Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

AUG 1 0 1999

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket No. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) - NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NUMBER TN0020168

On September 30, 1998, TVA applied to the Tennessee Water Pollution Control Division for modification of WBN's NPDES permit. The proposed modification addressed the addition of a Supplemental Condenser Cooling Water (SCCW) system and was approved on July 16, 1999. Therefore, in accordance with Section 3.2, "Reporting Requirements for Changes to, and Renewal of, the NPDES Permit or State Certification," of Appendix B, "Environmental Protection Plan," of WBN's Operating License, please find enclosed a copy of the approved NPDES permit.

If you have any questions, please telephone me at (423) 365-1824.

Sincerely,

P. L. Pace
Manager, Licensing and Industry Affairs

Enclosure
cc: See page 2

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C001

AUG 1 0 1999

cc (Enclosure):
NRC Resident Inspector
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Mr. Robert E. Martin, Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852

U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., Suite 23T85
Atlanta, Georgia 30303

50-390 WATTS BAR 1 TVA

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM PERMIT NUMBER TN0020168

REC'D W/LTR DTD 8/10/99...9908130118

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
401 CHURCH STREET
L & C ANNEX 6TH FLOOR
NASHVILLE TN 37243-1534

July 16, 1999

Mr. George E. Vickery
Chemistry Superintendent
TVA-Watts Bar Nuclear
P O BOX 2000
SPRING CITY, TN 37381

Subject: **NPDES Permit No. TN0020168**
TVA-Watts Bar Nuclear
Spring City, Rhea County, Tennessee

Dear Mr. Vickery:

In accordance with the provisions of the Tennessee Water Quality Control Act, Tennessee Code Annotated, Sections 69-3-101 through 69-3-120, the enclosed NPDES Permit is hereby issued by the Division of Water Pollution Control. The continuance and/or reissuance of this NPDES Permit is contingent upon your meeting the conditions and requirements as stated therein.

Please be advised that you have the right to appeal any of the provisions established in this NPDES Permit, in accordance with Tennessee Code Annotated, Section 69-3-110, and the General Regulations of the Tennessee Water Quality Control Board. If you elect to appeal, you should file a petition within thirty (30) days of the receipt of this permit.

The Division is with this letter making several interim requirements to assure protection of water quality during the initial operation of Outfall 113. Outfall 113 shall be monitored for pH, Total Suspended Solids, Total Residual Chlorine and Dissolved Oxygen once per week until the Division receives an adequate characterization of this discharge. Temperature of the effluent at Outfall 113 shall be continuously monitored at an hourly frequency during the compliance period when discharges are being made for the Supplemental Condenser Cooling Water (SCCW). The discharge at 113 shall not exceed 92.3°F (33.5°C) unless river bottom temperature measurement is collected for at least one site within the immediate zone of impact on at least an hourly basis. The Division requests that monitoring instream be made to verify compliance with water quality criteria during the compliance period. Results shall be reported to the Division with the monthly Discharge Monitoring Reports.

Concurrent with this letter, a letter modifying the Watts Bar Fossil Plant is being sent to remove Outfall 003 (used for the SCCW) from the fossil steam plant permit (Permit #TN0005461) and from the Watts Bar Fossil plant responsibility. This outfall is responsibility of Watts Bar Nuclear plant as of the effective date of the permit and is no longer part of the permit for the fossil plant.

If you have questions concerning this correspondence or if we may be of assistance to you in any way, please contact Mr. Larry Bunting at (615) 532-0665 or by E-mail at *lbunting@mail.state.tn.us.*

Sincerely,

Robert L. Haley for

Saya Ann Qualls, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAQ/LCB
P/WAT-5
20168FPT.DOC
Enclosure

cc: Division of Water Pollution Control, Permit Section
Environmental Assistance Center - Chattanooga, Division of Water Pollution Control
EPA, Region IV. Surface Water Permits

STATE OF TENNESSEE

NPDES PERMIT

No. TN0020168

Authorization to discharge under the
National Pollutant Discharge Elimination System (NPDES)

Issued By

Tennessee Department of Environment and Conservation
Division of Water Pollution Control
401 Church Street
6th Floor, L & C Annex
Nashville, Tennessee 37243-1534

...er authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the ...ited States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.)

Discharger:	**TVA-Watts Bar Nuclear Plant**
is authorized to discharge:	**Cooling waters and other treated wastewaters and storm waters**
from a facility located:	**in Spring City, Rhea County, Tennessee**
to receiving waters named:	**Tennessee River and Yellow Creek**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on:	**July 17, 1999**
This permit shall expire on:	**September 28, 2001**
Issuance date:	**July 16, 1999**

Paul E. Davis, Director
Division of Water Pollution Control

CN-0759

RDAs 2352 and 2366

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JULY 16, 1999 RATIONALE ADDENDUM

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PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

TVA-Watts Bar Nuclear Plant is authorized to discharge cooling tower blowdown, effluent from the Low Volume Waste pond (Outfall 103, see below), metal cleaning wastewater effluent (Outfall 107), diffuser backflow, Essential Raw Cooling Water (ERCW), cooling tower de-silting basin water, wastewater from the liquid radwaste treatment system, steam generator blowdown, fire protection system water, building sump water, ERCW strainer backwash, traveling screen water, potable water leakage, internal system leakage, storm water that drains to the Yard Holding Pond, and other process and nonprocess waters associated with nuclear power production as described in the Rationale and permit application. Discharges are authorized through Outfall 101 to the Tennessee River at mile 527.9. These discharges shall be limited and monitored by the permittee as specified below:

Outfall 101: Diffuser pipe at TN River mile 527.9

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 101
Cooling water, Storm runoff and Process Wastewater

EFFLUENT CHARACTERISTICS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	(mg/l)	(lb/day)	(mg/l)	(lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous	Recorder *
Certification of Instream Flow of 3500 cfs when required			Report as Yes/No		1/Month	Operation Records
TEMPERATURE, Effluent **	–	–	35° C	–	Continuous	Recorder
pH ***	Range 6.0 - 9.0				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	–	100.0	–	1/Week	Grab
OIL & GREASE	15.0	–	20.0	–	1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) ***	0.10	–	0.10	–	5/week	Grab ***
IC25 ****	25% Inhibition Concentration shall be ≥ 3.3% Effluent				Semi-annual	Composite ****

* Flow shall be reported in Million Gallons per Day (MGD). In the event that the continuous flow monitor is out of service, flow monitoring shall be estimated by intake pump logs.

** When the temperature monitoring equipment fails, monitoring will be once per day. Reasonable and timely effort will be made to restore the temperature recorder to operation as soon as possible. See Part III for further temperature requirements.

*** pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. TRC monitoring shall be applicable when chlorine or bromine is added.

**** See Part III for methodology.

See paragraph below regarding instream flow requirements.

TVA-Watts Bar Nuclear Plant is authorized to discharge cooling tower blowdown, effluent from the Low Volume Waste pond (Outfall 103, see below), metal cleaning wastewater effluent (Outfall 107), diffuser backflow, Essential Raw Cooling Water (ERCW), cooling tower de-silting basin water, fire protection system water, building sump water, ERCW strainer backwash, traveling screen water, potable water leakage, internal system leakage, storm water that drains to the Yard Holding Pond, and other process and nonprocess waters associated with nuclear power production as described in the Rationale and permit application. Discharges are authorized through Outfall 102 to the Tennessee River at mile 527.2. These discharges shall be limited and monitored by the permittee as specified below:

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 102
Cooling water, Storm runoff and Process Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW *	Report (MGD) *		Report (MGD) *		1/Day	Instantaneous
Certification of Instream Flow Requirements			Report as Yes/No		1/Month	Operation Records
TEMPERATURE, Effluent	–	–	35° C	–	1/Day	Grab
pH **	Range 6.0 - 9.0				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	–	100.0	–	1/Week	Grab
OIL & GREASE	15.0	–	20.0	–	1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) **	0.10	–	0.10	–	5/Week	Grab
IC25 ***	25% Inhibition Concentration shall be ≥ 3.3% Effluent				Semi-annual	Composite ***

* Flow shall be reported in Million Gallons per Day (MGD).

** pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection. The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. TRC monitoring shall be applicable when chlorine or bromine is added.

*** See Part III for methodology

Discharge through Outfall 102 (emergency overflow) is permitted under emergency situations only. This includes times when the diffuser pipe system is isolated as a result of diffuser maintenance, and other emergency situations to preserve the integrity of the yard holding pond dikes such as catastrophic storm events. All reasonable efforts shall be taken to resume normal discharge through Outfall 101 as soon as possible.

See paragraph below regarding instream flow requirements.

TVA-Watts Bar Nuclear Plant is authorized to discharge turbine building sump water, supernatant from the Alum sludge ponds, water treatment plant neutral waste sump, water from drum de-watering and storm water runoff through the Low Volume Waste pond internal monitoring point designated as Outfall 103 which discharges to the Yard Holding Pond.

These discharges shall be limited and monitored by the permittee as specified below:

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 103
Low Volume Waste Pond

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous *	Recorded
pH **	Within the range 6.0 - 9.0				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	250	100.0	834	1/Week	Grab
OIL & GREASE	15.0	125	20.0	167	1/Week	Grab

* Flow shall be reported in Million Gallons per Day (MGD). Where recorder fails, monitoring shall be 1/day estimated by pump logs.
** pH shall be measured within 15 minutes of sample collection.

TVA-Watts Bar Nuclear Plant is authorized to discharge metal cleaning wastewater, turbine building sump water, drum rinse water, diesel generator system coolant and storm water runoff through the internal monitoring point designated as Outfall 107 for the metal cleaning waste ponds which discharge to the Yard Holding Pond.

These discharges shall be limited and monitored by the permittee as specified below:

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 107
Metal Cleaning Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY		MSRMNT.	SAMPLE
	(mg/l)	(lb per million gallons per day)	(mg/l)	(lb per million gallons per day)	FRQNCY.	TYPE
FLOW	Report (MGD) *		Report (MGD) *		1/Week	Calculated
pH **	Within the range 6.0 - 9.0				1/Week	Grab
OIL & GREASE	15.0	125.1	15.0	125.1	1/Month	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	250.2	30.0	250.2	1/Month	Composite
COPPER, Total Recoverable	1.0	8.34	1.0	8.34	1/Week	Composite
IRON, Total Recoverable	1.0	8.34	1.0	8.34	1/Week	Composite
PHOSPHORUS, TOTAL ***	1.0	–	1.0	–	1/Week	Composite

* Flow shall be reported in Million Gallons per Day (MGD).

** pH analyses shall be performed within fifteen (15) minutes of sample collection.

*** Phosphorus will be monitored only during periods when phosphating chemicals or cleaning solutions are used.

TVA-Watts Bar Nuclear Plant is authorized to discharge treated sanitary wastewater through an internal monitoring point designated as Outfall 111 which goes to a drainageway to the Runoff Holding Pond.

These discharges shall be limited and monitored by the permittee as specified below:

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 111
Treated Sanitary Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY		MSRMNT. FRQNCY.	SAMPLE TYPE
	(mg/l)	(lb/day)	(mg/l)	(lb/day)		
FLOW	Report (MGD) *		Report (MGD) *		Continuous	Recorder
BOD5	30	–	45.0	–	1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	–	45.0	–	1/Week	Grab
SETTLEABLE SOLIDS	–	–	1.0 ml/L	–	2/Week	Grab
FECAL COLIFORM	see text of paragraph following this table				1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) **	–	–	2.0	–	5/Week	Grab

* Flow shall be reported in Million Gallons per Day (MGD).

** The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. TRC analyses shall be performed within fifteen (15) minutes of sample collection.

The wastewater discharge for Outfall 111 must be disinfected to the extent that viable coliform organisms are effectively eliminated. The concentration of the fecal coliform group after disinfection shall not exceed 200 per 100 ml. as the geometric mean based on a minimum of 10 samples, collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purpose of determining the geometric mean, individual samples having a fecal coliform group concentration of less than one (1) per 100 ml. shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml. Where less than 10 samples are made per month, the permittee shall use an arithmetic mean rather than the geometric mean.

TVA-Watts Bar Nuclear Plant is authorized to discharge sewage plant effluent coming from Outfall 111, building cooling water, fire protection system water and storm water runoff through Outfall 112 to an unnamed tributary to Yellow Creek.

These discharges shall be limited and monitored by the permittee as specified below:

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 112
Yard Runoff Holding Pond - Storm runoff

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		1/Week	Estimate *
pH **	Range 6.0 - 9.5				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	--	100.0	--	1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) **	0.011	--	0.019	--	1/Week	Grab
NITROGEN, AMMONIA TOTAL	1.46	--	2.42	--	1/Week	Grab
DISSOLVED OXYGEN (D.O.)	--	--	5.0 Min.	--	1/Week	Grab
IC25 ***	25% Inhibition Concentration shall be ≥ 100% Effluent				Semi-annual	Composite ***

* Flow shall be reported in Million Gallons per Day (MGD). Estimate based on measurement at existing weir.

** The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.

*** See Part III for methodology.

TVA-Watts Bar Nuclear Plant is authorized to discharge supplemental condenser cooling water (SCCW) through Outfall 113 to the Tennessee River at mile 529.2. These discharges shall be limited and monitored by the permittee as specified below:

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 113
Cooling water

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous	Recorded
pH ***	Range 6.0 - 9.0				1/Month****	Grab
TOTAL SUSPENDED SOLIDS (TSS)	Report	–	Report	–	1/Month****	Grab
TEMPERATURE, Effluent	Report Effluent Temperature **				Hourly	Recorder
TEMPERATURE, Edge of Mixing Zone			30.5° C		Hourly	Recorder
TEMPERATURE Rise upstream to downstream			3 C°		Hourly	Calculated
TEMPERATURE, Rate of Change, °C per hour			2 C° /hour		Hourly	Calculated
TEMPERATURE, Receiving Stream Bottom			33.5°C		Hourly	Recorder
Stream Flow Direction Recording	Report Data on Status of Flow				Hourly	Recorded
Certification of Instream Flow of 3500 cfs when required			Report as Yes/No		1/Month	Operation Records
CHLORINE, TOTAL RESIDUAL (TRC) ***	0.092	–	0.158	–	1/Month****	Grab
DISSOLVED OXYGEN (D.O.)	–	–	Report Min.	–	1/Month****	Grab
IC25 *****	25% Inhibition Concentration shall be ≥ 10.3% Effluent				Semi-annual	Composite ****

* Flow shall be reported in Million Gallons per Day (MGD).

** It is recognized that the temperature of the cooling water discharge will be greater than the temperature of the water prior to its use for cooling or other purposes. The maximum water temperature change shall not exceed 3°C relative to an upstream control point. Outside the mixing zone, this discharge must not cause the temperature of the receiving waters to exceed 30.5°C (except as a result of natural causes), and this discharge must not cause the maximum rate of temperature change in the receiving waters to exceed 2°C per hour (except as a result of natural causes). Receiving water temperature measurement limited above will be by bottom sensors within the mixing zone. For further temperature requirements see Permit Part III - B

*** The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.

**** Monitoring frequency will be as described in the paragraph following this table.

***** See Part III for methodology.

Monitoring will be sampled 1/Week for TSS, TRC, DO and pH until this discharge is characterized and form 2C submitted (see Part III-F). At that point frequency may be reduced to the 1/month frequency shown in the table with the concurrence of the Division.

See paragraph below regarding instream flow requirements.

NOTE: For the monitoring and reporting of measurements of FLOW, the "Monthly Avg." shall be the total flow volume during the reporting period divided by the number of calendar days in that period. The "Daily Max." shall be the total flow volume for the day with the greatest amount of discharge during the reporting period. Example: 3 discharges of 15,000 gallons/day and 1 discharge of 20,000 gallons/day during a 1-month period results in a Monthly Avg. of 65,000 gallons/30 days, or 2,166 gallons/day (to be reported as 0.002166 MGD). The Daily Max. to be reported for this example is 20,000 gallons/day or 0.020 MGD.

Additional monitoring requirements and conditions applicable to Outfalls 101, 102, 103, 107, 111, 112, and 113 include:

There shall be no discharge of PCB.

There shall be no distinctly visible floating scum, oil or other matter contained in the wastewater discharge. The wastewater discharge must not cause an objectionable color contrast in the receiving stream.

The wastewater discharge shall not contain pollutants in quantities that will be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

Sludge or any other material removed by any treatment works must be disposed of in a manner which prevents its entrance into or pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA 68-31-101 et seq. and the Tennessee Hazardous Waste Management Act, TCA 68-46-101 et seq.

For the purpose of evaluating Total Residual Chlorine (TRC) in this permit, analyses shall include any residual bromine with results reported as chlorine. Thus, there is no separate test for residual bromine, but one test for situations where combinations of chlorine and bromine are being used. Where TRC is specified as being monitored when it is added to the discharge, the permittee shall take efforts to see that sampling is made when TRC is characteristic of pollutants in the discharge.

For the purpose of evaluating compliance with the instream temperature criteria, continuous temperature measurements shall be calculated as one-hour averages.

For the purpose of evaluating compliance with the permit limits established herein, where certain limits are below the State of Tennessee published required detection levels (RDLs) for any given effluent characteristics, the results of analyses below the RDL shall be reported as Below Detection Level (BDL), unless in specific cases other detection limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed.

Discharges are authorized for Outfall 101 only during periods when flow in the receiving stream is 3,500 cubic feet per second or greater. All changes to the flow rate of the SCCW discharge (Outfall 113) will be done during periods when flow in the receiving waters is at least 3,500 Cubic feet per second. This includes periods of start-up, shut-down as well as other similar abrupt flow rate changes of the SCCW. When thermally loaded effluent is discharged through Outfall 102, all reasonable efforts shall be made to keep flow of at least 3500 cubic feet per second in the receiving waters. If such flow is absent, the permittee shall verify protection of water quality by taking instream temperature measurements. Compliance with flow requirements for 3,500 cfs flow instream for Outfalls 101, 102 and 113 discharges shall be certified monthly with the submission of Discharge Monitoring Reports submitted to the Division for these outfalls. Records concerning the instream flow shall be maintained and available upon request.

B. MONITORING PROCEDURES

1. Representative Sampling

Samples and measurements taken in compliance with the monitoring requirements for internal monitoring points and outfalls specified herein shall be representative of the volume and nature of the monitored discharge. Sampling and measurements for these outfalls and monitoring points shall be taken at the nearest accessible point after final treatment and prior to mixing with other waters or the receiving stream.

The permittee shall maintain a capability for composite sampling of Outfall 101 discharges. Temporary or mobile equipment may be used for this, but will be kept on-site and available for use if required.

2. Sampling Frequency

Where the permit requires sampling and monitoring of a particular effluent characteristic(s) at a frequency of less than once per day or daily, the permittee is precluded from marking the "No Discharge" block on the Discharge Monitoring Report if there has been any discharge from that particular outfall during the period which coincides with the required monitoring frequency, i.e. if the required monitoring frequency is once per month or 1/month, the monitoring period is one month, and if the discharge occurs during only one day in that period then the permittee must sample on that day and report the results of analyses accordingly. If there is no discharge at a particular Outfall at any time for the designated monitoring frequency (e.g. 1/Month), then the facility is required to mark the "No Discharge" box on the Discharge Monitoring Report and submit it according to the usual schedule.

