Other: _____

Permit Limits: (check one)		Code	Points
___	< 300 lbs/day	1	0
___	300 to 1000 lbs/day	2	5
___	>1000 to 3000 lbs/day	3	15
___	>3000 lbs/day	4	20

Code Checked: |___|

Points Scored: |___|___|

Total Points Factor 3: |___|___|

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

___ YES (if yes, check toxicity potential number below)
___ NO (if no, go to Factor 5)

Determine the human health toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column -- check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
___ No process waste streams	0	0	___ 3.	3	0	___ 7.	7	15
___ 1.	1	0	___ 4.	4	0	___ 8.	8	20
___ 2.	2	0	___ 5.	5	5	___ 9.	9	25
			___ 6.	6	10	___ 10.	10	30

Code Number Checked: |___|___|

Total Points Factor 4: |___|___|

NPDES Permit Rating Work Sheet

NPDES No.: | V | A | 0 | 0 | 8 | 3 | 0 | 9 | 7 |

FACTOR 5: Water Quality Factors

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge?*

		Code	Points
___	Yes	1	10
___	No	2	0

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

		Code	Points
___	Yes	1	0
___	No	2	5

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

		Code	Points
___	Yes	1	10
___	No	2	0

Code Number Checked: A |___| B |___| C |___|

Points Factor 5: A |___|___| + B |___| + C |___|___| = |___|___| TOTAL

FACTOR 6: Proximity to Near Coastal Waters

A. *Base Score: Enter flow code here (from Factor 2):* |___|___| *Enter the multiplication factor that corresponds to the flow code:* |___|___|

Check appropriate facility HPRI Code (from PCS):

	HPRI #	*Code*	*HPRI Score*
___	1	1	20
___	2	2	0
___	3	3	30
___	4	4	0
___	5	5	20

Flow Code	Multiplication Factor
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

HPRI code checked: |___|

Base Score: (HPRI Score) _____ x (Multiplication Factor) _____ = _____ (TOTAL POINTS)

B. *Additional Points--NEP Program*
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

		Code	Points
___	Yes	1	10
___	No	2	0

C. *Additional Points--Great Lakes Area of Concern*
for a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see instructions)

		Code	Points
___	Yes	1	10
___	No	2	0

Code Number Checked: A |___| B |___| C |___|

Points Factor 6: A |___|___| + B |___|___| + C |___|___| = |_____| TOTAL

NPDES Permit Rating Work Sheet

NPDES No: | V | A | 0 | 0 | 8 | 3 | 0 | 9 | 7 |

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	_____
2	Flow/Stream flow Volume	_____
3	Conventional Pollutants	_____
4	Public Health Impacts	_____
5	Water Quality Factors	_____
6	Proximity to Near Coastal Waters	_____
	TOTAL (Factors 1-6)	_____

S1. Is the total score equal to or greater than 80? _x_ Yes (Facility is a major) ___ No

S2. If the answer to the above question is no, would you like this facility to be discretionary major?
___ No
___ Yes (add 500 points to the above score and provide reason below:

Reason:

_____

_____

_____

_____

_____

NEW SCORE: 600

OLD SCORE: 600

Frank Bowman
Permit Reviewer's Name

(434) 582 - 5120
Phone Number

November 29, 2010
Date

ATTACHMENT 14

EPA/VIRGINIA DRAFT PERMIT SUBMISSION CHECKLIST

Part I. Virginia 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:	Dominion-Clover Power Station
NPDES Permit Number:	VA0083097
Permit Writer Name:	Frank Bowman
Date:	November 29, 2010

Major [x] **Minor** [ ] **Industrial** [x] **Municipal** [ ]

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	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
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		
8.a. Has a TMDL been developed and approved by EPA for the impaired water?		X	
8.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	
8.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		
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. Does the permit include appropriate Pretreatment Program requirements?			X
18. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
19. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
20. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
21. Has previous permit, application, and fact sheet been examined?	X		

Part II NPDES Draft Permit Checklist
Region III NPDES Permit Quality Review Checklist – For Non-Municipals
(To be completed and included in the record for all non-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 (Effluent Guidelines & BPJ)	Yes	No	N/A
1. Is the facility subject to a national effluent limitations guideline (ELG)?	X		
1.a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			X
1.b. If no, does the record indicate that a technology-based analysis based on best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?			X
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?			X
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?	X		
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production: for the facility (not design)?			X
5. Does the permit contain "tiered" limits that reflect projected increases in production or flow?		X	
5.a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			X
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?	X		
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average and/or monthly average limits?	X		
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?		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 record 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		
4.a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
4.b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
4.c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
4.d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (e.g., do calculations include ambient/background concentrations where data are available)?	X		
4.e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		
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 (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass concentration)?	X		
8. Does the fact sheet 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?	X		
1.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 his waiver?			X
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices?	X		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs?	X		
1.a. If yes, does the permit adequately incorporate and require compliance with the BMPs?	X		
2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	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 • Duty to reapply • Need to halt or reduce activity not a defense • Duty to mitigate • Proper O & M • Permit Actions • Property rights • Duty to provide information • Inspections and entry • Monitoring and reporting • Signatory requirement • Reporting requirements Planned change Anticipated non-compliance Transfers Monitoring Reports Compliance schedules 24-hour reporting Other non-compliance • Bypass • Upset			
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]?	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	Frank Bowman
Title	Environmental Engineer
Signature	
Date	November 29, 2010

ATTACHMENT 15

CHRONOLOGY SHEET

CHRONOLOGY OF EVENTS

APPLICATION RECEIVED	APPLICATION RETURNED	ADDITIONAL INFO REQUESTED	APPLICATION/ADD INFO DUE BACK IN RO	APPLICATION/ADD. INFO RECEIVED
July 13, 2010				

APPLICATION TO VDH: 7/14/10	VDH COMMENTS RECEIVED: 7/28/10
APPLICATION ADMIN. COMPLETE: 7/13/10	APPLICATION TECH. COMPLETE: 7/13/10

Date	DESCRIPTIVE STATEMENT [CHRONOLOGY OF EVENTS] (Meetings, telephone calls, letters, memos, hearings, etc. affecting permit from application to issuance)
7/28/10	Administratively complete letter sent
11/29/10	Draft permit/FS sent to Kip Foster for review
12/7/10	Draft permit/FS sent to owner
12/7/10	PN transmitted to newspaper for publication
12/8/10	PN sent to Public Officials and Email Distribution List
12/8/10	Date of Public Notice
12/22/10	PN verification received from newspaper
1/6/11	Conference call with owner
1/13/11	Permit signed