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

DEC 1 9 2006

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

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

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 – NOTIFICATION OF NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT RENEWAL

The purpose of this letter is to notify NRC that an application for renewal of NPDES Permit Number TN0020168 was released to the State of Tennessee on May 3, 2006. Section 3.2, "Reporting Requirements for Changes to, and Renewal of, the NPDES Permit or State Certification," of Appendix B, "Environmental Protection Plan," to facility operating license NPF-90, requires that NRC be notified at the time the renewal application is made. TVA acknowledges the delay in this notification and is addressing this issue in WBN's Corrective Action Program.

There are no regulatory commitments associated with this submittal. If there are any questions about this letter, please contact me at (423) 365-1824.

Sincerely,

for

J. D. Smith
Manager, Site Licensing
and Industry Affairs (Acting)

Enclosure
cc: See Page 2

D030
C001

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DEC 1 9 2006

Enclosure
cc (w/o Enclosure):

NRC Resident Inspector
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Mr. D. V. Pickett, Senior Project Manager
U.S. Nuclear Regulatory Commission
MS O8G9a
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

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

Enclosure

NPDES Permit Number TN0020168
Renewal Application Dated May 3, 2006

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

Mike Skaggs
Site Vice President, Watts Bar Nuclear Plant

May 3, 2006

Dr. Richard Urban, PhD
Division of Water Pollution Control
Chattanooga Field Office
Tennessee Department of Environment
and Conservation
State Office Building, Suite 550
540 McCallie Avenue
Chattanooga, Tennessee 37402

Dear Dr. Urban:

TENNESSEE VALLEY AUTHORITY (TVA) - WATTS BAR NUCLEAR PLANT (WBN) - NPDES PERMIT NO. TN0020168 - RENEWAL APPLICATION

Enclosed are a signed original and a copy of the NPDES permit renewal application packet consisting of EPA Form 1, site map, Form 2C, Form 2C addendum, flow schematic, Form 2E, and a permit address form. Sampling for permit renewal occurred in December 2005 and historical data were compiled from the period of October 1, 2004, through September 30, 2005.

TVA requests consideration of the following in the renewed permit application:

Outfall 101

Enclosed is a reasonable potential determination on the need for whole effluent toxicity (WET) testing for outfall serial numbers (OSNs) 101, 102, 112, and 113 at WBN. WBN is currently required by the biocide corrosion treatment plan (BCTP) approved in July 2004 in conjunction with Part IV.B of the NPDES permit to monitor once per year during oxidizing biocide use and once per year during non-oxidizing biocide use. TVA requests that the NPDES permit be made consistent with that frequency by modifying the permit limits table to 2/year or to refer to a footnote indicating that WET testing would be required once per year for oxidizing biocides and once per year for non-oxidizing biocides.

Outfall 102

Footnotes 4 and 6 appear to be incomplete sentences and should be corrected.

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Internal Monitoring Point (IMP) 103

1. TVA requests that oil and grease (O&G) monitoring at IMP 103 be reduced to once per month. There have been no detectable values for more than five years. With zero variability and values that are well below the permit limit, this discharge represents a very low risk. In addition, this is an internal monitoring point that is routed to OSN 101, where O&G is monitored again and compared to a permit limit.

2. TVA asks that the monitoring frequency for total suspended solids (TSS) be reduced to once per month. The maximum monthly average for the period from April 2001 to April 2006 was 23.6, below the permit limitation. Since the Division's policy is to require compliance with the monthly average even when only one measurement is made per month, WBN should have no difficulties complying with the monthly average. In addition, this discharge is routed to OSN 101 where further TSS limits are applied.

3. TVA requests that pH monitoring at this internal monitoring point be reduced to once per month since the pH is also monitored at OSN 101, the point at which the discharge reaches the receiving stream.

Internal Monitoring Point (IMP) 107

1. TVA believes that the current monitoring frequency for pH on the metal cleaning waste pond should be changed to 1/batch, consistent with the monitoring frequency for TSS, O&G, etc. It is currently described as 1/week which is not appropriate since the discharge typically does not occur at that frequency.

2. TVA recently notified the Chattanooga Field Office requesting authorization for a discharge of waste water from condenser tube cleaning that had been filtered to 5 microns to address asbestos that may have been present. This discharge was authorized by email dated March 14, 2006. TVA requests that this intermittent wastewater be authorized in the renewed permit.

Outfall 113

TVA requests that the requirement to monitor bottom temperatures at Outfall 113 be removed from the reissued permit. Reviewing data from April 2000 through April 2006 reveals that the maximum temperature recorded has been 29.3 degrees C while the permit limit is 33.5 degrees C. Removing this monitoring requirement appears to be very low risk as the data indicate no excursions and a reasonable margin of safety for protecting bottom temperatures.

Part II.C.3

TVA believes that the definition of overflow should be modified. It is currently defined by this section of the permit as "Overflow means the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than permitted outfalls." TVA believes the wording should be consistent with the wording of TCA 69-3-108(b)(5) which prohibits discharges of such wastes into waters or from "a location from which it is likely that the discharged substance will move into waters."

Part III. E

1. TVA recently received written authorization to treat *Pimephales promelas* toxicity samples (both effluent and intake samples) with UV to address problems with pathogenic interference in WET testing. A copy of this authorization is enclosed for your convenience. TVA requests that language be added to address this in the renewed permit. Suggested wording is: "The permittee is authorized to treat *Pimephales promelas* samples collected for toxicity testing at Outfall 112 with UV radiation for up to five minutes."

2. TVA believes the language regarding whole effluent toxicity being required during the first treatment after the effective date of the permit should be removed since the effective date is an unknown future date and the facility may already be in a treatment when the permit becomes effective. TVA suggests that language requiring tests to be conducted within 180 days of the effective date of the permit if oxidizing or nonoxidizing treatments have been utilized should be sufficient.

Part III. I

TVA requests inclusion of new language for the WBN permit, consistent with language found in Part III in all TVA fossil power permits in Tennessee which minimizes administrative burdens. The language is:

> The permittee shall be allowed to re-route flows past normal monitoring points as a temporary measure for maintenance purposes. However, such re-routing must be done in such a way that permit limitations are still being met in the receiving waters and compliance with permit limitations is monitored and reported on the DMRs for the rerouted flows. The receiving waters must be the same for the rerouted flows as for the normal discharges.

TVA offers the following general information in support of the NPDES renewal application.

1. Outfall 102 was not discharging at the time of renewal sample collection; therefore, the data presented on the pages for Outfall 102 are only historical data

from the few times flow has emanated from there. OSN 102 is an alternate discharge to OSN 101 so the renewal data for 101 are representative of 102.

2. Sampling for IMP 103 consisted of sampling Part II.A.-II.C. parameters only. IMP 103 is internal to OSN 101 where all required categories of pollutants were evaluated and sampled per EPA Form 2C instructions.

3. IMP 107 was not discharging during permit renewal sampling. This IMP is also internal to 101 where all required categories of pollutants were evaluated and sampled per Form 2C instructions; only historical data from IMP 107 are presented on the forms.

4. Outfall 112 consists of sanitary wastewater, potential cooling tower blowdown and fire protection flushes and storm water runoff.

5. Outfall 114 which consists of traveling screen backwash only from the supplemental condenser cooling water intake has been added to the permit application. This outfall consists of screen reject and raw water only. TVA requests no monitoring requirements, consistent with other screen backwash discharges at TVA facilities.

6. TVA is providing a copy of the report "Biological Monitoring of the Tennessee River near Watts Bar Nuclear Plant Discharge 2004 (June 2005 Final)" for your use.

TVA appreciates your consideration of the information provided herein in the development of the reissued permit. If you have any questions about this NPDES permit renewal application, please contact Lindy Johnson at (423) 751-3361 in Chattanooga, or you may contact her by email at lpjohnson@tva.gov. TVA requests an expeditious determination of completeness of the application.

Sincerely,

Mike Skaggs

Enclosures

(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086. Approval expires 5-31-92.

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: S F TN 2 6 4 0 0 3 0 0 3 5 T/A C D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area*(s)* below. If the label is complete and correct, you need not complete *Items 1, III, V, and VI (except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge to waters of the U.S.**? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge to waters of the U.S.**? (FORM 2B)		X	
	16	17	18		19	20	21
C. Is this a facility which currently results in **discharges to waters of the U.S.** other than those described in A or B above? (FORM 2C)	X		X	D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge to waters of the U.S.**? (FORM 2D)		X	
	22	23	24		25	26	27
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
	28	29	30		31	32	33
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
	34	35	36		37	38	39
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X		J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	
	40	41	42		43	44	45

III. NAME OF FACILITY

1 SKIP TVA-WATTS BAR NUCLEAR PLANT (15–16, 16–29, 30–69)

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*: 2 EIFORD-LEE, BETSY CHEM/ENV MGR (15–16, 16–45)

B. PHONE *(area code & no.)*: 423 (46–48) 365 (49–51) 3364 (52–55)

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX: 3 P.O. BOX 2000 (15–16, 16–45)

B. CITY OR TOWN: 4 SPRING CITY (15–16, 16–40)

C. STATE: TN (41–42)

D. ZIP CODE: 37381 (47–51)

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: 5 HWY 68 NUCLEAR PLANT ROAD (15–16, 16–45)

B. COUNTY NAME: RHEA (46–70)

C. CITY OR TOWN: 6 SPRING CITY (40)

D. STATE: TN (41–42)

E. ZIP CODE: 37381 (47–51)

F. COUNTY CODE *(if known)*: (52–54)

CONTINUE ON PAGE 2

I. SIC CODES *(4-digit, in order of priority)*

A. FIRST		B. SECOND	
4911	(specify) ELECTRICAL POWER GENERATION	C7	

C. THIRD		D. FOURTH	
	(specify)	C7	(specify)

III. OPERATOR INFORMATION

A. NAME: TENNESSEE VALLEY AUTHORITY

B. Is the name listed as Item VIII-A also the owner? [X] YES [ ] NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*
F = FEDERAL; M = PUBLIC *(other than federal or state)*; S = STATE; O = OTHER *(specify)*; P = PRIVATE
Answer: F (specify:)

D. PHONE *(area code & no.)*: CA 423 365 8767

E. STREET OR P.O. BOX: P.O. BOX 2000

F. CITY OR TOWN: SPRING CITY

G. STATE: TN

H. ZIP CODE: 37381

IX. INDIAN LAND Is the facility located on Indian lands? [ ] YES [X] NO

V. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	TIN	TN0020168	
D. PSD *(Air Emissions from Proposed Sources)*	C9		
B. UIC *(Underground Injection of Fluids)*	TIU		
C. RCRA *(Hazardous Wastes)*	TI		
E. OTHER *(specify)*	C9	TNR051343	(specify) TMSP (STORM WATER)
	C9	448529	(specify) TITLE V AIR PERMIT

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Inc X for precise requirements.

VII. NATURE OF BUSINESS *(provide a brief description)*

Production of electrical power via thermonuclear fission and associated operations.

Watts Bar Nuclear is located at approximate Tennessee River Mile 528. Unit 1 is rated to produce 1,270 MWe of electricity at full load.

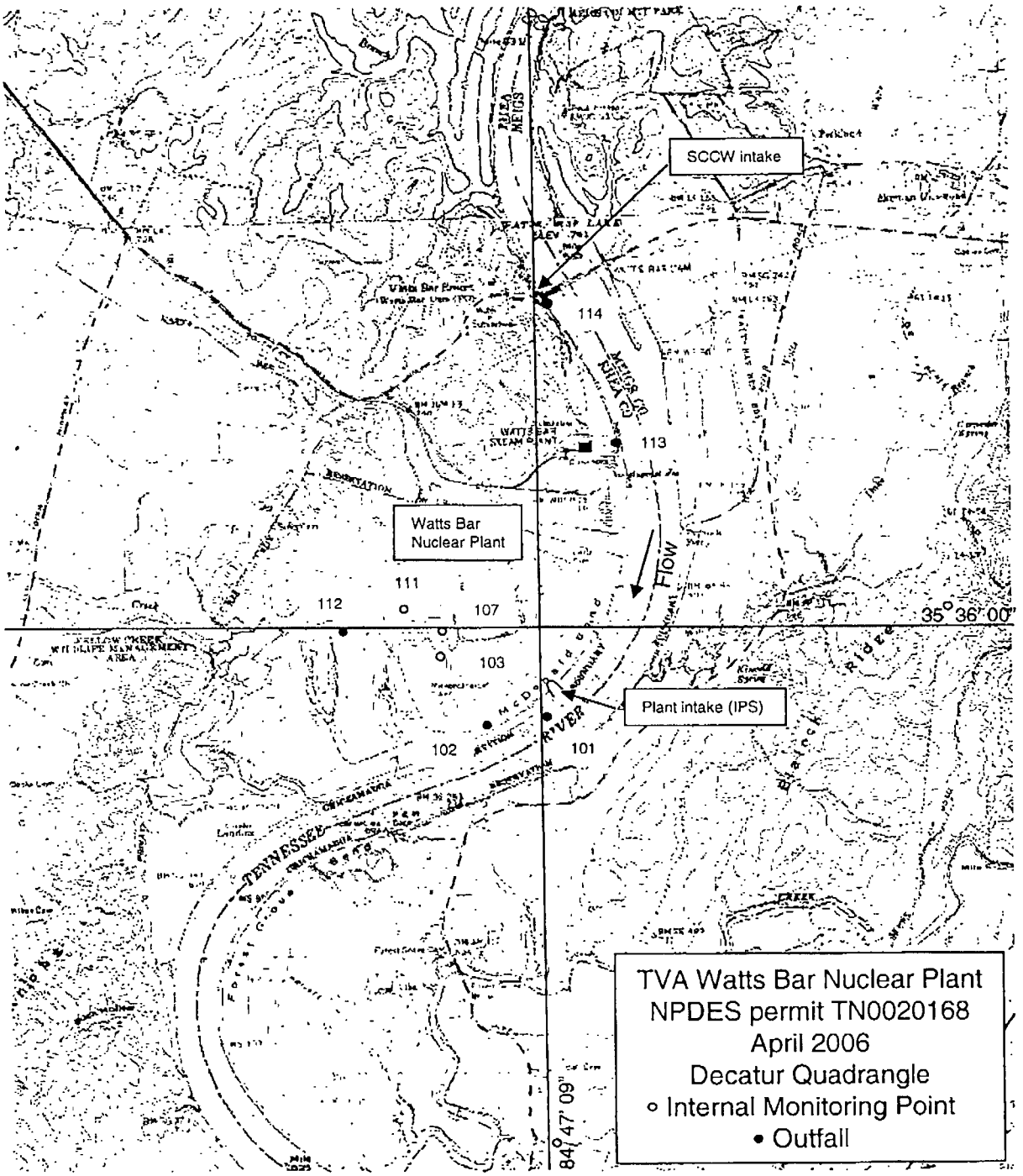
XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the

fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
Michael D. Skaggs Site Vice President Watts Bar Nuclear Plant		

COMMENTS FOR OFFICIAL USE ONLY



0 0.4 0.8 1.2 1.6 2 mi

0 0.6 1.2 1.8 2.4 3 km

MK
G

M=-4.171
G=1.289

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
TN2640030035

Form Approved
OMB No. 2040-0086
Approval expires 5/31/92

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FORM 2C

EPA

U. S. ENVIRONMENTAL PROTECTION AGENCY

APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER

EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS

Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
101	35	35	30	84	47	15	TENNESSEE RIVER @~TRM 527.9
102	35	35	45	84	47	30	UNNAMED TRIBUTARY OF TENNESSEE RIVER @~TRM 527.2
IMP 103	35	36	0	84	47	30	TENNESSEE RIVER @~TRM 527.9 via OSN 101
IMP 107	35	36	0	84	47	30	TENNESSEE RIVER @~TRM 527.9 via OSN 101
112	35	36	0	84	48	0	UNNAMED TRIBUTARY OF YELLOW CREEK @~TRM 526.9
113	35	35	45	84	46	45	TENNESSEE RIVER @~TRM 529.2
114	35	37	15	84	47	0	TENNESSEE RIVER @~TRM 529.8

II. FLOWS, SOURCES, OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
OSN 101	Diffuser Discharge (receives the following)	33.8217 MGD	Discharge through multiport diffuser	4	A
			See Biocide/Corrosion Treatment Plan		
	1) Yard Holding Pond	1.1437 MGD			
	a) Turbine Building Station Sump (TBSS) "A"	0 MGD			
	b) Cooling Tower Blowdown (CTBD) "A"	0 MGD			
	c) Emerg. Raw Cooling Water (ERCW) "A"	0 MGD			
	d) Raw Cooling Water (RCW) "A"	0 MGD			
	e) Ice condenser chiller/air coolers "A"	0 MGD			
	f) Low Volume Waste Treatment Pond (IMP 103)	0.2192 MGD	Unlined pond with sedimentation and	1	U
	Precipitation	[0.010 MGD]	neutralization	2	K
	Alum sludge supernate	[0.025 MGD]			
	Vendor water treatment RO reject	[0.05 MGD]			
	Turbine bldg station sump, receives:	[0.1342 MGD]	Floor drain collection w/oil skimming	X	X
	Laboratory waste	{0.0001 MGD}			
	Neutral Waste Tank	{0 MGD}			
	Potable Water Line Leaks	{0.0001 MGD}			
	System Leakage & Maintenance	{0.133 MGD}			
	High Pressure Fire Protection discharges	{0.001 MGD}			
	g) ERCW Header flushes	0 MGD			
	h) Precipitation	0.105 MGD			
	i) *Less* precipitation	*- 0.057 MGD*			
	j) Cooling Tower Desilting Basin	0.002 MGD	Sedimentation	1	U
	k) Non-rad Demin Water discharges to Yard Drains	0.011 MGD			
	l) Service Building Sump	0.020 MGD			

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

{} denotes an alternate flow path

Continue on Page 2

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
TN2640030035

Form Approved
OMB No. 2040-0086
Approval expires 5/31/92

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FORM 2C

EPA

U. S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

S

FALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN	3. SEC.	1. DEG.	2. MIN.	3. SEC.	

II. FLOWS, SOURCES, OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUT-FALL NO (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
OSN 101	m) Diesel Generator (D/G) Building Sump	0.0001 MGD	Leak collection w/ oil skimming	X	X
(continued)	n) Emergency D/G Building Sump	0.0001 MGD			
	o) CCW Pump Station Sump	0.0001 MGD			
	p) NaOCL Building Sump and Dike	0.001 MGD	Sedimentation	1	U
	q) High Pressure Fire Protection (HPFP) Flushes	0.003 MGD			
	r) Potable water line leaks	0.001 MGD			
	s) Storm Water Runoff	0.699 MGD			
	t) Rainwater releases from secondary	0.001 MGD			
	confinement for bulk chemical storage				
	u) Groundwater sump	0.001 MGD			
	v) Discharge from Lined/Unlined Metal Cleaning	0.031 MGD	1 MG Lined Pond, 5 MG Unlined Pond	1	U
	waste ponds (IMP 107)		Sedimentation, precip., neutralization	2	C, K
	Turbine bldg station sump w/metal cleaning waste	[0.0303 MGD]	Floor drain collection w/oil skimming	X	X
	Metal Cleaning wastes	[0.0003 MGD]			
	Storm water runoff	[0.0001 MGD]			
	Drum rinsing	[0.0001 MGD]			
	Drum dewatering	[0.0001 MGD]			
	Diesel cleaning coolant	[0.0001 MGD]			
	Condenser tube cleaning	[0 MGD]	Filtration to 5 microns for asbestos	X	X
	w) Trash sluice water, receives:	0.1062 MGD			
	Station drainage sumps	[0.072 MGD]			
	Emergency raw cooling water strainer leakage	[0 MGD]			
	ERCW Strainer backwash	[0.027 MGD]			
	ERCW Traveling Screen backwash	[0.0072 MGD]			

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

notes an alternate flow path

Continue on Page 2

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U. S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

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A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN	3. SEC.	1. DEG.	2. MIN.	3. SEC.	

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B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
OSN 101	**2 Cooling Tower Blowdown (CTBD), receives:**	**24.048 MGD**			
(continued)	a) Liquid Radwaste system	0.004 MGD	Ion Exchange and Filtration System	2	J
	which receives flow from the following:				
	1) Radioactive Floor and Equipment Drains,	[0.0039 MGD]			
	Tanks, and Sumps				
	2) Laboratory Wastes	[0.0001 MGD]			
	b) Steam Generator Blowdown	0.144 MGD			
	c) Condensate Denim Cleanup	0.0010 MGD	Neutralization	2	K
	d) Cooling Tower Blowdown Weir	23.899 MGD			
	3 Emergency Raw Cooling Water	**4.38 MGD**			
	4 Raw Cooling Water	**4.05 MGD**			
	5 Ice Condenser Chiller/Various Air coolers	**0.200 MGD**			
OSN 102	Yard holding Pond Overflow Weir (Emergency	**0.000 MGD**	See Outfall 001	1	U
	Outfall) - provides an alternate discharge path for the				
	diffuser discharge point (OSN 101)				
IMP 103	See description above in OSN 101				

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

enotes an alternate flow path

 Continue on Page 2

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FORM 2C

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APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

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For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN	3. SEC.	1. DEG.	2. MIN.	3. SEC.	

II. FLOWS, SOURCES, OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
IMP 107	Metal Cleaning Waste Ponds (LP and ULP)	0.031 MGD			
	See description above in OSN 101				
IMP 111	Sewage Treatment Plant	0.017 MGD	Secondary Treatment = Extended	1	U
			aeration modification of activated	2	H
			sludge	3	A
			Ozone disinfection	2	G
			Chlorine treatment (backup only)	2	F
OSN 112	Construction Run Off Holding Pond which receives	0.247 MGD	Sedimentation	1	O
	flow from the following:		Oil skimming	X	X
	1) Sewage Treatment Plant (IMP 111)	0.017 MGD	Discharge to surface water	4	A
	2) Training Center HVAC cooling water	0.0010 MGD			
	3) High pressure fire protection system flushing	0.100 MGD			
	4) Potable water leaks	0.0010 MGD			
	5) Storm water runnoff	0.2180 MGD			
OSN 113	Supplemental Condenser Cooling Water	129.0 MGD	Discharge to surface water	4	A
	System (Noncontact Cooling Water)				
OSN 114	SCCW Intake screen backwash	0.019 MGD	Discharge to surface water	4	A

CIAL USE ONLY (*effluent guidelines sub-categories*)

"A" denotes an alternate flow path

Continue on Page 2

CONTINUED FROM PAGE 1

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

[ ] YES *(complete the following table)* [X] NO *(go to Section III)*

1. OUTFALL NUMBER	2. OPERATION(s) CONTRIBUTING FLOW *(list)*	3. FREQUENCY a. DAYS PER WEEK *(specify average)*	3. FREQUENCY b. MONTHS PER YEAR *(specify average)*	4. FLOW a. FLOW RATE *(in mgd)* 1. LONG TERM AVERAGE	4. FLOW a. FLOW RATE *(in mgd)* 2. MAXIMUM DAILY	4. FLOW b. TOTAL VOLUME *(specify with units)* 1. LONG TERM AVERAGE	4. FLOW b. TOTAL VOLUME *(specify with units)* 2. MAXIMUM DAILY	4. FLOW c. DURATION *(in days)*
107	Lined Pond (0.91 MG)							
	Unlined Pond (6.5 MG)		4/year		3 MGD		3 MG	1
114	SCCW Intake screen backwash	7	12	1.04	1.04	0.019	1.04	365

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

[X] YES *(complete Item III-B)* [ ] NO *(go to Section IV)*

B. Are the limitations in the applicable effluent guideline expressed in terms of production *(or other measure of operation)*?

[ ] YES *(complete Item III-C)* [X] NO *(go to Section IV)*

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	2. AFFECTED OUTFALLS *(list outfall numbers)*

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

[ ] YES *(complete the following table)* [X] NO *(go to Item IV-B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS a. NO.	2. AFFECTED OUTFALLS b. SOURCE OF DISCHARGE	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE a. REQUIRED	4. FINAL COMPLIANCE DATE b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs *(or other environmental projects which may affect your discharges)* you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

[ ] MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

 Continue on Page 3

CONTINUED FROM PAGE 2

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*
TN2640030035

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding - Complete one set of tables for each outfall - Annotate the outfall number in the space provided. NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2C-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
Asbestos	cooling tower		
propylene oxide (as ethlyene-oxide - Pro Propylene oxide copolymer)	Nalco biodetergent 73551 as cooling water additive		

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ **YES** *(list all such pollutants below)* ☒ **NO** *(go to Item VI-B)*

 Continue on Page 4

CONTINUED FROM PAGE 3

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

[X] **YES** *(identify the test(s) and describe their purposes below)* [ ] **NO** *(go to Section VIII)*

S ual biotoxicity tests (3-Brood *Ceriodaphnia dubia* Survival and Reproduction Tests and 7-Day Fathead Minnow (Pimephales promelas) Larval Survival and Growth Tests are conducted on samples of final effluent from Outfall 101, 102, 112 and 113 as required by the NPDES permit.