3. Test Procedures

a. Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304 (h) of the Clean Water Act (the "Act"), as amended, under which such procedures may be required.

b. Unless otherwise noted in the permit, all pollutant parameters shall be determined according to methods prescribed in Title 40, CFR, Part 136, as amended, promulgated pursuant to Section 304 (h) of the Act.

c. Toxicity testing under this permit shall follow procedures referenced in Short-term Methods For Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002 or the most current edition.

4. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date and time of sampling;
b. The exact person(s) collecting samples;
c. The dates and times the analyses were performed;
d. The person(s) or laboratory who performed the analyses;
e. The analytical techniques or methods used, and;
f. The results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation shall be retained for a minimum of three (3) years, or longer, if requested by the Division of Water Pollution Control.

C. DEFINITIONS

The ***Monthly Average Concentration***, a limitation on the discharge concentration, in milligrams per liter (mg/L) or other specified units, is the arithmetic mean of all daily concentrations determined in a one-month period. For the purpose of this definition, a frequency of 2/Month is representative of 2 separate daily samples, each sample having been collected on a separate day during the monitoring period. For temperatures, the ***Monthly Average Concentration*** is the average temperature in Celsius degrees of the temperatures measured in the day. For river bottom temperature measurements associated with Outfall 113, the ***Monthly Average Concentration*** is the average of temperature measurements Celsius degrees that is measured during the day by all of the four river bottom monitors.

The ***Monthly Average Amount***, a discharge limitation measured in pounds per day (lb./day), is the total amount of any pollutant in the discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by a permit, the monthly average amount shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made. For the purpose of this definition, a frequency of 2/Month is representative of 2 separate daily samples, each sample having been collected on a separate day during the monitoring period.

The ***Daily Maximum Concentration*** is a limitation on the average concentration, in milligrams per liter (mg/L) or other specified units, of the discharge during any calendar day. When a proportional-to-flow composite sampling device is used, the daily concentration is the concentration of that 24-hour composite; when other sampling means are used, the daily concentration is the arithmetic mean of the concentrations of equal volume samples collected during any calendar day or sampling period. For temperatures, the ***Daily Maximum Concentration*** is the maximum temperature in Celsius degrees measured in the day. For river bottom temperature measurements associated with Outfall 113, the ***Daily Maximum Concentration*** is the maximum temperature in Celsius degrees that is measured in the day by any of the four river bottom monitors.

The ***Daily Maximum Amount***, is a limitation measured in pounds per day (lb./day), on the total amount of any pollutant in the discharge by weight during any calendar day.

The ***Instantaneous Concentration*** is a limitation on the concentration, in milligrams per liter (mg/L) or other specified units, of any pollutant contained in the discharge determined from a grab sample taken at any point in time.

A ***Composite Sample***, for the purposes of this permit, is a sample collected continually over a period of 24 hours at a rate proportional to the flow. With concurrence of the Division, time weighted composite sampling may be made in lieu of the flow proportional sampling.

A ***Grab Sample***, for the purposes of this permit, is defined as a single effluent sample collected at a particular time. The sample(s) shall be collected at the period(s) most representative of the total discharge.

For the purpose of this permit, a ***Calendar Day*** is defined as any 24-hour period.

For the purpose of this permit, a ***Quarter*** is defined as any one of the following three month periods: January 1 through March 31, April 1 through June 30, July 1 through September 30, or October 1 through December 31.

For the purpose of this permit, ***Semi-annually*** means the same as "once every six months." Measurements of the effluent characteristics concentrations may be made anytime during a 6 month period beginning from the issuance date of this permit so long as the second set of measurements for a given 12 month period are made approximately 6 months subsequent to that time, if feasible.

For the purpose of this permit, ***Annually*** is defined as once every twelve (12) months beginning with the date of issuance of this permit so long as the following set of measurements for a given 12 month period are made approximately 12 months subsequent to that time.

Hourly for permit compliance calculations at Outfall 113 and instream measurements associated with the Supplemental Condenser Cooling Water will be as follows. Measurements will be taken every 15 minutes. An hourly calculation will consist of the measurement at the beginning of the hour and the previous four (4) measurements divided by five, that is the total number of measurements.

D. REPORTING

1. Monitoring Results

Monitoring results shall be recorded monthly or quarterly and submitted monthly or quarterly using Discharge Monitoring Report (DMR) forms supplied by the Division of Water Pollution Control. Submittals shall be postmarked no later than 15 days after the completion of the reporting period. The top two copies of each report are to be submitted. A copy should be retained for the permittee's files. DMR's and any communication regarding compliance with the conditions of this permit must be sent to:

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
COMPLIANCE REVIEW SECTION
401 CHURCH STREET
L & C ANNEX 6TH FLOOR
NASHVILLE TN 37243-1534

The first DMR is due August 15, 1999.

DMR's must be signed and certified by a responsible corporate officer as defined in 40 CFR 122.22, a general partner or proprietor, or a principal municipal executive officer or ranking elected official, or his duly authorized representative. Such authorization must be submitted in writing and must explain the duties and responsibilities of the authorized representative.

2. Additional Monitoring by Permittee

If the permittee monitors any pollutant specifically limited by this permit more frequently than required at the location(s) designated, using approved analytical methods as specified herein, the results of such monitoring shall be included in the calculation and reporting of the values required in the DMR form. Such increased frequency shall also be indicated on the form.

3. Falsifying Reports

Knowingly making any false statement on any report required by this permit may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Water Pollution Control Act, as amended, and in Section 69-3-115 of the Tennessee Water Quality Control Act.

E. SCHEDULE OF COMPLIANCE

The permittee shall have 90 days from the effective date of the permit to comply with permit requirements for the following.

For the SCCW discharges, 90 days will be allowed for installation, testing, calibrating and adjusting the monitoring equipment and system during the initial start-up of the SCCW system. Notwithstanding the compliance period for monitoring requirements, the permittee shall make every effort to insure water quality is protected throughout start-up of the system. The permittee shall not cause a condition of pollution in the receiving waters and will be held responsible for any environmental harm that occurs during the compliance period (see Permit Part II-D).

PART II

A. GENERAL PROVISIONS

1. Duty to Reapply

Permittee is not authorized to discharge after the expiration date of this permit. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information and forms as are required to the Director of Water Pollution Control (the "Director") no later than 180 days prior to the expiration date.

2. Right of Entry

The permittee shall allow the Director, the Regional Administrator of the U.S. Environmental Protection Agency, or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or where records are required to be kept under the terms and conditions of this permit, and at reasonable times to copy these records;

b. To inspect at reasonable times any monitoring equipment or method or any collection, treatment, pollution management, or discharge facilities required under this permit; and

c. To sample at reasonable times any discharge of pollutants.

3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Water Pollution Control Act, as amended, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division of Water Pollution Control. As required by the Federal Act, effluent data shall not be considered confidential.

4. Proper Operation and Maintenance

a. The permittee shall at all times properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory and process controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit. Backup continuous pH and flow monitoring equipment are not required.

b. Dilution water shall not be added to comply with effluent requirements to achieve BCT, BPT, BAT and or other technology based effluent limitations such as those in State of Tennessee Rule 1200-4-5-.03.

5. Treatment Facility Failure

The permittee, in order to maintain compliance with this permit, shall control production, all discharges, or both, upon reduction, loss, or failure of the treatment facility, until the facility is restored or an alternative method of treatment is provided. This requirement applies in such situations as the reduction, loss, or failure of the primary source of power.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

7. Severability

The provisions of this permit are severable. If any provision of this permit due to any circumstance, is held invalid, then the application of such provision to other circumstances and to the remainder of this permit shall not be affected thereby.

8. Other Information

If the permittee becomes aware that he failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, then he shall promptly submit such facts or information.

B. CHANGES AFFECTING THE PERMIT

1. Planned Changes

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

2. Permit Modification, Revocation, or Termination

a. This permit may be modified, revoked and reissued, or terminated for cause as described in 40 CFR 122.62 and 122.64, Federal Register, Volume 49, No. 188 (Wednesday, September 26, 1984), as amended.

b. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

c. If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established for any toxic pollutant under Section 307(a) of the Federal Water Pollution Control Act, as amended, the Director shall modify or revoke and reissue the permit to conform to the prohibition or to the effluent standard, providing that the effluent standard is more stringent than the limitation in the permit on the toxic pollutant. The permittee shall comply with these effluent standards or prohibitions within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified or revoked and reissued to incorporate the requirement.

3. Change of Ownership

This permit may be transferred to another party (provided there are neither modifications to the facility or it's operations, nor any other changes which might affect the permit limits and conditions contained in the permit) by the permittee if:

a. The permittee notifies the Director of the proposed transfer at least 30 days in advance of the proposed transfer date;

b. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and liability between them; and

c. The Director, within 30 days, does not notify the current permittee and the new permittee of his intent to modify, revoke or reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

Pursuant to the requirements of 40 CFR 122.61, concerning transfer of ownership, the permittee must provide the following information to the Division in their formal notice of intent to transfer ownership: 1) the NPDES permit number of the subject permit; 2) the effective date of the proposed transfer; 3) the name and address of the transferor; 4) the name and address of the transferee; 5) the names of the responsible parties for both the transferor and transferee; 6) a statement that the transferee assumes responsibility for the subject NPDES permit; 7) a statement that the transferor relinquishes responsibility for the subject NPDES permit; 8) the signatures of the responsible parties for both the transferor and transferee pursuant to the requirements of 40 CFR 122.22(a), "Signatories to permit applications"; and, 9) a statement regarding any proposed modifications to the facility, it's operations, or any other changes which might affect the permit limits and conditions contained in the permit.

4. Change of Mailing Address

The permittee shall promptly provide to the Director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

C. NONCOMPLIANCE

1. Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable State and Federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

2. Reporting of Noncompliance

a. 24-Hour Reporting

In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Pollution Control in the appropriate Environmental Assistance Center within 24 hours from the time the permittee becomes aware of the circumstances. (The Environmental Assistance Center should be contacted for names and phone numbers of environmental response personnel.)

A written submission must be provided within five days of the time the permittee becomes aware of the circumstances unless this requirement is waived by the Director on a case-by-case basis. The permittee shall provide the Director with the following information:

i. A description of the discharge and cause of noncompliance;

ii. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and

iii. The steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

b. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph 2.a. above, the permittee shall report the noncompliance on the Discharge Monitoring Report. The report shall contain all information concerning the steps taken, or planned, to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

3. Bypassing

a. "***Bypass***" means the discharge of wastes from any portion of the collection or treatment system other than through permitted outfalls. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass is prohibited unless the following three (3) conditions are met:

i. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;

ii. There are not feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down-time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment down-time or preventative maintenance;

iii. The permittee submits notice of an unanticipated bypass to the Division of Water Pollution Control in the appropriate Environmental Assistance Center within 24 hours of becoming aware of the bypass (if this information is provided orally, a written submission must be provided within five days). When the need for the bypass is foreseeable, prior notification shall be submitted to the Director, if possible, at least ten (10) days before the date of the bypass.

c. The permittee shall operate the collection system so as to avoid bypassing. No new or additional flows shall be allowed that will contribute to bypass discharges or would otherwise overload any portion of the system.

4. Upset

a. "***Upset***" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. An upset shall constitute an affirmative defense to an action brought for noncompliance with such technology - based permit effluent limitations if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i. An upset occurred and that the permittee can identify the cause(s) of the upset;

ii. The permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;

iii. The permittee submitted information required under "Reporting of Noncompliance" within 24 hours of becoming aware of the upset (if this information is provided orally, a written submission must be provided within five days); and

iv. The permittee complied with any remedial measures required under "Adverse Impact."

5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

6. Diversion

a. "***Diversion***" is the intentional rerouting of wastewater within a treatment facility away from a biological portion of the treatment facility.

b. A diversion is permissible only when necessary to protect the active biomass from a wash-out due to peak flow events and when this action does not cause effluent limitations to be exceeded.

7. Washout

a. For domestic wastewater plants only, a "washout" shall be defined as loss of Mixed Liquor Suspended Solids (MLSS) of 30.00% or more. This refers to the MLSS in the aeration basin(s) only. This does not include MLSS decrease due to solids wasting to the sludge disposal system. A washout can be caused by improper operation or from peak flows due to infiltration and inflow.

b. A washout is prohibited. If a washout occurs the permittee must report the incident to the Division of Water Pollution Control in the appropriate Environmental Assistance Center within 24 hours by telephone. A written submission must be provided within five days. The washout must be noted on the discharge monitoring report. Each day of a washout is a separate violation.

D. LIABILITIES

1. Civil and Criminal Liability

Except as provided in permit conditions or "***Bypassing,***" "***Upset,***" "***Diversion,***" and "***Treatment Facility Failures,***" nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of wastewater to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its wastewater treatment and/or discharge activities in a manner such that public or private nuisances or health hazards will not be created.

2. Liability Under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or the Federal Water Pollution Control Act, as amended.

PART III

OTHER REQUIREMENTS

A. TOXIC POLLUTANTS

The permittee shall notify the Division of Water Pollution Control as soon as it knows or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis, of any toxic substance(s) (listed at 40 CFR 122, Appendix D, Table II and III) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

   a. One hundred micrograms per liter (100 ug/l);

   b. 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;

   c. Five (5) times the maximum concentration value reported for that pollutant(s) in the permit application in accordance with 122.21(g)(7); or

   d. The level established by the Director in accordance with 122.44(f).

2. 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 the permit, if that discharge will exceed the highest of the following "notification levels":

   a. Five hundred micrograms per liter (500 ug/l);

   b. One milligram per liter (1 mg/L) for antimony;

   c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 122.21(g)(7); or

   d. The level established by the Director in accordance with 122.44(f).

B. TEMPERATURE RELATED REQUIREMENTS, OUTFALL 113

TVA shall conduct routine temperature monitoring of the bottom of the discharge zone of the river along the periphery of the mussel relocation zone. Monitoring will be made by four thermistors wired to a data logger. Temperature data will be recorded for each thermistor on an hourly basis and will be available as unaggregated data for analysis. The temperature will be reported on the Discharge Monitoring Reports as daily maximum (highest value for a day for any of the monitors) and monthly average values (average of all 4 monitors). Flow direction of water near the Outfall 113 discharge shall be monitored by automated equipment. Any instream monitoring equipment failures shall be remedied as soon as reasonably practical. Records of the flow direction instream and of the bottom temperatures shall be used to assess the mixing zone and to further characterize the impacts on bottom dwelling organisms within the mixing zone.

TVA shall conduct four separate temperature surveys during the first year of full operation of the Supplemental Condenser Cooling Water project. These surveys are intended to better define the mixing zone and reflect seasonal changes in the mixing zone at Outfall 113. The plant should be operating at the time of the survey and the SCCW be thermally loaded. If a survey cannot be made during a period of plant operation due to planned or unplanned outages, the survey shall be conducted at another time when the plant is operating. Each survey shall consist of determining vertical temperature profiles that allow assessment of the predicted mixing zone. The survey area shall include the width of the river and the downstream extent of the predicted mixing zone. The goal of the surveys is to determine the actual effects of water releases from the dam and periods of no release from the dam upon the predicted mixing zone. The proposal for temperature survey shall be submitted to the Division and be approved prior to start of the survey.

A report of the surveys will be submitted to the Division within 9 months of the end of survey completion. The report shall summarize all data from the continuous monitoring as well as the survey results. The assessment must compare 1-hour averaging of temperatures with 24-hour averaging.

C. BIOMONITORING REQUIREMENTS, CHRONIC

The permittee shall conduct a 3-Brood *Ceriodaphnia dubia* Survival and Reproduction Test and a 7-Day Fathead Minnow *(Pimephales promelas)* Larval Survival and Growth Test on samples of final effluent from Outfalls 101, 102, 112, and 113. Testing for Outfall 102 shall only be required if the discharges from the emergency bypass are for a time period totaling more than 3 months (90 days).

The measured endpoint for toxicity will be the inhibition concentration causing 25% reduction (IC25) in survival, reproduction, or growth of the test organisms. The IC25 shall be determined based on a 25% reduction as compared to the controls, and as derived from linear interpolation. The average reproduction and growth responses will be determined based on the number of *Ceriodaphnia dubia* or *Pimephales promelas* larvae used to initiate the test.

Tests should be conducted with appropriate replicates of a total of five serial dilutions and a control, using the percent effluent dilutions as presented in the following tables.

Outfalls 101 and 102 Serial Dilutions for Whole Effluent Toxicity (WET) Testing					
4 X PL	2 X PL	Permit Limit (PL)	0.50 X PL	0.25 X PL	Control
% effluent					
13.2	6.6	3.3	1.7	0.83	0

Outfall 112 Serial Dilutions for Whole Effluent Toxicity (WET) Testing					
Permit Limit 100% Effluent	50% Effluent	25% Effluent	12.5 % Effluent	6.25% Effluent	Control
% effluent					
100	50	25	12.5	6.25	0

Outfall 113 Serial Dilutions for Whole Effluent Toxicity (WET) Testing					
4 X PL	2 X PL	Permit Limit (PL)	0.50 X PL	0.25 X PL	Control
% effluent					
41.2	20.6	10.3	5.2	2.58	0

The dilution/control water used will be a moderately hard water as described in EPA/600/4-91/002 (or the most current edition). A chronic standard reference toxicant quality assurance test shall be conducted with each species used in the toxicity tests and the results submitted with the discharge monitoring report.

Toxicity will be demonstrated if the IC25 is less than or equal to permit limit indicated for each outfall in the above tables. Toxicity demonstrated by the tests specified herein constitutes a violation of this permit.

All tests will be conducted using a minimum of three 24-hour flow-proportionate composite samples of final effluent collected on days 1, 3 and 5. If, in any control more than 20% of the test organisms die in 7 days, the test (control and effluent) is considered invalid and the test shall be repeated within two (2) weeks. Furthermore, if the results do not meet the acceptability criteria of section 4.9.1, EPA/600/4-91/002 (or the most current edition), that test shall be repeated. Any test initiated but terminated before completion must also be reported along with a complete explanation for the termination.

The toxicity tests specified herein shall be conducted semi-annually (2/Year) for Outfalls 101, 112, 113 and, if required, for Outfall 102. Tests shall begin no later than 90 days from the effective date of this permit.

In the event of a test failure, the permittee must start a follow-up test within 2 weeks and submit results from a follow-up test within 30 days from obtaining initial WET testing results. The follow-up test must be conducted using the same serial dilutions as presented in the corresponding table(s) above. **The follow-up test will not negate an initial failed test. In addition, the failure of a follow-up test will constitute a separate permit violation.**

In the event of 2 consecutive test failures or 3 test failures within a 12 month period for the same outfall, the permittee must initiate a Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) study within 30 days and so notify the Division by letter. This notification shall include a schedule of activities for the initial investigation of that outfall. Additionally, the permittee shall submit quarterly progress reports throughout the term of the TIE/TRE study. The toxicity must be reduced to allowable limits for that outfall within 2 years of initiation of the TIE/TRE study. Subsequent to the results obtained from the TIE/TRE studies, the permittee may request an extension of the TIE/TRE study period if necessary to conduct further analyses. The final determination of any extension period will be made at the discretion of the Division. The TIE/TRE study may be terminated at any time upon the completion and submission of 2 consecutive quarterly tests demonstrating compliance. **During the course of the TIE/TRE study, the permittee will continue to conduct toxicity testing of the Outfall being investigated in the TIE/TRE at a frequency of once every three months but will not be required to perform follow-up tests for that Outfall during the period of TIE/TRE study.**

Test procedures, quality assurance practices, determinations of effluent survival/reproduction and survival/growth values, and report formats will be made in accordance with Short-term Methods For Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002 or the most current edition.

Results of all tests, reference toxicant information, copies of raw data sheets, statistical analysis and chemical analyses shall be compiled in a report. The report will be written in accordance with Short-term Methods For Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002 or the most current edition.

Two copies of biomonitoring reports (including follow-up reports) shall be submitted to the Division. One copy of the report shall be submitted along with the discharge monitoring report (DMR). The second copy shall be submitted to the following address:

ATTN.: Water Pollution Control
TN Environmental Assistance Center - Chattanooga
State Office Building
540 McCallie Avenue, Suite 550
Chattanooga, TN 37402-2013

D. REOPENER CLAUSE

If an applicable standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(B)(2), and 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked and reissued to conform to that effluent standard or limitation.

E. PLACEMENT OF SIGNS

Within sixty (60) days of the effective date of this permit, the permittee shall place and maintain a sign(s) at each outfall and any bypass/overflow point in the collection system. For the purposes of this requirement, any bypass/overflow point that has discharged five (5) or more times in the last year must be so posted. The sign(s) should be clearly visible to the public from the bank and the receiving stream. The minimum sign size should be two feet by two feet (2' x 2') with one inch (1") letters. The sign should be made of durable material and have a white background with black letters.

The sign(s) are to provide notice to the public as to the nature of the discharge and, in the case of the permitted outfalls, that the discharge is regulated by the Tennessee Department of Environment and Conservation, Division of Water Pollution Control. The following is given as an example of the minimal amount of information that must be included on the sign:

EXAMPLE:

TREATED COOLING WATER AND INDUSTRIAL WASTEWATER
TVA-Watts Bar Nuclear
(Permittee's Contact Phone Number)
NPDES Permit NO. TN0020168
TENNESSEE DIVISION OF WATER POLLUTION CONTROL
1-888-891-8332 WPC ENVIRONMENTAL ASSISTANCE CENTER

F. OUTFALL CHARACTERIZATION FOR OUTFALL 113

Within two (2) years from the effective date on the title page of this permit or within 6 months prior to permit renewal, whichever comes first, the permittee shall submit to the Division of Water Pollution Control a completed Application Form 2C - Wastewater Discharge Information, Consolidated Permits Program (EPA Form 3510-2C) for the discharges from Outfall 113. Along with characterization of the discharge, waters in the cooling tower basins #1 and #2 shall each be sampled for asbestos fibers in the water and results reported to the Division with the form 2C.

There shall be at least three months of analyses available to the permittee before the form 2C is filed. Sampling included on form 2C must commence after the initial 90 day compliance schedule period. Once the permit application form 2C is submitted, the permittee may request that the Division reduce the monitoring frequency to once per month for Total Suspended Solids, Dissolved Oxygen, pH and Oil and Grease until the permit is modified or reissued.

G. ANTIDEGRADATION

Pursuant to the Rules of the Tennessee Department of Environment and Conservation, Chapter 1200-4-3-.06, titled "Tennessee Antidegradation Statement," and in consideration of the Department's directive in attaining the greatest degree of effluent reduction achievable in municipal, industrial, and other wastes, the permittee shall further be required, pursuant to the terms and conditions of this permit, to comply with the effluent limitations and schedules of compliance required to implement applicable water quality standards, to comply with a State Water Quality Plan or other State or Federal laws or regulations, or where practicable, to comply with a standard permitting no discharge of pollutants.

H. MUSSEL HABITAT ENHANCEMENT, OUTFALL 113

Mussels within the discharge zone shall be relocated to elsewhere in the mussel sanctuary before discharges begin. A report shall be submitted to the Tennessee Wildlife Resources Agency within 90 days of the completion of the mussel relocation.

Since discharge from Outfall 113 is to waters that are a part of a designated mussel sanctuary in the State of Tennessee, the permittee is required to enhance the available habitat for the mussel population of this stretch of the river. This shall be accomplished through improving conditions conducive to juvenile mussel recruitment. The habitat enhancement proposal shall be submitted for review and approval to both TWRA and the Division within six months of initial discharge from the supplemental condenser cooling water system operation. The proposal shall include structural and or administrative controls which have shown experimental or proven benefits in mussel habitat enhancement. A report of the results will be scheduled to be made to the Division six months after completion of the mussel habitat enhancement implementation.

I. FISH MONITORING PROGRAM, OUTFALL 113

In addition to the mussel relocation and a mussel habitat enhancement effort, the permittee shall conduct a fish monitoring program as agreed in preliminary plans submitted to the Division of Water Pollution Control. The program shall include impingement study for the horizontal traveling screens, entrainment monitoring for larval fish, sauger monitoring, striped bass investigation, and assessment of the overall fish community using the Reservoir Fish Assemblage Index sampling. A report of the results shall be submitted to the Division 6 months after the first full year of operation.

J. BIOCIDE TREATMENTS

The permittee shall not make biocide treatments to the waters discharged under this permit except under a plan which has been given prior approval by the Division of Water Pollution Control.

K. CERTIFIED OPERATOR

The sewage plant waste treatment facilities shall be operated under the supervision of a Grade I certified wastewater treatment operator in accordance with the Water Environmental Health Act of 1984.

PART IV

STORM WATER POLLUTION PREVENTION PLAN

The discharger will develop, document and maintain a storm water pollution prevention plan (SWPPP) pursuant to the requirements as set forth in the Tennessee Multi-Sector General Permit for Industrial Activities, Sector O, "Storm Water Discharges Associated With Industrial Activity From Steam Electric Power Generating Facilities, including Coal Handling Areas", Part 3, "Storm Water Pollution Prevention Plan Requirements", applicable to Steam Electric Power Generating Facilities. The plan shall be signed by either a principal executive officer of a corporation, the owner or proprietor of a sole proprietorship, or a partner or general partner of a partnership. The SWPPP developed and implemented shall contain, in addition to the requirements listed in the Tennessee Multi-Sector SWPPP guidelines for Steam Electric Power Generating Facilities, the following items:

A. PLAN IMPLEMENTATION

The plan should be modified to include SCCW storm water drainage area and be available for review within 180 days after permit coverage. Facilities should implement the management practices as soon as possible, but not later than one year after permit coverage. Where new construction is necessary to implement the management plan, a construction schedule should be included. Construction should be completed as soon as possible.

B. PLAN AVAILABILITY

The plan will be maintained by the discharger on the site or at a nearby office. Copies of the plan will be submitted to the Division of Water Pollution Control within ten working days of any request.

C. PLAN MODIFICATION

The plan will be modified as required by the Director of the Division of Water Pollution Control.

D. MONITORING PLAN

The storm water discharges discharged through the outfalls listed in this permit will be monitored as required in Part I. Section A., Effluent Limits and Monitoring Requirements. Other storm water runoff shall be addressed by the Storm Water Pollution Prevention Plan and Tennessee Multi-Sector Permit #TNR001343 requirements.

RATIONALE

TVA-Watts Bar Nuclear

NPDES PERMIT NO. TN0020168
Spring City, Rhea County, Tennessee

Permit Writer: Larry Bunting

I DISCHARGER

TVA-Watts Bar Nuclear
Spring City, Rhea County, Tennessee

Contact Person:
Mr. O. Erskin Hickman, Jr.

(423)365-3325

Nature of Business: Production of Electric power

SIC Code(s): 4911 Electric Power Generation
(NAICS code: 221113 - Nuclear Electric Power Generation)
Industrial Classification: Primary
Discharger Rating: Major

II PERMIT STATUS

NPDES Permit No. TN0020168 issued 9/30/1993
NPDES Permit No. TN0020168 modified 12/1/1993
NPDES Permit No. TN0020168 expired 9/29/1998

Initial Application for Renewal received 3/29/1998
Application Addendum received 10/28/1998

Watershed Scheduling

Environmental Assistance Center: Chattanooga
Primary Longitude: 84-47-09 Primary Latitude: 35-35-36
Hydrocode: 06020001 Watershed Group: 1
Watershed Identification: Tennessee River (Meigs & Rhea County)
Target Reissuance Date: 1998
Target Watershed Evaluation Date: 9/28/2001

III FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear discharges cooling water, storm water runoff and other treated wastewaters to the Tennessee River and to Yellow Creek. The site was designed with two ponds through which most of the water is passed. The Yard Holding Pond receives cooling water, storm runoff, discharged water from Outfalls 103, and 107 and backwash waters from the diffuser. Water from the Yard Holding Pond will discharge to the Tennessee River through either Outfall 101 or Outfall 102. The Runoff Holding Pond was initially constructed to control runoff from maintenance areas, shops and construction areas. These areas are no longer operating and are not contributing storm water pollutants as in the past. Outfall 112 is the discharge from this pond.

Appendix 1 summarizes facility discharges and the receiving stream information for Outfall 101, 102, 103, 107, 111, 112 and 113.

Outfall 101 Outfall 101 is the diffuser discharge into the Tennessee River. This is the point where most of the water other than supplemental condenser cooling water leaves the plant and enters the river. Large in-line valves can shut off flow to the diffusers. When the flow is shut off it goes instead to the Yard Holding Pond. The diffusers are shown with a flow rate of 66.4 million gallons per day for the permit calculations but in actual fact the daily volume of discharge through the diffusers is less than this (about 32.5 million gallons per day) because flow through the diffusers is shut off for part of the day while the plant is operating normally. Discharge though the diffuser is allowed only when there is 3,500 cubic feet per second flow being discharged through the upstream dam. Water discharges through the dam are often not made 24 hours per day. All wastewater treatment is done prior to water being sent to the Yard Holding Pond. Water from the Yard Holding pond goes to the diffusers and the Tennessee River.

Outfall 102 Outfall 102 is an emergency spillway that empties to the Tennessee River from the bank. It does not go through a diffuser into the river and the water is therefore not mixed as well as waters going through the diffuser. The discharge is identical to that of Outfall 101. Historically, Outfall 102 is not used. It has been used in the past when maintenance work was needed on the diffuser and the diffusers were shut down for a period of time. The permit will require that 3500 cubic feet per second flow be present when thermally loaded water is discharged through Outfall 102.

Outfall 103 Outfall 103 is an internal monitoring point for the Low Volume Waste Treatment Pond. It gets waters from the turbine building sump, the water treatment plant wastewaters, alum sludge pond supernatant and sumps. This water is discharged into the Yard Holding Pond and ultimately reaches the river through Outfall 101.

Outfall 107 Outfall 107 is the metal cleaning waste ponds internal monitoring point. It is in place to meet the effluent guidelines requirements for copper and iron treatment. After treatment, this water is discharged into the Yard Holding Pond and goes into the river through Outfall 101.

Outfall 111 Outfall 111 is an internal monitoring point for the sewage treatment plant. All waters from this outfall pass through Outfall 112 and into Yellow Creek.

Outfall 112 Outfall 112 is the discharge into an unnamed tributary into Yellow Creek. Water in this pond includes storm water and natural drainage as well as the water from the sewage treatment plant, Outfall 111 discharges pass through Outfall 112 into the tributary to Yellow Creek. Outfall 112 is at a dam that was constructed to collect runoff from a paint shop area, laydown areas and construction areas to provide

retention and settling. These activities have mostly ceased but the dam and pond remain. The current outfall now should discharge relatively uncontaminated site runoff mixed with the effluent discharges from Outfall 111. The pond behind the dam has begun to develop wetlands habitats around the edges of the ponded area.

Outfall 113 Outfall 113 is the supplemental condenser cooling water which discharges to the Tennessee River at the point of the previous Watts Bar Fossil Plant cooling water discharges. Watts Bar Fossil plant discharges through this outfall point have been re-routed to the ash pond. Fossil plant discharge water that is not thermally loaded and now discharges from a different point. Outfall 113 is upstream of the nuclear plant and below the dam. The water for the supplemental cooling water is taken from above the dam, used for cooling and discharged from the cooling tower basin back to the river through Outfall 113. Discharge changes shall be when 3,500 cubic feet per second flow is being discharged through the dam as much as possible. The flow is not a pumped discharge but is gravity fed. Rate of flow will thus depend on the lake levels at the time of the discharges.

The Tennessee River is controlled primarily by the Watts Bar Dam immediately upstream. When the Watts Bar Nuclear plant is discharging through Outfall 101, there has been an operational requirement that 3500 cfs flow be present in the stream. Further requirements for dam releases are being added for some discharge situation at Outfalls 102 and 113. Yellow Creek is a small stream that discharges to the Tennessee River.

IV APPLICABLE EFFLUENT LIMITATIONS GUIDELINES

The Standard Industrial Classification (SIC) code for TVA-Watts Bar Nuclear is 4911 Electric Power Generation. Process wastewater, cooling waters and runoff are covered by 40 CFR Part 423 for steam electric plants. Appendix 2 lists the applicable best available technology (BAT) and best conventional pollution control technology (BCT) effluent limitations guidelines for this Part. (Note: This nuclear facility has no coal pile runoff although it is included in the effluent guidelines.)

V PREVIOUS PERMIT LIMITS AND MONITORING REQUIREMENTS

Appendix 3 lists the previous permit limits for the industrial wastewater and cooling water discharges. The previous permit limits are for the most part retained. PCBs are no longer used at the site. The toxicity testing was changed to a inhibition concentration calculation methodology which is considered to be more accurate during the past permit. The runoff holding pond collected rain runoff from areas that are no longer being used (construction activity areas) and the runoff should be relatively uncontaminated except for input from the sewage treatment plant. There is a paint building in the Outfall 112 drainage area that may contribute storm water associated with industrial activity.

VI HISTORICAL MONITORING AND INSPECTION

During the previous permit term, TVA-Watts Bar Nuclear appears to have met most effluent limitations as outlined in the previous permit. Toxicity testing showed 5 noncompliances at Outfall 112. This seems to be the most problematic permit compliance monitoring condition for the past permit period. A summary of the data reported on Discharge Monitoring Report forms during the period January 1995 through November 1998 is summarized in Appendix 4.

VII NEW PERMIT LIMITS AND MONITORING REQUIREMENTS

The new permit limits are determined by using Best Professional Judgment (BPJ) through a comparison of any applicable EPA effluent guidelines or State of Tennessee maximum limits per Rule 1200-4-5-.03(2) with the previous permit limits and operational and/or treatability data. The more restrictive requirement from this comparison is checked against the appropriate water quality criteria. The most restrictive limit is used as the new permit limit. Appendix 5 lists all effluent limitations and monitoring requirements included in the new permit.

Two requirements are added to the permit that are not specific to any one outfall but apply generally. These have to do with biocide applications to control organisms that interfere with the plant's operations and asbestos characterization of the cooling tower basins.

Biocide applications

Treatments for slime control, control of macroinvertebrates such as zebra mussels or other organisms shall be made with concurrence of the Division. The facility currently uses chlorination/bromination as a biocide which is covered under the permit. Other applications may be made as needed with an approval of the plan for the treatment from the Division of Water Pollution Control.

Asbestos Monitoring in Cooling Tower Basin water

Water in the cooling tower basins shall be sampled for asbestos fibers and the results reported to the Division. The fill material in the towers contains asbestos and is not supposed to be in friable condition. There should be no asbestos shedding into the cooling water to any appreciable degree. However, the Division will require that this be monitored and reported at the time the characterization of Outfall 113 which will be due within 2 years of the permit's effective date.

Outfall 101 - Diffuser discharge

The waters discharged through the diffuser are

a) Yard Holding Pond water
  i) Low Volume Waste treatment pond (OUTFALL 103)
    a) Turbine building sump water
      (1) Equipment and floor drains
        (a) water from auxiliary boiler drains
        (b) Raw Cooling Water strainer backwash
        (c) Equipment cooling water and blowdown
        (d) system leakage and spills
        (e) low volume wastes
      (2) Condensate Demineralizer System
      (3) Water Treatment Plant Neutral waste tank
    b) Alum sludge ponds supernatant
      (1) Water treatment plant filter backwash sump
      (2) Water treatment plant filter backwash vendor sump
    c) Vendor Reverse Osmosis concentrate-neutral waste sump
    d) Storm runoff

e) Drum de-watering
f) Lab wastes

ii) Metal Cleaning Waste Treatment pond (OUTFALL 107)
a) Metal Cleaning Waste
b) Drum rinsing
c) Diesel generator system coolant
d) storm water

iii) Diffuser backflow
iv) Essential Raw Cooling Water (ERCW)
v) Cooling tower de-silting basin
vi) Fire protection system flushes
vii) Service building sump water
viii) Diesel generator building sump water
ix) Emergency Diesel Generator building sump water
x) Essential Raw Cooling Water (ERCW) Strainer backwash
xi) Traveling Screen
xii) Condenser circulating water (CCW) pump station sump
xiii) Sodium hypochlorite building sump water
xiv) Vendor water treatment plant neutral waste sump (alternate routing not normally used)
xv) Turbine building sump (alternate routing not normally used)
xvi) Potable water system leakage
xvii) Yard Holding Pond drainage system runoff

b) Liquid Radwaste system
i) Laundry and "hot" shower drains
ii) Radioactive floor drains and sumps
iii) Chemical drains
iv) System leakage and blowdown
v) Condensate demineralizer system (alternate routing not normally used)
vi) Lab waste

c) Steam Generator Blowdown

d) Condensate Demineralizer system (alternate routing not normally used)
i) Steam Generator Blowdown

e) Condenser Circulating Water, cooling tower blowdown
i) Raw Cooling Water (RCW) system
ii) Essential Raw Cooling Water system
iii) Water treatment plant neutral waste tank (alternate routing not normally used)

Flow

Flow shall be reported in Million Gallons per Day (MGD). Monitoring of flow quantifies the load of pollutants to the stream. Because the flow at Outfall 101 is not a 24 hour occurrence, the reported flow is less than the flow used for water quality calculations which is based on the flow rate at the times discharge is occurring. Should the continuous flow monitoring equipment fail or need to be taken off-line for repairs or calibration, the flow may be reported based on the intake pump logs. However, the permittee shall take reasonable steps to restore the continuous flow monitoring as soon as possible.

pH

The pH will be set as in the previous permit. The sample type will be grab. According to the State of Tennessee Water Quality Standards [Chapter 1200-4-3-.03(3) (c)], the pH for the protection of Fish and Aquatic Life shall lie within the range of 6.5 to 8.5 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours. The Tennessee Rule 1200-4-5-.03(2), "Effluent Limitations for Effluent Limited Segments," establishes technology based limits for pH within the range of 6.0 to 9.0. Considering that the receiving stream will provide some buffering capacity, effluent limitation for pH will be retained in a range 6.0 to 9.0.

Oil and Grease

The Division has determined that an oil and grease limitation is needed for this facility because of the potential of contamination from spills, leaks, and equipment cleaning washwater. According to the State of Tennessee Water Quality Standards for the protection of Fish & Aquatic Life [Chapter 1200-4-3-.03(3) (c)], there shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life in the receiving stream.

In the absence of applicable numerical water quality limits, federal effluent guidelines technology based limits for oil and grease will be 20 mg/L as a daily maximum concentration and 15 mg/L as a monthly average concentration. The sample type will be grab.