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

[X] **YES** *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)* [ ] **NO** *(go to Section IX)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code & no.)*	D. POLLUTANTS ANALYZED *(list)*
En mental Science Corp (ESC)	12065 Lebanon Rd Mt Juliet, Tn 37122	(615) 767-5859 (880)767-5859	Total Cyanide Total Phenols

X. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE *(type or print)*	B. PHONE NO. *(area code & no.)*
Michael D. Skaggs, Site Vice President, WBN	(423) 365-8767
C. SIGNATURE M Skaggs	**D. DATE SIGNED** 5/1/06

Chemicals Used in Plant Processes

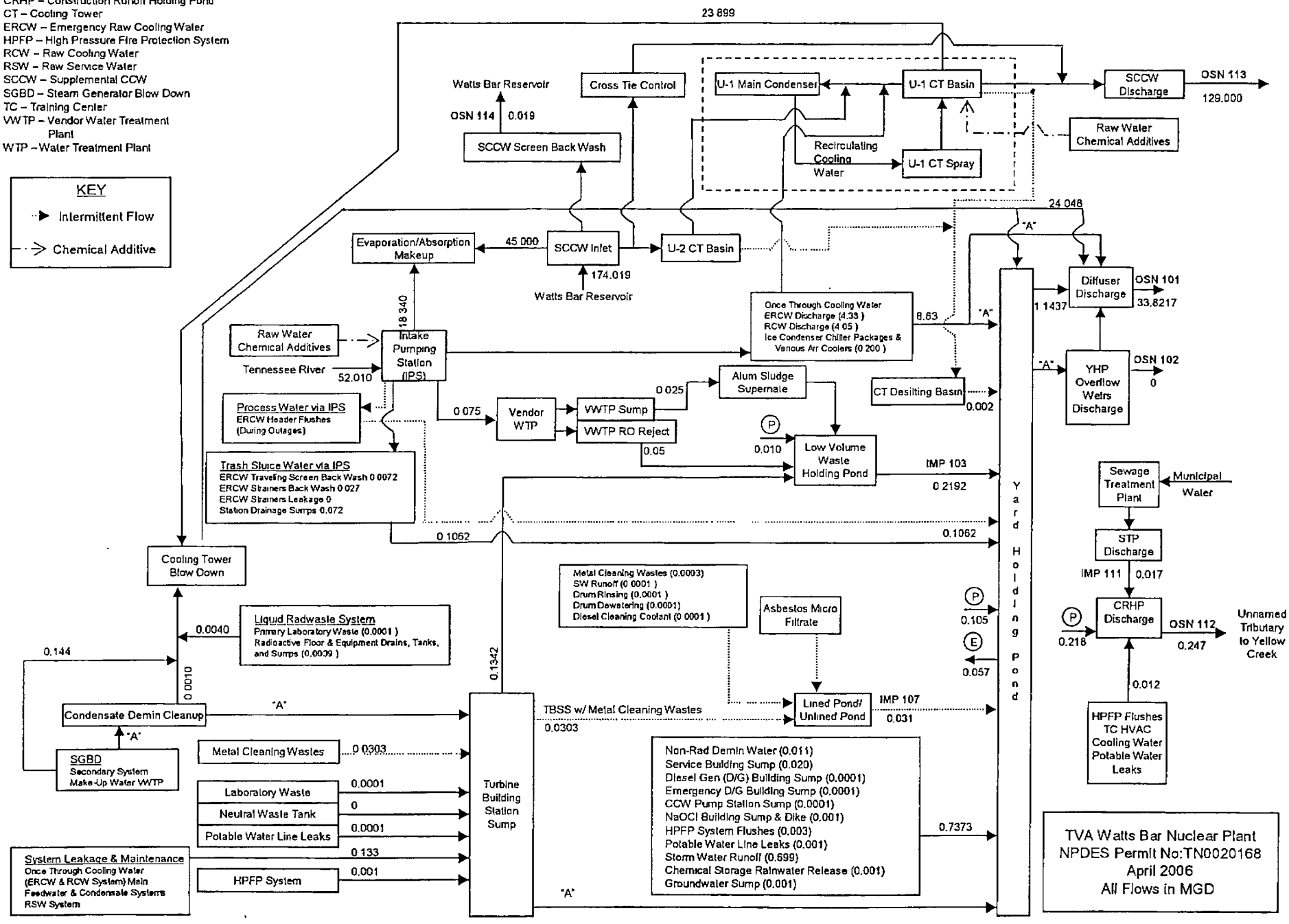
Chemical additives are used in plant processes and may be found in trace quantities in the various NPDES discharge points due to blowdown, leakage, and system maintenance activities. The following paragraph describes the most commonly used system additives. A table on the next page summarizes all chemical additives including the raw water additives that may be found in each outfall as well. The raw water additives are biocides and corrosion treatment chemicals and are discussed in more detail in the Biocide Corrosion Treatment Plan (BCTP) approved in July 2004 by the Division of Water Pollution Control.

Hydrazine, ammonia, boric acid, sodium tetraborate, monoethanolamine, sodium molybdate, sodium tolyltriazole, potassium hydroxide, and lithium hydroxide are routinely added to the Primary and Secondary Systems to control pH and corrosion. Up to 300 pounds of modified alpha cellulose could be added to the condenser intake channel to temporarily plug pinhole tube leaks in the condenser. Hydrogen peroxide may be added during refueling for Primary System cleanup to reduce radiation exposure to maintenance personnel. Similarly, small quantities of ethylene glycol, a heat transfer medium used in building chiller packages, the ice condenser chiller packages, and diesel generators, could end up via leakage or maintenance activities in OSNs 101, 102, internal monitoring point (IMP) 103, and IMP 107.

SUMMARY OF CHEMICALS ADDED BY DISCHARGE

DESCHARGE	DESCRIPTION	CHEMICAL ADDED
OSN 101	Diffuser Discharge	Ammonium Hydroxide, Ammonium Chloride, Alpha Cellulose, Boric Acid, Sodium Tetraborate, Bromine, Chlorine, Copolymer Dispersant, Ethylene Glycol, Hydrazine, Laboratory Chemical Wastes, Lithium, Molybdate, Monoethanolamine, Molluscicide, Oil and Grease, Phosphates, Phosphate Cleaning Agents, Paint Compounds, Sodium Hydroxide, Surfactant, Tolyltriazole, Zinc Sulfate, (also see BCTP)
OSN 102	Yard Holding Pond Overflow Weir (See OSN 101)	Alternate discharge path for OSN 101
IMP 103	Low Volume Waste Treatment Pond	Ammonium Hydroxide, Ammonium Chloride, Boric Acid, Sodium Tetraborate, Bromine, Chlorine Copolymer Dispersant, Ethylene Glycol, Hydrazine, Laboratory Chemical Wastes, Lithium, Molybdate, Monoethanolamine, Molluscicide, Oil and Grease, Phosphates, Phosphate Cleaning Agents, Paint Compounds, Sodium Hydroxide, Surfactant, Tolyltriazole, Zinc Sulfate, (also see BCTP)
IMP 107	Lined Pond & Unlined Pond	Metals - mainly Iron and Copper, Acids and Caustics, Ammonium Hydroxide, Ammonium Chloride, Boric Acid, Sodium Tetraborate, Bromine, Chlorine, Copolymer Dispersant, Hydrazine, Laboratory Chemical Wastes, Lithium, Monoethanolamine, Molybdate, Molluscicide, Oil and Grease, Phosphates, Phosphate Cleaning Agents, Sodium, Sodium Hydroxide, Surfactant, Tolyltriazole, Zinc Sulfate, (also see BCTP)
IMP 111	Sewage Treatment Plant	Chlorine, Organic Matter, Laboratory Chemical Wastes, Paint Compounds, Asbestos from Insulators taking showers, X-ray Film Processing Rinse Water
OSN 112	Runoff Holding Pond	Chlorine, Organic Matter, Paint Compounds, Asbestos from insulators taking showers, X-ray Film Processing Rinse Water, Potable Water (Cooling Tower at Training Center) and High Pressure Fire Protection flushes, (also see BCTP)

Abbreviations
"A" – Alternate Flow Path
CCW – Condenser Cooling Water
CRHP – Construction Runoff Holding Pond
CT – Cooling Tower
ERCW – Emergency Raw Cooling Water
HPFP – High Pressure Fire Protection System
RCW – Raw Cooling Water
RSW – Raw Service Water
SCCW – Supplemental CCW
SGBD – Steam Generator Blow Down
TC – Training Center
VWTP – Vendor Water Treatment Plant
WTP – Water Treatment Plant



Please type or print in the unshaded areas only.	EPA ID Number (copy from Item 1 of Form 1) TN2640030035	Form Approved OMB No. 2040-0086 Approval expires 7-31-88

Form 2E NPDES

EPA Facilities Which Do Not Discharge Process Wastewater

I. Receiving Waters

For this outfall, list the latitude and longitude, and name of the receiving water(s).

Outfall Number (list)	Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Receiving Water (name)
IMP 111	35	36	15	84	48	15	UNNAMED TRIBUTARY OF YELLOW CREEK VIA DSN 112

II. Discharge Date *(If a new discharger, the date you expect to begin discharging)*

NA

III. Type of Waste

A. Check the box(es) indicating the general type of wastes discharged.

[X] Sanitary Wastes [ ] Restaurant or Cafeteria Wastes [ ] Noncontact Cooling Water [ ] Other Nonprocess Wastewater *(identify)*

B. If any cooling water additives are used, list them here. Briefly describe their composition if this information is available.

n/a

IV. Effluent Characteristics

A. Existing Sources - Provide measurements for the parameters listed in the left-hand column below, unless waived by the permitting authority *(see instructions)*.

B. New Discharges - Provide estimates for the parameters listed in the left-hand column below, unless waived by the permitting authority. Instead of the number of measurements taken, provide the source of estimated values *(see instructions)*.

Pollutant or Parameter	(1) Maximum Daily Value *(include units)* Mass	(1) Maximum Daily Value *(include units)* Concentration	(2) Average Daily Value *(last year)* *(include units)* Mass	(2) Average Daily Value *(last year)* *(include units)* Concentration	(3) Number of Measurements Taken *(last year)* (or)	(4) Source of Estimate *(if new discharger)*
Biochemical Oxygen Demand (BOD)		15 mg/L		<3.3 mg/L	54	
Total Suspended Solids (TSS)		7.4 mg/L		<3 mg/L	54	
Fecal Coliform *(if believed present or if sanitary waste is discharged)*		<19 #/100ml		<9 #/100ml	6	
Total Residual Chlorine *(if chlorine is used)*		<0.05 mg/L (Not chlorinating)		NA	1	
Oil and Grease		< 5 mg/L		NA	1	
*Chemical oxygen demand (COD)		14 mg/L		NA	1	
*Total organic carbon (TOC)		4.2 mg/L		NA	1	
Ammonia *(as N)*		0.03 mg/L		NA	1	
Discharge Flow	Value 0.119 MGD		0.03 MGD		366	
pH *(give range)*	Value 6.24 - 6.82 S.U.		NA		4	
Temperature *(Winter)*	10.4 °C		NA °C		1	
Temperature *(Summer)*	NA °C		NA °C			

*Noncontact cooling water is discharged

V. Except for leaks or spills, will the discharge described in this form be intermittent or seasonal?
If yes, briefly describe the frequency of flow and duration. [ ] Yes [X] No

VI. Treatment System *(Describe briefly any treatment system(s) used or to be used)*

Four (4) Extended Aeration Plants with UV Treatment for disinfection.

her Information *(Optional)*
Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitation. Attach additional sheets, if necessary.

Presently the discharge is being monitored weekly for E. Coli.

VIII. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title	B. Phone No. *(area code & no.)*
Michael D. Skaggs, Site Vice President	423-365-8767
C. Signature M Skaggs	D. Date Signed 5/1/06

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

NPDES PERMIT APPLICATION ADDRESSES

All addresses must be completed even if the same address is used:

NPDES PERMIT NUMBER: TN0020168

CORPORATE HEADQUARTERS (where permit should be sent):

CONTACT PERSON: Betsy Eiford-Lee, Mgr Chemical & Environmental (Name / Title) TELEPHONE: (423) 365-3364

COMPANY NAME: Tennessee Valley Authority – Watts Bar Nuclear Plant

STREET AND/OR P.O. BOX: P.O. Box 2000

CITY: Spring City STATE TN ZIP CODE: 37381

PERMIT BILLING ADDRESS (where invoices should be sent):

CONTACT PERSON: Jerri L. Phillips (Name) Environmental Scientist (Title) TELEPHONE: (423) 365-3576

FACILITY NAME : Tennessee Valley Authority – Watts Bar Nuclear Plant

STREET AND/OR P.O. BOX: P. O. Box 2000

CITY: Spring City STATE: TN ZIP CODE: 37381

FACILITY LOCATION (actual location of permit site):

CONTACT PERSON: Jerri L. Phillips (Name) Environmental Scientist (Title) TELEPHONE: (423) 365-3576

FACILITY NAME: Tennessee Valley Authority – Watts Bar Nuclear Plant

STREET AND/OR P.O. BOX: HWY 68 Nuclear Plant Road

CITY: Spring City STATE: TN ZIP CODE: 37381

COUNTY: Rhea TELEPHONE: (423) 365-3576

DMR MAILING ADDRESS (where preprinted Discharge Monitoring Reports should be sent):

CONTACT PERSON: Lindy Johnson (Name) Sr. Water Reg. Spec (Title) TELEPHONE: (423) 751-3361

FACILITY NAME: Tennessee Valley Authority – Watts Bar Nuclear Plant

STREET AND/OR P.O. BOX: 1101 Market Street, LP 5D

CITY: Chattanooga STATE: TN ZIP CODE: 37402

CN-1090 RDAs 2352 AND 2366

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PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS

EPA I.D. NUMBER *(copy from Item 1 of Form 1)* TN2640030035

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

[redacted]

OUTFALL NO. 101

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	3. UNITS *(specify if blank)* a. CONCEN-TRATION	b. MASS	4. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*	3						1	mg/L		<2		1
b. Chemical Oxygen Demand *(COD)*	<5						1	mg/L		6		1
c. Total Organic Carbon *(TOC)*	2.0						1	mg/L		1.7		1
d. Total Suspended Solids *(TSS)*	10.3				5.8		17	mg/L		6		1
e. Ammonia *(as N)*	0.10						1	mg/L		0.02		1
f. Flow	VALUE 71.6		VALUE		VALUE 36		366	MGD		VALUE 46.70		1
g. Temperature *(winter)*	VALUE 27.7		VALUE		VALUE 19.2		178	°C		VALUE 9.8		1
h. Temperature *(summer)*	VALUE 32.3		VALUE		VALUE 27.2		183	°C		VALUE NA		NA
i. pH	MINIMUM 7.11	MAXIMUM 8.56	MINIMUM	MAXIMUM			31	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCEN-TRATION	b. MASS	5. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)	X		<2						1	mg/L		<2		1
b. Chlorine, Total Residual	X		<0.05				<0.03		259	mg/L		<0.05		1
c. Color	X		10						1	PCU		5		1
d. Fecal Coliform		X	NA											
e. Fluoride (16984-48-8)	X		0.1						1	mg/L		<0.1		1
f. Nitrate-Nitrite *(as N)*	X		0.32						1	mg/L		0.22		1

CONTINUE ON PAGE V-2

ITEM V-B CONTINUED FROM PAGE V-1

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE (optional) b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)	X		0.22						1	mg/L		0.19		1
h. Oil and Grease	X		<5.0				<5.0		17	mg/L		<5.0		1
i. Phosphorus (as P), Total (7723-14-0)	X		0.09						1	mg/L		0.04		1
j. Radioactivity														
(1) Alpha, Total	X		<7.0 (1)						1	pCi/L		<7.0		1
(2) Beta, Total	X		<3.4 (1)						1	pCi/L		<3.4		1
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (as SO_4) (14808-79-8)	X		14						1	mg/L		13		1
l. Sulfide (as S)	X		<0.02						1	mg/L		<0.02		1
m. Sulfite (as SO_3) (14265-45-3)	X		<0.5						1	mg/L		<0.5		1
n. Surfactants	X		<0.1						1	mg/L		<0.1		1
o. Aluminum, Total (7429-90-5)	X		0.21						1	mg/L		0.20		1
p. Barium, Total (7440-39-3)	X		0.02						1	mg/L		0.02		1
q. Boron, Total (7440-42-8)	X		<0.2						1	mg/L		<0.2		1
r. Cobalt, Total (7440-48-4)	X		<0.001						1	mg/L		<0.001		1
s. Iron, Total (7439-89-6)	X		0.21						1	mg/L		0.23		1
t. Magnesium, Total (7439-95-4)	X		5.5						1	mg/L		4.9		1
u. Molybdenum, Total (7439-98-7)	X		<0.02						1	mg/L		<0.02		1
v. Manganese, Total (7439-96-5)	X		0.032						1	mg/L		0.051		1
w. Tin, Total (7440-31-5)	X		<0.05						1	mg/L		<0.05		1
x. Titanium, Total (7440-32-6)	X		<0.005						1	mg/L		<0.005		1

CONTINUE ON PAGE V-3

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	101

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)	X			<0.003						1	mg/L		<0.003		1
2M. Arsenic, Total (7440-38-2)	X			<0.001						1	mg/L		<0.001		1
3M. Beryllium, Total, (7440-41-7)	X			<0.001						1	mg/L		<0.001		1
4M. Cadmium, Total (7440-43-9)	X			<0.0001						1	mg/L		<0.0001		1
5M. Chromium, Total (7440-47-3)	X			<0.001						1	mg/L		<0.001		1
6M. Copper, Total (7440-50-8)	X			0.003						1	mg/L		<0.001		1
7M. Lead, Total (7439-92-1)	X			<0.001						1	mg/L		<0.001		1
8M. Mercury, Total (7439-97-6)	X			<0.0001						1	mg/L		<0.0001		1
9M. Nickel, Total (7440-02-0)	X			<0.001						1	mg/L		<0.001		1
10M. Selenium, Total (7782-49-2)	X			<0.001						1	mg/L		<0.001		1
11M. Silver, Total (7440-22-4)	X			<0.0001						1	mg/L		<0.0001		1
12M. Thallium, Total (7440-28-0)	X			<0.002						1	mg/L		<0.002		1
13M. Zinc, Total (7440-66-6)	X			0.94				<0.08		25	mg/L		<0.01		1
14M. Cyanide, Total (57-12-5)	X			<0.005						1	mg/L		<0.005		1
15M. Phenols, Total	X			<0.04						1	mg/L		<0.04		1
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUE ON PAGE V-4

1. POLL[illegible] AND [illegible] NUMB (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TEST-ING RE-QUIRED	b. BE-LIEVED PRE-SENT	c. BE-LIEVED AB-SENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY [illegible] (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANAL-YSES	a. CONCEN-TRATION	b. MASS	a. LONG T[illegible] AVERAGE [illegible]		b. NO. OF ANAL-YSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) [illegible]	(1) CONCENTRATION	(2) MASS				(1) CONCEN-TRATION	(2, [illegible]	
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	X			<0.001						1	mg/L		<0.001		1
2V. Acrylonitrile (107-13-1)	X			<0.001						1	mg/L		<0.001		1
3V. Benzene (71-43-2)	X			<0.001						1	mg/L		<0.001		1
4V. Bis *(Chloro-methyl)* Ether (542-88-1)	X			<0.1						1	mg/L		<0.1		1
5V. Bromoform (75-25-2)	X			<0.001						1	mg/L		<0.001		1
6V. Carbon Tetrachloride (56-23-5)	X			<0.001						1	mg/L		<0.001		1
7V. Chlorobenzene (108-90-7)	X			<0.01						1	mg/L		<0.01		1
8V. Chlorodi-bromomethane (124-48-1)	X			<0.001						1	mg/L		<0.001		1
9V. Chloroethane (75-00-3)	X			<0.01						1	mg/L		<0.01		1
10V. 2-Chloro-ethylvinyl Ether (110-75-8)	X			<0.01						1	mg/L		<0.01		1
11V. Chloroform (67-66-3)	X			<0.0005						1	mg/L		<0.0005		1
12V. Dichloro-bromomethane (75-27-4)	X			<0.001						1	mg/L		<0.001		1
13V. Dichloro-difluoromethane (75-71-8)	X			<0.001						1	mg/L		<0.001		1
14V. 1,1-Dichloro-ethane (75-34-3)	X			<0.001						1	mg/L		<0.001		1
15V. 1,2-Dichloro-ethane (107-06-2)	X			<0.001						1	mg/L		<0.001		1
16V. 1,1-Dichloro-ethylene (75-35-4)	X			<0.001						1	mg/L		<0.001		1
17V. 1,2-Dichloro-propane (78-87-5)	X			<0.01						1	mg/L		<0.01		1
18V. 1,3-Dichloro-propylene (542-75-6)	X			<0.001						1	mg/L		<0.001		1
19V. Ethylbenzene (100-41-4)	X			<0.001						1	mg/L		<0.001		1
20V. Methyl Bromide (74-83-9)	X			<0.01						1	mg/L		<0.01		1
21V. Methyl Chloride (74-87-3)	X			<0.001						1	mg/L		<0.001		1

CONTINUE ON PAGE V-5

CONTINUED FROM PAGE V-4

EPA I.D. NUMBER (c[illegible] item 1 of Form 1) [illegible]0030035

OUTFALL NUMBER 101

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)	X			0.001						1	mg/L		0.002		1
23V. 1,1,2,2-Tetrachloroethane (79-34-5)	X			<0.0005						1	mg/L		<0.0005		1
24V. Tetrachloroethylene (127-18-4)	X			<0.0005						1	mg/L		<0.0005		1
25V. Toluene (108-88-3)	X			<0.001						1	mg/L		<0.001		1
26V. 1,2-Trans-Dichloroethylene (156-60-5)	X			<0.01						1	mg/L		<0.01		1
27V. 1,1,1-Trichloroethane (71-55-6)	X			<0.001						1	mg/L		<0.001		1
28V. 1,1,2-Trichloroethane (79-00-5)	X			<0.0002						1	mg/L		<0.0002		1
29V. Trichloroethylene (79-01-6)	X			<0.001						1	mg/L		<0.001		1
30V. Trichlorofluoromethane (75-69-4)	X			<0.01						1	mg/L		<0.01		1
31V. Vinyl Chloride (75-01-4)	X			<0.002						1	mg/L		<0.002		1
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)	X			<0.005						1	mg/L		<0.005		1
2A. 2,4-Dichlorophenol (120-83-2)	X			<0.005						1	mg/L		<0.005		1
3A. 2,4-Dimethylphenol (105-67-9)	X			<0.005						1	mg/L		<0.005		1
4A. 4,6-Dinitro-O-Cresol (534-52-1)	X			<0.024						1	mg/L		<0.024		1
5A. 2,4-Dinitrophenol (51-28-5)	X			<0.02						1	mg/L		<0.02		1
6A. 2-Nitrophenol (88-75-5)	X			<0.005						1	mg/L		<0.005		1
7A. 4-Nitrophenol (100-02-7)	X			<0.03						1	mg/L		<0.03		1
8A. P-Chloro-M Cresol (59-50-7)	X			<0.024						1	mg/L		<0.024		1
9A. Pentachlorophenol (87-86-5)	X			<0.005						1	mg/L		<0.005		1
10A. Phenol (108-95-2)	X			<0.005						1	mg/L		<0.005		1
11A. 2,4,6-Trichlorophenol (88-06-2)	X			<.0.0027						1	mg/L		<.0.0027		1

CONTINUE ON PAGE V-6

CONTINUED FROM PAGE V-5

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	X			<0.005						1	mg/L		<0.005		1
2B. Acenaphtylene (208-96-8)	X			<0.0023						1	mg/L		<0.0023		1
3B. Anthracene (120-12-7)	X			<0.0007						1	mg/L		<0.0007		1
4B. Benzidine (92-87-5)	X			<0.05						1	mg/L		<0.05		1
5B. Benzo *(a)* Anthracene (56-55-3)	X			<0.0003						1	mg/L		<0.0003		1
6B. Benzo *(a)* Pyrene (50-32-8)	X			<0.0003						1	mg/L		<0.0003		1
7B. 3,4-Benzo-fluoranthene (205-99-2)	X			<0.0003						1	mg/L		<0.0003		1
8B. Benzo *(ghi)* Perylene (191-24-2)	X			<0.01						1	mg/L		<0.01		1
9B. Benzo *(k)* Fluoranthene (207-08-9)	X			<0.0003						1	mg/L		<0.0003		1
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)	X			<0.005						1	mg/L		<0.005		1
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)	X			<0.001						1	mg/L		<0.001		1
12B. Bis *(2-Chloro-isopropyl)* Ether (102-60-1)	X			<0.005						1	mg/L		<0.005		1
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)	X			<0.0025						1	mg/L		<0.0025		1
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)	X			<0.005						1	mg/L		<0.005		1
15B. Butyl Benzyl Phthalate (85-68-7)	X			<0.005						1	mg/L		<0.005		1
16B. 2-Chloro-naphthalene (91-58-7)	X			<0.005						1	mg/L		<0.005		1
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)	X			<0.005						1	mg/L		<0.005		1
18B. Chrysene (218-01-9)	X			<0.0025						1	mg/L		<0.0025		1
19B. Dibenzo *(a,h)* Anthracene (53-70-3)	X			<0.01						1	mg/L		<0.01		1
20B. 1,2-Dichloro-benzene (95-50-1)	X			<0.002						1	mg/L		<0.002		1
21B. 1,3-Dichloro-benzene (541-73-1)	X			<0.002						1	mg/L		<0.002		1

CONTINUE ON PAGE V-7

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
TN2640030035	101

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)	X			<0.0044						1	mg/L		<0.0044		1
23B. 3,3'-Dichlorobenzidine (91-94-1)	X			<0.025						1	mg/L		<0.025		1
24B. Diethyl Phthalate (84-66-2)	X			<0.0019						1	mg/L		<0.0019		1
25B. Dimethyl Phthalate (131-11-3)	X			<0.0016						1	mg/L		<0.0016		1
26B. Di-N-Butyl Phthalate (84-74-2)	X			<0.0025						1	mg/L		<0.0025		1
27B. 2,4-Dinitrotoluene (121-14-2)	X			<0.001						1	mg/L		<0.001		1
28B. 2,6-Dinitrotoluene (606-20-2)	X			<0.005						1	mg/L		<0.005		1
29B. Di-N-Octyl Phthalate (117-84-0)	X			<0.01						1	mg/L		<0.01		1
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	X			<0.1						1	mg/L		<0.1		1
31B. Fluoranthene (206-44-0)	X			<0.0022						1	mg/L		<0.0022		1
32B. Fluorene (86-73-7)	X			<0.0003						1	mg/L		<0.0003		1
33B. Hexachlorobenzene (118-74-1)	X			<0.0019						1	mg/L		<0.0019		1
34B. Hexachlorobutadiene (87-68-3)	X			<0.005						1	mg/L		<0.005		1
35B. Hexachlorocyclopentadiene (77-47-4)	X			<0.03						1	mg/L		<0.03		1
36B. Hexachloroethane (67-72-1)	X			<0.0005						1	mg/L		<0.0005		1
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)	X			<0.01						1	mg/L		<0.01		1
38B. Isophorone (78-59-1)	X			<0.005						1	mg/L		<0.005		1
39B. Naphthalene (91-20-3)	X			<0.005						1	mg/L		<0.005		1
40B. Nitrobenzene (98-95-3)	X			<0.005						1	mg/L		<0.005		1
41B. N-Nitrosodimethylamine (62-75-9)	X			<0.001						1	mg/L		<0.001		1
42B. N-Nitrosodi-N-Propylamine (621-64-7)	X			<0.005						1	mg/L		<0.005		1

CONTINUE ON PAGE V-8

CONTINUED FROM PAGE V-7

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B. N-Nitrosodiphenylamine (86-30-6)	X			<0.005						1	mg/L		<0.005		1
44B. Phenanthrene (85-01-8)	X			<0.0007						1	mg/L		<0.0007		1
45B. Pyrene (129-00-0)	X			<0.0003						1	mg/L		<0.0003		1
46B. 1,2,4 - Trichlorobenzene (120-82-1)	X			<0.005						1	mg/L		<0.005		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β -BHC (319-85-7)			X												
4P. γ- BHC (58-89-9)			X												
5P. δ- BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Endosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

CONTINUE ON PAGE V-9

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	101

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. LONG TERM AVERAGE VALUE		a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES *(continued)*															
17B. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

NOTES:

(1) Natual background radiation levels.