Total PCB

Federal effluent guidelines state that there shall be no discharge of PCB from facilities under Part 423. PCB's commonly were used in transformers but this facility has not detected PCB in the past permit period and the transformers that could serve as a source no longer contain PCB. No numerical limit or monitoring will be included in the permit. However, the permit will retain the narrative prohibition against discharge of PCB in line with the language in Part 423.

Total Suspended Solids (TSS)

According to the State of Tennessee Water Quality Standards for the protection of Fish & Aquatic Life [Chapter 1200-4-3-.03(3) (c)], there shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life in the receiving stream.

TSS requirements from the federal effluent guidelines will be used as permit limit. This is 30 mg/L as a monthly average and 100 mg/L as the daily maximum concentrations. The facility has had little problem with TSS in the effluent and objects to dedicating sampling equipment to the outfall on a permanent basis. The Division thinks the ability to composite sample this discharge is important, especially if situations arise where loadings to the stream must be calculated. This concern is not directly tied to a concern about TSS as a pollutant. The permittee has agreed to have equipment on-site and available if composite sampling is wanted for the discharge. However, TSS will be sampled for this permit by grab sample.

Temperature

Temperature loading to the river is mixed with the receiving waters by being put through a diffuser. Instream temperature criteria will be met at the edge of the mixing zone. The mixing zone is defined for this discharge as being a maximum width of 240 feet (the width of the diffuser) and extending 240 feet downstream. The diffuser is only operated when background flow is present from the dam. This is done through an operational requirement. The previous permit required that the modeling be done to protect water quality. The modeling was made using daily average temperatures and was submitted in December 1993 (Discharge Temperature Limit Evaluation for Watts Bar Nuclear Plant, Report # WR28-1-85-137). The report was based on the 24-hour average for discharge evaluation as specified in the permit issued in 1993. The modeling assumed both nuclear units in operation and concluded that a steady-state discharge of 38.3°C under worse case conditions which included 1) full thermal load from the fossil plant, 2) the worst meteorology and 3) no operation of Watts Bar Hydro facility would still protect the water quality based on modeling using daily averaging. A daily average value of 35°C was proposed to include a margin of safety. A continuous discharge at the temperature maximum of 35°C will not exceed water quality outside of the mixing zone based on past modeling. Temperature will be grab sampled.

Toxicity Testing

Based on the analysis provided by the facility the reasonable potential evaluation indicates that toxicity testing may be dropped for 101. However, the Division notes that toxicity testing is not unreasonable given the potential for variability of inputs to the discharge. Therefore, toxicity testing will remain in the permit. Analyses will be made using the IC25. Permit limits will be changed to reflect the slight change in dilution for the permit from the previous permit. Sampling will be composited.

Permit limits will be set at 3.3% for the Inhibition Concentration for 25% (IC25) of the organisms. This is in contrast to limits of 9.78% for the LC50 and NOEC limit of 2.93% of the previous permit. Measurement frequency will be twice per year.

Total Residual Chlorine

The water quality criteria are 0.011 mg/L as a chronic continuous concentration and 0.019 mg/L for the maximum concentration. Total Residual Chlorine will be retained in the new permit at the previous permit limits. Chlorine monitoring will not be required during periods when chlorine or bromine are not being added. For the purposes of the permit, Total Residual chlorine will include both chlorine and bromine reported as chlorine. The background concentration of Total Residual Chlorine is assumed to be 0.0 mg/L. Concentration limits at the flow of 66.4 MGD comes to only 28.5% of the allocation. (The permit writer assessed the toxics by making an across the board allocation for 40% of the allocation to Outfall 101 and 60% to Outfall 113 and assuming toxics were conservative and that discharges were going to the same spot.) Thus, there is a margin of safety in the permit limits that have been applied in the past. The previous permit limit works out to be more stringent than other requirements and will be retained.

Please note that the current detection level for Total Residual Chlorine for this facility is recognized at 0.05 mg/L for this effluent. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode.

Outfall 102 - Emergency Spillway/Yard Holding Pond discharge

This discharge will be limited and treated as the Outfall 101 discharge. If the diffuser has to be taken out of service, water is diverted to the Yard Holding Pond which will fill up. Once water reaches the height of the emergency spillway, water discharges through the spillway which goes down a drainageway to the Tennessee River. The Yard Holding Pond will be subject to the same limits as if the water went through the diffusers. If the ponds were nearly full and a very large rain event occurred, the Yard Holding Pond could start discharging through the emergency spillway. While maintenance on the diffusers is a planned activity, storm related discharges through the outfall can be unplanned.

The permittee shall not use Outfall 102 for a permanent discharge situation. The diffusers will be put back in service by reasonable efforts being taken to maintain or repair them as quickly as possible. Thus, all discharges through Outfall 102 are temporary and not routine or permanent discharge activity.

Temperature

Temperature loading to the river will be the same as for discharge through the diffusers. However, the discharge situation is quite different. Mixing is not enforced in the receiving waters by being put through a diffuser, instead the effluent enters the receiving waters by a side bank discharge at the surface of the water. Further, discharge through the emergency spillway cannot be controlled the way the diffuser discharge is. The water would discharge through the outfall until the pond level goes down. Discharge will be made regardless of whether Watts Bar Hydro is releasing water or not.

Maximum estimated discharge temperature for the 101 diffuser discharge is 35°C. The maximum temperature in the emergency spillway of 102 was estimated at 40°C. The spillway temperature assumes a worst case situation which would produce the 40°C temperature are blowdown discharges to the pond of 97.3°F (36.3°C), meteorological conditions as in July 1952 (historical worst case at time of analysis), a pond surface elevation of 707 feet, no advective cooling of water in the pond and no discharge from the Watts Bar dam for 12 hours. If a 40°C discharge of 60 cfs were discharged at receiving water summer pool elevation of 682 feet when receiving water temperature was 84.5°F (29.2°C) and river flow was 0.3 feet per second velocity then it creates a steady state in the receiving stream at about 3000 feet downstream and the width of the mixing zone is 1000 feet (almost the entire channel width). However, this scenario is unrealistic in these extreme assumptions and a three mile downstream extent of thermal effect is not acceptable.

For the purposes of the permit, the discharge limitation for the pond will be set as the same as it is for the diffuser discharge. A requirement is added that there be at least 3500 cfs in the receiving waters when discharge is made through the emergency spillway for the Yard Holding Pond. This condition for flow in the receiving waters will not apply when discharge consists of storm-related waters that are not significantly thermally loaded by plant operations.

Toxicity Testing

Toxicity testing will be required at Outfall 102 only when testing cannot be made for Outfall 101 and discharges are being made through Outfall 102. Discharges must be sampled if more than 90 days of discharge are made. Composite sampling will be used and limitation made as for the Outfall 101 discharge.

Outfall 103 - Low Volume Waste pond

The low volume waste pond has not shown contaminants of concern at the levels typically seen at the discharge/monitoring point. This pond discharges to the Yard Holding Pond by a submerged structure which serves as an oil/water separator. The turbine building sump typically goes to the low volume pond.

Algae have grown in the pond and photosynthesis creates predictable daily fluctuations of dissolved oxygen and pH. Grass carp have been tried in the pond to control algae. However, to meet the effluent requirements of Part 423, treatment of pH is needed to fulfill the effluent guidelines which limit pH to the range 6-9.

Aluminum will be discontinued in the monitoring of this discharge. It has not been a problem and there is no reason to continue the monitoring the discharge from the alum sludge ponds into the low volume pond. PCB monitoring will be discontinued since PCB use in equipment at the site has discontinued. Otherwise, limits will be continued as they have under the previous permit except for the frequencies. Frequencies are reduced because of the relatively small impact discharges have on the Yard Holding Pond from this small volume input that has been demonstrated able to meet past permit limits.

Outfall 107 - Metal Cleaning Waste pond

The metal cleaning waste ponds discharge to the Yard Holding Pond. Piping allows water to be routed to either the metal cleaning waste pond or to the low volume pond.

Discharges depend upon the presence of wastewaters to treat. Discharge is greater when maintenance activities increase the wastewater to be treated. There are times when no discharge is made. Quantity limits will be assigned corresponding to the concentration limits present. Previous permit limits are more stringent than effluent guidelines and will be retained. Monthly average limits will be set as indicated by effluent guidelines. Monitoring frequency will be reduced because there have been no compliance or operational problems seen with this internal treatment system going to the Yard Holding Pond.

Outfall 111 - Sewage Treatment Plant

The sewage treatment plant treats the sanitary wastewater at the site and discharges to a drainageway that has not been classified as waters of the state in past permits. Waters from the discharge mix with runoff from construction areas and other service areas that were present during plant construction. The wastewaters along with other runoff enter the Runoff Holding Pond and go through Outfall 112.

The sewage treatment plant is treating less wastewater now than when construction activity was on-going and more people were present. The plant treats sewage generated at the site. Permit limits from the previous permit will be retained. Plant must be under supervision of a Certified Operator for sewage treatment for the state of Tennessee.

Outfall 112 -Runoff Holding Pond

a) Sewage treatment plant discharges (OUTFALL 111)
b) Training center HVAC cooling water
c) Fire protection system flushes
d) Potable water line leakage
e) Storm runoff.

Flow

The flow at the dam is estimated by measuring the level of the flow of a V-notch weir. The weir is not properly set up for accurate flow measurement because there is not a sufficient distance in front of the weir for accuracy. Further, the large flows will be such that they overwhelm the flow measurement equipment. For low flows, measurements are reasonably close and will be sufficient for this permit. Flows will be reported as Million Gallons per Day and be estimated by the flow equipment present.

Ammonia

The monthly average limit and daily maximum limit for Ammonia will be set based on calculated ammonia toxicity. The previous permit limits are too high for discharge to a stream with no other dilution of the effluent. No distinction will be made for seasons. A limit will be set at 1.46 mg/L as the monthly average based on the CCC calculated as shown below. A limit will be set at 2.42 mg/L as the daily maximum based on the CMC (salmonid species not present in receiving waters). The values are based on protection of water quality based on EPA's revised water quality criteria for ammonia issued in 1998. The pH used to calculate the water quality value for the monthly average is the median of reported pH values for both minimum and maximum values (pH = 7.9) for the DMR. The median of the reported maximum pH values on DMRs was used to calculate the daily maximum (pH = 8.65).

The formula used to calculate this is

$$CMC = \frac{0.411}{(1 + 10^{(7.204 - pH)})} + \frac{58.1}{(1 + 10^{(pH - 7.204)})}$$

$$CCC = \frac{0.0858}{(1 + 10^{(7.688 - pH)})} + \frac{3.70}{(1 + 10^{(pH - 7.688)})}$$

Other requirements

For Outfall 112, other permit limits will be retained from the previous permit. Note that the pH limits are in response to diurnal algae effects in the pond. When much algae are present, photosynthesis raises pH during the middle of the day but declines during night-time hours. Receiving waters should have a buffering capacity for this effect. The permit will require composite sampling for toxicity testing monitoring.

Outfall 113 - Supplemental Condenser Cooling Water

Supplemental Condenser Cooling water is considered once through cooling water under 40 CFR Part 423 for the purposes of this permit. Water intake for the supplemental condenser cooling water is through the intake for the fossil plant behind the dam. Outfall designation of '113' has been used previously to designate a different discharge used during the plant construction phase. This former outfall has been defunct and unused for years and no longer exists. The designation of this discharge as Outfall 113 should not be confused with the previous Outfall designated as 113.

Flow

Flow shall be reported in Million Gallons per Day (MGD) for Outfall 113. Discharge flow is by gravity flow and flows will be different depending on the winter and summer lake levels. The system is operated by gravity flow rather than pumping the water and, thus, is influenced by how high the water is in the reservoirs. Higher Watts Bar Lake levels in summer will create a greater head and thus more flow. Should the continuous flow monitoring equipment fail or need to be taken off-line for repairs or calibration, the flow shall be measured by staff gauge as a backup method until the flow monitoring system is brought back on-line. The permittee shall take reasonable steps to restore the continuous flow monitoring as soon as possible. In addition instream flow indicators shall be monitored to indicate when occurrences of flow is not in a downstream direction. Data on the status of the bottom flow indicators will be reported with the discharge monitoring reports. Once the mixing zone is well defined, it is anticipated that these bottom temperature monitors will no longer be needed.

The permit will require that sudden changes to thermal loading be made when flow is present instream from dam releases to the extent possible. This cannot be met if there are more pressing concern for human safety or the environment (capsized boats, spills, etc.). However, the permittee should make all efforts to see that abrupt thermal load changes (such as start-up and shut-down) are done during periods of dam release.

pH

Considering that the receiving stream will provide some buffering capacity, effluent limitation for pH will be -set for the range 6.0 to 9.0. The sample type will be grab. During initial operation of the discharge monitoring frequency will be 1/Week. This will be required by letter. With the concurrence of the Division, frequency of monitoring will be 1/month after submittal of form 2-C.

Total PCB

Federal effluent guidelines states that there shall be no discharge of PCB from facilities under Part 423. PCB's commonly were used in transformers but this facility has not detected PCB in the past permit period and the transformers that could serve as a source no longer contain PCB. No numerical limit or monitoring will be included in the permit. However, the permit will retain the narrative prohibition against discharge of PCB in line with the language in Part 423.

Total Suspended Solids (TSS)

According to the State of Tennessee Water Quality Standards for the protection of Fish & Aquatic Life [Chapter 1200-4-3-.03(3) (c)], there shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life in the receiving stream. initial operation of the discharge monitoring frequency will be 1/Week. This will be required by letter. With the concurrence of the Division, frequency of monitoring will be 1/month after submittal of form 2-C.

Temperature

Tennessee's water quality criteria for temperature contains three parts as outlined below. The temperature of the receiving waters will not exceed 30.5°C (T_{max}) instream after mixing and shall not cause an upstream to downstream temperature change (ΔT) of more than 3C°. The rate of temperature change (dT/dt) instream shall not be more than 2 Celsius degrees per hour. All these conditions shall be met at the edge of the mixing zone for the discharge. Further, the extent of the mixing zone should be such that fish and aquatic life are not harmed by the discharge. The permittee shall conduct automated instream temperature monitoring at an upstream point (below the dam) and at a downstream point (at the downstream edge of the mixing zone described below) to evaluate compliance with the criteria.

TVA, as part of the application process, presented dilution model results which predicted a mixing zone, the extent of which appeared to allow the free passage of fish while avoiding bottom dwelling species. During periods of dam operation, the mixing zone is predicted to extend along the right bank for approximately 1000 feet. During periods of dam shut off, the mixing zone is predicted to extend across the entire width of the river. Normally, a "bank to bank" mixing zone is not allowable; however, in this case, only near the surface does the mixing zone extend across the width of the river.

The boundaries associated with this predicted mixing zone reflect 24-hour average temperatures as opposed to instantaneous temperatures. The thermal water quality criteria (T_{max} = 30.5°C, $\Delta T \leq 3$ C°, $dT/dt \leq 2$ C°/hr) should be applied as instantaneous maximums. The Division recognizes that applying this criteria instantaneously is problematic due to the dynamic nature of the receiving stream (barge traffic, dam operations, etc.). For this reason, the Division contends that compliance with the criteria is more appropriately based on 1-hour average temperatures. The extent of a mixing zone with boundaries based on 1-hour average temperatures has not been determined.

This permit will require instream temperature surveys to determine the 3-dimensional extent of a mixing zone with boundaries that meet thermal criteria on an hourly average basis. The instream temperature monitoring will be used to establish thermal requirements in future permits for the facility. Ideally, this monitoring would demonstrate an acceptably sized mixing zone and would also lead to determination of an appropriate end-of-pipe temperature requirement. However, the monitoring may also indicate the need for pursuit of a 316(a) variance.

The outfall geometry is designed to divert the discharge away from bottom dwelling species, thus protecting such species from thermal impact. In order evaluate the effectiveness of this diversion, continuous near-bottom temperature monitoring is required. Four monitors will be placed around the periphery of a zone of immediate impact from which mussels have been relocated. Each monitor will report near-bottom temperature. A limit of 33.5° C (92.3° F) will be set for these monitors as an instantaneous maximum value based on protection of bottom dwelling species. The compliance point for this limit is well within the mixing zone and thus may be set higher than 30.5 ° C. Results will be reported on the DMRs. Directional flow sensors will also be used to monitor flow within the zone of immediate impact.

During the term of this permit, the near-bottom temperature limit will be reported on the DMRs. Exceedences of this limit will be considered permit violations. The facility's compliance with instream thermal criteria within the water column may be evaluated using TVA's proposed instream compliance model (based on 24-hour averaging) and instream data (based on 1-hour averaging). Additionally, biological data from required fish and mussel studies will be considered in determining whether or not the discharge is causing a thermal harm to aquatic life.

Toxicity Testing

Toxicity testing will be required for Outfall 113. The effluent contacts other water which has been chlorinated and may contain other toxics. Some contamination can occur from mixing and therefore testing will be required for the Outfall 113 discharges. Composited samples will be used. Analyses will be made using the IC25. See biomonitoring section below.

Total Residual Chlorine

Chlorine is not added to the SCCW discharged water as such. However, some mixing with chlorinated waters will occur in the cooling tower basins. It is expected that chlorine will not be a detectable pollutant in the discharge. The water quality criteria are 0.011 mg/L as a chronic continuous concentration and 0.019 mg/l for the maximum concentration. Chlorine monitoring will not be required during periods when chlorine or bromine are not being added to the system. For the purposes of the permit, Total Residual Chlorine will include both chlorine and bromine reported as chlorine. initial operation of the discharge monitoring frequency will be 1/Week. This will be required by letter. With the concurrence of the Division, frequency of monitoring will be 1/month after submittal of form 2-C.

The permit writer assessed the toxics by making an across the board allocation for 29% of the allocation to Outfall 101 and 71% to Outfall 113. This assumes toxics were conservative and that discharges were going to the same spot. In actual fact, the discharges will be more than a mile apart. Water quality standards must be met instream. Allocation was a simple mass balance and no modeling of decay under various conditions has been made. This means that there is a margin of safety in the permit limits. Effluent guidelines state that TRC shall not exceed the quantity of 0.5 mg/L times the volume of the sources for a daily maximum or 0.2 mg/L times the source volumes for the monthly average but water quality is more stringent. The monthly average limit of 0.092 mg/L and the daily maximum limit of 0.158 mg/l for Total Residual Chlorine will be set in the permit. The new limits are based on the TN Water Quality Standards applied to a low flow stream condition of 2062 MGD. The background concentration of Total Residual Chlorine is assumed to be 0.0 mg/L.

Please note that the current detection level for Total Residual Chlorine for this facility is recognized at 0.05 mg/L for this effluent. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode.

Dissolved Oxygen

There is some possibility that intake water will be low in dissolved oxygen at times. By the time water moves through the system and reaches the discharge it is expected to be well oxygenated. However, dissolved oxygen will be monitored in the permit once per week until the discharge is characterized. The sample type will be grab. If the monitoring during this permit's period reflect that dissolved oxygen levels are not a problem for the discharge, it is expected that the monitoring for dissolved oxygen will be dropped in future permits.

Review for toxics:

The following discussion applies to Appendix 4 which reviews water quality protection concerns for Toxics and compares the various potential limits for applicability to the present permit requirements.

The following formulas are used to evaluate water quality protection:

$$Cm = \frac{QsCs + QwCw}{Qs + Qw}$$

where:

Cm = resulting in-stream concentration after mixing
Cw = concentration of pollutant in wastewater
Cs = stream background concentration
Qw = wastewater flow
Qs = stream low flow

to protect water quality:

$$Cw \leq \frac{(S_A)\,[Cm\,(Qs + Qw) - QsCs]}{Qw}$$

where (S_A) is the percent "Stream Allocation".