Note: Long term average values from October 1, 2004 through September 30, 2005.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS

EPA I.D. NUMBER *(copy from Item 1 of Form 1)* TN2640030035

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

[redacted]

OUTFALL NO. Outfall 102 (alt to 101)

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	3. UNITS *(specify if blank)* a. CONCENTRATION	b. MASS	4. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*												
b. Chemical Oxygen Demand *(COD)*		NO DISCHARGE FROM 102 DURING RENEWAL SAMPLING.										
c. Total Organic Carbon *(TOC)*		SEE DISCHARGE OF 101 FOR REP. DATA. HISTORICAL DATA FROM 102.										
d. Total Suspended Solids *(TSS)*	5.5				5.2		2	mg/L				
e. Ammonia *(as N)*												
f. Flow	VALUE 29.3				17.41		7	MGD		VALUE		
g. Temperature *(winter)*	VALUE 12.1				11.2		7	°C		VALUE		
h. Temperature *(summer)*	VALUE NA				NA			°C		VALUE		
i. pH	MINIMUM 7.46	8.06					3	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)														
b. Chlorine, Total Residual			0.06				0.026		7	mg/L				
c. Color														
d. Fecal Coliform														
e. Fluoride (16984-48-8)														
f. Nitrate-Nitrite *(as N)*														

CONTINUE ON PAGE V-2

ITEM V-B CONTINUED FROM PAGE V-1

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE (optional) b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)														
h. Oil and Grease			<5				<5		2	mg/L				
i. Phosphorus (as P), Total (7723-14-0)														
j. Radioactivity														
(1) Alpha, Total														
(2) Beta, Total														
(3) Radium, Total														
(4) Radium 226, Total														
k. Sulfate (as SO_4) (14808-79-8)														
l. Sulfide (as S)														
m Sulfite (as SO_3) (14265-45-3)														
n. Surfactants														
o. Aluminum, Total (7429-90-5)														
p. Barium, Total (7440-39-3)														
q. Boron, Total (7440-42-8)														
r. Cobalt, Total (7440-48-4)														
s. Iron,Total (7439-89-6)														
t. Magnesium, Total (7439-95-4)														
u. Molybdenum, Total (7439-98-7)														
v. Manganese, Total (7439-96-5)														
w. Tin, Total (7440-31-5)														
x. Titanium, Total (7440-32-6)														

CONTINUE ON PAGE V-3

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	102 (alt to 101)

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)															
2M. Arsenic, Total (7440-38-2)															
3M. Beryllium, Total, (7440-41-7)															
4M. Cadmium, Total (7440-43-9)															
5M. Chromium, Total (7440-47-3)															
6M. Copper, Total (7440-50-8)															
7M. Lead, Total (7439-92-1)															
8M. Mercury, Total (7439-97-6)															
9M. Nickel, Total (7440-02-0)															
10M. Selenium, Total (7782-49-2)															
11M. Silver, Total (7440-22-4)															
12M. Thallium, Total (7440-28-0)															
13M. Zinc, Total (7440-66-6)				0.01				<0.01		3	mg/L				
14M. Cyanide, Total (57-12-5)															
15M. Phenols, Total															
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P Dioxin (1764-01-6)				DESCRIBE RESULTS											

CONTINUE ON PAGE V-4

1. POLLU AND C NUMB (if availab	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TEST-ING RE-QUIRED	b. BE-LIEVED PRE-SENT	c. BE-LIEVED AB-SENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY V (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANAL-YSES	a. CONCEN-TRATION	b. MASS	a. LONG TE AVERAGE		b. NO. OF ANAL-YSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2	(1) CONCENTRATION	(2) MASS				(1) CONCEN-TRATION	(2	
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)															
2V. Acrylonitrile (107-13-1)															
3V. Benzene (71-43-2)															
4V. Bis *(Chloro-methyl)* Ether (542-88-1)															
5V. Bromoform (75-25-2)															
6V. Carbon Tetrachloride (56-23-5)															
7V. Chlorobenzene (108-90-7)															
8V. Chlorodi-bromomethane (124-48-1)															
9V. Chloroethane (75-00-3)															
10V. 2-Chloro-ethylvinyl Ether (110-75-8)															
11V. Chloroform (67-66-3)															
12V. Dichloro-bromomethane (75-27-4)															
13V. Dichloro-difluoromethane (75-71-8)															
14V. 1,1-Dichloro-ethane (75-34-3)															
15V. 1,2-Dichloro-ethane (107-06-2)															
16V. 1,1-Dichloro-ethylene (75-35-4)															
17V. 1,2-Dichloro-propane (78-87-5)															
18V. 1,3-Dichloro-propylene (542-75-6)															
19V. Ethylbenzene (100-41-4)															
20V. Methyl Bromide (74-83-9)															
21V. Methyl Chloride (74-87-3)															

CONTINUE ON PAGE V-5

EPA I.D. NUMBER (c[illegible] Item 1 of Form 1)	OUTFALL NUMBER
TNC040030035	102 (alt to 101)

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)															
23V. 1,1,2,2-Tetrachloroethane (79-34-5)															
24V. Tetrachloroethylene (127-18-4)															
25V. Toluene (108-88-3)															
26V. 1,2-Trans-Dichloroethylene (156-60-5)															
27V. 1,1,1-Trichloroethane (71-55-6)															
28V. 1,1,2-Trichloroethane (79-00-5)															
29V. Trichloroethylene (79-01-6)															
30V. Trichlorofluoromethane (75-69-4)															
31V. Vinyl Chloride (75-01-4)															
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)															
2A. 2,4-Dichlorophenol (120-83-2)															
3A. 2,4-Dimethylphenol (105-67-9)															
4A. 4,6-Dinitro-O-Cresol (534-52-1)															
5A. 2,4-Dinitrophenol (51-28-5)															
6A. 2-Nitrophenol (88-75-5)															
7A. 4-Nitrophenol (100-02-7)															
8A. P-Chloro-M Cresol (59-50-7)															
9A. Pentachlorophenol (87-86-5)															
10A. Phenol (108-95-2)															
11A. 2,4,6-Trichlorophenol (88-06-2)															

CONTINUE ON PAGE V-6

CONTINUED FROM PAGE V-5

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)															
2B. Acenaphtylene (208-96-8)															
3B. Anthracene (120-12-7)															
4B. Benzidine (92-87-5)															
5B. Benzo *(a)* Anthracene (56-55-3)															
6B. Benzo *(a)* Pyrene (50-32-8)															
7B. 3,4-Benzo-fluoranthene (205-99-2)															
8B. Benzo *(ghi)* Perylene (191-24-2)															
9B. Benzo *(k)* Fluoranthene (207-08-9)															
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)															
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)															
12B. Bis *(2-Chloro-isopropyl)* Ether (102-60-1)															
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)															
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)															
15B. Butyl Benzyl Phthalate (85-68-7)															
16B. 2-Chloro-naphthalene (91-58-7)															
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)															
18B. Chrysene (218-01-9)															
19B. Dibenzo *(a,h)* Anthracene (53-70-3)															
20B. 1,2-Dichloro-benzene (95-50-1)															
21B. 1,3-Dichloro-benzene (541-73-1)															

CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
TN2640030035	102 (alt to 101)

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG VALUE (if available)		d. NO OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)															
23B. 3,3'-Dichlorobenzidine (91-94-1)															
24B. Diethyl Phthalate (84-66-2)															
25B. Dimethyl Phthalate (131-11-3)															
26B. Di-N-Butyl Phthalate (84-74-2)															
27B. 2,4-Dinitrotoluene (121-14-2)															
28B. 2,6-Dinitrotoluene (606-20-2)															
29B. Di-N-Octyl Phthalate (117-84-0)															
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)															
31B. Fluoranthene (206-44-0)															
32B. Fluorene (86-73-7)															
33B. Hexachlorobenzene (118-74-1)															
34B. Hexachlorobutadiene (87-68-3)															
35B. Hexachlorocyclopentadiene (77-47-4)															
36B. Hexachloroethane (67-72-1)															
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)															
38B. Isophorone (78-59-1)															
39B. Naphthalene (91-20-3)															
40B. Nitrobenzene (98-95-3)															
41B. N-Nitrosodimethylamine (62-75-9)															
42B. N-Nitrosodi-N-Propylamine (621-64-7)															

CONTINUE ON PAGE V-8

CONTINUED FROM PAGE V-7

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B. N-Nitrosodiphenylamine (86-30-6)															
44B. Phenanthrene (85-01-8)															
45B. Pyrene (129-00-0)															
46B. 1,2,4 - Trichlorobenzene (120-82-1)															
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)															
2P. α-BHC (319-84-6)															
3P. β -BHC (319-85-7)															
4P. γ- BHC (58-89-9)															
5P. δ- BHC (319-86-8)															
6P. Chlordane (57-74-9)															
7P. 4,4'-DDT (50-29-3)															
8P. 4,4'-DDE (72-55-9)															
9P. 4,4'-DDD (72-54-8)															
10P. Dieldrin (60-57-1)															
11P. α-Endosulfan (115-29-7)															
12P. β-Endosulfan (115-29-7)															
13P. Endosulfan Sulfate (1031-07-8)															
14P. Endrin (72-20-8)															
15P. Endrin Aldehyde (7421-93-4)															
16P. Heptachlor (76-44-8)															

CONTINUE ON PAGE V-9

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	102 (alt to 101)

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. LONG TERM AVERAGE VALUE		a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES *(continued)*															
17B. Heptachlor Epoxide (1024-57-3)															
18P. PCB-1242 (53469-21-9)															
19P. PCB-1254 (11097-69-1)															
20P. PCB-1221 (11104-28-2)															
21P. PCB-1232 (11141-16-5)															
22P. PCB-1248 (12672-29-6)															
23P. PCB-1260 (11096-82-5)															
24P. PCB-1016 (12674-11-2)															
25P. Toxaphene (8001-35-2)															

NOTES:

(1) Natual background radiation levels.

Note: Long term average values from October 1, 2004 through September 30, 2005.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)* TN2640030035

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. IMP 103 (Int. to 101)

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	4. INTAKE b. NO OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*	19	INTERNAL DISCHARGE TO OUTFALL 101					1	mg/L				
b. Chemical Oxygen Demand *(COD)*	15						1	mg/L				
c. Total Organic Carbon *(TOC)*	3.4						1	mg/L				
d. Total Suspended Solids *(TSS)*	19				7.21		26	mg/L				
e. Ammonia *(as N)*	6.2						1	mg/L				
f. Flow	VALUE 1.5		VALUE		VALUE 0.23		289	MGD		VALUE		
g. Temperature *(winter)*	VALUE 10.2		VALUE		VALUE NA		1	°C		VALUE		
h. Temperature *(summer)*	VALUE NA		VALUE NA		VALUE NA		NA	°C		VALUE		
i. pH	MINIMUM 7.00	MAXIMUM 8.89	MINIMUM	MAXIMUM			49	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE b. NO OF ANALYSES
a. Bromide (24959-67-9)	X		<2						1	mg/L				
b. Chlorine, Total Residual	X		<0.05						1	mg/L				
c. Color	X		10						1	PCU				
d. Fecal Coliform		X	NA											
e. Fluoride (16984-48-8)	X		0.12						1	mg/L				
f. Nitrate-Nitrite *(as N)*	X		3.3						1	mg/L				

CONTINUE ON PAGE V-2

ITEM V-B CONTINUED FROM PAGE V-1

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE (optional) b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)	X		<0.01						1	mg/L				
h. Oil and Grease	X		<5.0				<5.0		26	mg/L				
i. Phosphorus (as P), Total (7723-14-0)	X		0.12						1	mg/L				
j. Radioactivity														
(1) Alpha, Total	X		<7.0 (1)						1	pCi/L				
(2) Beta, Total	X		<3.4 (1)						1	pCi/L				
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (as SO_4) (14808-79-8)	X		29						1	mg/L				
l. Sulfide (as S)	X		<0.02						1	mg/L				
m Sulfite (as SO_3) (14265-45-3)	X		<0.5						1	mg/L				
n. Surfactants	X		<0.1						1	mg/L				
o. Aluminum, Total (7429-90-5)	X		0.08						1	mg/L				
p. Barium, Total (7440-39-3)	X		0.03						1	mg/L				
q. Boron, Total (7440-42-8)	X		<0.2						1	mg/L				
r. Cobalt, Total (7440-48-4)	X		<0.001						1	mg/L				
s. Iron, Total (7439-89-6)	X		0.08						1	mg/L				
t. Magnesium, Total (7439-95-4)	X		8.4						1	mg/L				
u. Molybdenum, Total (7439-98-7)	X		<0.02						1	mg/L				
v. Manganese, Total (7439-96-5)	X		0.020						1	mg/L				
w. Tin, Total (7440-31-5)	X		<0.05						1	mg/L				
x. Titanium, Total (7440-32-6)	X		<0.005						1	mg/L				

CONTINUE ON PAGE V-3

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	IMP 103

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE *(if available)* (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	c. LONG TERM AVRG. VALUE *(if available)* (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO OF ANALYSES
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)	X			<0.003						1	mg/L				
2M. Arsenic, Total (7440-38-2)	X			<0.001						1	mg/L				
3M. Beryllium, Total, (7440-41-7)	X			<0.001						1	mg/L				
4M. Cadmium, Total (7440-43-9)	X			<0.0001						1	mg/L				
5M. Chromium, Total (7440-47-3)	X			<0.001						1	mg/L				
6M. Copper, Total (7440-50-8)	X			0.004						1	mg/L				
7M. Lead, Total (7439-92-1)	X			<0.001						1	mg/L				
8M. Mercury, Total (7439-97-6)	X			<0.0001						1	mg/L				
9M. Nickel, Total (7440-02-0)	X			<0.001						1	mg/L				
10M. Selenium, Total (7782-49-2)	X			<0.001						1	mg/L				
11M. Silver, Total (7440-22-4)	X			<0.0001						1	mg/L				
12M. Thallium, Total (7440-28-0)	X			<0.002						1	mg/L				
13M. Zinc, Total (7440-66-6)	X			<0.01						1	mg/L				
14M. Cyanide, Total (57-12-5)	X			<0.005						1	mg/L				
15M. Phenols, Total	X			<0.04						1	mg/L				
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUE ON PAGE V-4

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)															
2V. Acrylonitrile (107-13-1)															
3V. Benzene (71-43-2)															
4V. Bis *(Chloromethyl)* Ether (542-88-1)															
5V. Bromoform (75-25-2)															
6V. Carbon Tetrachloride (56-23-5)															
7V. Chlorobenzene (108-90-7)															
8V. Chlorodibromomethane (124-48-1)															
9V. Chloroethane (75-00-3)															
10V. 2-Chloroethylvinyl Ether (110-75-8)															
11V. Chloroform (67-66-3)															
12V. Dichlorobromomethane (75-27-4)															
13V. Dichlorodifluoromethane (75-71-8)															
14V. 1,1-Dichloroethane (75-34-3)															
15V. 1,2-Dichloroethane (107-06-2)															
16V. 1,1-Dichloroethylene (75-35-4)															
17V. 1,2-Dichloropropane (78-87-5)															
18V. 1,3-Dichloropropylene (542-75-6)															
19V. Ethylbenzene (100-41-4)															
20V. Methyl Bromide (74-83-9)															
21V. Methyl Chloride (74-87-3)															

Volatile, Acid, and Base/Neutral Compounds Sampled at DSN 101.

CONTINUE ON PAGE V-5

EPA I.D. NUMBER (copy from Item 1 of Form 1) 0030035

OUTFALL NUMBER IMP 103

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)															
23V. 1,1,2,2-Tetrachloroethane (79-34-5)															
24V. Tetrachloroethylene (127-18-4)															
25V. Toluene (108-88-3)															
26V. 1,2-Trans-Dichloroethylene (156-60-5)															
27V. 1,1,1-Trichloroethane (71-55-6)															
28V. 1,1,2-Trichloroethane (79-00-5)															
29V. Trichloroethylene (79-01-6)															
30V. Trichloro-fluoromethane (75-69-4)															
31V. Vinyl Chloride (75-01-4)															
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)															
2A. 2,4-Dichlorophenol (120-83-2)															
3A. 2,4-Dimethylphenol (105-67-9)															
4A. 4,6-Dinitro-O-Cresol (534-52-1)															
5A. 2,4-Dinitrophenol (51-28-5)															
6A. 2-Nitrophenol (88-75-5)															
7A. 4-Nitrophenol (100-02-7)															
8A. P-Chloro-M Cresol (59-50-7)															
9A. Pentachlorophenol (87-86-5)															
10A. Phenol (108-95-2)															
11A. 2,4,6-Trichlorophenol (88-06-2)															

Volatile, Acid, and Base/Neutral Compounds Sampled at DSN 101.

CONTINUE ON PAGE V-6

CONTINUED FROM PAGE V-5

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)															
2B. Acenaphtylene (208-96-8)															
3B. Anthracene (120-12-7)															
4B. Benzidine (92-87-5)															
5B. Benzo *(a)* Anthracene (56-55-3)															
6B. Benzo *(a)* Pyrene (50-32-8)															
7B. 3,4-Benzo-fluoranthene (205-99-2)															
8B. Benzo *(ghi)* Perylene (191-24-2)															
9B. Benzo *(k)* Fluoranthene (207-08-9)															
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)															
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)															
12B. Bis *(2-Chloro-isopropyl)* Ether (102-60-1)															
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)															
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)															
15B. Butyl Benzyl Phthalate (85-68-7)															
16B. 2-Chloro-naphthalene (91-58-7)															
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)															
18B. Chrysene (218-01-9)															
19B. Dibenzo *(a,h)* Anthracene (53-70-3)															
20B. 1,2-Dichloro-benzene (95-50-1)															
21B. 1,3-Dichloro-benzene (541-73-1)															

Volatile, Acid, and Base/Neutral Compounds Sampled at DSN 101.

CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
TN2640030035	IMP 103

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)															
23B. 3,3'-Dichlorobenzidine (91-94-1)															
24B. Diethyl Phthalate (84-66-2)															
25B. Dimethyl Phthalate (131-11-3)															
26B. Di-N-Butyl Phthalate (84-74-2)															
27B. 2,4-Dinitrotoluene (121-14-2)															
28B. 2,6-Dinitrotoluene (606-20-2)															
29B. Di-N-Octyl Phthalate (117-84-0)															
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)															
31B. Fluoranthene (206-44-0)															
32B. Fluorene (86-73-7)															
33B. Hexachlorobenzene (118-74-1)															
34B. Hexachlorobutadiene (87-68-3)															
35B. Hexachlorocyclopentadiene (77-47-4)															
36B. Hexachloroethane (67-72-1)															
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)															
38B. Isophorone (78-59-1)															
39B. Naphthalene (91-20-3)															
40B. Nitrobenzene (98-95-3)															
41B. N-Nitrosodimethylamine (62-75-9)															
42B. N-Nitrosodi-N-Propylamine (621-64-7)															

Volatile, Acid, and Base/Neutral Compounds Sampled at DSN 101.

CONTINUE ON PAGE V-8

CONTINUED FROM PAGE V-7

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS *(continued)*															
43B. N-Nitrosodiphenylamine (86-30-6)															
44B. Phenanthrene (85-01-8)				Volatile, Acid, and Base/Neutral Compounds Sampled at DSN 101.											
45B. Pyrene (129-00-0)															
46B. 1,2,4 - Trichlorobenzene (120-82-1)															
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β -BHC (319-85-7)			X												
4P. γ- BHC (58-89-9)			X												
5P. δ- BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Endosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

CONTINUE ON PAGE V-9

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	IMP 103

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. LONG TERM AVERAGE VALUE		a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES *(continued)*															
17B. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

NOTES:

(1) Natual background radiation levels.

Note: Long term average values from October 1, 2004 through September 30, 2005.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS

EPA I.D. NUMBER *(copy from Item 1 of Form 1)* TN2640030035

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO IMP 107 (int.to 101)

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	3. UNITS *(specify if blank)* a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	b. NO OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*	NO DISCHARGE FROM 107 DURING RENEWAL SAMPLING.											
b. Chemical Oxygen Demand *(COD)*	INTERNAL DISCHARGE TO 101 - HISTORICAL DATA FROM 107.											
c. Total Organic Carbon *(TOC)*												
d. Total Suspended Solids *(TSS)*	7.0				4.5		4	mg/L				
e. Ammonia *(as N)*												
f. Flow	VALUE 2.6		VALUE		VALUE 1.9		4	MGD		VALUE		
g. Temperature *(winter)*	VALUE NA		VALUE		VALUE NA			°C		VALUE		
h. Temperature *(summer)*	VALUE NA		VALUE		VALUE NA			°C		VALUE		
i. pH	MINIMUM 8.35	MAXIMUM 8.52	MINIMUM	MAXIMUM			4	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	b. NO OF ANALYSES
a. Bromide (24959-67-9)														
b. Chlorine, Total Residual														
c. Color														
d. Fecal Coliform														
e. Fluoride (16984-48-8)														
f. Nitrate-Nitrite *(as N)*														

CONTINUE ON PAGE V-2

ITEM V-B CONTINUED FROM PAGE V-1

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)														
h. Oil and Grease			<5				<5		4	mg/L				
i. Phosphorus (as P), Total (7723-14-0)			0.16				0.09		4	mg/L				
j. Radioactivity														
(1) Alpha, Total														
(2) Beta, Total														
(3) Radium, Total														
(4) Radium 226, Total														
k. Sulfate (as SO_4) (14808-79-8)														
l. Sulfide (as S)														
m Sulfite (as SO_3) (14265-45-3)														
n. Surfactants														
o. Aluminum, Total (7429-90-5)														
p. Barium, Total (7440-39-3)														
q. Boron, Total (7440-42-8)														
r. Cobalt, Total (7440-48-4)														
s. Iron,Total (7439-89-6)			0.37				0.20		4	mg/L				
t. Magnesium, Total (7439-95-4)														
u. Molybdenum, Total (7439-98-7)														
v. Manganese, Total (7439-96-5)														
w. Tin, Total (7440-31-5)														
x. Titanium, Total (7440-32-6)														

CONTINUE ON PAGE V-3

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	IMP 107

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)															
2M. Arsenic, Total (7440-38-2)															
3M. Beryllium, Total, (7440-41-7)															
4M. Cadmium, Total (7440-43-9)															
5M. Chromium, Total (7440-47-3)															
6M. Copper, Total (7440-50-8)				0.006				0.0048		4	mg/L				
7M. Lead, Total (7439-92-1)															
8M. Mercury, Total (7439-97-6)															
9M. Nickel, Total (7440-02-0)															
10M. Selenium, Total (7782-49-2)															
11M. Silver, Total (7440-22-4)															
12M. Thallium, Total (7440-28-0)															
13M. Zinc, Total (7440-66-6)															
14M. Cyanide, Total (57-12-5)															
15M. Phenols, Total															
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P Dioxin (1764-01-6)				DESCRIBE RESULTS											

CONTINUE ON PAGE V-4

CONTINUED FROM PAGE V-3

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)															
2V. Acrylonitrile (107-13-1)															
3V. Benzene (71-43-2)															
4V. Bis (Chloromethyl) Ether (542-88-1)															
5V. Bromoform (75-25-2)															
6V. Carbon Tetrachloride (56-23-5)															
7V. Chlorobenzene (108-90-7)															
8V. Chlorodibromomethane (124-48-1)															
9V. Chloroethane (75-00-3)															
10V. 2-Chloroethylvinyl Ether (110-75-8)															
11V. Chloroform (67-66-3)															
12V. Dichlorobromomethane (75-27-4)															
13V. Dichlorodifluoromethane (75-71-8)															
14V. 1,1-Dichloroethane (75-34-3)															
15V. 1,2-Dichloroethane (107-06-2)															
16V. 1,1-Dichloroethylene (75-35-4)															
17V. 1,2-Dichloropropane (78-87-5)															
18V. 1,3-Dichloropropylene (542-75-6)															
19V. Ethylbenzene (100-41-4)															
20V. Methyl Bromide (74-83-9)															
21V. Methyl Chloride (74-87-3)															

CONTINUE ON PAGE V-5

EPA I.D. NUMBER (copy from Item 1 of Form 1) '0030035 | OUTFALL NUMBER IMP 107

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)															
23V. 1,1,2,2-Tetrachloroethane (79-34-5)															
24V. Tetrachloroethylene (127-18-4)															
25V. Toluene (108-88-3)															
26V. 1,2-Trans-Dichloroethylene (156-60-5)															
27V. 1,1,1-Trichloroethane (71-55-6)															
28V. 1,1,2-Trichloroethane (79-00-5)															
29V. Trichloroethylene (79-01-6)															
30V. Trichlorofluoromethane (75-69-4)															
31V. Vinyl Chloride (75-01-4)															
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)															
2A. 2,4-Dichlorophenol (120-83-2)															
3A. 2,4-Dimethylphenol (105-67-9)															
4A. 4,6-Dinitro-O-Cresol (534-52-1)															
5A. 2,4-Dinitrophenol (51-28-5)															
6A. 2-Nitrophenol (88-75-5)															
7A. 4-Nitrophenol (100-02-7)															
8A. P-Chloro-M Cresol (59-50-7)															
9A. Pentachlorophenol (87-86-5)															
10A. Phenol (108-95-2)															
11A. 2,4,6-Trichlorophenol (88-06-2)															

CONTINUE ON PAGE V-6

CONTINUED FROM PAGE V-5

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)															
2B. Acenaphtylene (208-96-8)															
3B. Anthracene (120-12-7)															
4B. Benzidine (92-87-5)															
5B. Benzo *(a)* Anthracene (56-55-3)															
6B. Benzo *(a)* Pyrene (50-32-8)															
7B. 3,4-Benzo-fluoranthene (205-99-2)															
8B. Benzo *(ghi)* Perylene (191-24-2)															
9B. Benzo *(k)* Fluoranthene (207-08-9)															
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)															
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)															
12B. Bis *(2-Chloro-isopropyl)* Ether (102-60-1)															
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)															
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)															
15B. Butyl Benzyl Phthalate (85-68-7)															
16B. 2-Chloro-naphthalene (91-58-7)															
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)															
18B. Chrysene (218-01-9)															
19B. Dibenzo *(a,h)* Anthracene (53-70-3)															
20B. 1,2-Dichloro-benzene (95-50-1)															
21B. 1,3-Dichloro-benzene (541-73-1)															

CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
TN2640030035	IMP 107

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)															
23B. 3,3'-Dichlorobenzidine (91-94-1)															
24B. Diethyl Phthalate (84-66-2)															
25B. Dimethyl Phthalate (131-11-3)															
26B. Di-N-Butyl Phthalate (84-74-2)															
27B. 2,4-Dinitrotoluene (121-14-2)															
28B. 2,6-Dinitrotoluene (606-20-2)															
29B. Di-N-Octyl Phthalate (117-84-0)															
30B. 1,2-Diphenylhydrazine *(as Azobenzene)* (122-66-7)															
31B. Fluoranthene (206-44-0)															
32B. Fluorene (86-73-7)															
33B. Hexachlorobenzene (118-74-1)															
34B. Hexachlorobutadiene (87-68-3)															
35B. Hexachlorocyclopentadiene (77-47-4)															
36B. Hexachloroethane (67-72-1)															
37B. Indeno *(1,2,3-cd)* Pyrene (193-39-5)															
38B. Isophorone (78-59-1)															
39B. Naphthalene (91-20-3)															
40B. Nitrobenzene (98-95-3)															
41B. N-Nitrosodimethylamine (62-75-9)															
42B. N-Nitrosodi-N-Propylamine (621-64-7)															

CONTINUE ON PAGE V-8

CONTINUED FROM PAGE V-7

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B. N-Nitrosodiphenylamine (86-30-6)															
44B. Phenanthrene (85-01-8)															
45B. Pyrene (129-00-0)															
46B. 1,2,4 - Trichlorobenzene (120-82-1)															
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)															
2P. α-BHC (319-84-6)															
3P. β -BHC (319-85-7)															
4P. γ- BHC (58-89-9)															
5P. δ- BHC (319-86-8)															
6P. Chlordane (57-74-9)															
7P. 4,4'-DDT (50-29-3)															
8P. 4,4'-DDE (72-55-9)															
9P. 4,4'-DDD (72-54-8)															
10P. Dieldrin (60-57-1)															
11P. α-Endosulfan (115-29-7)															
12P. β-Endosulfan (115-29-7)															
13P. Endosulfan Sulfate (1031-07-8)															
14P. Endrin (72-20-8)															
15P. Endrin Aldehyde (7421-93-4)															
16P. Heptachlor (76-44-8)															

CONTINUE ON PAGE V-9

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	IMP 107

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. LONG TERM AVERAGE VALUE		a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES *(continued)*															
17B. Heptachlor Epoxide (1024-57-3)															
18P. PCB-1242 (53469-21-9)															
19P. PCB-1254 (11097-69-1)															
20P. PCB-1221 (11104-28-2)															
21P. PCB-1232 (11141-16-5)															
22P. PCB-1248 (12672-29-6)															
23P. PCB-1260 (11096-82-5)															
24P. PCB-1016 (12674-11-2)															
25P. Toxaphene (8001-35-2)															

Note: Long term average values from October 1, 2004 through September 30, 2005.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)* TN2640030035

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO 112

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE *(if available)* (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	c. LONG TERM AVRG. VALUE *(if available)* (2) MASS	d. NO. OF ANALYSES	3. UNITS *(specify if blank)* a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	b. NO OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*	4						1	mg/L				
b. Chemical Oxygen Demand *(COD)*	13						1	mg/L				
c. Total Organic Carbon *(TOC)*	5.0						1	mg/L				
d. Total Suspended Solids *(TSS)*	33.0				11.5		53	mg/L				
e. Ammonia *(as N)*	0.58				0.11		54	mg/L				
f. Flow	VALUE 0.65		VALUE		VALUE 0.27		54	MGD		VALUE		
g. Temperature *(winter)*	VALUE 5.3		VALUE NA		VALUE NA		1	°C		VALUE		
h. Temperature *(summer)*	VALUE NA		VALUE NA		VALUE NA			°C		VALUE		
i. pH	MINIMUM 6.6	MAXIMUM 9.0	MINIMUM	MAXIMUM			57	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE *(if available)* (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	c. LONG TERM AVRG. VALUE *(if available)* (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	b. NO OF ANALYSES
a. Bromide (24959-67-9)	X		<2						1	mg/L				
b. Chlorine, Total Residual	X		<0.05				<0.02		9	mg/L				
c. Color	X		35						1	PC Units				
d. Fecal Coliform	X		27						1	No./100ml				
e. Fluoride (16984-48-8)	X		0.11						1	mg/L				
f. Nitrate-Nitrite *(as N)*	X		1.7						1	mg/L				

CONTINUE ON PAGE V-2

ITEM V-B CONTINUED FROM PAGE V-1

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE (optional) b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)	X		0.54						1	mg/L				
h. Oil and Grease	X		<5						1	mg/L				
i. Phosphorus (as P), Total (7723-14-0)	X		0.26						1	mg/L				
j. Radioactivity														
(1) Alpha, Total	X		<7.0 (1)						1	pCi/L				
(2) Beta, Total	X		6.6 +/- 1.4						1	pCi/L				
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (as SO_4) (14808-79-8)	X		42						1	mg/L				
l. Sulfide (as S)	X		0.02						1	mg/L				
m Sulfite (as SO_3) (14265-45-3)	X		<0.5						1	mg/L				
n. Surfactants	X		<0.1						1	mg/L				
o. Aluminum, Total (7429-90-5)	X		0.43						1	mg/L				
p. Barium, Total (7440-39-3)	X		0.05						1	mg/L				
q. Boron, Total (7440-42-8)	X		<0.2						1	mg/L				
r. Cobalt, Total (7440-48-4)	X		<0.001						1	mg/L				
s. Iron, Total (7439-89-6)	X		0.48						1	mg/L				
t. Magnesium, Total (7439-95-4)	X		8.0						1	mg/L				
u. Molybdenum, Total (7439-98-7)	X		<0.02						1	mg/L				
v. Manganese, Total (7439-96-5)	X		0.065						1	mg/L				
w. Tin, Total (7440-31-5)	X		<0.05						1	mg/L				
x. Titanium, Total (7440-32-6)	X		<0.005						1	mg/L				

CONTINUE ON PAGE V-3

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	112

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)	X			<0.003						1	mg/L				
2M. Arsenic, Total (7440-38-2)	X			<0.001						1	mg/L				
3M. Beryllium, Total, (7440-41-7)	X			<0.001						1	mg/L				
4M. Cadmium, Total (7440-43-9)	X			<0.0001						1	mg/L				
5M. Chromium, Total (7440-47-3)	X			<0.001						1	mg/L				
6M. Copper, Total (7440-50-8)	X			<0.001						1	mg/L				
7M. Lead, Total (7439-92-1)	X			<0.001						1	mg/L				
8M. Mercury, Total (7439-97-6)	X			<0.0001						1	mg/L				
9M. Nickel, Total (7440-02-0)	X			<0.001						1	mg/L				
10M. Selenium, Total (7782-49-2)	X			<0.001						1	mg/L				
11M. Silver, Total (7440-22-4)	X			<0.0001						1	mg/L				
12M. Thallium, Total (7440-28-0)	X			<0.002						1	mg/L				
13M. Zinc, Total (7440-66-6)	X			<0.01						1	mg/L				
14M. Cyanide, Total (57-12-5)	X			<0.005						1	mg/L				
15M. Phenols, Total	X			<0.04						1	mg/L				
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUE ON PAGE V-4

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X" a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	X			<0.001						1	mg/L				
2V. Acrylonitrile (107-13-1)	X			<0.001						1	mg/L				
3V. Benzene (71-43-2)	X			<0.001						1	mg/L				
4V. Bis (*Chloromethyl*) Ether (542-88-1)	X			<0.1						1	mg/L				
5V. Bromoform (75-25-2)	X			<0.001						1	mg/L				
6V. Carbon Tetrachloride (56-23-5)	X			<0.001						1	mg/L				
7V. Chlorobenzene (108-90-7)	X			<0.01						1	mg/L				
8V. Chlorodibromomethane (124-48-1)	X			<0.001						1	mg/L				
9V. Chloroethane (75-00-3)	X			<0.01						1	mg/L				
10V. 2-Chloroethylvinyl Ether (110-75-8)	X			<0.01						1	mg/L				
11V. Chloroform (67-66-3)	X			<0.0005						1	mg/L				
12V. Dichlorobromomethane (75-27-4)	X			<0.001						1	mg/L				
13V. Dichlorodifluoromethane (75-71-8)	X			<0.001						1	mg/L				
14V. 1,1-Dichloroethane (75-34-3)	X			<0.001						1	mg/L				
15V. 1,2-Dichloroethane (107-06-2)	X			<0.001						1	mg/L				
16V. 1,1-Dichloroethylene (75-35-4)	X			<0.001						1	mg/L				
17V. 1,2-Dichloropropane (78-87-5)	X			<0.01						1	mg/L				
18V. 1,3-Dichloropropylene (542-75-6)	X			<0.001						1	mg/L				
19V. Ethylbenzene (100-41-4)	X			<0.001						1	mg/L				
20V. Methyl Bromide (74-83-9)	X			<0.01						1	mg/L				
21V. Methyl Chloride (74-87-3)	X			<0.001						1	mg/L				

CONTINUE ON PAGE V-5

EPA I.D. NUMBER (copy from item 1 of Form 1) T[illegible]40030035 | OUTFALL NUMBER 112

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)	X			<0.001						1	mg/L				
23V. 1,1,2,2-Tetrachloroethane (79-34-5)	X			<0.0005						1	mg/L				
24V. Tetrachloroethylene (127-18-4)	X			<0.0005						1	mg/L				
25V. Toluene (108-88-3)	X			<0.001						1	mg/L				
26V. 1,2-Trans-Dichloroethylene (156-60-5)	X			<0.01						1	mg/L				
27V. 1,1,1-Trichloroethane (71-55-6)	X			<0.001						1	mg/L				
28V. 1,1,2-Trichloroethane (79-00-5)	X			<0.0002						1	mg/L				
29V. Trichloroethylene (79-01-6)	X			<0.001						1	mg/L				
30V. Trichlorofluoromethane (75-69-4)	X			<0.01						1	mg/L				
31V. Vinyl Chloride (75-01-4)	X			<0.002						1	mg/L				
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)	X			<0.005						1	mg/L				
2A. 2,4-Dichlorophenol (120-83-2)	X			<0.005						1	mg/L				
3A. 2,4-Dimethylphenol (105-67-9)	X			<0.005						1	mg/L				
4A. 4,6-Dinitro-O-Cresol (534-52-1)	X			<0.024						1	mg/L				
5A. 2,4-Dinitrophenol (51-28-5)	X			<0.02						1	mg/L				
6A. 2-Nitrophenol (88-75-5)	X			<0.005						1	mg/L				
7A. 4-Nitrophenol (100-02-7)	X			<0.03						1	mg/L				
8A. P-Chloro-M Cresol (59-50-7)	X			<0.024						1	mg/L				
9A. Pentachlorophenol (87-86-5)	X			<0.005						1	mg/L				
10A. Phenol (108-95-2)	X			<0.005						1	mg/L				
11A. 2,4,6-Trichlorophenol (88-06-2)	X			<.0.0027						1	mg/L				

CONTINUE ON PAGE V-6

CONTINUED FROM PAGE V-5

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	X			<0.005						1	mg/L				
2B. Acenaphtylene (208-96-8)	X			<0.0023						1	mg/L				
3B. Anthracene (120-12-7)	X			<0.0007						1	mg/L				
4B. Benzidine (92-87-5)	X			<0.05						1	mg/L				
5B. Benzo *(a)* Anthracene (56-55-3)	X			<0.0003						1	mg/L				
6B. Benzo *(a)* Pyrene (50-32-8)	X			<0.0003						1	mg/L				
7B. 3,4-Benzo-fluoranthene (205-99-2)	X			<0.0003						1	mg/L				
8B. Benzo *(ghi)* Perylene (191-24-2)	X			<0.01						1	mg/L				
9B. Benzo *(k)* Fluoranthene (207-08-9)	X			<0.0003						1	mg/L				
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)	X			<0.005						1	mg/L				
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)	X			<0.001						1	mg/L				
12B. Bis *(2-Chloro-isopropyl)* Ether (102-60-1)	X			<0.005						1	mg/L				
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)	X			<0.0025						1	mg/L				
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)	X			<0.005						1	mg/L				
15B. Butyl Benzyl Phthalate (85-68-7)	X			<0.005						1	mg/L				
16B. 2-Chloro-naphthalene (91-58-7)	X			<0.005						1	mg/L				
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)	X			<0.005						1	mg/L				
18B. Chrysene (218-01-9)	X			<0.0025						1	mg/L				
19B. Dibenzo *(a,h)* Anthracene (53-70-3)	X			<0.01						1	mg/L				
20B. 1,2-Dichloro-benzene (95-50-1)	X			<0.002						1	mg/L				
21B. 1,3-Dichloro-benzene (541-73-1)	X			<0.002						1	mg/L				

CONTINUE ON PAGE V-7

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
TN2640030035	112

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)	X			<0.0044						1	mg/L				
23B. 3,3'-Dichlorobenzidine (91-94-1)	X			<0.025						1	mg/L				
24B. Diethyl Phthalate (84-66-2)	X			<0.0019						1	mg/L				
25B. Dimethyl Phthalate (131-11-3)	X			<0.0016						1	mg/L				
26B. Di-N-Butyl Phthalate (84-74-2)	X			<0.0025						1	mg/L				
27B. 2,4-Dinitrotoluene (121-14-2)	X			<0.001						1	mg/L				
28B. 2,6-Dinitrotoluene (606-20-2)	X			<0.005						1	mg/L				
29B. Di-N-Octyl Phthalate (117-84-0)	X			<0.01						1	mg/L				
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	X			<0.1						1	mg/L				
31B. Fluoranthene (206-44-0)	X			<0.0022						1	mg/L				
32B. Fluorene (86-73-7)	X			<0.0003						1	mg/L				
33B. Hexachlorobenzene (118-74-1)	X			<0.0019						1	mg/L				
34B. Hexachlorobutadiene (87-68-3)	X			<0.005						1	mg/L				
35B. Hexachlorocyclopentadiene (77-47-4)	X			<0.03						1	mg/L				
36B. Hexachloroethane (67-72-1)	X			<0.0005						1	mg/L				
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)	X			<0.01						1	mg/L				
38B. Isophorone (78-59-1)	X			<0.005						1	mg/L				
39B. Naphthalene (91-20-3)	X			<0.005						1	mg/L				
40B. Nitrobenzene (98-95-3)	X			<0.005						1	mg/L				
41B. N-Nitrosodimethylamine (62-75-9)				<0.001						1	mg/L				
42B. N-Nitrosodi-N-Propylamine (621-64-7)	X			<0.005						1	mg/L				

CONTINUE ON PAGE V-8

CONTINUED FROM PAGE V-7

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B. N-Nitrosodiphenylamine (86-30-6)	X			<0.005						1	mg/L				
44B. Phenanthrene (85-01-8)	X			<0.0007						1	mg/L				
45B. Pyrene (129-00-0)	X			<0.0003						1	mg/L				
46B. 1,2,4 - Trichlorobenzene (120-82-1)	X			<0.005						1	mg/L				
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β-BHC (319-85-7)			X												
4P. γ-BHC (58-89-9)			X												
5P. δ-BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Endosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

CONTINUE ON PAGE V-9

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	112

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. *MAXIMUM DAILY VALUE*		b. *MAXIMUM 30 DAY VALUE (if available)*		c. *LONG TERM AVRG. VALUE (if available)*		d. NO. OF ANALYSES	a. LONG TERM AVERAGE VALUE		a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES *(continued)*															
17B. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

NOTES:

(1) Natual background radiation levels.

Note: Long term average values from October 1, 2004 through September 30, 2005.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)* IN2640030035

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO 113

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT <5.0	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Dema (BOD)	<2						1	mg/L		<2		1
b. Chemical Oxygen Demand (COD)	6						1	mg/L		6		1
c. Total Organic Carbon (TOC)	1.8						1	mg/L		1.7		1
d. Total Suspended Solids (TSS)	5.3				3.6		12	mg/L		6		1
e. Ammonia (as N)	<0.01						1	mg/L		0.02		1
f. Flow	VALUE 208		VALUE		VALUE 135		367	MGD		VALUE 46.7		1
g. Temperature (winter)	VALUE 30.1		VALUE		VALUE 21.3		170	°C		VALUE 9.8		1
h. Temperature (summer)	VALUE 34.2		VALUE		VALUE 29.5		184	°C		VALUE NA		NA
i. pH	MINIMUM 6.53	MAXIMUM 8.36	MINIMUM	MAXIMUM			15	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (if available) (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)	X		<2						1	mg/L		<2		1
b. Chlorine, Total Residual	X		<0.05				<0.03		215	mg/L		<0.05		1
c. Color	X		5						1	PCU		5		1
d. Fecal Coliform		X	NA											
e. Fluoride (16984-48-8)	X		0.11						1	mg/L		<0.1		1
f. Nitrate-Nitrite (as N)	X		0.28						1	mg/L		0.22		1

CONTINUE ON PAGE V-2

ITEM V-B CONTINUED FROM PAGE V-1

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)	X		<0.01						1	mg/L		0.19		1
h. Oil and Grease	X		<5.0						1	mg/L		<5.0		1
i. Phosphorus (as P), Total (7723-14-0)	X		<0.01						1	mg/L		0.04		1
j. Radioactivity														
(1) Alpha, Total	X		<7.0 (1)						1	pCi/L		<7.0		1
(2) Beta, Total	X		<3.4 (1)						1	pCi/L		<3.4		1
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (as SO_4) (14808-79-8)	X		13						1	mg/L		13		1
l. Sulfide (as S)	X		<0.02						1	mg/L		<0.02		1
m Sulfite (as SO_3) (14265-45-3)	X		<0.5						1	mg/L		<0.5		1
n. Surfactants	X		<0.1						1	mg/L		<0.1		1
o. Aluminum, Total (7429-90-5)	X		0.06						1	mg/L		0.20		1
p. Barium, Total (7440-39-3)	X		0.02						1	mg/L		0.02		1
q. Boron, Total (7440-42-8)	X		<0.2						1	mg/L		<0.2		1
r. Cobalt, Total (7440-48-4)	X		<0.001						1	mg/L		<0.001		1
s. Iron, Total (7439-89-6)	X		0.09						1	mg/L		0.23		1
t. Magnesium, Total (7439-95-4)	X		5.1						1	mg/L		4.9		1
u. Molybdenum, Total (7439-98-7)	X		<0.02						1	mg/L		<0.02		1
v. Manganese, Total (7439-96-5)	X		0.032						1	mg/L		0.051		1
w. Tin, Total (7440-31-5)	X		<0.05						1	mg/L		<0.05		1
x. Titanium, Total (7440-32-6)	X		<0.005						1	mg/L		<0.005		1

CONTINUE ON PAGE V-3

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	113

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)	X			<0.003						1	mg/L		<0.003		1
2M. Arsenic, Total (7440-38-2)	X			<0.001						1	mg/L		<0.001		1
3M. Beryllium, Total, (7440-41-7)	X			<0.001						1	mg/L		<0.001		1
4M. Cadmium, Total (7440-43-9)	X			<0.0001						1	mg/L		<0.0001		1
5M. Chromium, Total (7440-47-3)	X			<0.001						1	mg/L		<0.001		1
6M. Copper, Total (7440-50-8)	X			0.001						1	mg/L		<0.001		1
7M. Lead, Total (7439-92-1)	X			<0.001						1	mg/L		<0.001		1
8M. Mercury, Total (7439-97-6)	X			<0.0001						1	mg/L		<0.0001		1
9M. Nickel, Total (7440-02-0)	X			<0.001						1	mg/L		<0.001		1
10M. Selenium, Total (7782-49-2)	X			<0.001						1	mg/L		<0.001		1
11M. Silver, Total (7440-22-4)	X			<0.0001						1	mg/L		<0.0001		1
12M. Thallium, Total (7440-28-0)	X			<0.002						1	mg/L		<0.002		1
13M. Zinc, Total (7440-66-6)	X			<0.01						1	mg/L		<0.01		1
14M. Cyanide, Total (57-12-5)	X			<0.005						1	mg/L		<0.005		1
15M. Phenols, Total	X			<0.04						1	mg/L		<0.04		1
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUE ON PAGE V-4

1. POL. ..T AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUEN. a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAK. al) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	X			<0.001						1	mg/L		<0.001		1
2V. Acrylonitrile (107-13-1)	X			<0.001						1	mg/L		<0.001		1
3V. Benzene (71-43-2)	X			<0.001						1	mg/L		<0.001		1
4V. Bis *(Chloromethyl)* Ether (542-88-1)	X			<0.1						1	mg/L		<0.1		1
5V. Bromoform (75-25-2)	X			<0.001						1	mg/L		<0.001		1
6V. Carbon Tetrachloride (56-23-5)	X			<0.001						1	mg/L		<0.001		1
7V. Chlorobenzene (108-90-7)	X			<0.01						1	mg/L		<0.01		1
8V. Chlorodibromomethane (124-48-1)	X			<0.001						1	mg/L		<0.001		1
9V. Chloroethane (75-00-3)	X			<0.01						1	mg/L		<0.01		1
10V. 2-Chloroethylvinyl Ether (110-75-8)	X			<0.01						1	mg/L		<0.01		1
11V. Chloroform (67-66-3)	X			<0.0005						1	mg/L		<0.0005		1
12V. Dichlorobromomethane (75-27-4)	X			<0.001						1	mg/L		<0.001		1
13V. Dichlorodifluoromethane (75-71-8)	X			<0.001						1	mg/L		<0.001		1
14V. 1,1-Dichloroethane (75-34-3)	X			<0.001						1	mg/L		<0.001		1
15V. 1,2-Dichloroethane (107-06-2)	X			<0.001						1	mg/L		<0.001		1
16V. 1,1-Dichloroethylene (75-35-4)	X			<0.001						1	mg/L		<0.001		1
17V. 1,2-Dichloropropane (78-87-5)	X			<0.01						1	mg/L		<0.01		1
18V. 1,3-Dichloropropylene (542-75-6)	X			<0.001						1	mg/L		<0.001		1
19V. Ethylbenzene (100-41-4)	X			<0.001						1	mg/L		<0.001		1
20V. Methyl Bromide (74-83-9)	X			<0.01						1	mg/L		<0.01		1
21V. Methyl Chloride (74-87-3)	X			<0.001						1	mg/L		<0.001		1

CONTINUE ON PAGE V-5

EPA I.D. NUMBER (Item 1 of Form 1)	OUTFALL NUMBER
40030035	113

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)	X			<0.001						1	mg/L		0.002		1
23V. 1,1,2,2-Tetrachloroethane (79-34-5)	X			<0.0005						1	mg/L		<0.0005		1
24V. Tetrachloroethylene (127-18-4)	X			<0.0005						1	mg/L		<0.0005		1
25V. Toluene (108-88-3)	X			<0.001						1	mg/L		<0.001		1
26V. 1,2-Trans-Dichloroethylene (156-60-5)	X			<0.01						1	mg/L		<0.01		1
27V. 1,1,1-Trichloroethane (71-55-6)	X			<0.001						1	mg/L		<0.001		1
28V. 1,1,2-Trichloroethane (79-00-5)	X			<0.0002						1	mg/L		<0.0002		1
29V. Trichloroethylene (79-01-6)	X			<0.001						1	mg/L		<0.001		1
30V. Trichlorofluoromethane (75-69-4)	X			<0.01						1	mg/L		<0.01		1
31V. Vinyl Chloride (75-01-4)	X			<0.002						1	mg/L		<0.002		1
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)	X			<0.005						1	mg/L		<0.005		1
2A. 2,4-Dichlorophenol (120-83-2)	X			<0.005						1	mg/L		<0.005		1
3A. 2,4-Dimethylphenol (105-67-9)	X			<0.005						1	mg/L		<0.005		1
4A. 4,6-Dinitro-O-Cresol (534-52-1)	X			<0.024						1	mg/L		<0.024		1
5A. 2,4-Dinitrophenol (51-28-5)	X			<0.02						1	mg/L		<0.02		1
6A. 2-Nitrophenol (88-75-5)	X			<0.005						1	mg/L		<0.005		1
7A. 4-Nitrophenol (100-02-7)	X			<0.03						1	mg/L		<0.03		1
8A. P-Chloro-M Cresol (59-50-7)	X			<0.024						1	mg/L		<0.024		1
9A. Pentachlorophenol (87-86-5)	X			<0.005						1	mg/L		<0.005		1
10A. Phenol (108-95-2)	X			<0.005						1	mg/L		<0.005		1
11A. 2,4,6-Trichlorophenol (88-06-2)	X			<0.0027						1	mg/L		<.0.0027		1

CONTINUE ON PAGE V-6

CONTINUED FROM PAGE V-5

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	X			<0.005						1	mg/L		<0.005		1
2B. Acenaphtylene (208-96-8)	X			<0.0023						1	mg/L		<0.0023		1
3B. Anthracene (120-12-7)	X			<0.0007						1	mg/L		<0.0007		1
4B. Benzidine (92-87-5)	X			<0.05						1	mg/L		<0.05		1
5B. Benzo *(a)* Anthracene (56-55-3)	X			<0.0003						1	mg/L		<0.0003		1
6B. Benzo *(a)* Pyrene (50-32-8)	X			<0.0003						1	mg/L		<0.0003		1
7B. 3,4-Benzo-fluoranthene (205-99-2)	X			<0.0003						1	mg/L		<0.0003		1
8B. Benzo *(ghi)* Perylene (191-24-2)	X			<0.01						1	mg/L		<0.01		1
9B. Benzo *(k)* Fluoranthene (207-08-9)	X			<0.0003						1	mg/L		<0.0003		1
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)	X			<0.005						1	mg/L		<0.005		1
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)	X			<0.001						1	mg/L		<0.001		1
12B. Bis *(2-Chloro-isopropyl)* Ether (102-60-1)	X			<0.005						1	mg/L		<0.005		1
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)	X			<0.0025						1	mg/L		<0.0025		1
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)	X			<0.005						1	mg/L		<0.005		1
15B. Butyl Benzyl Phthalate (85-68-7)	X			<0.005						1	mg/L		<0.005		1
16B. 2-Chloro-naphthalene (91-58-7)	X			<0.005						1	mg/L		<0.005		1
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)	X			<0.005						1	mg/L		<0.005		1
18B. Chrysene (218-01-9)	X			<0.0025						1	mg/L		<0.0025		1
19B. Dibenzo *(a,h)* Anthracene (53-70-3)	X			<0.01						1	mg/L		<0.01		1
20B. 1,2-Dichloro-benzene (95-50-1)	X			<0.002						1	mg/L		<0.002		1
21B. 1,3-Dichloro-benzene (541-73-1)	X			<0.002						1	mg/L		<0.002		1

CONTINUE ON PAGE V-7

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
TN2640030035	113

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)	X			<0.0044						1	mg/L		<0.0044		1
23B. 3,3'-Dichlorobenzidine (91-94-1)	X			<0.025						1	mg/L		<0.025		1
24B. Diethyl Phthalate (84-66-2)	X			<0.0019						1	mg/L		<0.0019		1
25B. Dimethyl Phthalate (131-11-3)	X			<0.0016						1	mg/L		<0.0016		1
26B. Di-N-Butyl Phthalate (84-74-2)	X			<0.0025						1	mg/L		<0.0025		1
27B. 2,4-Dinitrotoluene (121-14-2)	X			<0.001						1	mg/L		<0.001		1
28B. 2,6-Dinitrotoluene (606-20-2)	X			<0.005						1	mg/L		<0.005		1
29B. Di-N-Octyl Phthalate (117-84-0)	X			<0.01						1	mg/L		<0.01		1
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	X			<0.1						1	mg/L		<0.1		1
31B. Fluoranthene (206-44-0)	X			<0.0022						1	mg/L		<0.0022		1
32B. Fluorene (86-73-7)	X			<0.0003						1	mg/L		<0.0003		1
33B. Hexachlorobenzene (118-74-1)	X			<0.0019						1	mg/L		<0.0019		1
34B. Hexachlorobutadiene (87-68-3)	X			<0.005						1	mg/L		<0.005		1
35B. Hexachlorocyclopentadiene (77-47-4)	X			<0.03						1	mg/L		<0.03		1
36B. Hexachloroethane (67-72-1)	X			<0.0005						1	mg/L		<0.0005		1
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)	X			<0.01						1	mg/L		<0.01		1
38B. Isophorone (78-59-1)	X			<0.005						1	mg/L		<0.005		1
39B. Naphthalene (91-20-3)	X			<0.005						1	mg/L		<0.005		1
40B. Nitrobenzene (98-95-3)	X			<0.005						1	mg/L		<0.005		1
41B. N-Nitrosodimethylamine (62-75-9)	X			<0.001						1	mg/L		<0.001		1
42B. N-Nitrosodi-N-Propylamine (621-64-7)	X			<0.005						1	mg/L		<0.005		1

CONTINUE ON PAGE V-8

CONTINUED FROM PAGE V-7

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B. N-Nitrosodiphenylamine (86-30-6)	X			<0.005						1	mg/L		<0.005		1
44B. Phenanthrene (85-01-8)	X			<0.0007						1	mg/L		<0.0007		1
45B. Pyrene (129-00-0)	X			<0.0003						1	mg/L		<0.0003		1
46B. 1,2,4 - Trichlorobenzene (120-82-1)	X			<0.005						1	mg/L		<0.005		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β -BHC (319-85-7)			X												
4P. γ- BHC (58-89-9)			X												
5P. δ- BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Endosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

CONTINUE ON PAGE V-9

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
TN2640030035	113

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. LONG TERM AVERAGE VALUE		a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES *(continued)*															
17B. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

NOTES:

(1) Natual background radiation levels.