Calculations for this permit have been done using a standardized worksheet (APPENDIX 5a), titled "Water Quality Based Effluent Calculations." Division policy dictates the following procedures in establishing these permit limits:

1. The critical low flow values are determined using USGS data:

   Fish and Aquatic Life Protection
   7Q10 - Low flow under natural conditions
   1Q10 - Regulated low flow conditions

   Other than Fish and Aquatic Life Protection
   30Q2 - Low flow under natural conditions

2. Fish & Aquatic Life water quality criteria for certain metals are developed through application of hardness dependent equations. These criteria are combined with dissolved fraction methodologies in order to formulate the final effluent concentrations.

3. For criteria that are hardness dependent, chronic and acute concentrations are based on a hardness of 50 mg/L and total suspended solids (TSS) of 10 mg/L unless STORET or water supply intake data substantiate a different value. Minimum and maximum limits on the hardness value used for water quality calculations are 25 mg/L and 400 mg/L respectively.

4. Background concentrations are determined from the Division data base, results of sampling obtained from the permittee, and/or obtained from nearby stream sampling data. If this background data is not sufficient, one-half of the chronic "In-stream Allowable" water quality criteria for fish and aquatic life is used. If the measured background concentration is greater than the chronic "In-stream Allowable" water quality criteria, then the measured background concentration is replaced with the chronic "In-stream Allowable" water quality criteria for the purpose of calculating the appropriate effluent limitation (Cw). Under these circumstances, and in the event the "stream allocation" is less than 100%, the calculated chronic effluent limitation for fish and aquatic life should be equal to the chronic "In-stream Allowable" water quality criteria. These guidelines should be strictly followed where the industrial source water is not the receiving stream. Where the industrial source water is the receiving stream, and the measured background concentration is greater than the chronic "In-stream Allowable" water quality criteria, consideration may be given as to the degree to which the permittee should be required to meet the requirements of the water quality criteria in view of the nature and characteristics of the receiving stream.

Each worksheet has fourteen (14) data columns, all of which may not be applicable to any particular characteristic constituent of the discharge. A description of each column is as follows:

Column 1: The "Stream Background" concentrations of the effluent characteristics.
Column 2: The "Chronic" Fish and Aquatic Life Water Quality Criteria. For Cadmium, Copper, Lead, Nickel, and Zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Continuous Concentration (CCC) is calculated using the equation:

$CCC = (\exp \{ m_C [\ln (\text{stream hardness})] + b_C \}) (CCF)$

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 1200-4-3-.03 and the EPA interim final rule for aquatic life metals criteria contained in Federal Register. May 4, 1995, p. 22229. Values for other metals are in the total form and are not hardness dependent; no chronic criteria exists for silver. Published criteria are used for non-metal parameters.

Column 3: The "Acute" Fish and Aquatic Life Water Quality Criteria. For Cadmium, Copper, Lead, Nickel, Silver, and Zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Maximum Concentration (CMC) is calculated using the equation:

$CMC = (\exp \{ m_A [\ln (\text{stream hardness})] + b_A \}) (ACF)$

ACF = Acute Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 1200-4-3-.03 and the EPA interim final rule for aquatic life metals criteria contained in Federal Register. May 4, 1995, p. 22229. Values for other metals are in the total form and are not hardness dependent; no acute criteria exists for Total Chromium. Published criteria are used for non-metal parameters.

Column 4: The "Effluent Fraction Dissolved" converts the value for dissolved metal at laboratory conditions (columns 2 & 3) to total recoverable metal at in-stream ambient conditions (columns 5 & 6). This factor is calculated using the linear partition coefficients found in Technical Guidance Manual for Performing Waste Load Allocations, Book II: Streams and Rivers, EPA-440/4-84-022 and the equation:

$$\frac{C_{diss}}{C_{total}} = \frac{1}{1 + \{ [K_{po}] [ss^{(1+a)}] [10^{-6}] \}}$$

ss = in-stream suspended solids concentration [mg/L]

Linear partition coefficients for streams are used for unregulated (3Q20 or 7Q10) receiving waters, and linear partition coefficients for lakes are used for regulated (1Q20) receiving waters. The stream partition coefficient for lead is based on a revised graphical data fit for stream TSS up to 100 mg/L by C. Delos. For those parameters not in the dissolved form in columns 2 & 3 (and all non-metal parameters), an "Effluent Fraction Dissolved" of 1 is used.

Column 5: The "Chronic" Fish and Aquatic Life Water Quality Criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 2 by the value in column 4.

Column 6: The "Acute" Fish and Aquatic Life Water Quality Criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 3 by the value in column 4.

Column 7: The "Chronic" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the Chronic limit.

Column 8: The "Acute" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the Acute limit.

Column 9: The In-Stream Water Quality Criteria for the protection of Human Health associated with the stream use classification of Organism Consumption (Recreation).

Column 10: The In-Stream Water Quality Criteria for the protection of Human Health associated with the stream use classification of Water and Organism Consumption. These criteria are only to be applied when the stream use classification for the receiving stream includes both "Recreation" and "Domestic Water Supply."

Column 11: The In-Stream Water Quality Criteria for the protection of Human Health associated with the stream use classification of Domestic Water Supply.

Column 12: The Calculated Effluent Concentration associated with Organism Consumption.

Column 13: The Calculated Effluent Concentration associated with Water and Organism Consumption.

Column 14: The Calculated Effluent Concentration associated with Domestic Water Supply.

NOTE: The calculated chronic water quality effluent concentrations from Column 7 should be compared, individually, to the values calculated in Columns 12, 13, and 14 in order to determine the most stringent chronic permit limitations. The calculated acute water quality effluent concentrations from Column 8 should then be compared, individually, to values equal to two (2) times the values presented in Columns 12, 13, and 14 in order to determine the most stringent acute permit limitations. These water quality based limits should then be compared to any technology based (CFR or Tennessee "Rules") effluent limitations, and/or any previous permit limitations, for final determination of the permit limits.

For the discharges at Watts Bar Nuclear Plant, the toxics evaluated in these spreadsheets are not required as permit limitations except for chlorine which is limited. Boron was evaluated but not limited because the 15 mg/L that could be present will not be a water quality problem at the dilution available when the diffuser discharge is operating. Criteria for boron is one for long-term irrigation uses where the boron should not exceed 0.75 mg/L.

Storm Water Pollution Prevention Plan (SWPPP)

The new permit will contain a Storm Water Pollution Prevention Plan (SWPPP) developed to regulate storm water runoff. This SWPPP is meant to ensure that runoff from the facility site is not a significant source of pollution to the receiving stream. The discharger will develop, document and maintain the SWPPP pursuant to the requirements as set forth in the Tennessee's Storm Water Multi-Sector General Permit for Industrial Activities, Sector O, "*Storm Water Discharges Associated with Industrial Activity from Steam Electric Power Generating Facilities, Including Coal Handling Areas*", Part 3, "Storm Water Pollution Prevention Plan Requirements", as included in the ATTACHMENT I of this permit. The effectiveness of this SWPPP will be investigated after the results of the storm water runoff monitoring have been submitted. At that time, should the results so dictate, the Division maintains the authority to institute specific numeric limitations for the monitored parameters.

VIII BIOMONITORING REQUIREMENTS

The discharge of industrial wastewater from Outfall 101, 102, 112, and 113 may contain several different pollutants, the combined effect of which has a reasonable potential to be detrimental to fish and aquatic life. The Tennessee Water Quality Standards criteria stipulates that "*The waters shall not contain toxic substances, whether alone or in combination with other substances, which will produce toxic conditions...*".

Biomonitoring will provide information relative to the toxicity of the discharges. Calculation of toxicity limits is as follows:

where wastewater is not withdrawn from receiving waters:

$$IWC = \frac{Qw}{Qs + Qw} \times 100 = \text{Instream Water Concentration}$$

where wastewater is withdrawn from the receiving waters:

$$IWC = \frac{Qw}{Qs} \times 100 = \text{Instream Water Concentration}$$

where **Qw** is a wastewater flow and **Qs** is a receiving stream low flow. Please refer to Appendix 1 for details regarding facility discharge and receiving stream.

If we assume immediate and complete mixing, protection of the stream from chronic effects requires:

$IWC \leq 1.0 \times IC25$; or,

$IC25 \geq IWC$

For OUTFALL 112:

Chronic Toxicity

$$IWC = \frac{Qw}{0 + Qw} \times 100 = 100\ \%\ \text{Concentration}$$

therefore, $IC25 \geq 100\ \%$

Therefore, WET testing will be required on 100% effluent. If toxicity is demonstrated in any of the effluent samples specified above, this will constitute a violation of this permit.

For OUTFALL 101 (and Outfall 102 as needed):

Toxicity testing will not be required at Outfall 102 unless Outfall 102 is used for discharges in lieu of Outfall 101 for a period of time exceeding 3 months. The stream low flow (2062 MGD) is the source of the effluent and thus, the withdrawal of the intake is subtracted from the background low flow.

Chronic Toxicity

$$IWC = \frac{66.4}{1995.6} \times 100 = 3.3\ \%\ \text{Concentration}$$

therefore, $IC25 \geq 3.3\ \%$

Therefore, WET testing will be required with a permit limit set at 3.3% effluent. If toxicity is demonstrated in any of the effluent samples specified above, this will constitute a violation of this permit.

For OUTFALL 113:

Note the stream low flow (2062 MGD) is the source of the effluent and thus, the withdrawal of the intake is subtracted from the background low flow.

Chronic Toxicity

$$IWC = \frac{192}{1870} \times 100 = 10.3\ \%\ \text{Concentration}$$

therefore, IC25 $\geq$ 10.3 %

Therefore, WET testing will be required with a permit limitation set at 10.3% effluent. If toxicity is demonstrated in any of the effluent samples specified above, this will constitute a violation of this permit.

The toxicity tests specified herein shall be conducted twice per year (semi-annually) and begin no later than 180 days from the effective date of this permit. The details regarding biomonitoring methodology can be found in Part III of the permit.

IX ANTIDEGRADATION

Tennessee's Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Chapter 1200-4-3-.06. This statement outlines the criteria for the two types of high quality waters. Outstanding National Resource Waters (ONRWs), as designated by the Water Quality Control Board, are commonly referred to as Tier 3 waters. Other high quality waters, as identified by the Division, are commonly referred to as Tier 2 waters. Other surface waters not specifically identified and/or designated as high quality are referred to as Tier 1 waters. Some Tier 1 waters may be identified by the Division as not meeting existing criteria and appear on a list of impacted waters per Section 303(d) of the Clean Water Act.

Tier 2: The Division has made a stream tier determination of the receiving waters associated with the subject discharge(s) and has found the (stream or river) to be a high quality water. No permanent degradation of water quality will be allowed unless the applicant demonstrates to the Water Quality Control Board that the degradation is economically and socially justifiable. The specific requirements for this demonstration are described in the Rules of the Tennessee Department of Environment and Conservation, Chapter 1200-4-3-.06(4). Tier 2 determination is prompted by the presence of endangered species. The area approximately 10 miles below the dam is considered to have high ecological value as a mussel sanctuary. The stream is considered to also be valuable as a specialized fishery and was rated as medium value for water quality considerations. In spite of the rating, it needs to be noted that Watts Bar dam has historically been a source of water quality degradation for dissolved oxygen and criteria have not historically been met. Dissolved oxygen is ameliorated by a system installed upstream of the dam which may improve the situation.

Outfall 113 is replacing the previously permitted fossil plant discharge with a discharge that has less volume but higher temperatures. Discharge is made through the same conduit as the fossil plant discharges which no longer are made. While the discharge point is the same, the nature of the discharge is changing somewhat although the pollutant of concern remains the thermal load. The heat load from the supplemental condenser cooling water is not viewed as an additional pollutant to these waters. Watts Bar Fossil fuel Plant discharges were permitted and allocated without a specified mixing zone being defined in the permit. A mixing zone is being specified for this permit.

Because of the ecological concerns, mussels are being relocated in a small zone at the discharge area. As mitigation, the permittee is to provide some habitat in the mussel sanctuary. Mussel relocation is being made according to a plan approved by the Tennessee Wildlife Resources Agency. A permit condition will require that habitat enhancement be attempted within the mussel sanctuary. One of the greatest concerns is that juvenile mussels are not being effectively recruited in the river. Habitat enhancements are designed to allow expansion of the populations within the sanctuary.

In addition to the mussel concerns, the permittee will also monitor fish in the river following implementation of the SCCW discharge.

X PERMIT DURATION

The proposed limitations meet the requirements of Section 301(b)(2)(A), (C), (D), (E), and (F) of the Clean Water Act as amended. It is the intent of the Division to organize the future issuance and expiration of this particular permit such that other permits located in the same watershed and group within the State of Tennessee will be set for issuance and expiration at the same time. In order to meet the target reissuance date for the Tennessee River (Meigs & Rhea County) watershed and following the directives for the Watershed Management Program initiated in January, 1996, the permit will be issued for a term that will expire 9/28/2001.

APPENDIX 1

FACILITY DISCHARGES AND RECEIVING WATERS

FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear
TN0020168

OUTFALL 101	
LONGITUDE	LATITUDE
84-47-09	35-35-36

FLOW (MGD)	DISCHARGE SOURCE
66.4000	Diffuser Discharge,
	Condenser Circulating Water,
	Yard Holding Pond storm runoff
	Steam generator Blowdown
	Demineralizer Condensate
	Liquid Radwaste system discharges, etc.
66.4000	**TOTAL DISCHARGE**

RECEIVING STREAM DISCHARGE ROUTE			
Tennessee River at mile 527.9			
STREAM LOW FLOW (CFS)	7Q10	1Q20	30Q2
	4910.0	3190.0	8580
(MGD)	3174.0	2062.0	5546.0

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH	RECREATION	IRRIGATION	LW&W	DOMESTIC
X	X	X	X	X
INDUSTRIAL	NAVIGATION			
X	X			

Treatment: None; wastewaters are pretreated prior to release to Yard Holding Pond or the diffuser

Reference: Flow Duration and Low Flows of Tennessee Streams through 1992 by George S. Outlaw and Jess D. Weaver. Water Resources Investigations Report 95-4293 prepared by the U.S. Geological Survey in Cooperation with the Tennessee Department of Environment and Conservation and the Tennessee Valley Authority. Nashville, Tennessee, 1996, p. 57. The facility has an operational requirement of 2263 MGD for Watts Bar Hydro but the 1Q20 was used instead of this value.

FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear
TN0020168

OUTFALL 102	
LONGITUDE	LATITUDE
84-47-30	35-35-45

FLOW (MGD)	DISCHARGE SOURCE
66.4000	Emergency Bypass of Yard Holding Pond
	(Used when Diffuser cannot be operated &
	Yard Holding Pond fills up. Typically, 102
	doesn't discharge)
	Water can be diverted from Diffuser to the
	Yard Holding Pond
66.4000	**TOTAL DISCHARGE**

RECEIVING STREAM DISCHARGE ROUTE			
Unnamed tributary to Tennessee River Mile 527.2			
STREAM LOW FLOW (CFS)	7Q10	1Q20	30Q2
	4910.0	3190.0	8580
(MGD)	3174.0	2062.0	5546.0

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH	RECREATION	IRRIGATION	LW&W	DOMESTIC
X	X	X	X	X
INDUSTRIAL	NAVIGATION			
X	X			

Treatment: Chemical oxidation, chemical precipitation, sedimentation,aerated lagoons. flocculation, ammonia stripping

Reference: Flow Duration and Low Flows of Tennessee Streams through 1992 by George S. Outlaw and Jess D. Weaver. Water Resources Investigations Report 95-4293 prepared by the U.S. Geological Survey in Cooperation with the Tennessee Department of Environment and Conservation and the Tennessee Valley Authority. Nashville, Tennessee, 1996, p. 57. The facility has an operational requirement of 2263 MGD for Watts Bar Hydro but the 1Q20 was used instead of this value.

FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear
TN0020168

OUTFALL 103	
LONGITUDE	LATITUDE
84-48-11	35-36-04

FLOW (MGD)	DISCHARGE SOURCE
1.0000	Process wastewater
	Includes water from alum sludge ponds
	The turbine building sump drains to
	the low Volume Pond
1.0000	TOTAL DISCHARGE

RECEIVING STREAM DISCHARGE ROUTE			
Internal monitoring point that discharges through the Yard Holding Pond to the Diffuser (Outfall 101)			
STREAM LOW FLOW (CFS)	7Q10	1Q20	30Q2
	0.0	NA	NA
(MGD)	0.0	NA	NA

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH	RECREATION	IRRIGATION	LW&W	DOMESTIC
X	X	X	X	X
INDUSTRIAL	NAVIGATION			
X	X			

Treatment: This is the same water that is typically sent through the diffuser. It serves as the overflow for the Yard Holding Pond.

* No low stream flow assigned to the internal monitoring point which discharges to the Yard Holding Pond.

FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear
TN0020168

OUTFALL 107	
LONGITUDE	LATITUDE
84-48-11	35-36-04

FLOW (MGD)	DISCHARGE SOURCE
2.6500	Process wastewater
2.6500	TOTAL DISCHARGE

RECEIVING STREAM DISCHARGE ROUTE			
Internal Monitoring point for Metal Cleaning Wastes, discharges to Low Volume pond (Outfall 103) and eventually exits the Diffuser			
STREAM LOW FLOW (CFS)	7Q10	1Q20	30Q2
	0.0	NA	NA
(MGD)	0.0	NA	NA

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH	RECREATION	IRRIGATION	LW&W	DOMESTIC
X	X	X	X	X
INDUSTRIAL	NAVIGATION			
X				

Treatment: pH adjustment, metals precipitation

* No low stream flow assigned to the internal monitoring point which discharges to the Yard Holding Pond.

FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear
TN0020168

OUTFALL 111	
LONGITUDE	LATITUDE
84-48-11	35-36-04

FLOW (MGD)	DISCHARGE SOURCE
0.1200	Sewage Treatment Plant
0.1200	TOTAL DISCHARGE

RECEIVING STREAM DISCHARGE ROUTE			
Yellow Creek, discharges to natural drainageway going to Runoff Holding Pond			
STREAM LOW FLOW (CFS)	7Q10	1Q20	30Q2
	0.0	NA	NA
(MGD)	0.0	NA	NA

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH	RECREATION	IRRIGATION	LW&W	DOMESTIC
X	X	X	X	
INDUSTRIAL	NAVIGATION			

Treatment: aerobic digestion, settling

FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear
TN0020168

OUTFALL 112	
LONGITUDE	LATITUDE
84-48-11	35-36-04

FLOW (MGD)	DISCHARGE SOURCE
0.2550	Cooling water, Storm water runoff
	Outfall is outlet to the runoff holding pond
0.2550	TOTAL DISCHARGE

RECEIVING STREAM DISCHARGE ROUTE			
Unnamed tributary of Yellow Creek			
STREAM LOW FLOW (CFS)	7Q10	1Q20	30Q2
	0.0	NA	NA
(MGD)	0.0	NA	NA

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH	RECREATION	IRRIGATION	LW&W	DOMESTIC
X	X	X	X	
INDUSTRIAL	NAVIGATION			

Treatment: Chemical oxidation, chemical precipitation, sedimentation,aerated lagoons, flocculation, ammonia stripping

* Reference: Flow Duration and Low Flows of Tennessee Streams through 1992 by George S. Outlaw and Jess D. Weaver. Water Resources Investigations Report 95-4293 prepared by the U.S. Geological Survey in Cooperation with the Tennessee Department of Environment and Conservation and the Tennessee Valley Authority. Nashville, Tennessee 1996 p. xxv

FACILITY DISCHARGES AND RECEIVING WATERS

TVA-Watts Bar Nuclear
TN0020168

OUTFALL 113	
LONGITUDE	LATITUDE
84-47-09	35-35-36

FLOW (MGD)	DISCHARGE SOURCE
192.0000	*Supplemental Condenser Cooling Water*
192.0000	**TOTAL DISCHARGE**

RECEIVING STREAM DISCHARGE ROUTE			
Tennessee River at mile 529.2			
STREAM LOW FLOW (CFS)	**7Q10**	**1Q20**	**30Q2**
	4910.0	3190.0	8580
(MGD)	3173.4	2062.0	5546.0

STREAM USE CLASSIFICATIONS (WATER QUALITY)				
FISH	RECREATION	IRRIGATION	LW&W	DOMESTIC
X	X	X	X	X
INDUSTRIAL	NAVIGATION			
X	X			

Treatment:

* Reference: Flow Duration and Low Flows of Tennessee Streams through 1992 by George S. Outlaw and Jess D. Weaver. Water Resources Investigations Report 95-4293 prepared by the U.S. Geological Survey in Cooperation with the Tennessee Department of Environment and Conservation and the Tennessee Valley Authority. Nashville, Tennessee, 1996, p. 57. The facility has an operational requirement of 2263 MGD for Watts Bar Hydro but the 1Q20 was used instead of this value.

APPENDIX 2

APPLICABLE EFFLUENT LIMITATIONS GUIDELINES

SIC GROUP 4911
40 CFR PART 423

GROUP NAME: STEAM ELECTRIC POWER GENERATING

	BPT		BAT	
	SUBPART 423.12		SUBPART 423.13	
	MONTHLY	DAILY	MONTHLY	DAILY
EFFLUENT CHARACTERISTIC	AVG. CONC. (mg/l)	MAX. CONC. (mg/l)	AVG. CONC. (mg/l)	MAX. CONC. (mg/l)
TSS	30	100	--	--
OIL AND GREASE	15	20	--	--
COPPER (T)	1.0	1.0	1.0	1.0
IRON (T)	1.0	1.0	1.0	1.0
*CHLORINE (F.A.)**	0.2	0.5	--	--
*CHLORINE (T.R.)***	--	--	--	0.2
126 Priority Chemicals (Appendix A)	--	--	No Detectable Amount	No Detectable Amount
CHROMIUM (T)	--	--	0.2	0.2
ZINC (T)	--	--	1.0	1.0

(*) Chlorine, Free Available (F.A.).
(**) Chlorine, Total Residual (T.R.).

BPT NOTES

The pH of all discharges, except once through cooling water, shall be within the range of 6.0 to 9.0 standard units.

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

The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of the low volume waste sources times the concentration listed for TSS and Oil and Grease.

The quantity of pollutants discharged in metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of metal cleaning wastes times the concentrations listed for TSS, Oil and Grease, Copper (T), and Iron (T).

The quantity of pollutants discharge in once through cooling water and cooling water blowdown shall not exceed the quantity determined by multiplying the waste stream sources times the concentrations listed for Chlorine, Free Available (F.A.).

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BAT NOTES

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

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 for Chlorine, Total Residual (T.R.).

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

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 for Chlorine, Free Available (F.A.), the 126 Priority Pollutants, Chromium (T), and Zinc (T). At the permitting authority's discretion, instead of the monitoring specified in 40 CFR Part 122.11(b), compliance with the limitations for the 126 Priority Pollutants 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 136.

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 for Copper (T) and Iron (T).

MISCELLANEOUS NOTES

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 one 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 (the latter is the case in Tennessee), that the units in a particular location cannot operate at or below this level of chlorination.

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 limitations specified in the paragraphs of this section. Concentration limitations shall be those concentrations specified in this section.

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 these paragraphs of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

APPENDIX 3

PREVIOUS PERMIT LIMITS AND MONITORING REQUIREMENTS

PERMIT LIMITS

OUTFALL 101 : DIFFUSER PIPE AT TRM 527.9

Low Volume Wastewater, Condensate Demineralizer Wastewater, Metal Cleaning Wastewater, Cooling Tower Desilting Basin Wastewater, Intake Screen and Strainer Backwash, Steam Generator Blowdown, Cooling Tower Blowdown, Neutralization Tank Wastewater, Liquid Rad Waste, Fire Protection Wastewater, Building Sump Discharges, Miscellaneous Flows, and StormWater Runoff

	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
EFFLUENT CHARACTERISTIC	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW 4/	Report (MGD)		Report (MGD)		Continuous	Recorder *
DISCHARGE TEMP.	--		35 Deg.C		Continuous	Recorder **
CHLORINE (Tl.Res.)	--	--	0.10	--	5/7	Grab 1/
PCB's 3/	NO DISCHARGE		NO DISCHARGE		1/360	Grab
pH	Range 6.0 - 9.0		Range 6.0 - 9.0		1/7	Grab
OIL AND GREASE	15	--	20	--	1/7	Grab
TSS	30	--	100	--	1/7	Grab
96HR LC50 2/	--		Survival in 9.78% Eff.		1/180	Grab
NOEC 2/	Surv.Grwth,Repro. 2.93% Efl.		--		1/180	Grab

There shall be no distinct discharge of floating scum, solids, oil sheen, visible foam, or other floating matter in the diffuser discharge.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Diffuser pipe prior to entry into the Tennessee River.

* In the event the continuous flow monitor is out of service, flow monitoring shall be by intake pump logs.

** In the event that the continuous temperature recorder is out of service, monitoring shall be conducted at a frequency of once per day (1/Day). Note that reasonable and timely action must be taken to repair the temperature recorder and restore it to full operation on a timely basis or as soon as possible.

Footnotes continued on next page following Outfall 102 ...

PERMIT LIMITS

OUTFALL 102 (EMERGENCY OVERFLOW) TO TRM 527.2

Low Volume Wastewater, Condensate Demineralizer Wastewater, Metal Cleaning Wastewater, Cooling Tower Desilting Basin Wastewater, Intake Screen and Strainer Backwash, Steam Generator Blowdown, Cooling Tower Blowdown, Neutralization Tank Wastewater, Liquid Rad Waste, Fire Protection Wastewater, Building Sump Discharges, Miscellaneous Flows, and StormWater Runoff

	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
EFFLUENT CHARACTERISTIC	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW 5/	Report (MGD)		Report (MGD)		1/Day	Grab
DISCHARGE TEMP.	--		40 Deg.C		1/Day	Instantaneous
CHLORINE (Ttl.Res.)	--	--	0.10	--	5/7	Grab 1/
PCB's 3/	NO DISCHARGE		NO DISCHARGE		1/360	Grab
pH	Range 6.0 - 9.0		Range 6.0 - 9.0		1/7	Grab
OIL AND GREASE	15	--	20	--	1/7	Grab
TSS	30	--	100	--	1/7	Grab
96HR LC50 2/	--		Survival in 10.74% Effl.		1/180	Grab
NOEC 2/	Surv.Grwth,Repro. 3.22% Efl.		--		1/180	Grab

There shall be no distinct discharge of floating scum, solids, oil sheen, visible foam, or other floating matter in the emergency overflow discharge.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Emergency overflow weir prior to entry into the Tennessee River.

Footnotes for Outfall 101 and Outfall 102

1/ Monitoring for Chlorine, total residual, shall be applicable only during periods of chlorine addition. Multiple grab samples shall be taken at a rate of four (4) samples during one shift each day. If continuous application of a biocide other than chlorine, the BCDH additive previously approved by the Division for clam and bacterial control, or "Clamtrol", is to be utilized (longer than 2 hours per day), the permittee will submit to the Division a plan describing the biocide, the material feed rate, and actions proposed to ensure compliance with established effluent limitations during biocide application. Note, the limits for chlorine, total residual, are expressed as an Instantaneous Maximum Concentration.

2/ See Part III for the monitoring requirements and measurement frequencies of the LC50 and NOEC tests.

3/ If PCB's are detected this would constitute a violation of this permit. Likewise, monitoring would revert to once every ninety days (1/90) for a period of one year, then annually thereafter provided there are no further PCB discharges.

4/ There shall be no discharge through the plant diffuser pipe system when the Tennessee River flow rate is less than 3,500 CFS. Positive interlocks with the Watts Bar Hydroelectric Plant shall be provided to assume compliance with this requirement.

5/ DISCHARGE THROUGH OUTFALL 102 (EMERGENCY OVERFLOW) IS PERMITTED UNDER EMERGENCY SITUATIONS ONLY WHEN THE DIFFUSER PIPE SYSTEM IS ISOLATED AS A RESULT OF DIFFUSER MAINTENANCE, AND OTHER EMERGENCY SITUATIONS SUCH AS CATASTROPHIC STORM EVENTS OR TO OTHERWISE PRESERVE THE INTEGRITY OF THE YARD HOLDING POND DIKES.

PERMIT LIMITS

OUTFALL 103 : LOW VOLUME WASTE TO YARD HOLDING POND

Turbine Building Sump Wastewater, Alum Sludge Pond Wastewater, and Stormwater Runoff

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD)		Report (MGD)		1/Day	Pump Logs
pH	Range 6.0 - 9.0		Range 6.0 - 9.0		3/7 1/	Grab
OIL AND GREASE	15	125	20	167	1/7 1/	Grab
TSS	30	250	100	834	1/7 1/	Grab
ALUMINUM	--	--	10	--	5/7 3/	Grab
PCB's 2/	NO DISCHARGE		NO DISCHARGE		1/360	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Treatment Pond discharge prior to mixing with other waste streams.

1/ In the event that the Turbine Building Sump is discharged directly to the yard holding pond, TSS, Oil and Grease, and pH shall be monitored 5/7.

2/ If PCB's are detected this would constitute a violation of this permit. Likewise, monitoring would revert to once every ninety days (1/90) for a period of one year, then annually thereafter provided there are no further PCB discharges.

3/ The sampling point shall be the discharge point from the Alum sludge ponds. This monitoring requirement is only applicable when effluent from the Alum sludge ponds is discharged to a point other than the low volume waste treatment pond.

PERMIT LIMITS

OUTFALL 107 : METAL CLEANING WASTE TO YARD HOLDING POND

Metal Cleaning Wastewater and Stormwater Runoff

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/batch)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/batch)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD)		Report (MGD)		1/Day	Calculation
pH	Range 6.0 - 9.0		Range 6.0 - 9.0		1/Day	Grab
OIL AND GREASE	--	--	15	--	1/Day	Grab
TSS	--	--	30	--	1/Day	Composite 1/
COPPER (T)	--	--	1.0	--	1/Day	Composite 1/
IRON (T)	--	--	1.0	--	1/Day	Composite 1/
PHOSPHOROUS (P) 2/	--	--	1.0	--	1/Day	Composite 1/

Metal cleaning waste shall mean any cleaning compounds, rinse waters or any other waterborne residues derived from cleaning any metal process equipment.

Metal cleaning waste shall not be discharged into a pond(s) before all non-metal cleaning liquids have been removed to the extent practical without discharging previously removed solids.

In the event that metal cleaning wastes must be processed and discharged through the liquid radwaste system, the limitations and monitoring requirements above shall apply to the discharge from the liquid radwaste system prior to mixing with the cooling tower blowdown.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Discharge from the individual pond(s) prior to mixing with any other waste stream.

1/ A Composite sample shall consist of 1 grab sample at the beginning of discharge and 1 grab sample immediately prior to termination of discharge.

2/ Limitations and monitoring requirements shall apply only if phosphorous bearing cleaning solutions are used.

PERMIT LIMITS

OUTFALL 111 : DRAINAGE DITCH TO RUNOFF HOLDING POND
Treated Sanitary Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD)		Report (MGD)		Continuous	Recorder *
BOD5	30	--	45	--	1/7	Grab
TSS	30	--	45	--	1/7	Grab
SETTLEABLE SOLIDS	--	--	1.0 ml/l	--	2/7	Grab
FECAL COLIFORM	See Note 1/		See Note 1/		1/7	Grab
CHLORINE (Ttl.Res.)	--	--	2.0 2/	--	5/7	Grab

There shall be no distinct discharge of floating scum, solids, oil sheen, visible foam, and other floating matter in other than trace amounts.

The wastewater discharge must not cause an objectionable color contrast in the receiving stream.

Sludge or any other material removed by any treatment works must be disposed of in a manner which prevents its entrance into or pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA 53-4301 et seq. and the Tennessee Hazardous Waste Management Act, TCA 53-6301 et seq.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Sewage Treatment Plant effluent prior to mixing with any other waste stream.

* In the event the continuous recorder is out of service, flow shall be determined by grab measurement at the "V-notch" weir at a rate of once per day (1/Day).

1/ The wastewater discharge must be disinfected to the extent that viable coliform organisms are effectively eliminated. The concentrations of the fecal coliform group after disinfection shall not exceed 200 per 100 ml. as the geometric mean based on a minimum of 10 samples, collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals not less than 12 hours. For the purpose of determining the geometric mean, individual samples having a fecal coliform group concentration of less than one (1) per 100 ml. shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml. The geometric mean of fecal coliform samples shall not be determined unless 10 or more samples are taken in any month. Since the fecal coliform monitoring requirement for this permit is less than 10 samples per month, permittee shall report minimum, arithmetic average, and maximum values. Non-compliance with established fecal coliform limits shall be reported by the permittee only when the concentration of the fecal coliform group in any individual sample exceeds 1000 per 100 ml. Notwithstanding the above, the division may monitor or may require that the permittee monitor the discharge in order to determine compliance with the geometric mean limitation.

2/ Chlorine, total residual, limits shall be expressed in terms of Instantaneous Maximum Concentration.

PERMIT LIMITS

OUTFALL 112 : RUNOFF HOLDING POND TO UNNAMED TRIBUTARY TO YELLOW CREEK

Sanitary Wastewater, Training Center HVAC Cooling Water,
Fire Protection Wastewater, and Stormwater Runoff

	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
EFFLUENT CHARACTERISTIC	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD)		Report (MGD)		1/7	Instantaneous 1/
TSS	30	--	100	--	1/7	Grab
AMMONIA	5.0	--	12 4/	--	1/7	Grab
DO	--	--	5.0 Min.	--	1/7	Grab
pH	Range 6.0 - 9.5		Range 6.0 - 9.5		1/7	Grab
96HR LC50 3/	--		Survival in 100% Effl.		1/180	Grab
NOEC 3/	Surv,Grwth,Repro. 100% Efl.		--		1/180	Grab
CHLORINE (Ttl.Res.)	.011 2/	--	.019 2/	--	1/7	Grab

There shall be no distinct discharge of floating scum, solids, oil sheen, visible foam, and other floating matter in other than trace amounts.

The wastewater discharge must not cause an objectionable color contrast in the receiving stream.

Sludge or any other material removed by any treatment works must be disposed of in a manner which prevents its entrance into or pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA 53-4301 et seq. and the Tennessee Hazardous Waste Management Act, TCA 53-6301 et seq.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Treatment pond discharge prior to mixing with other streams.

1/ The Instantaneous "Estimate" of flow may be determined based upon measurements incorporating monitoring and sampling facilities previously utilized by this facility for monitoring and reporting purposes in the previous permit. Due to the nature of the discharge and the volume of the discharge, the permittee need only demonstrate compliance with the flow monitoring requirements of this permit using their best "estimate".

2/ Field tests for chlorine, total residual, have a working detection limit of approximately 0.1 mg/l, therefore, the instantaneous maximum and weekly average concentrations for this parameter will be 0.1 mg/l under such testing conditions. Note that the limits for chlorine, total residual, are expressed in terms of the Weekly Average Concentration and the Instantaneous Maximum Concentration.

3/ See Part III for the monitoring requirements and measurement frequencies of the LC50 and NOEC tests.

4/ Ammonia limit of 12 mg/l represents the Instantaneous Maximum Concentration.

APPENDIX 4

HISTORICAL MONITORING AND INSPECTION

DISCHARGE MONITORING REPORT SUMMARY

TVA-Watts Bar Nuclear

OUTFALL 101

			Monthly Average					
EFFLUENT CHARACTERISTIC	Units	Frequency	Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	Continuous	Report	32.146	31.876	54.381	20.636	NA
Temp.	[° C]	Continuous	--					NA
pH		1/Week	6.0 - 9.0 *	8.0426	8.1	8.6	7.2	0
TSS	[mg/l]	1/Week	30	10.191	11	18	3	0
PCB	[mg/l]	1/Year	No Discharge					0
Oil & Grease	[mg/l]	1/Week	15			13	<5	0
TRC	[mg/l]	5/Week	--					NA

			Daily Maximum					
EFFLUENT CHARACTERISTIC	Units	Frequency	Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	Continuous	Report					NA
Temp.	[° C]	Continuous	35	22.66	23	31	10	0
pH		1/Week	6.0 - 9.0 *	8.5617	8.6	8.9	7.9	0
TSS	[mg/l]	1/Week	100	14.213	14	32	5	0
PCB	[mg/l]	1/Year	No discharge	0	0	0	0	0
Oil & Grease	[mg/l]	1/Week	20			14	<5	0
TRC	[mg/l]	5/Week	0.1	0.0453	0.035	0.09	0.03	0
96-hour LC50	%	semi-annual	9.78					0
NOEC	%	semi-annual	2.93					0

Values below detection were omitted from calculation of average; average not determined where there are < 4 values

* DMR pH data in the Monthly Average columns are for sample low values; data in the Daily Maximum columns are for sample high values.

DISCHARGE MONITORING REPORT SUMMARY

TVA-Watts Bar Nuclear

OUTFALL 102

			Monthly Average					
EFFLUENT CHARACTERISTIC	Units	Frequency	Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	Continuous	Report					
Temp.	[° C]	Continuous	--					
pH		1/Week	6.0 - 9.0					
TSS	[mg/l]	1/Week	30					
PCB	[mg/l]	1/Year	No Discharge					
Oil & Grease	[mg/l]	1/Week	15					
TRC	[mg/l]	5/Week	--					

			Daily Maximum					
EFFLUENT CHARACTERISTIC	Units	Frequency	Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	Continuous	Report					--
Temp.	[° C]	Continuous	35					--
pH		1/Week	6.0 - 9.0					--
TSS	[mg/l]	1/Week	100					--
PCB	[mg/l]	1/Year	No discharge					--
Oil & Grease	[mg/l]	1/Week	20					--
TRC	[mg/l]	5/Week	0.1					--
96-hour LC50	%	semi-annual	9.78					
NOEC	%	semi-annual	2.93					

There was only one discharge event through this outfall, therefore no statistics are summarized.

* DMR pH data in the Monthly Average columns are for sample low values; data in the Daily Maximum columns are for sample high values.