Note: Long term average values from October 1, 2004 through September 30, 2005.

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
401 CHURCH STREET
L&C ANNEX 6th FLOOR
NASHVILLE, TN 37243-1534

April 7, 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
RECEIPT # 7004 2510 0002 4678 0347

Gordon Park
Manager of Environmental Affairs
Tennessee Valley Authority
1101 Market Street, LP-5D
Chattanooga, Tennessee 37402

RE: TVA-Watts Bar Nuclear Plant, Cumberland Fossil, and Kingston Fossil Plants
NPDES Permit # TN0020168, TN0005789, and TN0005452
Rhea, Stewart, and Roane Counties, Tennessee

Dear Mr. Park:

This responds to the request made on behalf of TVA, dated February 7, 2006, for written division approval to allow effluent samples from outfall 112 at Watts Bar, outfall 002 at Cumberland, and outfall 002 at Kingston to be treated, for toxicity testing on *Pimephales promelas,* with UV radiation.

The division has reviewed the request and hereby approves the use of UV radiation at the above referenced facilities as proposed in your letter.

If you have any questions regarding this correspondence please feel free to contact me at 615-532-0672.

Sincerely,

Christopher S. Moran
Manager, Enforcement and Compliance Section

RECEIVED
APR 11 2006
ENVIRONMENTAL AFFAIRS

cc: OGC
WPC-Permits-PRM
WPC-EFO-CH-RDU, WMK
WPC-EFO-N-Joey Holland, DJE
WPC-EFO-K-Jeff Horton
Lindy Johnson-TVA

Johnson, Lindy P.

From: Chris Moran [Chris.Moran@state.tn.us]
Sent: Monday, April 17, 2006 2:25 PM
To: Johnson, Lindy P.
Subject: Re: question about UV letter

Lindy - I agree that it is appropriate to treat both the effluent and intake samples. I think in drafting the letter responding to your request, we did not take into account that the permits allow testing of intake water. Please let me know if you need anything more formal than this email.

Chris Moran, Manager
Enforcement & Compliance
Division of Water Pollution Control

>>> "Johnson, Lindy P." <lpjohnson@tva.gov> 04/14/06 8:43 AM >>>
Hi Chris,

We were getting together our next toxicity test for Watts Bar Nuclear Outfall 112 (happily with the ability to treat samples with UV). In the letter, you state that we are authorized to treat ***effluent*** samples with UV. My question is (after talking with our toxicologist), shouldn't we also be authorized to treat our intake samples so we are appropriately comparing intake to effluent? (I think our earlier request just requested authorization to treat samples.)

Treating intake samples could also prevent us from having to invalidate tests due to intake toxicity due to pathogenic interference.

Would you be agreeable to treating intake samples as well under the same conditions authorized in your letter for effluent samples? Please advise.

Thanks.

Lindy Printz Johnson
Tennessee Valley Authority
Environmental Affairs, LP 5D-C.
phone: 423 751 3361
fax: 423 751 7011
email: lpjohnson@tva.gov

TENNESSEE VALLEY AUTHORITY (TVA) - WATTS BAR NUCLEAR PLANT (WBN) - NPDES PERMIT NO. TN0020168 - APPLICATION FOR RENEWAL

Current Whole Effluent (WET) Toxicity Limits:

Outfall 101 -	7-day or 3-brood IC_{25} ≥2.4% effluent (42.3 TUc) Monitoring Frequency = 2/year
Outfall 102 -	7-day or 3-brood IC_{25} ≥2.4% effluent (42.3 TUc) Monitoring Frequency = 2/year (only if discharge operated ≥30 days from Jan. - Jun., or Jul. - Dec. if all toxicity testing has not been completed for Outfall 101)
Outfall 112 -	7-day or 3-brood IC_{25} ≥100% effluent (1 TUc) Monitoring Frequency = 2/year
Outfall 113 -	7-day or 3-brood IC_{25} ≥7.6% effluent (13.2 TUc) Monitoring Frequency = 2/year

Proposed Whole Effluent (WET) Toxicity Requirements:

Outfall 101 -	7-day or 3-brood IC_{25} ≥2.4% effluent (42.3 TUc) Monitoring Frequency = 2/year, one during oxidizing biocide treatment and one during non-oxidizing biocide treatment
Outfall 102 -	Same as currently required
Outfall 112 -	7-day or 3-brood IC_{25} ≥100.0% effluent. Same frequency as current. Requesting inclusion of

	authorization to use UV treatment on *Pimephales promelas* in permit.
Outfall 113 -	7-day or 3-brood IC_{25} ≥7.6% effluent (13.2 TUc) Monitoring Frequency = 2/year, one during oxidizing biocide treatment and one during non-oxidizing biocide treatment

Outfalls 101 and 113:
In accordance with EPA's recommendation (Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001), WBN Outfall OSN101 and Outfall OSN113 would not be required to have chronic WET limits based on a demonstration of no Reasonable Potential (RP) for excursions above the ambient water quality chronic (CCC) criterion using effluent data for current operating conditions. Following guidance in the Technical Support Document (TSD), when no RP exists, biomonitoring would be conducted at a frequency of only once every 5 years as part of the permit renewal process to document acceptable effluent toxicity and toxicity at the instream wastewater concentration (IWC) would serve only as a hard trigger for accelerated toxicity biomonitoring.

However, raw water used at the facility is treated with corrosion inhibitors and biocide products. These products, which can become concentrated in the cooling tower system, are discharged through Outfalls 101 and 113. The chemical makeup of the products used can change during the permit period and the combined toxicity effect of the chemicals is not known. Thus it is not feasible to control toxicity only by the application of chemical specific effluent limits to the discharge. Toxicity testing is a reasonable method to evaluate the toxicity impacts of the products in the effluent. Therefore, TVA believes it is appropriate to maintain the current WET requirements for WBN Outfalls OSN101 and OSN113 that are specified in the Biocide Corrosion Treatment Plan (BCTP), approved by letter on dated July 30, 2004, with one test per outfall during oxidizing biocide treatment and one test per outfall during non-oxidizing biocide treatment. TVA is requesting permit language consistent with the BCTP.

The following RP determination utilizes nine years (19 studies) and six years (13 studies) of WET biomonitoring data collected for Outfalls 101 and 113, respectively. Only IC_{25} based studies were used in this determination. Table 1 summarizes Outfall 101 biomonitoring results while Table 3 summarizes Outfall 113 biomonitoring results.

Outfall 102:
Sampling and analysis of Outfall OSN102 has not been required under the current permit since the conditions for biomonitoring were not met. No RP determination was made for this Outfall.

Outfall 112:

In accordance with EPA's recommendation (Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001), WBN Outfall OSN112 should retain its WET chronic limit based on a demonstration of Reasonable Potential (RP) for excursions above the ambient water quality chronic (CCC) criteria using effluent data. The following RP determination utilizes nine years (28 studies) of WET biomonitoring data collected for Outfall 112. Only IC_{25} based studies were used in this determination. Table 2 summarizes Outfall 112 biomonitoring results obtained during the last twelve years.

Table 1. Summary of WBN Outfall OSN101 WET Biomonitoring Results:

Test Date	Test Species	Acute Results (96-h Survival)		Chronic Results	
		% Survival in Highest Concentration Tested	Study Toxicity Units (TUa)	IC_{25}	Study Toxicity Units (TUc)
Hypothesis Based NOEC:					
1. Feb. 2-9, 1994	*Ceriodaphnia dubia*	100%	<1.0	-	10.2† (IC_{25}:<1.0)
	Pimephales promelas	100%		-	
2. Aug. 26 - Sept. 22, 1994	*Ceriodaphnia dubia*	100%	<1.0	-	<1.0
	Pimephales promelas	100%		-	
3. Feb. 1-8, 1995	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	98%		>100%	
4. Aug. 9-16, 1995	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	100%		>100%	
5. Feb. 23 - Mar. 1, 1996	*Ceriodaphnia dubia*	100%	<1.0	-	<1.0
	Pimephales promelas	98%		-	
IC_{25} Based					
6. Aug. 22-29, 1996*	*Ceriodaphnia dubia*	89%	<1.0	>100%	<1.0
	Pimephales promelas	100%		>100%	
7. Feb. 19-26, 1997*	*Ceriodaphnia dubia*	80%	<1.0	58.0%	1.7
	Pimephales promelas	100%		>100%	
8. Aug. 12-20, 1997*	*Ceriodaphnia dubia*	0%	3.1	30.9%	3.2
	Pimephales promelas	100%		>100%	
9. Feb. 24 - Mar. 3, 1998*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	100%		>100%	
10. Sept. 16, 1998*	*Ceriodaphnia dubia*	0%	3.2	32.4%	3.1
	Pimephales promelas	98%		>100%	
11. Mar. 2-9, 1999*	*Ceriodaphnia dubia*	100%	<1.0	>100%	2.5
	Pimephales promelas	90%		40%	
12. Sept. 9 - Oct. 6, 1999*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
	Pimephales promelas	100%		>13.2%	
13. Apr. 4-11, 2000*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
Mar. 22-29, 2000*	*Pimephales promelas*	98%		>13.2%	
14. Oct. 25 - Nov. 1, 2000*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
	Pimephales promelas	100%		>13.2%	

Summary of WBN Outfall OSN101 WET Biomonitoring Results (continued):

Test Date	Test Species	Acute Results (96-h Survival)		Chronic Results	
		% Survival in Highest Concentration Tested	Study Toxicity Units (TUa)	IC_{25}	Study Toxicity Units (TUc)
15. Apr. 18-25, 2001*	*Ceriodaphnia dubia*	89%	<7.58	>13.2%	<7.58
Apr. 17-24, 2001*	*Pimephales promelas*	95%		>13.2%	
16. Oct. 15-22, 2001*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
	Pimephales promelas	100%		>13.2%	
17. Apr. 14-19, 2002*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
Apr. 28 - May 3, 2002*	*Pimephales promelas*	100%		>13.2%	
18 Oct. 22-29, 2002*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
Oct. 21-28, 2002*	*Pimephales promelas*	100%		>13.2%	
19. Apr. 14-21, 2003*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
	Pimephales promelas	100%		>13.2%	
20. Nov. 3-10, 2003*	*Ceriodaphnia dubia*	90%	<7.58	12.1%	8.3
	Pimephales promelas	100%		>13.2%	
21. Apr. 20-27, 2004*	*Ceriodaphnia dubia*	100%	<7.58	>13.2%	<7.58
	Pimephales promelas	98%		>13.2%	
22. Nov. 8-13, 2004*	*Ceriodaphnia dubia*	100%	<5.20	>19.2%	<5.20
	Pimephales promelas	100%		>19.2%	
23. Apr. 12-19, 2005*	*Ceriodaphnia dubia*	100%	<5.20	>19.2%	<5.20
	Pimephales promelas	100%		>19.2%	
24. Nov. 2-9, 2005*	*Ceriodaphnia dubia*	100%	<5.20	>19.2%	<5.20
	Pimephales promelas	98%		>19.2%	
n		38	19		19
Maximum		100%	7.58		8.30
Minimum		0%	1.00		1.00
Mean		92.8%	5.35		5.51
CV		0.24	0.51		0.47

†Statistical endpoint biased by selection of the dilution series. IC_{25} derived from original data.

*Used in RP determination.

Shaded area designates data collected during current permit (Effective Date: November 5, 2004).

Current permit limit: IC_{25} ≥2.4%, 42.3 TUc.

Current permit dilution series: Control, 1.2%, 2.4%, 4.8%, 9.6%, 19.2%.

Table 2. Summary of WBN Outfall OSN112 WET Biomonitoring Results:

Test Date	Test Species	Acute Results (96-h Survival)		Chronic Results	
		% Survival in Highest Concentration Tested	Study Toxicity Units (TUa)	IC_{25}	Study Toxicity Units (TUc)
Hypothesis Based NOEC:					
1. February 2-9, 1994	*Ceriodaphnia dubia*	100%	<1.0	-	4.0
	Pimephales promelas	90%		-	
2. Feb. 18-25, 1994	*Ceriodaphnia dubia*	100%	<1.0	-	4.0
	Pimephales promelas	95%		-	
3. Mar. 23-30, 1994	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	98%		>100%	
4. Aug. 26 - Sept. 2, 1994	*Ceriodaphnia dubia*	90%	<1.0	-	<1.0
	Pimephales promelas	100%		-	
5. Feb. 1-8, 1995	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	100%		>100%	
6. Aug. 9-16, 1995	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	100%		>100%	
7. Feb. 23 - Mar. 1, 1996	*Ceriodaphnia dubia*	100%	<1.0	-	<1.0
	Pimephales promelas	88%		-	
IC_{25} Based					
8. Aug. 22-29, 1996*	*Ceriodaphnia dubia*	89%	<1.0	67.5%	1.5
	Pimephales promelas	100%		>100%	
9. Sept. 6-12, 1996*‡	*Ceriodaphnia dubia*	90%	<1.0	10.0%	10.0
	Pimephales promelas	-		-	
10. Feb. 19-26, 1997*	*Ceriodaphnia dubia*	100%	<1.0	>100%	1.7
	Pimephales promelas	65%		59.1%	
11. Mar. 14-21, 1997*	*Ceriodaphnia dubia*	100%	<1.0	>100%	1.1
	Pimephales promelas	90%		94.3%	
12. Jul. 2-9, 1997*‡	*Ceriodaphnia dubia*	-	<1.0	-	<1.0
	Pimephales promelas	100%		>100%	
13. Aug. 12-20, 1997*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	100%		>100%	
14. Feb. 24 - Mar. 3, 1998*	*Ceriodaphnia dubia*	100%	<1.0	>100%	2.0
	Pimephales promelas	70%		49.0%	
15. Mar. 24-31, 1998*‡	*Ceriodaphnia dubia*	-	<1.0	-	2.7
	Pimephales promelas	75%		37.3%	

Summary of WBN Outfall OSN112 WET Biomonitoring Results (continued):

Test Date	Test Species	Acute Results (96-h Survival) % Survival in Highest Concentration Tested	Study Toxicity Units (TUa)	Chronic Results IC_{25}	Study Toxicity Units (TUc)
16. Apr. 26 - May 6, 1998*‡	*Ceriodaphnia dubia*	-	<1.0	-	<1.0
(w/UV & AB tests)	*Pimephales promelas*	100%		>100%	
17. Nov. 17-24, 1998*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/AB test)	*Pimephales promelas*	100%		>100%	
18. Mar. 2-9, 1999*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/AB test)	*Pimephales promelas*	95%		>100%	
19. Oct. 19-26, 1999*	*Ceriodaphnia dubia*	100%	<1.0	99.4%	1.0
(w/AB test)	*Pimephales promelas*	100%		>100%	
20. Dec. 7-13, 1999*‡	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	-		-	
21. Apr. 4-11, 2000*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
Mar. 22-29, 2000*	*Pimephales promelas*	93%		>100%	
22. Nov. 28 - Dec. 6, 2000*	*Ceriodaphnia dubia*	90%	<1.0	>100%	<1.0
	Pimephales promelas	98%		>100%	
23. Apr. 18-25, 2001*	*Ceriodaphnia dubia*	90%	<1.0	>100%	4.2
	Pimephales promelas	78%		23.8%	
24. May 7-14, 2001*‡	*Ceriodaphnia dubia*	-	<1.0	-	<1.0
	Pimephales promelas	100%		>100%	
25. Oct. 16-23, 2001*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
	Pimephales promelas	98%		>100%	
26. Apr. 23-30, 2002*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/UV test)	*Pimephales promelas*	100%		>100%	
27.Oct. 22-29, 2002*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/UV test)	*Pimephales promelas*	98%		>100%	
28. Apr. 15-22, 2002*	*Ceriodaphnia dubia*	100%	<1.0	>100%	1.2
(w/UV test)	*Pimephales promelas*	65%		82.5%	
29. Apr. 29 - May 6, 2003*‡	*Ceriodaphnia dubia*	-	<1.0	-	<1.0
(w/UV test)	*Pimephales promelas*	88%		>100%	
30. Nov. 3-11, 2003*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/UV test)	*Pimephales promelas*	100%		>100%	
31. Apr. 20-27, 2004*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/UV test)	*Pimephales promelas*	100%		>100%	

Summary of WBN Outfall OSN112 WET Biomonitoring Results (continued):

Test Date	Test Species	Acute Results (96-h Survival)		Chronic Results	
		% Survival in Highest Concentration Tested	Study Toxicity Units (TUa)	IC_{25}	Study Toxicity Units (TUc)
32. Nov. 8-13, 2004*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/UV test)	*Pimephales promelas*	95%		>100%	
33. Apr. 12-19, 2005*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/UV test)	*Pimephales promelas*	80%		80.2%	1.2
34. May 3-10, 2005*	*Ceriodaphnia dubia*	-	<1.0	-	-
(w/UV test + upstream)	*Pimephales promelas*	100%		>100%	<1.0
34. Nov. 29 - Dec. 6, 2005*	*Ceriodaphnia dubia*	100%	<1.0	>100%	<1.0
(w/UV test)	*Pimephales promelas*	100%		>100%	
n		48	28		28
Maximum		100%	1		10
Minimum		65%	1		1
Mean		95%	1		1.59
CV		0.10	0		1.12

‡Single species test.
*Used in RP determination.
Shaded area designates data collected during current permit (Effective Date: November 5, 2004).
Current permit limit: IC25 ≥100%, 1.0 TUc
Current permit dilution series: Control, 6.25%, 12.5%, 25.0%, 50.0%, 100.0%

Table 3. Summary of WBN Outfall OSN113 WET Biomonitoring Results:

Test Date	Test Species	Acute Results (96-h Survival)		Chronic Results	
		% Survival in Highest Concentration Tested	Study Toxicity Units (TUa)	IC_{25}	Study Toxicity Units (TUc)
		IC_{25} Based			
1. October 19-26, 1999*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	<2.43
	Pimephales promelas	98%		>41.2%	
2. Apr. 4-11, 2000*	*Ceriodaphnia dubia*	90%	<2.43	19.5%	5.0
	Pimephales promelas	100%		>41.2%	
3. Oct. 25 - Nov. 1, 2000*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	<2.43
	Pimephales promelas	98%		>41.2%	
4. Apr. 18-25, 2001*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	4.0
	Pimephales promelas	100%		25.1%	
5. Oct. 15-23, 2001*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	<2.43
	Pimephales promelas	100%		>41.2%	
6. Apr. 14-19, 2002*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	5.0
Apr. 28 - May 3, 2002*	*Pimephales promelas*	93%		20.0%	
7. Oct. 21-28, 2002*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	<2.43
	Pimephales promelas	98%		>41.2%	
8. Apr. 15-22, 2003*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	<2.43
	Pimephales promelas	93%		>41.2%	
9. Nov. 3-10, 2003*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	<2.43
	Pimephales promelas	100%		>41.2%	
10. Apr. 20-27, 2004*	*Ceriodaphnia dubia*	100%	<2.43	>41.2%	<2.43
	Pimephales promelas	100%		>41.2%	
11. Nov. 9-16, 2004*	*Ceriodaphnia dubia*	100%	<3.29	>30.4%	<3.29
	Pimephales promelas	100%		>30.4%	
12. Apr. 12-19, 2005*	*Ceriodaphnia dubia*	100%	<3.29	>30.4%	<3.29
	Pimephales promelas	98%		>30.4%	

Summary of WBN Outfall OSN113 WET Biomonitoring Results (continued):

Test Date	Test Species	Acute Results (96-h Survival) % Survival in Highest Concentration Tested	Study Toxicity Units (TUa)	Chronic Results IC_{25}	Study Toxicity Units (TUc)
13. Nov. 2-9, 2005*	*Ceriodaphnia dubia*	100%	<3.29	>30.4%	<3.29
	Pimephales promelas	98%		>30.4%	
n		26	13		13
Maximum		100%	3.29		5
Minimum		90%	2.43		2.43
Mean		99%	2.63		3.14
CV		0.03	0.14		0.31

*Used in RP determination.
Shaded area designates data collected during current permit (Effective Date: November 5, 2004).
Current permit limit: IC25 ≥7.6%, 13.2 TUc.

Current permit dilution series: Control, 1.9%, 3.8%, 7.6%, 15.2%, 30.4%.

OSN 101

Reasonable Potential (RP) Determination Based on OSN101 Effluent Data Only

Technical Support Document, Text Box 3-2 and Section 3.3 (EPA/505/2-90-001)

DILUTION

OSN101 Discharge Flow = 34.04 MGD (calculated as mean flow, Nov. 5, 2004 - Mar. 31 2006, per Technical Support Document)

Stream 1Q10 = 2062 MGD

Dilution Factor (DF): $DF = \frac{Qs}{Qw} = \frac{2062}{34.04} = 60.6$

Instream Wastewater Concentration (IWC): $IWC = DF^{-1} \times 100 = 1.65\%$

Chronic TOXICITY

Step 1 **Nineteen WET Biomonitoring Studies, Maximum Observed Toxicity is 8.3 TUc.**

[Average toxicity = 5.51 TUc; compliance limit = 42.3 TUc ($IC_{25} \geq 2.37\%$ effluent).]

Step 2-3 **Coefficient of variation (CV) = 0.47. For 19 samples and a CV of 0.5, the multiplying factor (99% confidence level and 99% probability) is 2.1.**

Step 4 **Low river flow = 2062 MGD and WBN Outfall OSN101 discharge = 34.04 MGD = 1.65% Instream Waste Concentration (IWC) after mixing.**

At a 0.0165 IWC: **8.3 TUc x 2.1 x 0.0165 = 0.29 TUc**

Step 5 **0.41 TUc is less than the ambient CCC criterion of 1.0 TUc. This outcome demonstrates that no Reasonable Potential for excursions above the CCC exists, based on effluent data obtained from testing conducted under current operating conditions.**

OSN 112

Reasonable Potential (RP) Determination Based on OSN112 Effluent Data Only

Technical Support Document, Text Box 3-2 and Section 3.3 (EPA/505/2-90-001)

DILUTION

OSN112 Discharge Flow = 0.279 MGD (calculated as mean flow, Nov. 5 2004 - Mar. 31 2006, per Technical Support Document)

Stream 7Q10 = 0.000 MGD

Dilution Factor (DF): $DF = \frac{Qs + Qw}{Qw} = \frac{0.279}{0.279} = 1.0$

Instream Wastewater Concentration (IWC): $IWC = \frac{Qw}{Qs + Qw} \times 100 = 100\%$

Chronic TOXICITY

Step 1 **Twenty-eight WET Biomonitoring Studies, Maximum Observed Toxicity is 10.0 TUc.**

[Average toxicity = 1.59 TUc; compliance limit = 1.0 TUc ($IC_{25} \geq 100\%$ effluent).]

Step 2-3 **Coefficient of variation (CV) = 1.12. For 28 samples and a CV of 1.1, the multiplying factor (99% confidence level and 99% probability) is 3.8.**

Step 4 **Low stream flow = 0.000 MGD and WBN Outfall OSN112 discharge = 0.279 MGD = 100% Instream Waste Concentration (IWC) after mixing.**

At a 1.0 IWC: **10.0 TUc x 3.8 x 1.0 = 38 TUc**

Step 5 **38 TUc is greater than the ambient CCC criterion of 1.0 TUc. Reasonable potential, therefore, exists for excursions above the CCC, based on effluent data. This requires a permit limit.**

OSN 113

Reasonable Potential (RP) Determination Based on OSN113 Effluent Data Only

Technical Support Document, Text Box 3-2 and Section 3.3 (EPA/505/2-90-001)

DILUTION

OSN113 Discharge Flow = 131.35 MGD (calculated as mean flow, Nov. 5, 2004 - Mar. 31 2006, per Technical Support Document)

Stream 1Q10 = 2062 MGD

Dilution Factor (DF): $DF = \frac{Qs + Qw}{Qw} = \frac{2062 + 131.35}{131.35} = 16.7$

Instream Wastewater Concentration (IWC): $IWC = DF^{-1} \times 100 = 5.99\%$

Chronic TOXICITY

Step 1 **Thirteen WET Biomonitoring Studies, Maximum Observed Toxicity is 5.0 TUc.**

[Average toxicity = 3.14 TUc; compliance limit = 13.2 TUc (IC_{25} ≥7.58% effluent).]

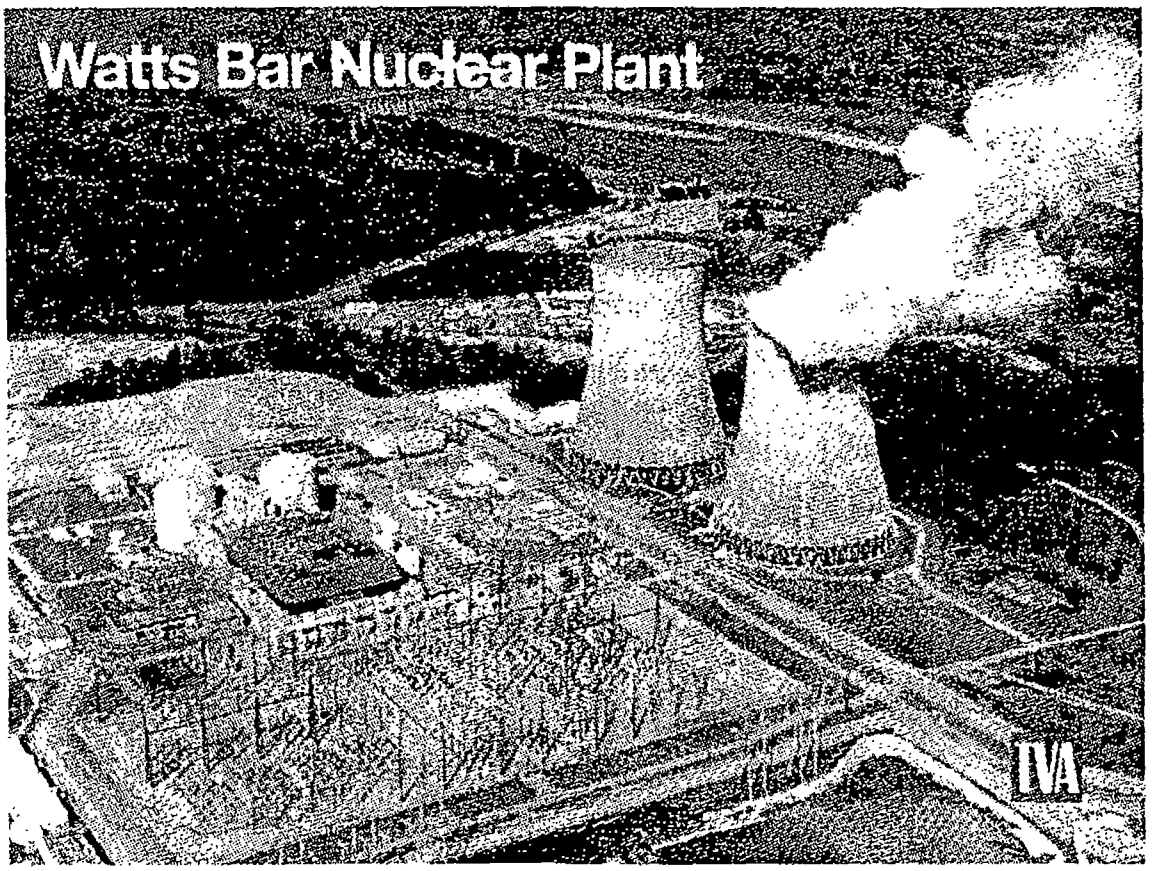
Step 2-3 **Coefficient of variation (CV) = 0.31. For 13 samples and a CV of 0.3, the multiplying factor (99% confidence level and 99% probability) is 1.7.**

Step 4 **Low stream flow plus WBN Outfall OSN113 discharge = 2193.35 MGD and WBN Outfall OSN113 discharge = 131.35 MGD = 5.99% Instream Waste Concentration (IWC) after mixing.**

At a 5.99 IWC: **5.0 TUc x 1.7 x 0.0599 = 0.51 TUc**

Step 5 **0.51 TUc is less than the ambient CCC criterion of 1.0 TUc. This outcome demonstrates that no Reasonable Potential for excursions above the CCC exists, based on effluent data obtained from testing conducted under current operating conditions.**

Biological Monitoring of the Tennessee River Near Watts Bar Nuclear Plant Discharge 2004



by

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Final

Aquatic Monitoring and Management
Knoxville, Tennessee

Table of Contents

	Page
Introduction	1
Methods	2
Fish Community	2
Benthic Macroinvertebrate Community	3
Sport Fishing Index	4
Spring Sport Fish Survey	5
Results and Discussion	5
Fish Community	5
Benthic Macroinvertebrate Community	6
Sport Fishing Index	6
Spring Sport Fish Survey	7
Literature Cited	9

List of Tables

Table 1.	Scoring Results for the Twelve Metrics and Overall Reservoir Fish Assemblage Index for Chickamauga Reservoir, 2004.	10
Table 2.	Recent (1993-2004) RFAI Scores Developed Using the RFAI Metrics Upstream and Downstream of Watts Bar Nuclear Plant	11
Table 3.	Scoring Results for the Twelve Metrics and Overall RFAI for Watts Bar Reservoir, 2004.	12
Table 4.	Species Listing and Catch Per Unit Effort for Chickamauga Reservoir Forebay and Sequoyah Transition Transects During the Fall Electrofishing and Gill Netting on Chickamauga Reservoir, 2004 (Electrofishing Effort = 300 Meters of Shoreline and Gill Netting Effort = 10 Net-Nights).	13
Table 5.	Species Listing and Catch Per Unit Effort for the Transition, and Inflow Transects During the Fall Electrofishing and Gill Netting on Chickamauga Reservoir, 2004 (Electrofishing Effort = 300 Meters of Shoreline and Gill Netting Effort = 10 Net-Nights).	14
Table 6.	Individual Metric Ratings and the Overall Benthic Community Index Scores for Watts Bar Forebay and Sites Downstream of Watts Bar Nuclear Plant, Watts Bar and Chickamauga Reservoirs, November 2004.	16

List of Tables
(continued)

		Page
Table 7.	Average Mean Density Per Square Meter of Benthic Taxa Collected at the Downstream Site Near Watts Bar Nuclear Plant, Chickamauga Reservoir, November 2004.	17
Table 8.	Recent (1994-2004) Benthic Index Scores Collected as Part of the Vital Signs Monitoring Program at Watts Bar Reservoir Transition and Forebay Zone Sites (Upstream), and Chickamauga Reservoir Inflow (Upstream) and Transition (Downstream) Sites.	19
Table 9.	Sport Fishing Index Results for Chickamauga Reservoir, 2003.	19
Table 10.	Sport Fishing Index Results for Watts Bar Reservoir, 2003.	20
Table 11.	Sport Fishing Index Population Quantity and Creel Quantity and Quality Metrics and Scoring Criteria.	21
Table 12.	Sport Fishing Index Population Quality Metrics and Scoring Criteria.	23
Table 13.	Electrofishing Catch Rate, Mean Weight, Percent Harvestable, Numbers of Black Bass Greater than Five Pounds, Numbers of Black Bass Greater than Four Pounds and Largest Black Bass Collected, Chickamauga Reservoir Black Bass Surveys, 1995-2004.	23
Table 14.	Black Bass Catch Per Hour Compared to Habitat Types by Location.	24
Table 15.	Black Bass Catch Per Hour Compared to Habitat Types by Reservoir.	24
Table 16.	Electrofishing Catch Rate, Mean Weight, Percent Harvestable, Numbers of Black Bass Greater than Five Pounds, Numbers of Black Bass Greater than Four Pounds and Largest Black Bass Collected, Watts Bar Reservoir Black Bass Surveys, 1995-2004.	25

List of Figures

Figure 1.	Parameters used to calculate the Sport Fishing Index.	25
Figure 2.	Annual Chickamauga Reservoir RFAI scores for sample years between 1993 and 2004.	26

List of Figures
(continued)

		Page
Figure 3.	Annual Watts Bar Reservoir RFAI scores for sample years between 1993 and 2004.	27
Figure 4.	Sport Fishing Index results for Chickamauga Reservoir between 1997 and 2003.	28
Figure 5.	Sport Fishing Index results for Watts Bar Reservoir between 1997 and 2003.	29
Figure 6.	Chickamauga Reservoir length frequency histogram, (all sites) spring 2004.	30
Figure 7.	Relative stock density values for Tennessee River Reservoirs.	30
Figure 8.	Proportional stock density values for Tennessee River Reservoirs.	31
Figure 9.	Chickamauga Reservoir mean relative weights (Wr) for largemouth bass broken out by RSD category and fish numbers.	31
Figure 10.	Watts Bar Reservoir length frequency histogram, (all sites) spring 2004.	32
Figure 11.	Watts Bar Reservoir mean relative weights (Wr) for largemouth bass.	32

Acronyms

BI	Benthic Macroinvertebrate Index
BIP	Balanced Indigenous Population
NPDES	National Pollutant Discharge Elimination System
PSD	Proportional Stock Density
QA	Quality Assurance
RFAI	Reservoir Fish Assemblage Index
RSD	Relative Stock Density
RSDM	Relative Stock Density of Memorable-sized
RSDP	Relative Stock Density of Preferred-sized
RSDT	Relative Stock Density of Trophy-sized
SAHI	Shoreline Assessment Habitat Index
SCCW	Supplemental Condenser Cooling Water
SFI	Sport Fishing Index

Acronyms
(continued)

SSS	Spring Sport Fish Survey
TRM	Tennessee River Mile
TVA	Tennessee Valley Authority
VS	Vital Signs
WBN	Watts Bar Nuclear Plant
Wr	Relative Weight

Introduction

Section 316(a) of the Clean Water Act specifies that industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. Industries responsible for point-source discharges of heated water can obtain a variance from state water quality standards if the industry can demonstrate compliance with thermal criteria by documenting the maintenance of Balanced Indigenous Populations (BIP) of aquatic life in the vicinity of its discharge.

Historically, the Tennessee Valley Authority (TVA) used special studies to evaluate affects on aquatic life in the vicinity of its power plant discharges. In July 1999, a Supplemental Condenser Cooling Water (SCCW) system went on line at TVA's Watts Bar Nuclear Plant (WBN). As required by WBN's National Pollutant Discharge Elimination System (NPDES) permit TN0020168, impacts to aquatic communities in the vicinity of WBN and Watts Bar Reservoir forebay were evaluated. Baxter et al. (2001) recommended components of TVA's Vital Signs (VS) monitoring program (Dycus and Meinert 1993), the Reservoir Fish Assemblage Index (RFAI) and Benthic Macroinvertebrate Index (BI) to WBN management as a means of assessing Chickamauga and Watts Bar Reservoirs' aquatic community integrity while the SCCW is operational. The purpose of this document is to briefly summarize and provide results of the Calendar Year 2004 monitoring and analyses to the Tennessee Department of Environment and Conservation and compare these results with historical monitoring data.

Prior to 1990, TVA reservoir studies focused on reservoir ecological assessments to meet specific needs as they arose. In 1990, TVA instituted a Valley-wide VS monitoring program which is a broad-based evaluation of the overall ecological conditions in major reservoirs. Data is evaluated with a multi-metric monitoring approach utilizing five environmental indicators: dissolved oxygen, chlorophyll, sediment quality, benthic macroinvertebrate community, and the fish community. When this program was initiated, specific evaluation techniques were developed for each indicator, and these techniques were fine-tuned to better represent ecological conditions. The outcome of this effort was development of multi-metric evaluation techniques for the fish assemblage (i.e., RFAI) and the benthic community, as described below. These multi-metric evaluation techniques have proven successful in TVA's monitoring efforts as well as other federal and state monitoring programs. For consistency, only RFAI analyses between 1993 and 2004 will be utilized. The BI is used primarily to support the RFAI analysis.

The Sport Fishing Index (SFI) was developed to quantify sport fishing quality for individual sport fish species. The SFI relies on measurements of quantity and quality aspects of angler success and fish population characteristics. This provides biologists with a reference point to measure the quality of a sport fishery. Comparison of the population sampling parameters and creel results for a particular sport fish species with expectations of these parameters from a high quality fishery (reference conditions) allows for the determination of fishing quality. Indices have been developed for black bass (largemouth, smallmouth and spotted bass), sauger, striped bass, bluegill, and channel catfish.

In recent years, SFI information has been used to describe the quality of the resident fishery in conjunction with compliance monitoring, thermal variance requests, and other regulatory issues at TVA nuclear plants in Tennessee. Similar NPDES compliance monitoring programs using the methodologies described above are also being performed at Browns Ferry Nuclear, Colbert and Widows Creek Fossil Plants in Alabama.

Based on the RFAI and benthic macroinvertebrate analyses, TVA biologists have concluded that the SCCW and WBN operation had no effect on the fish and benthic macroinvertebrate communities in the vicinity of WBN and Watts Bar Reservoir forebay during Calendar Year 2004.

The TVA Spring Sport Fish Survey (SSS) is conducted to evaluate the sport fish population of TVA Reservoirs. The results of the survey are used by state agencies to protect, improve and assess the quality of sport fisheries. Predominant habitat types in the reservoir are surveyed to determine sport fish abundance. In addition to accommodating TVA and state databases, this surveying method aligns with TVA Watershed Team and TVA's Reservoir Operations Study objectives. Sample sites are selected using the shoreline habitat characteristics employed by the Watershed Teams. The survey predominantly targets three species of black bass (largemouth, smallmouth, and spotted bass) and black and white crappie. These species are the predominant sport fish sought after by fisherman.

Methods

Fish Community

Reservoirs are typically divided into three zones for VS monitoring – inflow, transition and forebay. The inflow zone is generally in the upper reaches of the reservoir and is riverine in nature; the transition zone or mid-reservoir is the area where water velocity decreases due to increased cross-sectional area, and the forebay is the lacustrine area near the dam. The Chickamauga Reservoir inflow zone sample site is located at Tennessee River Mile (TRM) 529.0, the transition zone is sampled at TRM 490.5, and the forebay zone sample site is located at TRM 472.3. The VS inflow zone starts below Watts Bar Dam at TRM 529 and extends downstream to TRM 526.3. This station is used to provide downstream data for the 316(a) thermal variance studies performed in 1993 to 1995, 1997, and 1999 to 2004. Since the WBN discharge is located within Chickamauga Reservoir inflow zone, no upstream control site data are available for comparison. Watts Bar Reservoir forebay site (TRM 531) will be used to document any notable changes in Tennessee River ecological conditions above the WBN discharge but will not be used for upstream/downstream comparisons of RFAI scores.

Fish samples consisted of fifteen 300-meter electrofishing runs (approximately 10 minutes duration) and ten experimental gill net sets (five 6.1 meter panels with mesh sizes of 2.5, 5.1, 7.6, 10.2, and 12.7 cm) per site. Attained values for each of the 12 metrics were compared to reference conditions for transition zones of lower mainstream Tennessee River reservoirs and assigned scores based upon three categories hypothesized to represent relative degrees of degradation: least degraded -5; intermediate -3; and most degraded -1. These categories are

based on "expected" fish community characteristics in the absence of human-induced impacts other than impoundment. Individual metric scores for a site are summed to obtain the RFAI score.

Comparison of the attained RFAI score from the potential impact zone to a predetermined criterion has been suggested as a method useful in identifying the presence of normal community structure and function and hence existence of a BIP. For multi-metric indices, two criteria have been suggested to ensure a conservative screening for a BIP. First, if an RFAI score reaches 70 percent of the highest attainable score (adjusted upward to include sample variability), and second, if fewer than half of RFAI metrics potentially influenced by thermal discharge receive a low (1) or moderate (3) score, then normal community structure and function would be present indicating that a BIP existed. Under these conditions the heated discharge would meet screening criteria and no further evaluation would be needed.

The range of RFAI scores possible is from 12 to 60. As discussed in detail below, the average variance for RFAI scores in TVA reservoirs is 6 ($\pm$ 3). Therefore, any location that attains an RFAI score of 45 (42 + our sample variance of 3) or higher would be considered to demonstrate a BIP. It must be stressed that scores below this endpoint do not necessarily reflect an adversely impacted fish community. The endpoint is used to serve as a conservative screening level; for example, any fish community that meets these criteria is obviously not adversely impacted. RFAI scores below this level would require a more in-depth look to determine if a BIP exist. If a score below this criterion is obtained, an inspection of individual RFAI metric results would be an initial step to help identify if WBN operation is a contributing factor. This approach is appropriate if a validated multi-metric index is being used and scoring criteria applicable to the zone of study are available.

The Quality Assurance (QA) component of VS monitoring deals with how well the RFAI scores can be repeated and is accomplished by collecting a second set of samples at 15-20 percent of the sites each year. Previous statistical analyses with the QA component of VS has shown that the comparison of RFAI index scores from 54 paired sample sets collected over a seven year period ranged from 0 to 18 points. Based on these findings, the 75th percentile is 6 and the 90th percentile is 12. The mean difference between these 54 paired scores is 4.6 points with 95 percent confidence limits of 3.4 and 5.8. Therefore, a difference of 6 points or less was the value selected for defining "similar" scores between upstream and downstream fish communities. That is, if the downstream RFAI score is within 6 points of the upstream score, the communities will be considered similar. It is important to bear in mind that differences greater than 6 points can be expected simply due to method variation (25 percent of the QA paired sample sets exceeded that value). When this occurs, a metric-by-metric examination will be conducted to determine what caused the difference in scores and the potential for the difference to be thermally related.

Benthic Macroinvertebrate Community

Ten benthic grab samples were collected at equally spaced points along the upstream and downstream transects. A Ponar sampler was used for most samples but a Peterson sampler was used when heavier substrate was encountered. Collection and processing techniques followed standard VS procedures. Bottom sediments were washed on a 533μ screen; organisms were then

picked from the screen and remaining substrate and identified to Order or Family level in the field using no magnification. Benthic community results were evaluated using seven community characteristics or metrics. Results for each metric were assigned a rating of 1, 3, or 5 depending upon how they compared to reference conditions developed for VS sample sites. The ratings for the seven metrics were summed to produce a total benthic score for each sample site. Each reservoir section (inflow, transition, or forebay) differs in their maximum potential for benthic diversity; thus, the criteria for assigning metric ratings were adjusted accordingly such that the total benthic scores from sites on different reservoir sections are comparable. Potential scores ranged from 7 to 35. Ecological health ratings ("Poor," "Fair,", or "Good") are then applied to scores. A similar or higher benthic index score at the downstream site compared to the Watts Bar forebay site is used as basis for determining WBN's absence of impact on the benthic community.

The QA component of VS monitoring shows that the comparison of benthic index scores from 49 paired sample sets collected over a seven year period ranged from 0 to 14 points, the 75th percentile was 4, the 90th percentile was 6. The mean difference between these 49 paired scores was 3.1 points with 95 percent confidence limits of 2.2 and 4.1. Based on these results, a difference of 4 points or less is the value selected for defining "similar" scores between upstream and downstream benthic communities. That is, if the downstream benthic score is within 4 points of the upstream score, the communities will be considered similar. Once again, it is important to bear in mind that differences greater than 4 points can be expected simply due to method variation (25 percent of the QA paired sample sets exceeded that value). When this occurs, a metric-by-metric examination will be conducted to determine what caused the difference in scores and the potential for the difference to be thermally related.

Sport Fishing Index

Calculations described by Hickman (2000) were used to compare SFI values for selected quantity and quality parameters from creel and population samples to expected values that would occur in a good or high quality fishery. Quantity parameters include angler success and catch per unit effort from standard population samples (electrofishing, trap and experimental gill netting). Population quality is based on measurement of five aspects of each resident sport fish community. Four of these aspects address size structure (proportional number of fish in each length group) of the community, Proportional Stock Density (PSD), Relative Stock Density of Preferred-sized fish (RSDP), Relative Stock Density of Memorable-sized fish (RSDM), and Relative Stock Density of Trophy-sized fish (RSDT) (Figure 1). Relative weight (Wr), a measure of the average condition of individual fish makes up the fifth population quality aspect.

As described by Hickman (2000), observed values were compared to reference ranges and assigned a corresponding numerical value. The SFI value is calculated by adding the scores for quantity and quality from existing data and multiplying by two when only creel or population data are available. Species received a low score when insufficient numbers of individuals were captured to reliably determine proportional densities or relative weights for particular parameters. SFI scores are typically compared to average Tennessee Valley reservoir scores; however, Valley-wide scores are unavailable from natural resource agencies. Therefore, Chickamauga

Reservoir fish species scores will be compared to previous years. The 2004 State Fisheries gill netting and creel data were not available for analysis before this report was published; therefore 2003 SFI data were used for analysis.

Spring Sport Fish Survey

A spring sportfish survey was conducted on Watts Bar Reservoir April 2004. Twelve sites at four locations including Watts Bar Dam, Blue Springs, Caney Creek and Center's Ferry were sampled using boat-mounted electrofishers. Each run consisted of thirty minutes of continuous electrofishing in the littoral zones of prominent habitat types represented in the reservoir. Summer pool level for Watts Bar is 741.0 msl and sampling was conducted at 740.5 msl.

TVA Fisheries Biologists use electrofishing equipment to sample fish at selected locations. In that process an electric current is used to temporarily stun the fish so they float to the surface of the water. The fish are collected with nets, counted, weighed, measured, and released unharmed. Each run consisted of thirty minutes of continuous electrofishing, a total of twenty-four hours, in the littoral zones of prominent habitat types represented in the reservoir.

Results of the SSS monitoring were calculated using Shoreline Assessment Habitat Index (SAHI), Relative Stock Density (RSD), PSD, and Wr.

Habitat type is evaluated using the SAHI metric and is a critical component incorporated into the spring sport fish survey. The resultant habitat designations (good, fair and poor) are correlated to black bass abundance (numbers/hour).

RSD is the number of fish greater than a minimum preferred length in a stock divided by the number of fish greater than or equal to a minimum stock size.

PSD is the number of fish greater than or equal to a minimum quality length in a sample divided by the number of fish greater than or equal to a minimum stock length.

Wr is an index that quantifies fish condition and the preferred range value is 90-105% for moderate density bass populations such as those found in the Tennessee Valley latitudes.

Results and Discussion

Fish Community

In the autumn of 2004, RFAI results from the downstream site received the RFAI score of 42 (Good) indicating that resident fish community below the WBN discharge was above the screening level and considered to have BIP (Table 1). In fact, the inflow site averaged an RFAI score of 46 for the last ten sample years (Table 2). The RFAI scores for the inflow site remained in the good to excellent ecological health range for all sampling seasons (Figures 2 and 3). Watts Bar Reservoir RFAI forebay data collected between 1993 and 2004 reflect little change in the overall ecological health of the fish communities at this site (Figure 3). Five of the eight sample seasons scored in the good range; the other three sample seasons were only slightly below the good range illustrating only slight variability in ecological health. Watts Bar Reservoir forebay

reached 75 percent of its highest potential RFAI score (Tables 2 and 3) and Chickamauga inflow reached 70 percent of its highest potential score in sample year 2004 (Tables 1 and 2) indicating that a BIP exists downstream of the WBN discharge and that neither the operation of WBN or SCCW are adversely affecting fish communities in the vicinity of the discharge.

Electrofishing and gill netting catch rates for individual species collected in Chickamauga Reservoir downstream of the discharge are listed in Tables 4 and 5. Thirty two species were collected at the inflow site in 2004 (Table 5) compared to 29 species collected in 2003 (Baxter and Gardner 2004).

Benthic Macroinvertebrate Community

Table 6 provides results and ratings for each metric as well as the overall benthic index score for three monitoring sites: one site upstream and two sites downstream from WBN. Table 7 summarizes density by taxon at the downstream collection site (TRM 527.4). The sample from Watts Bar Reservoir forebay (TRM 532.5) was field processed and no lower level taxonomic identifications were made. In 2004 samples, the Watts Bar forebay station had a benthic index score of 17 ("Poor") while both the Chickamauga Reservoir downstream sites (TRM 527.4 and TRM 518) scored 33 ("Good"). Therefore, WBN has not had an effect on the benthic macroinvertebrate community immediately downstream from the plant.

Table 8 provides benthic index scores from VS monitoring at the forebay, inflow, and transition zone sites on Chickamauga and Watts Bar reservoirs from 1994 through 2004. The Chickamauga transition zone sample site (TRM 490.5) is of sufficient distance downstream (37 miles) such that results would not be expected to reflect plant effects. In 2004, both sites immediately downstream from WBN (TRM 527.4 and TRM 518) produced a score of 33 (excellent). This suggests that WBN has had no effect on the macroinvertebrate community immediately downstream from the plant.

Sport Fishing Index

In the autumn of 2003, Chickamauga Reservoir's sport fish population received similar SFI scores compared to the seven year average. Black bass, largemouth bass, smallmouth bass, spotted bass, crappie and white bass received higher scores than their seven year averages (Table 9 and Figure 4). Both sauger and striped bass received lower scores in 2003 compared to scores in 2002. The score for sauger was the lowest it has been since 1997 when this analysis technique was implemented by TVA. This quality assessment is not necessarily indicative of a trend. Historical data indicate that SFI scores typically vary across years. However if future scores continue to decline, further investigation would be warranted. Channel catfish, crappie and white bass received their highest SFI scores to date. Crappie and white bass scores increased from 38 to 42 and 30 to 40, respectively (Table 9 and Figure 4).

SFI results for Watts Bar Reservoir's black bass species received lower scores in 2003 compared to their seven year averages (Table 10). Bluegill, white and striped bass received higher scores than their seven year averages (Table 10 and Figure 5).

Tables 11 and 12 illustrate SFI scoring criteria for population metrics and creel quantity and quality.

Sauger, striped bass, and channel catfish are easily caught during their spring migration to preferred spawning habitats. Fishing creel surveys conducted in the spring would better describe and evaluate these species compared to only using autumn fisheries surveys.