DISCHARGE MONITORING REPORT SUMMARY

TVA-Watts Bar Nuclear

OUTFALL 103

EFFLUENT CHARACTERISTIC	Units	Frequency	Monthly Average					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Day	Report	0.703	0.64	1.524	0.097	
pH		3/Week	6.0 - 9.0	7.2022	7.2	8.3	6.1	
TSS amount	[#/day]	1/Week	250	65.114	56	196	8	
TSS concentration	[mg/l]	1/Week	30	10.5	9.5	25	4	
Oil/Grease amount	[#/day]	1/Week	125	N/A				
Oil/Grease concentr.	[mg/l]	1/Week	15	N/A		< 5		
Aluminum	[mg/l]	5/Week	--					
PCB	[mg/l]	Annual	No Discharge					

EFFLUENT CHARACTERISTIC	Units	Frequency	Daily Maximum					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Day	Report	1.0675	1.074	2.45	0.097	
pH		3/Week	6.0 - 9.0	8.5156	8.6	9	7.7	
TSS amount	[#/day]	1/Week	834	91.844	66	324	11	
TSS concentration	[mg/l]	1/Week	100	14.578	12	70	4	
Oil/Grease amount	[#/day]	1/Week	167					
Oil/Grease concentr.	[mg/l]	1/Week	20			16	6	
Aluminum	[mg/l]	5/Week	10			1	0.2	
PCB	[mg/l]	Annual	No Discharge					

Values below detection were omitted from calculation of average; average not determined where there are < 4 values

* DMR pH data in the Monthly Average columns are for sample low values; data in the Daily Maximum columns are for sample high values.

DISCHARGE MONITORING REPORT SUMMARY
TVA-Watts Bar Nuclear

OUTFALL 107

EFFLUENT CHARACTERISTIC	Units	Frequency	Monthly Average					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Day	Report	2.301	2.3375	3.4	0.9	
pH		1/Day	6.0 - 9.0	7.9042	7.95	8.8	6.8	
Oil and Grease	[mg/l]	1/Day	--					
TSS concentration	[mg/l]	1/Day	--					
Copper, total	[mg/l]	1/Day	--					
Iron, total	[mg/l]	1/Day	--					
Phosphorus	[mg/l]	1/Day	--					

EFFLUENT CHARACTERISTIC	Units	Frequency	Daily Maximum					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Day	Report	2.4035	2.5925	3.4	0.9	
pH		1/Day	6.0 - 9.0	8.0417	8.15	8.8	6.9	
Oil and Grease	[mg/l]	1/Day	15			< 5		
TSS concentration	[mg/l]	1/Day	30	5.8947	6	14	2	
Copper, total	[mg/l]	1/Day	1	0.041	0.025	0.1	0.01	
Iron, total	[mg/l]	1/Day	1	0.4454	0.38	1.1	0.05	1
Phosphorus	[mg/l]	1/Day	1	N/A				

Values below detection were omitted from calculation of average; average not determined where there are < 4 values

* DMR pH data in the Monthly Average columns are for sample low values; data in the Daily Maximum columns are for sample high values.

DISCHARGE MONITORING REPORT SUMMARY
TVA-Watts Bar Nuclear

OUTFALL 111

EFFLUENT CHARACTERISTIC	Units	Frequency	Monthly Average					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Day	Report	0.0305	0.03	0.103	0.01	
Bioch. Ox. Demand 5	[mg/l]	1/Week	30	6.8	5.5	14	2	
TSS	[mg/l]	1/Week	30	4.25	4	8	1	
Settleable Solids	[ml/l]	2/Week	--					
Fecal Coliforms	col/100m	1/Week	200	89.143	88	> 794	2	3
Chlorine, total resid.	[mg/l]	5/Week	--					

EFFLUENT CHARACTERISTIC	Units	Frequency	Daily Maximum					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Day	Report	0.0718	0.068	0.144	0.018	
Bioch. Ox. Demand 5	[mg/l]	.1/Week	45	7.5882	5	27	2	
TSS	[mg/l]	1/Week	45	4.1163	2	23	1	
Settleable Solids	[ml/l]	2/Week	1			< 0.1		
Fecal Coliforms	col/100m	1/Week	1000	174.38	54	976	2	
Chlorine, total resid.	[mg/l]	5/Week	2	0.4702	0.4	1.8	0.2	

Values below detection were omitted from calculation of average; average not determined where there are < 4 values
* DMR pH data in the Monthly Average columns are for sample low values; data in the Daily Maximum columns are for sample high values.

DISCHARGE MONITORING REPORT SUMMARY
TVA-Watts Bar Nuclear

OUTFALL 112

EFFLUENT CHARACTERISTIC	Units	Frequency	Monthly Average					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Week	Report	0.2403	0.1945	0.573	0.001	
pH		1/Week	6.0 - 9.5	7.5565	7.4	9.2	6.8	
Dissolved Oxygen	[mg/l]	1/Week	--					
TSS concentration	[mg/l]	1/Week	30	11.822	11	24	3	
Ammonia	[mg/l]	1/Week	5	0.2445	0.11	1.2	0	
Chlorine, total resid.	[mg/l]	1/Week	0.011	N/A				
96-hour LC50	%	semi-annual	100					
NOEC	%	semi-annual	100					

EFFLUENT CHARACTERISTIC	Units	Frequency	Daily Maximum					
			Permit Limit	DMR Average	DMR Median	DMR High	DMR Low	Rpt. Periods Out of Compl.
Flow Rate	[MGD]	1/Day	Report	0.491	0.537	1.75	0.001	
pH		3/Week	6.0 - 9.5	8.6239	8.65	9.6	7	1
Dissolved Oxygen	[mg/l]	1/Week	> 5	8.8239	8.45	17	2.6	1
TSS concentration	[mg/l]	1/Week	100	18.196	17	40	6	
Ammonia	[mg/l]	1/Week	12	0.382	0.2	1.6	0.04	
Chlorine, total resid.	[mg/l]	1/Week	0.019	N/A				
96-hour LC50	%	semi-annual	100					
NOEC	%	semi-annual	100					2

Values below detection were omitted from calculation of average; average not determined where there are < 4 values

* DMR pH data in the Monthly Average columns are for sample low values; data in the Daily Maximum columns are for sample high values.

APPENDIX 5a

WATER QUALITY BASED EFFLUENT CALCULATIONS

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 101

FACILITY: TVA-Watts Bar Nuclear
PERMIT #: TN0020168

Stream (1Q20)	Stream (30Q2)	Acute Waste Flow	Long Term Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Stream Allocation
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[mg/l]	[%]
2062.000	5546.000	66.400	32.146	10	50	60

	1	2	3	4	5	6	7	8
	Stream	Fish/Aqua. Life		Effluent	Fish & Aquatic Life Water Quality Criteria (1Q20)			
	Bckgrnd.	Water Quality Criteria		Fraction	In-Stream Allowable		Calc. Effluent Concentration	
EFFLUENT	Conc.	Chronic	Acute	Dissolved	Chronic	Acute	Chronic	Acute
CHARACTERISTIC	[ug/l]	[ug/l]	[ug/l]	[Fraction]	[ug/l]	[ug/l]	[ug/l]	[ug/l]
Cadmium *	0.300	0.617	1.746	0.193	3.203	9.058	**56.0**	**168.6**
Copper *	3.000	6.278	8.856	0.218	28.802	40.630	**498.0**	**725.5**
Lead *	0.600	1.174	30.136	0.143	8.185	210.029	**146.2**	**4028.2**
Nickel *	40.000	87.450	787.426	0.206	425.011	3826.925	**7428.7**	**72856.2**
Silver *	0.000	NA	1.047	1.000	NA	1.047	**N/A**	**20.1**
Zinc *	29.000	58.088	63.613	0.125	464.562	508.745	**8394.4**	**9244.1**
Mercury, (T) **	0.006	0.012	2.400	1.000	0.012	2.400	**0.12**	**46.0**
Chromium (T) ***	50.000	100.000	NA	1.000	100.000	N/A	**991.6**	**NA**
Cyanide (d)	2.600	5.200	22.000	1.000	5.200	22.000	**51.6**	**374.7**
Boron	0.038	NA	NA	1.000	NA	NA	**NA**	**NA**
Toluene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**
Benzene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**
Total Phthalates	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**
Chlorine (T. Res.) [Note]	0.000	11.000	19.000	1.000	11.000	19.000	**102.3**	**176.6**

Note: Chlorine allocation is for 29% allocation. Outfall 113 is allocated at 71%

	9	10	11	12	13	14
	Human Health Water Quality Criteria (30Q2)					
	In-Stream Criteria			Calc. Effluent Concentration (using the Long Term Waste Flow Avg.)		
EFFLUENT	Organisms	Water/Organism	DWS	Organisms	Water/Organism	DWS
CHARACTERISTIC	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]
Cadmium *	NA	NA	5.0	**NA**	**NA**	**489.5**
Copper *	NA	N/A	NA	**NA**	**NA**	**NA**
Lead *	NA	NA	5.0	**NA**	**NA**	**458.5**
Nickel *	4600.0	610.0	100.0	**474795.6**	**59370.5**	**6271.0**
Silver *	NA	NA	NA	**NA**	**NA**	**NA**
Zinc *	NA	NA	NA	**NA**	**NA**	**NA**
Mercury, (T) **	0.15	0.14	2.0	**15.0**	**14.0**	**207.6**
Chromium (T) ***	NA	NA	100.0	**NA**	**NA**	**5235.8**
Cyanide (d)	220000.0	700.0	200.0	**22905378.9**	**72612.5**	**20554.2**
Boron (irrigation uses)	750.0	NA	NA	**78083.5**	**NA**	**NA**
Toluene	200000.0	6800.0	1000.0	**20823316.4**	**707992.8**	**104116.6**
Benzene	710.0	12.0	5.0	**73922.8**	**1249.4**	**520.6**
Total Phthalates	137259.0	28718.0	NA	**14290937.9**	**2990020.0**	**NA**
Chlorine (T. Res.)	NA	NA	NA	**NA**	**NA**	**NA**

* Denotes metals for which Fish & Aquatic Life Criteria are expressed as a function of total hardness. The Fish & Aquatic Life criteria for this metal are in the dissolved form at laboratory conditions. The in-stream allowable criteria and calculated effluent concentrations are in the total recoverable form.

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 113

FACILITY: TVA-Watts Bar Nuclear
PERMIT #: TN0020168

Stream (1Q20) [MGD]	Stream (30Q2) [MGD]	Waste Flow [MGD]	Ttl. Susp. Solids [mg/l]	Hardness (as CaCO3) [mg/l]	Stream Allocation [%]
2062.000	5546.000	192.000	10	50	40

	1	2	3	4	5	6	7	8
	Stream Bckgmd. Conc.	Fish/Aqua. Life Water Quality Criteria		Effluent Fraction Dissolved	Fish & Aquatic Life Water Quality Criteria (1Q20)			
					In-Stream Allowable		Calc. Effluent Concentration	
EFFLUENT CHARACTERISTIC		Chronic	Acute		Chronic	Acute	Chronic	Acute
	[ug/l]	[ug/l]	[ug/l]	[Fraction]	[ug/l]	[ug/l]	[ug/l]	[ug/l]
Cadmium *	0.300	0.617	1.746	0.193	3.203	9.058	**13.750**	**41.245**
Copper *	3.000	6.278	8.856	0.218	28.802	40.630	**122.360**	**177.906**
Lead *	0.600	1.174	30.136	0.143	8.185	210.029	**35.856**	**983.684**
Nickel *	40.000	87.450	787.426	0.206	425.011	3826.925	**1823.946**	**17798.770**
Silver *	0.000	NA	1.047	1.000	NA	1.047	**N/A**	**4.918**
Zinc *	29.000	58.088	63.613	0.125	464.562	508.745	**2056.925**	**2264.404**
Mercury, (T) **	0.006	0.012	2.400	1.000	0.012	2.400	**0.031**	**11.244**
Chromium (T) ***	50.000	100.000	NA	1.000	100.000	N/A	**254.792**	**N/A**
Cyanide (d)	2.600	5.200	22.000	1.000	5.200	22.000	**13.249**	**92.139**
Toluene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**
Benzene	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**
Total Phthalates	0.000	NA	NA	1.000	NA	NA	**NA**	**NA**
Chlorine (T. Res.) [Note]	0.000	11.000	19.000	1.000	11.000	19.000	**91.686**	**158.367**

Note: Chlorine allocation for Outfall 101 is 29% and for Outfall 113 is 71%

	9	10	11	12	13	14
	Human Health Water Quality Criteria (30Q2)					
	In-Stream Criteria			Calc. Effluent Concentration		
EFFLUENT CHARACTERISTIC	Organisms	Water/Organism	DWS	Organisms	Water/Organism	DWS
	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]
Cadmium *	NA	NA	5.0	**NA**	**NA**	**56.3**
Copper *	NA	N/A	NA	**NA**	**NA**	**NA**
Lead *	NA	NA	5.0	**NA**	**NA**	**52.8**
Nickel *	4600.0	610.0	100.0	**54527.0**	**6829.9**	**733.3**
Silver *	NA	NA	NA	**NA**	**NA**	**NA**
Zinc *	NA	NA	NA	**NA**	**NA**	**NA**
Mercury, (T) **	0.15	0.14	2.0	1.7	1.6	**23.8**
Chromium (T) ***	NA	NA	100.0	**NA**	**NA**	**617.7**
Cyanide (d)	220000.0	700.0	200.0	**2629886.6**	**8337.9**	**2360.8**
Toluene	200000.0	6800.0	1000.0	**2390833.3**	**81288.3**	**11954.2**
Benzene	710.0	12.0	5.0	**8487.5**	**143.5**	**59.8**
Total Phthalates	137259.0	28718.0	NA	**1640817.0**	**343299.8**	**NA**
Chlorine (T. Res.)	NA	NA	NA	**NA**	**NA**	**NA**

* Denotes metals for which Fish & Aquatic Life Criteria are expressed as a function of total hardness. The Fish & Aquatic Life criteria for this metal are in the dissolved form at laboratory conditions. The in-stream allowable criteria and calculated effluent concentrations are in the total recoverable form.

Appendix 5b

NEW PERMIT EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Outfall 101: Diffuser pipe at TN River mile 527.9

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 101
Cooling water, Storm runoff and Process Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous	Recorder *
TEMPERATURE, Effluent **	--	--	35° C	--	Continuous	Instantaneous
pH ***	Range 6.0 - 9.0				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	--	100.0	--	1/Week	Grab
OIL & GREASE	15.0	--	20.0	--	1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) ***	0.10	--	0.10	--	5/week	Grab ***
IC25 ****	25% Inhibition Concentration shall be > 3.3% Effluent				Semi-annual	Composite ****

* Flow shall be reported in Million Gallons per Day (MGD). In the event that the continuous flow monitor is out of service, flow monitoring shall be estimated by intake pump logs.

** When the temperature monitoring equipment fails, monitoring will be once per day. Reasonable and timely effort will be made to restore the temperature recorder to operation as soon as possible. See Part III for further temperature requirements.

*** pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection. The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. TRC monitoring shall be applicable when chlorine or bromine is added.

**** See Part III for methodology.

Outfall 102: Emergency Bypass for Yard Holding Pond TN River mile 527.2

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 102
Cooling water, Storm runoff and Process Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW *	Report (MGD) *		Report (MGD) *		1/Day	Instantaneous
TEMPERATURE, Effluent	--	--	35° C	--	1/Day	Grab
pH **	Range 6.0 - 9.0				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	--	100.0	--	1/Week	Grab
OIL & GREASE	15.0	--	20.0	--	1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) **	0.10	--	0.10	--	5/Week	Grab
IC25 ***	25% Inhibition Concentration shall be . 3.3% Effluent				Semi-annual	Composite ***

* Flow shall be reported in Million Gallons per Day (MGD).

** pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection. The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. TRC monitoring shall be applicable when chlorine or bromine is added.

*** See Part III for methodology

Outfall 103: Low Volume Pond discharge to Yard Holding Pond

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 103
Low Volume Waste Pond

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous *	Recorded
pH **	Within the range 6.0 - 9.0				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	250	100.0	834	1/Week	Grab
OIL & GREASE	15.0	125	20.0	167	1/Week	Grab

* Flow shall be reported in Million Gallons per Day (MGD). Where recorder fails, monitoring shall be 1/day estimated by pump logs.

** pH shall be measured within 15 minutes of sample collection.

Outfall 107: Metal Cleaning Wastewater discharge to Yard Holding Pond

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 107
Metal Cleaning Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		1/Week	Instantaneous
pH **	Within the range 6.0 - 9.0				1/Week	Grab
OIL & GREASE	15.0	331.7	15.0	331.7	1/Month	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	663.5	30.0	663.5	1/Month	Composite
COPPER,TOTAL	1.0	22.1	1.0	22.1	1/Week	Composite
IRON, TOTAL	1.0	22.1	1.0	22.1	1/Week	Composite
PHOSPHORUS, TOTAL ***	1.0	--	1.0	--	1/Week	Composite

* Flow shall be reported in Million Gallons per Day (MGD).

** pH analyses shall be performed within fifteen (15) minutes of sample collection.

*** Phosphorus will be monitored only during periods when phosphating chemicals or cleaning solutions are used.

Outfall 111: Sanitary Wastewater discharge to Runoff Holding Pond

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 111
Treated Sanitary Wastewater

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous	Recorder
BOD5	30	--	45.0	--	1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	--	45.0	--	1/Week	Grab
SETTLEABLE SOLIDS	--	--	1.0 ml/L	--	2/Week	Grab
FECAL COLIFORM	see text of paragraph following this table				1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) **	--	--	2.0	--	5/Week	Instantaneous

* Flow shall be reported in Million Gallons per Day (MGD).

** The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.

The wastewater discharge for Outfall 111 must be disinfected to the extent that viable coliform organisms are effectively eliminated. The concentration of the fecal coliform group after disinfection shall not exceed 200 per 100 ml. as the geometric mean based on a minimum of 10 samples, collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purpose of determining the geometric mean, individual samples having a fecal coliform group concentration of less than one (1) per 100 ml. shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml. Where less than 10 samples are made per month, the permittee shall use an arithmetic mean rather than the geometric mean.

Outfall 112: Runoff Holding Pond discharge to Yellow Creek

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 112
Yard Runoff Holding Pond - Storm runoff

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		1/Week	Estimate *
pH **	Range 6.0 - 9.5				1/Week	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	--	100.0	--	1/Week	Grab
CHLORINE, TOTAL RESIDUAL (TRC) **	0.011	--	0.019	--	1/Week	Grab
NITROGEN, AMMONIA TOTAL	1.46	--	2.42	--	1/Week	Grab
DISSOLVED OXYGEN (D.O.)	--	--	5.0 Min.	--	1/Week	Grab
IC25 ***	25% Inhibition Concentration shall be > 100% Effluent				Semi-annual	Composite ***

* Flow shall be reported in Million Gallons per Day (MGD). Estimate based on measurement at existing weir.

** The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.

*** See Part III for methodology.

Outfall 113: Supplemental Condenser Cooling Water discharge to Tennessee River mile 529.2

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 113
Cooling water

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC. (mg/l)	AVG. AMNT. (lb/day)	MAX. CONC. (mg/l)	MAX. AMNT. (lb/day)	MSRMNT. FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous	Recorded
pH ***	Range 6.0 - 9.0				1/Month****	Grab
TOTAL SUSPENDED SOLIDS (TSS)	Report	–	Report	–	1/Month****	Grab
TEMPERATURE, Effluent	Report Effluent Temperature **				Continuous	Recorder
TEMPERATURE, Receiving Stream			33.5°C		Continuous **	Instantaneous
Stream Flow Direction Recording	Report Data on Status of Flow				Continuous	Recorded
CHLORINE, TOTAL RESIDUAL (TRC) ***	0.092	–	0.158	–	1/Month****	Grab
DISSOLVED OXYGEN (D.O.)	–	–	Report Min.	–	1/Month****	Grab
IC25 *****	25% Inhibition Concentration shall be > 10.3% Effluent				Semi-annual	Composite ****

* Flow shall be reported in Million Gallons per Day (MGD).