Spring Sport Fish Survey

Chickamauga Reservoir

A total of 18 hours of electrofishing resulted in 736 black bass collected; of these, 60.2% were harvestable size (10" or greater). Of the total black bass collected, 579 were largemouth, 120 were spotted and 37 were smallmouth bass. Overall catch rate (40.9 fish/hr.) was less than the 2003 survey (62.0/hour) (Table 13). The average weight of harvestable sized black bass was 1.3 pounds. The largest black bass collected was s 6.6 pound largemouth bass taken from Skull Island. Numbers of lunker bass were well represented with a total of 21 bass greater than three pounds, 13 greater than four pounds and 6 over five pounds. In 2003, 23 bass over four pounds were collected and eight of them were five pounds plus.

Length frequency histograms illustrated a bimodal distribution with the dominant size classes being the 10-11 inch and 13-14 inch groups (Figure 6). Good representation of the memorable category sized fish was also evident.

Habitat type is a critical component that has been incorporated into the spring sportfish survey. This metric is derived from the SAHI developed by Resource Stewardship. The resultant habitat designations (good, fair and poor) are correlated to black bass abundance (numbers/hour). A positive correlation of habitat type-to-black bass abundance was evident on Chickamauga Reservoir during the 2004 survey. Among the three areas sampled, the correlations at Skull Island were positive but Sale Creek and Harrison Bay showed some variability among habitat types, i.e., the catch rates (abundance) did not align with the habitat designation types (Table 14). Overall catch rates for the reservoir were 49, 42 and 31 at the good, fair and poor habitats, respectively (Table 15).

RSD is the number of fish greater than a minimum preferred length in a stock divided by the number of fish greater than or equal to a minimum stock size. The RSD value (15) fell within the desirable range (10-25) (Figure 7). The PSD is the number of fish greater than or equal to a minimum quality length in a sample divided by the number of fish greater than or equal to a minimum stock length. The PSD value (53) was also within the preferred range (40-70) (Figure 8). Wr is an index that quantifies fish condition and the preferred range value is 90-105% for moderate density bass populations such as those found in the Tennessee Valley latitudes. The values shown in Figure 9 are designated by inch groups which reflect the classical categories, i.e., 0-7 = substock, 8-11 = stock, 12-14 = quality, 15-19 = preferred, 20-24 = memorable and 25+ = trophy. All categories fell within the desired range, which reflects excellent condition of black bass in all size groups of the population. Field observations of large numbers of prey fish indicate an abundance of forage for all size classes of black bass.

A total of 106 crappie (88 black and 18 white crappie) were also collected during the survey. The crappies were collected predominantly from tree tops, stumps and other physical structures in shallow water.

Watts Bar Reservoir

A total of 24 hours of electrofishing resulted in 1,246 black bass collected; of these, 88.2% were harvestable size (10" or greater). Of the total black bass collected, 1,011 were largemouth, 157 were spotted and 78 were smallmouth bass. Overall catch rate (51.9 fish/hr.) was similar to the last three years surveyed (Table 16). The average weight of harvestable sized black bass was 1.5 pounds. The largest black bass was a 5.9 pound largemouth bass taken from Kingston. Numbers of lunker bass were up from last year's survey. A total of 13 bass over four pounds were collected and 2 of these were over five pounds.

Length frequency histograms illustrated a typical bell-shaped curve with the dominant size class being the 14-15 inch group (Figure 10). All size classes up to 22 inches were represented in the population.

Habitat type is a critical component that has been incorporated into the spring sportfish survey. This metric is derived from the SAHI developed by Resource Stewardship Group. The resultant habitat designations (good, fair and poor) are correlated to black bass abundance (numbers/hour). A positive correlation occurred at Blue Springs and Kingston sites. At Watts Bar Dam and Caney Creek the catch rate-to-black bass abundance was more variable (Table 14). The overall reservoir catch rates were 68, 47 and 44 fish/hour at the good, fair and poor habitat types, respectively (Table 15).

RSD is the number of fish greater than a minimum preferred length in a stock divided by the number of fish greater than or equal to a minimum stock size. The RSD value (24) fell within the desirable range (10-25) (Figure 7). The PSD is the number of fish greater than or equal to a minimum quality length in a sample divided by the number of fish greater than or equal to a minimum stock length. The PSD value (84) was outside the preferred range (40-70) (Figure 8). Wr is an index that quantifies fish condition and the preferred range value is 90-105% for moderate density bass populations such as those found in the Tennessee Valley latitudes. Relative weight data for Watts Bar fell within the desirable range of 90-105% indicating a balanced population structure of healthy, robust fish (Figure 11).

A total of 237 crappie (136 black and 101 white crappie) were collected during the survey.

Literature Cited

Baxter, D. S., K. D. Gardner, and G. D. Hickman. 2001. Watts Bar Nuclear Plant Supplemental Condenser Cooling Water System Fish Monitoring Program. Tennessee Valley Authority, Resource Stewardship, Norris, Tennessee. 33pp.

Baxter, D. S., K. D. Gardner, and D. L. Lowery. 2004. Biological Monitoring of the Tennessee River Near Watts Bar Nuclear Plant Discharge, 2003. Tennessee Valley Authority, Resource Stewardship, Norris, Tennessee. 35pp.

Dycus, D. L. and D. L. Meinert. 1993. Reservoir Monitoring, Monitoring and Evaluation of Aquatic Resource Health and Use Suitability in Tennessee Valley Authority Reservoirs. Tennessee Valley Authority, Water Resources, Chattanooga, Tennessee, TVA/WM-93/15.

Hickman, G. D. 2000. Sport Fish Index (SFI), A Method to Quantify Sport Fishing Quality. Environmental Science & Policy 3 (2000) S117-S125.

Table 1. Scoring Results for the Twelve Metrics and Overall Reservoir Fish Assemblage Index for Chickamauga Reservoir, 2004.

		Forebay TRM 472.3		Transition TRM 490.5		Inflow TRM 529.0		Sequoyah TRM 482.0	
Metric		**Obs**	**Score**	**Obs**	**Score**	**Obs**	**Score**	**Obs**	**Score**
A. Species richness and composition									
1. Number of species		25	3	32	5	29	5	27	3
2. Number of centrarchid species		7	5	8	5	7	5	6	5
3. Number of benthic invertivores		3	1	4	3	4	3	3	1
4. Number of intolerant species		5	5	5	5	4	3	5	5
5. Percent tolerant individuals	electrofishing	37.2	1.5	55.1	1.5	64.8	1.0	58.8	1.5
	gill netting	30.6	0.5	22.9	1.5	0	0	45.9	0.5
6. Percent dominance by one species	electrofishing	33.8	1.5	29.6	1.5	50.0	1.0	30.4	1.5
	gill netting	27.8	1.5	20.7	1.5	0	0	29.6	0.5
7. Number non-native species	electrofishing	0.4	2.5	0.8	2.5	0.5	5	0.9	2.5
	gill netting	0	2.5	0.5	2.5	0	0	0.6	2.5
8. Number of top carnivore species		8	5	11	5	10	5	9	5
B. Trophic composition									
9. Percent top carnivores	electrofishing	10.9	2.5	19.9	2.5	16.9	3	9.6	1.5
	gill netting	48.9	1.5	50.5	1.5	0	0	39.6	1.5
10. Percent omnivores	electrofishing	9.5	2.5	15.0	2.5	51.2	3	19.4	2.5
	gill netting	42.8	0.5	33.0	1.5	0	0	48.4	0.5

Table 1. (continued)

		Forebay TRM 472.3		Transition TRM 490.5		Inflow TRM 529.0		Sequoyah TRM 482.0	
Metric		**Obs**	**Score**	**Obs**	**Score**	**Obs**	**Score**	**Obs**	**Score**
C. Fish abundance and health									
11. Average number per run	electrofishing	**51.3**	**0.5**	**49.3**	**0.5**	**99.9**	**3.0**	**60.8**	**0.5**
	gill netting	**18.0**	**1.5**	**18.8**	**1.5**	**0**	**0**	**15.9**	**1.5**
12. Percent anomalies	electrofishing	**1.0**	**2.5**	**1.2**	**2.5**	**1.3**	**5.0**	**1.5**	**2.5**
	gill netting	**0**	**2.5**	**0.5**	**2.5**	**0**	**0**	**0**	**2.5**
RFAI		**43**		**49**		**42**		**41**	
		Good		**Good**		**Good**		**Good**	

*Percent composition of the most abundant species

Table 2. Recent (1993-2004) RFAI Scores Developed Using the RFAI Metrics Upstream and Downstream of Watts Bar Nuclear Plant.

Station	Reservoir	Location	1993	1994	1995	1996	1997	1998	1999	2000*	2001	2002*	2003*	2004	1993-2004 Average
Downstream	Chickamauga	TRM 529	52	52	46		44		42	44	46	48	48	42	46
Upstream	Watts Bar	TRM 531	43	48		44		41	36	44	39	39	45	43	42

*The 2000, and 2002 sample years were not part of the VS monitoring program, however the same methodology was applied.

Table 3. Scoring Results for the Twelve Metrics and Overall RFAI for Watts Bar Reservoir, 2004.

		Forebay TRM 531.0	
Metric		**Obs**	**Score**
A. Species richness and composition			
1. Number of species		28	5
2. Number of centrarchid species		7	5
3. Number of benthic invertivores		3	1
4. Number of intolerant species		4	3
5. Percent tolerant individuals	electrofishing	81.8	0.5
	gill netting	26.6	1.5
6. Percent dominance by one species	electrofishing	36.8	1.5
	gill netting	23.4	1.5
7. Number non-native species	electrofishing	1.4	2.5
	gill netting	1.3	2.5
8. Number of top carnivore species		11	5
B. Trophic composition			
9. Percent top carnivores	electrofishing	6.5	1.5
	gill netting	57.1	2.5
10. Percent omnivores	electrofishing	35.1	1.5
	gill netting	31.8	1.5
C. Fish abundance and health			
11. Average number per run	electrofishing	66.6	0.5
	gill netting	15.4	1.5
12. Percent anomalies	electrofishing	1.6	2.5
	gill netting	0	2.5
RFAI			43
			Good

Table 4. Species Listing and Catch Per Unit Effort for Chickamauga Reservoir Forebay and Sequoyah Transition Transects During the Fall Electrofishing and Gill Netting on Chickamauga Reservoir, 2004 (Electrofishing Effort = 300 Meters of Shoreline and Gill Netting Effort = 10 Net-Nights).

	Forebay TRM 472.3			Transition TRM 482.0		
Common Name	**Electrofishing Catch Rate Per Run**	**Electrofishing Catch Rate Per Hour**	**Gill Netting Catch Rate Per Net Night**	**Electrofishing Catch Rate Per Run**	**Electrofishing Catch Rate Per Hour**	**Gill Netting Catch Rate Per Net Night**
Spotted gar	-	-	-	0.53	2.68	-
Skipjack herring	-	-	3.30	-	-	1.50
Gizzard shad	3.13	16.73	5.00	9.80	49.16	4.70
Threadfin shad	3.40	18.15	-	1.07	5.35	-
Common carp	0.20	1.07	-	0.53	2.68	-
Golden shiner	0.80	4.27	0.10	0.20	1.00	1.50
Emerald shiner	17.33	92.53	-	12.20	61.20	-
Spotfin shiner	0.20	1.07	-	0.07	0.33	-
Bluntnose minnow	-	-	-	0.20	1.00	-
Smallmouth buffalo	-	-	-	0.07	0.33	-
Spotted sucker	0.40	2.14	0.20	0.40	2.01	0.10
Blue catfish	-	-	1.40	-	-	0.80
Channel catfish	0.73	3.91	1.20	1.00	5.02	0.70
`lathead catfish	0.40	2.14	0.50	-	-	0.20
.√hite bass	0.07	0.36	0.10	-	-	-
Yellow bass	-	-	2.80	-	-	1.70
Striped bass	-	-	-	-	-	0.10
Warmouth	0.33	1.78	-	-	-	-
Redbreast sunfish	4.53	24.20	-	3.73	18.73	-
Green sunfish	0.33	1.78	-	-	-	-
Bluegill	7.47	39.86	0.20	18.47	92.64	0.50
Longear sunfish	0.27	1.42	-	0.47	2.34	-
Redear sunfish	2.13	11.39	0.40	5.07	25.42	0.80
Smallmouth bass	0.33	1.78	-	0.33	1.67	-
Spotted bass	2.07	11.03	0.50	1.93	9.70	1.80
Largemouth bass	2.40	12.81	0.20	2.73	13.71	0.40
White crappie	-	-	-	-	-	0.20
Black crappie	0.33	1.78	1.40	0.33	1.67	0.40
Logperch	0.40	2.14	-	0.07	0.33	-
Sauger	-	-	-	-	-	0.20
Freshwater drum	1.27	6.76	0.70	0.87	4.35	0.50
Brook silverside	2.73	14.59	-	0.67	3.34	-
Chestnut lamprey	-	-	-	0.07	0.33	-
Total	**51.25**	**273.69**	**18.00**	**60.81**	**304.99**	**15.9**
Number Samples	**15**		**10**	**15**		**10**
umber Collected	**769**		**180**	**912**		**159**
Species Collected	**26**		**15**	**23**		**16**

Table 5. Species Listing and Catch Per Unit Effort for the Transition, and Inflow Transects During the Fall Electrofishing and Gill Netting on Chickamauga Reservoir, 2004 (Electrofishing Effort = 300 Meters of Shoreline and Gill Netting Effort = 10 Net-Nights).

	Transition TRM 490.5			Inflow TRM 529.0		Forebay TRM 531.0		
Common Name	Electrofishing Catch Rate Per Run	Electrofishing Catch Rate Per Hour	Gill Netting Catch Rate Per Net Night	Electrofishing Catch Rate Per Run	Electrofishing Catch Rate Per Hour	Electrofishing Catch Rate Per Run	Electrofishing Catch Rate Per Hour	Gill Netting Catch Rate Per Net Night
Longnose gar	-	-	0.10	1.20	6.21	0.07	0.38	-
Spotted gar	0.53	2.73	-	0.07	0.34	-	-	-
Skipjack herring	-	-	2.80	-	-	-	-	3.40
Gizzard shad	5.73	29.35	3.90	50.00	258.62	22.07	126.34	3.60
Threadfin shad	0.33	1.71	-	13.07	67.59	0.07	0.38	-
Largescale stoneroller	-	-	-	0.07	0.34	-	-	-
Common carp	0.27	1.37	-	0.40	2.07	0.47	2.67	0.10
Golden shiner	0.40	2.05	0.10	0.07	0.34	-	-	-
Emerald shiner	4.13	21.16	-	0.60	3.10	0.73	4.20	-
Spotfin shiner	0.13	0.68	-	0.73	3.79	1.07	6.11	-
Bluntnose minnow	0.33	1.71	-	0.07	0.34	-	-	-
Smallmouth buffalo	-	-	-	0.07	0.34	0.60	3.44	0.10
Black buffalo	-	-	-	-	-	0.13	0.76	-
Spotted sucker	0.20	1.02	0.20	0.27	1.38	0.93	5.34	1.30
Black redhorse	-	-	-	-	-	-	-	-
Golden redhorse	0.07	0.34	0.10	0.13	0.69	-	-	0.10
Blue catfish	-	-	1.50	-	-	-	-	0.30
Channel catfish	0.67	3.41	0.70	0.60	3.10	0.13	0.76	0.80
Flathead catfish	0.40	2.05	0.40	0.60	3.10	0.33	1.91	0.30
White bass	-	-	-	2.13	11.03	0.07	0.38	1.70
Yellow bass	0.07	0.34	3.10	1.73	8.97	0.07	0.38	0.50

Table 5. (continued)

	Transition TRM 490.5			Inflow TRM 529.0		Forebay TRM 531.0		
Common Name	**Electrofishing Catch Rate Per Run**	**Electrofishing Catch Rate Per Hour**	**Gill Netting Catch Rate Per Net Night**	**Electrofishing Catch Rate Per Run**	**Electrofishing Catch Rate Per Hour**	**Electrofishing Catch Rate Per Run**	**Electrofishing Catch Rate Per Hour**	**Gill Netting Catch Rate Per Net Night**
Warmouth	0.53	2.73	0.20	-	-	0.33	1.91	-
Striped bass	-	-	0.10	-	-	0.13	0.76	0.10
Redbreast sunfish	2.87	14.68	-	1.27	6.55	3.80	21.76	-
Green sunfish	0.07	0.34	-	0.33	1.72	0.73	4.20	-
Bluegill	14.60	74.74	0.20	5.93	30.69	24.53	140.46	-
Longear sunfish	0.87	4.44	-	2.13	11.03	-	-	-
Redear sunfish	5.07	25.94	1.90	4.27	22.07	2.80	16.03	0.10
Hybrid sunfish	-	-	-	0.07	0.34	0.47	2.67	-
Smallmouth bass	1.20	6.14	-	1.67	8.62	1.73	9.92	0.10
Spotted bass	3.27	16.72	1.80	3.27	16.90	0.20	1.15	0.90
Largemouth bass	2.67	13.65	-	4.33	22.41	1.73	9.92	0.10
White crappie	0.13	0.68	-	0.40	2.07	-	-	0.30
Black crappie	1.53	7.85	1.00	1.53	7.93	-	-	1.30
Yellow perch	0.13	0.68	-	0.07	0.34	0.33	1.91	-
Logperch	0.20	1.02	-	1.20	6.21	-	-	-
Sauger	-	-	0.20	-	-	-	-	0.10
Freshwater drum	1.27	6.48	0.50	1.13	5.86	0.67	3.82	0.20
Brook silverside	0.87	4.44	-	0.53	2.76	2.40	13.74	-
Inland silverside	0.67	3.41	-	-	-	-	-	-
Chestnut lamprey	0.13	0.68	-	-	-	-	-	-
Total	**49.34**	**252.54**	**18.80**	**99.94**	**516.85**	**66.59**	**381.3**	**15.4**
Number Samples	**15**		**10**	**15**		**15**		**10**
Number Collected	**740**		**188**	**1,499**		**999**		**154**
Species Collected	**30**		**18**	**32**		**26**		**20**

Table 6. Individual Metric Ratings and the Overall Benthic Community Index Scores for Watts Bar Forebay and Sites Downstream of Watts Bar Nuclear Plant, Watts Bar and Chickamauga Reservoirs, November 2004.

	TRM 532.5		TRM 527.4		TRM 518	
Metric	**Obs**	**Rating**	**Obs**	**Rating**	**Obs**	**Rating**
1. Average number of taxa	4	3	13.9	5	10.8	5
2. Proportion of samples with long-lived organisms	20%	1	100%	5	100%	5
3. Average number of EPT taxa	0.2	1	1.9	3	0.9	3
4. Average proportion of oligochaete individuals	19.8%	5	1.1%	5	2.7%	5
5. Average proportion of total abundance comprised by the two most abundant taxa DOM	90.4%	1	57.6%	5	60.4%	5
6. Average density excluding chironomids and oligochaetes TOTNONCT	61.7	1	2028.3	5	1320.5	5
7. Zero-samples - proportion of samples containing no organisms	0	5	0	5	0	5
Benthic Index Score		**17 Poor**		**33 Excellent**		**33 Excellent**

TRM 532.5 scored with forebay criteria, TRM 527.4 and 518 scored with inflow criteria.
Benthic Index Scores: Very Poor 7-12, Poor 13-18, Fair 19-23, Good 24-29, Excellent 30-35

Table 7. Average Mean Density Per Square Meter of Benthic Taxa Collected at the Downstream Site Near Watts Bar Nuclear Plant, Chickamauga Reservoir, November 2004.

Chickamauga Reservoir	TRM 527.4	
Species	Mean Density	Occurrence per site
Nematoda		
Turbellaria		
Tricladida		
Planariidae		
Dugesia tigrina	258	9
Annelida		
Oligocheata		
Lumbriculidae	2	1
Naididae		
Nais sp.	3	2
Tubificidae	28	4
Branchiura sowerbyi	2	1
Hirudinea	13	3
Rhynchobdellida		
Glossiphoniidae	2	1
Helobdella triserialis	2	1
Pharnygobdellida		
Coelenterata		
Hydra americana	2	1
Crustacea		
Amphipoda		
Gammaridae		
Gammarus sp.	167	8
Insecta		
Ephemeroptera		
Leptohypidae		
Tricorythodes sp.	3	2
Trichoptera		
Polycentropodidae		
Cyrnellus fraternus	417	9
Hydropsychidae		
Cheumatopsyche sp.	10	3
Leptoceridae		
Ceraclea sp.	18	5
Chironomidae		
Axarus sp.	2	1
Cricotopus sp.	2	1

Table 7. (continued)

Chickamauga Reservoir	TRM 527.4	
Species	Mean Density	Occurrence per site
Dicrotendipes simpsoni	5	3
Dicrotendipes sp.	8	4
Glyptotendipes sp.	22	4
Parachironomus sp.	12	4
Rheotanytarsus sp.	8	1
Mollusca		
Gastropoda		
Lymnophila		
Ancylidae		
Ferrissia rivularis	23	6
Planorbidae		
Menetus dilatatus	58	6
Physidae		
Physella sp.	2	1
Gastropoda		
Mesogastropoda		
Hydrobiidae		
Amnicola sp.	8	2
Pleuroceridae		
Pleurocera canaliculata	28	6
Viviparidae		
Viviparus Georgianus	10	1
Viviparus sp.	123	7
Bivalvia		
Veneroida		
Corbiculidae		
Corbicula fluminea <10mm	437	9
Corbicula fluminea >10mm	77	7
Dreissenidae		
Dreissena polymorpha	5	2
Sphaeriidae		
Musculium transversum	232	9
Unionoida		
Unionidae	15	4
Number of samples	**10**	
Sum	**2003**	
Number of taxa	**27**	
Number of EPT taxa	**4**	
Sum of area sampled	**0.60**	

Table 8. Recent (1994-2004) Benthic Index Scores Collected as Part of the Vital Signs Monitoring Program at Watts Bar Reservoir Transition and Forebay Zone Sites (Upstream), and Chickamauga Reservoir Inflow (Upstream) and Transition (Downstream) Sites.

Site	*Reservoir*	*Location*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	**Average**
Upstream	Watts Bar	TRM 560.8	29		25		23		21		21			24
Upstream	Watts Bar	TRM 532.5	13		11		13		15	13	9	15	17	13
Downstream	Chickamauga	TRM 527.4								29	27	33	33	31
Downstream	Chickamauga	TRM 518.0	19	23		25		21	23	29	25	29	33	25
Downstream	Chickamauga	TRM 490.5	33	29		31		31	23	25	23	31	29	28

Scores that are considered very poor range from 7-12, poor range from 13-18, fair range from 19-23, good range from 23-29 and excellent range from 30-35.

Table 9. Sport Fishing Index Results for Chickamauga Reservoir, 2003.

	Years							
Species	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**1997-2004 Average SFI Score**
Black bass	35	41	25	35	31	34	34	34
Bluegill	30		32	33	32	32	31	32
Channel catfish	32		32	29	30	25	33	35
Crappie			31	31	32	38	42	35
Largemouth bass	34	37	34	32	28	36	36	34
Spotted bass	20	37	24	40	26	32	32	30
Sauger	27	36	32	39	30	31	27	32
Smallmouth bass	20	20	24	22	40	32	32	28
Striped bass	35		30	30	40	34	31	33
White bass			31	30	30	30	40	32

Table 10. Sport Fishing Index Results for Watts Bar Reservoir, 2003.

	Years							
Species	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**1997-2004 Average SFI Score**
Black bass	42	39	25	41	37	36	31	36
Bluegill	35	30	31	27	36	26	36	32
Channel catfish	30	25	25	22	26	21	30	26
Crappie	20	44	35	37	31	30	31	33
Largemouth bass	44	26	36	43	39	36	34	37
Spotted bass		31		38	30	28	30	31
Sauger	32	30	30	34	29	20	30	29
Smallmouth bass	22	39	32	38	30	38	24	32
Striped bass	25	25	36	39	36	40	43	35
White bass		25	30	25	30	30	30	28

Table 11. Sport Fishing Index Population Quantity and Creel Quantity and Quality Metrics and Scoring Criteria.

Metrics	Scores		
	5	10	15
Black bass			
Population (quantity)			
TVA electrofishing catch/hour	< 15	15-31	> 31
State electrofishing (catch/hour)	< 62	62-124	> 124
Creel (quantity)[a]			
Anglers (catch/hour)	< 0.3	0.3-0.6	> 0.6
BAIT and BITE data	< 1.1	1.1-2.3	> 2.3
Creel (quality)			
Pressure (hours/acre)	< 8	8-16	> 16
Largemouth bass			
Population (quantity)[b]			
TVA electrofishing catch/hour	< 13	13-25	> 25
State electrofishing (catch/hour)	< 53	53-106	> 106
Creel (quantity)			
Anglers (catch/hour)	< 0.29	0.29-0.58	> 0.58
Creel (quality)			
Pressure (hours/acre)	< 8	8-16	> 16
Smallmouth bass			
Population (quantity)			
TVA electrofishing catch/hour	< 4	4-8	> 8
State electrofishing (catch/hour)	< 8	8-15	> 15
Creel (quantity)			
Anglers (catch/hour)	< 0.1	0.1-0.3	> 0.3
Creel (quality)			
Pressure (hours/acre)	< 8	8-16	> 16
Spotted bass			
Population (quantity)			
TVA electrofishing catch/hour	< 5	5-11	> 11
State electrofishing (catch/hour)	< 14	14-27	> 27
Creel (quantity)			
Anglers (catch/hour)	< 0.07	0.07-0.13	> 0.13
Creel (quality)			
Pressure (hours/acre)	< 8	8-16	> 16

Table 11. (continued)

Metrics	Scores		
	5	10	15
Sauger			
Population (quantity)			
Experimental gill net (catch/net night)	< 9	9-17	> 17
Creel (quantity)			
Anglers (catch/hour)	< 0.5	0.5-1	> 1
Creel (quality)			
Pressure (hours/acre)	< 5	5-10	> 10
Channel catfish			
Population (quantity)			
Experimental gill net (catch/net night)	< 2	2-4	> 4
Creel (quantity)			
Anglers (catch/hour)	< 0.3	0.3-0.7	> 0.7
Creel (quality)			
Pressure (hours/acre)	< 9	9-19	> 19

[a]Each worth 2.5, 5.0, and 7.5 points if both data sets are available.
[b]TVA electrofishing only used when state agency electrofishing data are unavailable.

Table 12. Sport Fishing Index Population Quality Metrics and Scoring Criteria.