** It is recognized that the temperature of the cooling water discharge will be greater than the temperature of the water prior to its use for cooling or other purposes. The maximum water temperature change shall not exceed 3°C relative to an upstream control point. Outside the mixing zone, this discharge must not cause the temperature of the receiving waters to exceed 30.5°C (except as a result of natural causes), and this discharge must not cause the maximum rate of temperature change in the receiving waters to exceed 2°C per hour (except as a result of natural causes). Receiving water temperature measurement limited above will be by bottom sensors within the mixing zone. For further temperature requinements see Permit Part III - B

*** The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.

**** Monitoring frequency will be as described in the paragraph following this table.

***** See Part III for methodology.

Monitoring may be reduced to the 1/month frequency shown for TSS, TRC, DO and pH with the concurrence of the Division once this discharge is characterized and form 2C submitted (see Part III-F). Until that time frequency for these parameters will be sampled 1/Week.

ATTACHMENT 1 - STORM WATER SECTOR O

Q. Storm Water Discharges Associated With Industrial Activity From Water Transportation Facilities That Have Vehicle Maintenance Shops and/or Equipment Cleaning Operations

1. **Discharges Covered Under This Section**. The requirements listed under this section shall apply to storm water discharges from water transportation facilities that have vehicle (vessel) maintenance shops and/or equipment cleaning operations. The water transportation industry includes facilities engaged in foreign or domestic transport of freight or passengers in deep sea or inland waters; marine cargo handling operations; ferry operations; towing and tugboat services; and marinas (facilities commonly identified by Standard Industrial Classification (SIC) code Major Group 44).

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

2. **Special Conditions**

a) Prohibition of Non-storm Water Discharges. In addition to the general discharge prohibitions in part III.A, this section specifically prohibits non-storm water discharges of wastewaters, such as bilge and ballast water, sanitary wastes, pressure wash water, and cooling water originating from vessels. The operators of such discharges must obtain coverage under a separate NPDES permit if discharged to waters of the State or through a municipal separate storm sewer system.

3. **Storm Water Pollution Prevention Plan Requirements**

a) Contents of Plan. The plan shall include, at a minimum, the following items:

(1) Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team who are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

(2) Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials which may potentially be significant pollutant sources. Each plan shall include, at a minimum:

painting); loading/unloading areas; and onsite waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g., biochemical oxygen demand, etc.) of concern shall be identified.

(3) Measures and Controls. Each facility covered by this permit shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

(a) Good Housekeeping—Good housekeeping requires the maintenance of areas which may contribute pollutants to storm water discharges in a clean, orderly manner. The following areas must be specifically addressed, when applicable at a facility:

(i) Pressure Washing Area—When pressure washing is used to remove marine growth from vessels, the discharge water must be permitted by an NPDES permit. The pollution prevention plan must describe the measures to collect or contain the discharge from the pressure washing area, detail the method for the removal of the visible solids, describe the method of disposal of the collected solids, and identify where the discharge will be released (i.e., the receiving waterbody, storm sewer system, sanitary sewer system).

(ii) Blasting and Painting Areas—The facility must consider containing all blasting and painting activities to prevent abrasives, paint chips, and overspray from reaching the receiving water or the storm sewer system. The plan must describe measures taken at the facility to prevent or minimize the discharge of spent abrasive, paint chips, and paint into the receiving waterbody and storm sewer system. The facility may consider hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris. Where required, a schedule for cleaning storm water conveyances to remove deposits of abrasive blasting debris and paint chips should be addressed within the plan. The plan should include any standard operating practices with regard to blasting and painting activities. Such included items may be the prohibition of performing uncontained blasting and painting over open water or blasting and painting during windy conditions which can render containment ineffective.

(iii) Material Storage Areas—All stored and containerized materials (fuels, paints, solvents, waste oil, antifreeze, batteries) must be stored in a protected, secure location away from drains and plainly labeled. The plan must describe measures that prevent or minimize contamination of the storm water runoff from such storage areas. The facility must specify which materials are stored indoors and consider containment or enclosure for materials that are stored outdoors. Above ground storage tanks, drums, and barrels permanently stored outside must be delineated on the site map with a description of the containment measures in place to prevent leaks and spills. The facility must consider implementing an inventory control plan to prevent excessive purchasing, storage, and handling of potentially hazardous materials. Those facilities where abrasive blasting is performed must specifically include a discussion on the storage and disposal of spent abrasive materials generated at the facility.

(iv) Engine Maintenance and Repair Areas—The plan must describe measures that prevent or minimize contamination of the storm water runoff from all areas used for engine maintenance and repair. The facility may consider performing all maintenance activities indoors, maintaining an organized inventory of materials used in the shop, draining all parts of fluids prior to disposal, prohibiting the

(e) Employee Training—Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify how often training will take place, but in all cases training must be held at least annually (once per calendar year). Employee training must, at a minimum, address the following areas when applicable to a facility: used oil management; spent solvent management; proper disposal of spent abrasives; proper disposal of vessel wastewaters, spill prevention and control; fueling procedures; general good housekeeping practices; proper painting and blasting procedures; and used battery management. Employees, independent contractors, and customers must be informed about BMPs and be required to perform in accordance with these practices. The facility must consider posting instructions, easy to read descriptions or graphic depictions of BMPs, spill control/clean-up equipment and emergency phone numbers in the work areas.

(f) Recordkeeping and Internal Reporting Procedures—A description of incidents (such as spills, or other discharges), along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

(g) Non-storm Water Discharges

(i) The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with Part VII.G. of this permit. Such certification may not be feasible if the facility operating the storm water discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the storm water pollution prevention plan shall indicate why the certification required by this part was not feasible, along with the identification of potential significant sources of non-storm water at the site. A discharger that is unable to provide the certification required by this paragraph must notify the Division of Water Pollution Control in accordance with paragraph XI.Q.3.a.(3)(g)(iii) (below).

(ii) Sources of non-storm water that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge. Any non-storm water discharges that are not permitted under an individual NPDES permit should be brought to the attention of the Division's local Field Office (see APPENDIX I).

(iii) Failure to Certify—Any facility that is unable to provide the certification required (testing for non-storm water discharges), must notify the Division of Water Pollution Control by **November 30, 1997** or, for facilities which begin to discharge storm water associated with industrial activity after **November 30, 1997**, 180 days after submitting an NOI to be covered by this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe:

not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part VII.G. (Signatory Requirements) of this permit.

(d) Where compliance evaluation schedules overlap with inspections required under 3.a.(3)(d), the compliance evaluation may be conducted in place of one such inspection.

4. **Numeric Effluent Limitations**. There are no additional numeric effluent limitations beyond those described in Part V.B of this permit.

5. **Monitoring and Reporting Requirements**

a) Analytical Monitoring Requirements. During the period beginning **January 1, 1998** lasting through **December 31, 1998** and the period beginning **January 1, 2000** lasting through **December 31, 2000**, permittees with water transportation facilities must monitor their storm water discharges associated with industrial activity at least quarterly (4 times per year) during years 2 and 4 except as provided in paragraphs 5.a.(3) (Sampling Waiver), 5.a.(4) (Representative Discharge), and 5.a.(5) (Alternative Certification). Water transportation facilities are required to monitor their storm water discharges for the pollutants of concern listed in Table Q-1 below. Facilities must report in accordance with 5.b. (Reporting). In addition to the parameters listed in Table Q-1 below, the permittee shall provide the date and duration (in hours) of the storm event(s) sampled; rainfall measurements or estimates (in inches) of the storm event that generated the sampled runoff; the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge sampled.

Table Q-1.
Monitoring Requirements

Pollutants of Concern	Monitoring Cut-Off Concentration
Total Recoverable Aluminum	0.75 mg/L
Total Recoverable Iron	5.0 mg/L
Total Recoverable Lead	0.0816 mg/L
Total Recoverable Zinc	0.117 mg/L

(1) Monitoring Periods. Water transportation facilities shall monitor samples collected during the sampling periods of: January to March, April to June, July to September, and October to December for the years specified in paragraph a. (above).

(2) Sample Type. A minimum of one grab sample shall be taken. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm

(5) Alternative Certification. A discharger is not subject to the monitoring requirements of this section provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring reports required under paragraph b below, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan, and submitted to the Division of Water Pollution Control in accordance with Part VI.C. of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (b) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations.

b) Reporting. Permittees with water transportation facilities shall submit monitoring results for each outfall associated with industrial activity [or a certification in accordance with Sections (3), (4), or (5) above] obtained during the reporting period beginning **January 1, 1998** lasting through **December 31, 1998** on TMSP Storm Water Monitoring Report Form(s) postmarked no later than the 31st day of the following March. Monitoring results [or a certification in accordance with Sections (3), (4), or (5) above] obtained during the period beginning **January 1, 2000** lasting through **December 31, 2000** shall be submitted on TMSP Storm Water Monitoring Report Form(s) postmarked no later than the 31st day of the following March. For each outfall, one signed TMSP Storm Water Monitoring Report form must be submitted per storm event sampled. Signed copies of TMSP Storm Water Monitoring Reports, or said certifications, shall be submitted to the Enforcement and Compliance Section of the Division of Water Pollution Control located at 6th Floor L & C Annex, 401 Church Street, Nashville, TN 37243-1534.

(1) Additional Notification. In addition to filing copies of discharge monitoring reports in accordance with paragraph b (above), water transportation facilities with at least one storm water discharge associated with industrial activity through a large or medium municipal separate storm sewer system (systems serving a population of 100,000 or more) must submit signed copies of discharge monitoring reports to the operator of the municipal separate storm sewer system in accordance with the dates provided in paragraph b (above).

c) Quarterly Visual Examination of Storm Water Quality. Facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination must be made at least once in each designated period [described in paragraph (1) below] during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

(1) Examinations shall be conducted in each of the following periods for the purposes of visually inspecting storm water quality associated with storm water runoff or snowmelt: January through March; April through June; July through September; and October through December.

(2) Examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The

Rationale Addendum
July 16, 1999

Several changes are made to the Rationale and permit to clarify the permit's conditions and correct some errors.

Outfall 107 – Permit limits will be expressed as an amount limit that will be calculated based on the volume of water in each batch treated. EPA expressed concern that the volume used would be fine if all batches were the same volume, but that differing volumes should be required to meet different amounts based on the effluent guidelines. The basis for the limit will be the same (for example,1 mg/L for iron) but will be expressed as 8.34 pounds per million gallons of discharge rather than assuming 2.65 million gallons for each batch (for iron, variable amount depending on the size of the batch rather than the 22.1 pounds noted in the draft permit that corresponds to 2.65 million gallons).

For metals, EPA requested that permit limits refer to total recoverable metal rather than total. This is changed in the permit. The revised table is as follows.

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 107
Metal Cleaning Wastewater

	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG. CONC.	AVG. AMNT.	MAX. CONC.	MAX. AMNT.	MSRMNT.	SAMPLE
EFFLUENT CHARACTERISTIC	(mg/l)	(lb per million gallons per day)	(mg/l)	(lb per million gallons per day)	FRQNCY.	TYPE
FLOW	Report (MGD) *		Report (MGD) *		1/Week	Calculated
pH **	Within the range 6.0 - 9.0				1/Week	Grab
OIL & GREASE	15.0	125.1	15.0	125.1	1/Month	Grab
TOTAL SUSPENDED SOLIDS (TSS)	30.0	250.2	30.0	250.2	1/Month	Composite
COPPER,Total Recoverable	1.0	8.34	1.0	8.34	1/Week	Composite
IRON, Total Recoverable	1.0	8.34	1.0	8.34	1/Week	Composite
PHOSPHORUS, TOTAL ***	1.0	--	1.0	--	1/Week	Composite

* Flow shall be reported in Million Gallons per Day (MGD).

** pH analyses shall be performed within fifteen (15) minutes of sample collection.

*** Phosphorus will be monitored only during periods when phosphating chemicals or cleaning solutions are used.

Sample type for residual chlorine for Outfall 111 is changed from "instantaneous" to "grab".

The permit compliance monitoring is re-written to be clearer for Outfall 113. Evaluation of instream temperature criteria will be monitored and reported on the maximum temperature for the

month, the difference in upstream and downstream temperatures and the rate of temperature change. These will be reported on the Discharge Monitoring Reports as well as the river bottom monitors within the mixing zone. Evaluation of the temperature criteria will be on an hourly basis. The revised table is shown below.

PERMIT LIMITS

TVA-Watts Bar Nuclear

OUTFALL 113
Cooling water

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY		DAILY			
	AVG CONC (mg/l)	AVG AMNT (lb/day)	MAX CONC (mg/l)	MAX AMNT (lb/day)	MSRMNT FRQNCY.	SAMPLE TYPE
FLOW	Report (MGD) *		Report (MGD) *		Continuous	Recorded
pH ***	Range 6.0 - 9.0				1/Month****	Grab
TOTAL SUSPENDED SOLIDS (TSS)	Report	--	Report	--	1/Month****	Grab
TEMPERATURE, Effluent	Report Effluent Temperature **				Hourly	Recorder
TEMPERATURE, Edge of Mixing Zone			30.5° C		Hourly	Recorder
TEMPERATURE Rise upstream to downstream			3 C°		Hourly	Calculated
TEMPERATURE, Rate of Change, °C per hour			2 C° /hour		Hourly	Calculated
TEMPERATURE, Receiving Stream Bottom			33.5°C		Hourly	Recorder
Stream Flow Direction Recording	Report Data on Status of Flow				Hourly	Recorded
Certification of Instream Flow of 3500 cfs when required			Report as Yes/No		1/Month	Operation Records
CHLORINE, TOTAL RESIDUAL (TRC) ***	0.092	--	0.158	--	1/Month****	Grab
DISSOLVED OXYGEN (D.O.)	--	--	Report Min.	--	1/Month****	Grab
IC25 *****	25% Inhibition Concentration shall be ≥ 10.3% Effluent				Semi-annual	Composite ****

* Flow shall be reported in Million Gallons per Day (MGD).

** It is recognized that the temperature of the cooling water discharge will be greater than the temperature of the water prior to its use for cooling or other purposes. The maximum water temperature change shall not exceed 3°C relative to an upstream control point. Outside the mixing zone, this discharge must not cause the temperature of the receiving waters to exceed 30.5°C (except as a result of natural causes), and this discharge must not cause the maximum rate of temperature change in the receiving waters to exceed 2°C per hour (except as a result of natural causes). Receiving water temperature measurement limited above will be by bottom sensors within the mixing zone. For further temperature requirements see Permit Part III - B

*** The required quantitation level for Total Residual Chlorine is 0.05 mg/L. The acceptable methods for detection, as specified in 40 CFR Part 136, are the amperometric titration, DPD colorimetric, and specific ion electrode. pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.

**** Monitoring frequency will be as described in the paragraph following this table.

***** See Part III for methodology.

EPA had concerns that the condition for flow be clearly enforceable under the permit. Statements about the flow instream that is required for discharges at 101,102 and 113 have been combined into a single paragraph in Part I along with a certification requirement. The paragraph is as follows.

"Discharges are authorized for Outfall 101 only during periods when flow in the receiving stream is 3,500 cubic feet per second or greater. All changes to the flow rate of the SCCW discharge (Outfall 113) will be done during periods when flow in the receiving waters is at least 3,500 Cubic feet per second. This includes periods of start-up, shut-down as well as other similar abrupt flow rate changes of the SCCW. When thermally loaded effluent is discharged through Outfall 102, all reasonable efforts shall be made to keep flow of at least 3500 cubic feet per second in the receiving waters. If such flow is absent, the permittee shall verify protection of water quality by taking instream temperature measurements. Compliance with flow requirements for 3,500 cfs flow instream for Outfalls 101, 102 and 113 discharges shall be certified monthly with the submission of Discharge Monitoring Reports submitted to the Division for these outfalls. Records concerning the instream flow shall be maintained and available upon request."

The Draft Permit stated in Part I-B-1,

"Samples and measurements taken in compliance with the monitoring requirements specified herein shall be representative of the volume and nature of the monitored discharge, and shall be taken after treatment and prior to mixing with uncontaminated storm water runoff not part of the discharge or the receiving stream."

EPA objected to the wording here and the permit is re-worded as follows for this paragraph.

"Samples and measurements taken in compliance with the monitoring requirements for internal monitoring points and outfalls specified herein shall be representative of the volume and nature of the monitored discharge. Sampling and measurements for these outfalls and monitoring points shall be taken at the nearest accessible point after final treatment and prior to mixing with other waters or the receiving stream."

The sentence in Part III-B that reads "Any equipment failures shall be remedied as soon as reasonably practical." is changed to "Any instream monitoring equipment failures shall be remedied as soon as reasonably practical." to be more clear.

Antidegradation - Tennessee has reviewed the Tier II classification of the receiving waters that was made and described in the draft permit's rationale. A large part of the basis for the classification was for ecological value of mussels in the water resource of the area. But the state has reviewed the classification of waters at the Watts Bar Fossil and Nuclear plants and determined that these are Tier I waters at this point. Changing the classification does not lessen the state's regulatory responsibility to see that waters and aquatic organisms are protected, nor does it relax or remove responsibility of the permittee to protect water quality or the aquatic organisms present in the water from harmful effects of the discharges. Classification as Tier I recognizes that organisms and ecological considerations present at this stretch of the river are not sufficient to classify the water as a high quality water. Reclassification as a Tier I does not affect draft permit conditions or language.

REQUIREMENTS FOR MAKING A PERMIT APPEAL

Permit Appeal (Tennessee Department of Conservation, Chapter 1200-4-1.05(6), and T.C.A. Section 69-3-110)

1. Petitions must be made within 30 days of the receipt of the final permit.

2. Petitions shall contain the following:

   (a) The name, mailing address, and telephone number of the person mailing the request and the names and addresses of all persons he or she represents;

   (b) A clear and concise statement of each legal or factual matter alleged to be issue; and

   (c) Specific reference to each permit condition which the petitioner contests. The petitioner may suggest alternate permit terms which would meet the requirements of the Water Quality Control Act; if the petitioner challenges permit conditions which ate justified in the fact sheet (or Rationale), the petitioner should indicate how the basis for the permit condition is in error or indicate why an alternate condition is necessary.

3. Petitions should be addressed to the Water Quality Control Board and filed in duplicate at the following address: Paul E. Davis, Director; Division of Water Pollution Control; Department of Environment and Conservation; 401 Church Street; L&C Annex, Sixth Floor; Nashville, Tennessee 37243-1534.

4. The appeal of a permit or a permit condition has the effect of staying the contested provisions. Therefore, if a permit is being reissued, the permittee will be considered to be authorized under the terms of the old permit and/or any unappealed terms of the reissued permit. If it is a new permit, the applicant will be considered to be without a permit for the activity until final agency action.

E8060092-D4WPC1

ENCLOSURE 1

OFFSITE DOSE CALCULATION MANUAL (ODCM)

MATRIX OF NRC'S CONCERNS