	Scores		
	5	**10**	**15**
Metrics			
Population (quality)	1	2	3
PSD	< 20 or > 80	20-39 or 61-80	40-60
RSDP (preferred)	0 or > 60	1-9 or 41-60	10-40
RSDM (memorable)	0 or > 25	1-4 or 11-25	5-10
RSDT (trophy)	0	< 1	≥ 1
W_r (Stock-preferred size fish)	< 90	> 110	90-110

Table 13. Electrofishing Catch Rate, Mean Weight, Percent Harvestable, Numbers of Black Bass Greater than Five Pounds, Numbers of Black Bass Greater than Four Pounds and Largest Black Bass Collected, Chickamauga Reservoir Black Bass Surveys, 1995-2004.

Year	EF Catch Rate (no./hr.)	Mean Weight (lbs.)	% Harvestable	Bass >4 lbs.	Bass >5 lbs.	Largest bass (lbs.)
2004	40.9	1.3	60.2	13	6	6.6
2003	62.0	1.3	65.8	23	8	6.4
2002	57.4	1.1	59.4	9	4	6.6
2001	34.5	0.8	45.2	0	0	2.8
2000	34.4	1	51.2	3	0	4.8
1999	10.6	1.3	60.7	3	1	6.1
1998	37.2	1.1	44.5	9	2	6.6
1997	40.2	1	70.1	8	4	8.7
1996	51	1.2	42.6	13	9	7.9
1995	62	1.2	61.8	28	12	8.3

Table 14. Black Bass Catch Per Hour Compared to Habitat Types by Location.

	Habitat Designation		
Reservoir and Site	**Good**	**Fair**	**Poor**
Chickamauga			
Harrison Bay	62(4)	30(4)	47(4)
Sale Creek	35(4)	58(4)	30(4)
Skull Island	50(2)	37(8)	17(2)
Watts Bar			
Blue Springs	57(3)	42(4)	42(5)
Caney Creek	61(4)	56(4)	59(4)
Kingston	70(4)	31(3)	28(5)
Watts Bar Dam	87(3)	51(6)	54(3)

Catch per hour = number of fish collected per hour
( ) = number of transects sampled at each location

Table 15. Black Bass Catch Per Hour Compared to Habitat Types by Reservoir.

	HABITAT DESIGNATION		
Reservoir	**Good**	**Fair**	**Poor**
Chickamauga	49	41	34
Watts Bar	68	47	44
Wheeler	99	75	43

Catch per hour = number of fish collected per hour

Table 16. Electrofishing Catch Rate, Mean Weight, Percent Harvestable, Numbers of Black Bass Greater than Five Pounds, Numbers of Black Bass Greater than Four Pounds and Largest Black Bass Collected, Watts Bar Reservoir Black Bass Surveys, 1995-2004.

Year	EF Catch Rate (no./hr.)	Mean Weight (lbs.)	% Harvestable	Bass >4 lbs.	Bass >5 lbs.	Largest bass (lbs.)
2004	51.9	1.5	88.2	13	2	5.9
2003	56.6	1.1	81.6	11	2	5.4
2002	57.0	1.2	70.7	28	10	6.4
2001	73.6	1.5	29.3	5	5	6.4
2000	17.0	1.2	56.3	3	1	5.3
1999	19.9	0.9	66.7	11	3	8.1
1998	55.8	1.0	88.6	6	4	7.2
1997	61.8	1.3	47.6	8	8	6.2
1996	34.3	1.6	79.0	9	7	7.7
1995	101.0	1.1	78.6	32	15	6.6

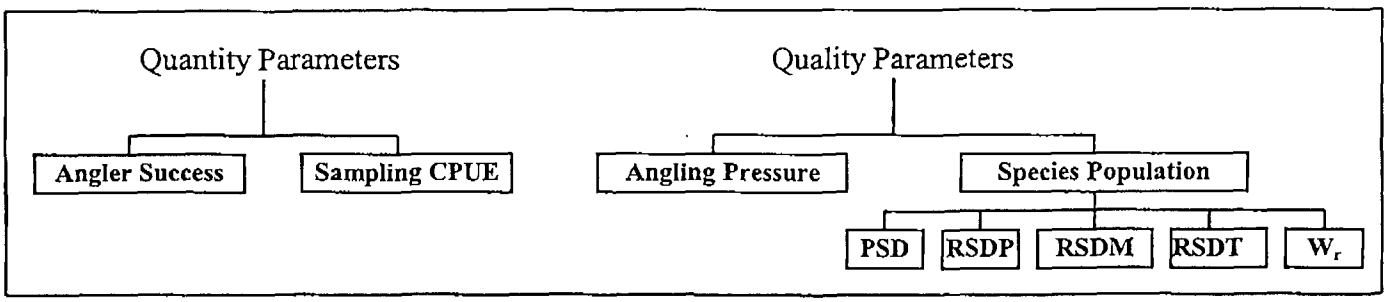

Figure 1. Parameters used to calculate the Sport Fishing Index.

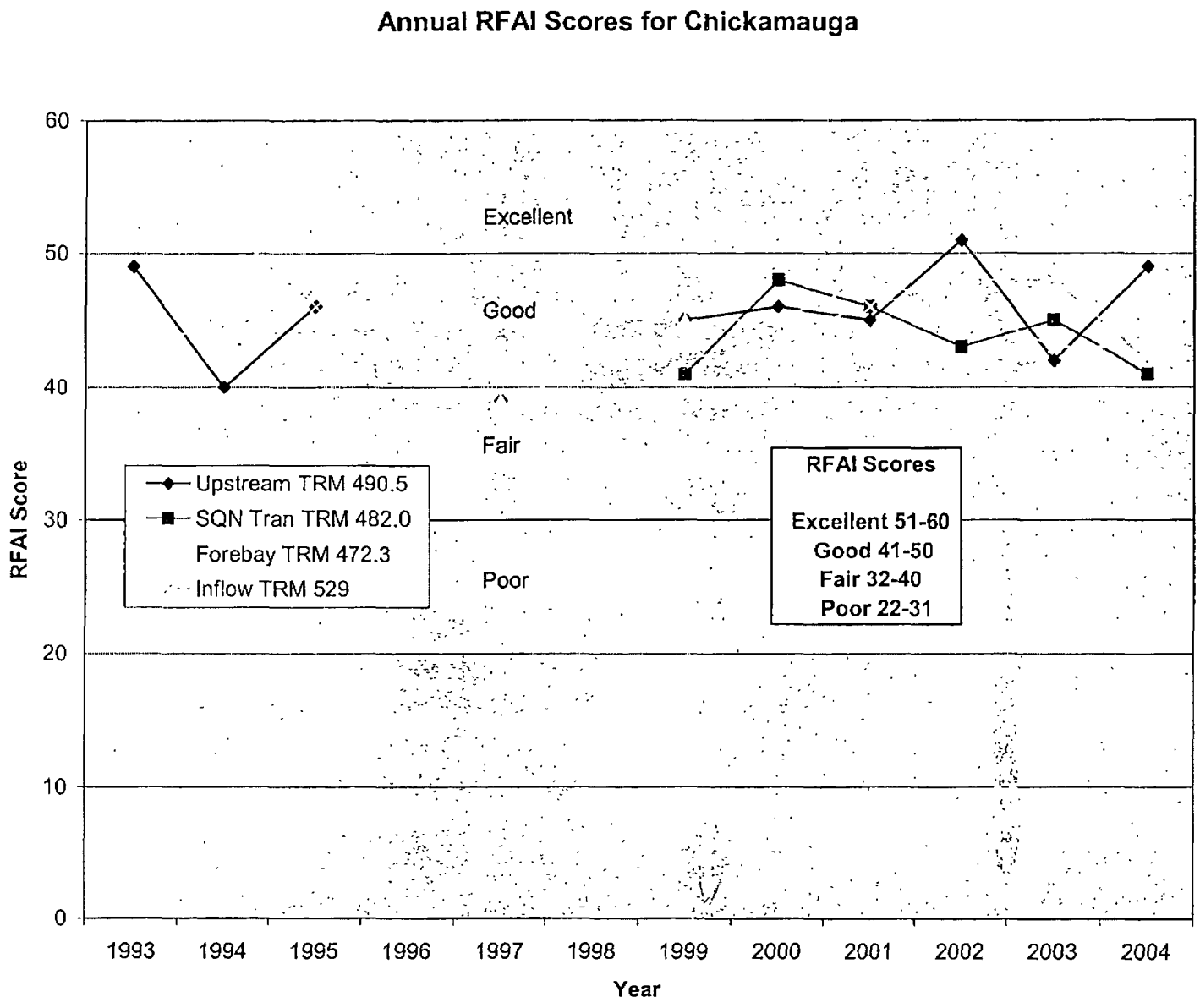

Figure 2. Annual Chickamauga Reservoir RFAI scores for sample years between 1993 and 2004.

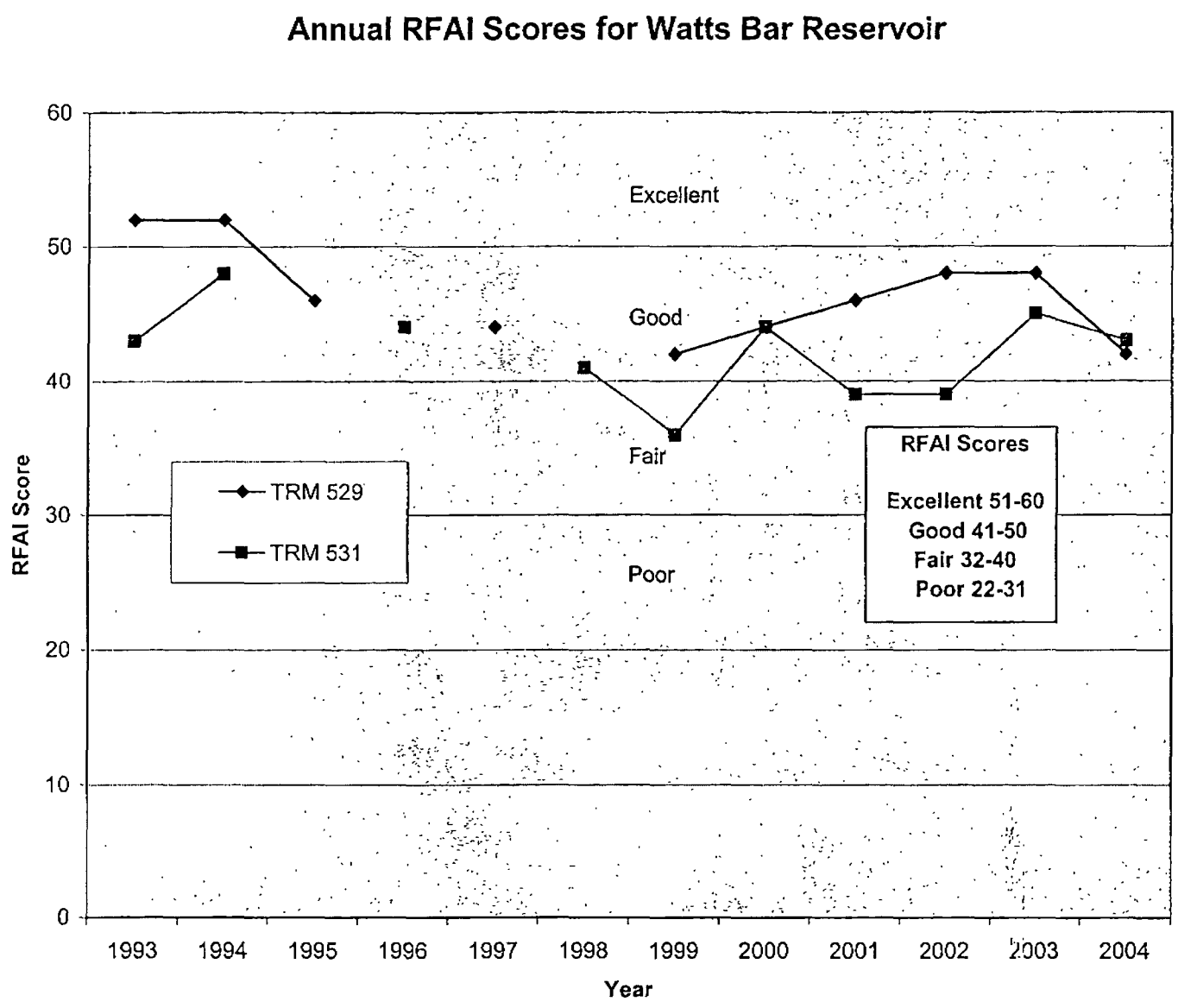

Figure 3. Annual Watts Bar Reservoir RFAI scores for sample years between 1993 and 2004.

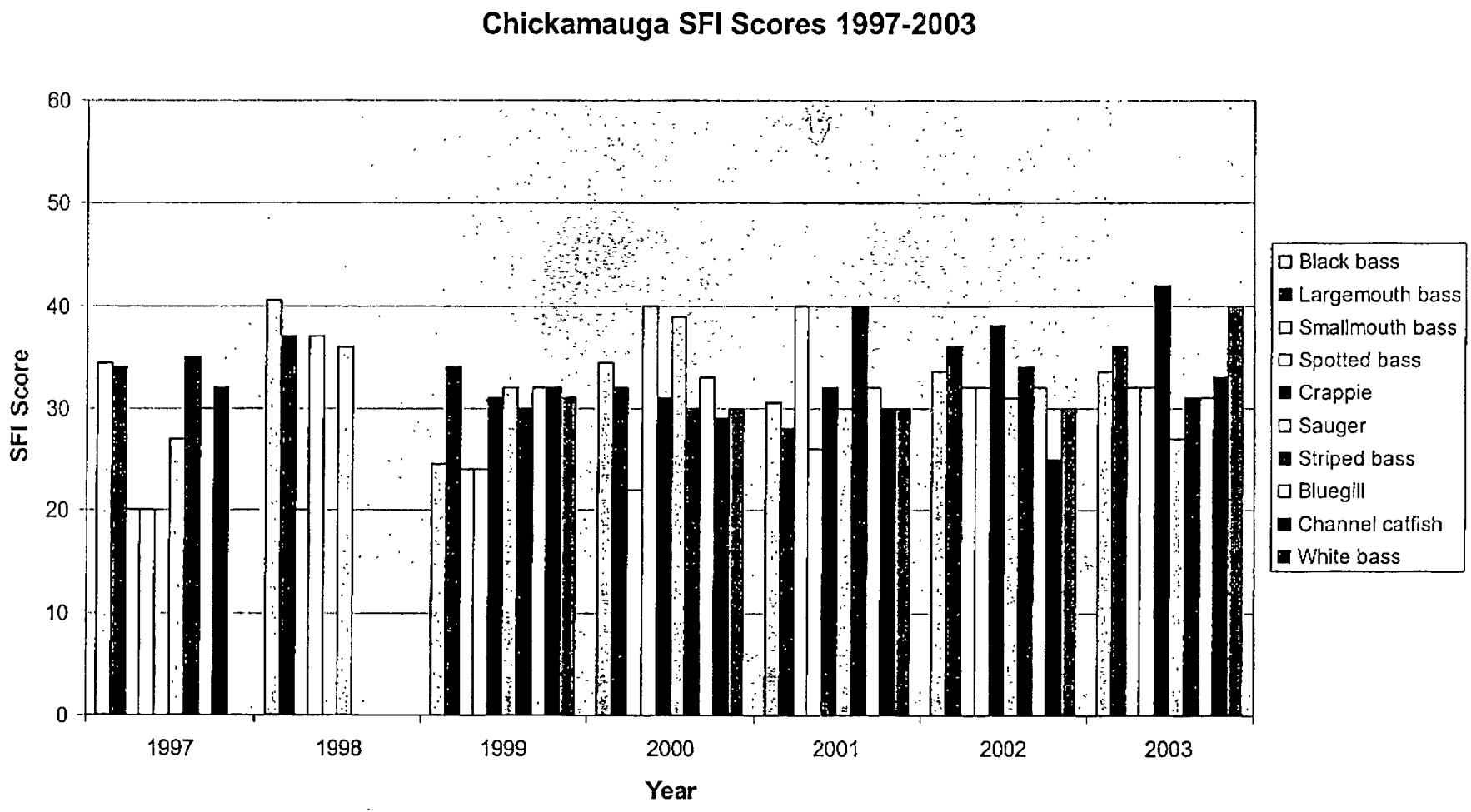

Figure 4. Sport Fishing Index results for Chickamauga Reservoir between 1997 and 2003.

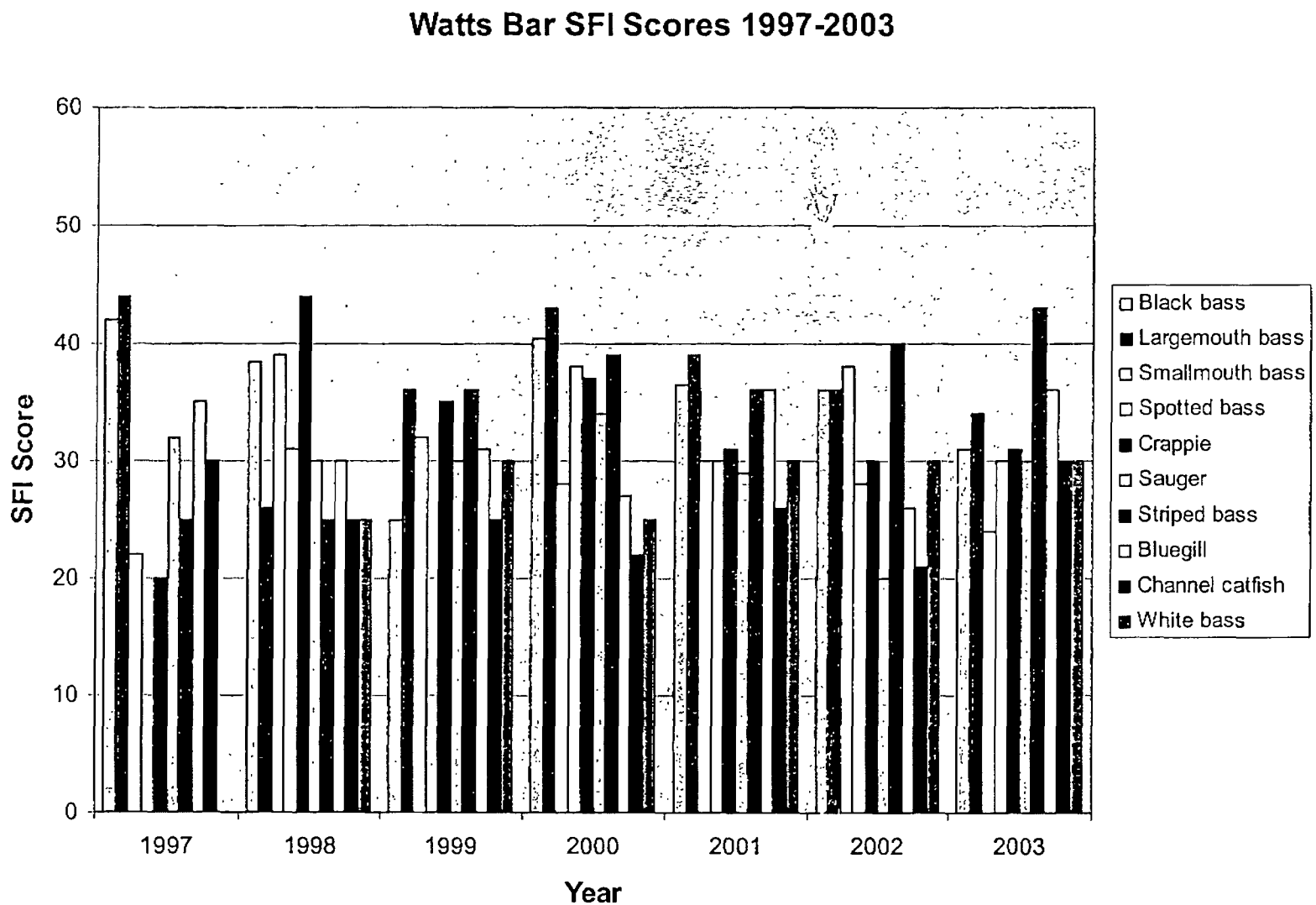

Figure 5. Sport Fishing Index results for Watts Bar Reservoir between 1997 and 2003.

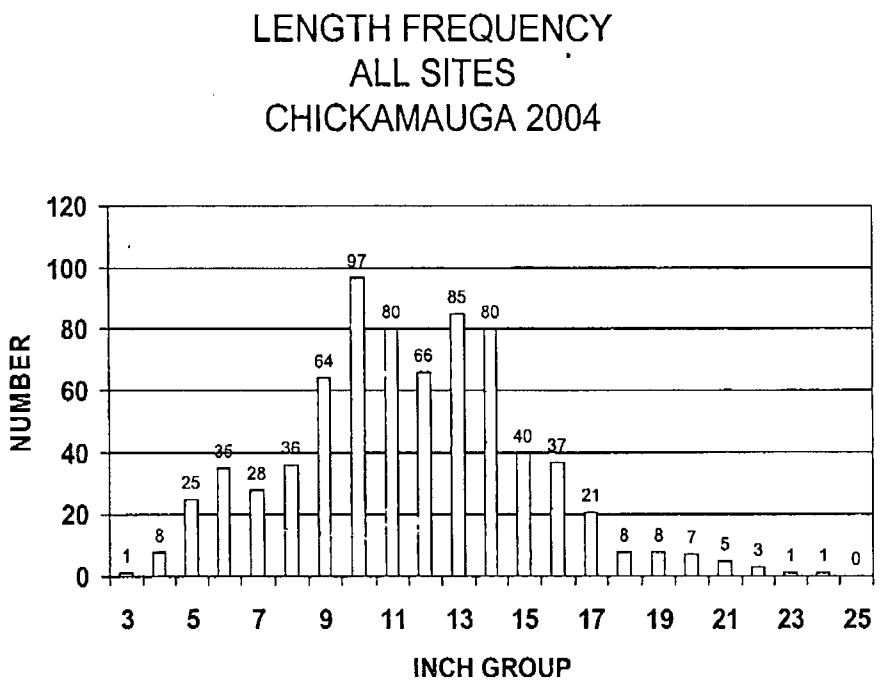

Figure 6. Chickamauga Reservoir length frequency histogram, (all sites) spring 2004.

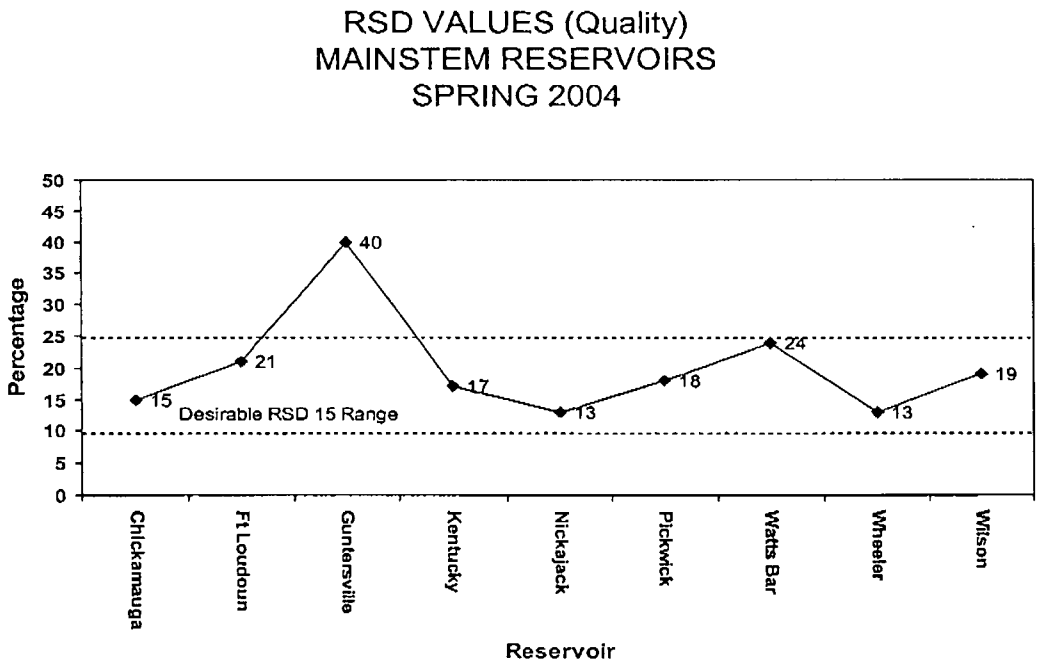

Figure 7. Relative stock density values for Tennessee River Reservoirs.

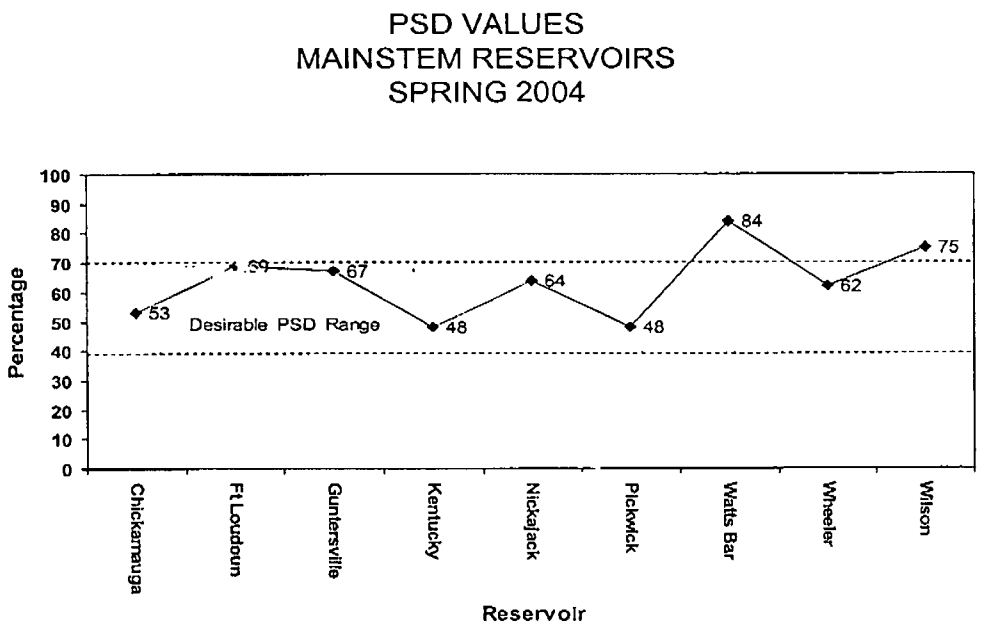

Figure 8. Proportional stock density values for Tennessee River Reservoirs.

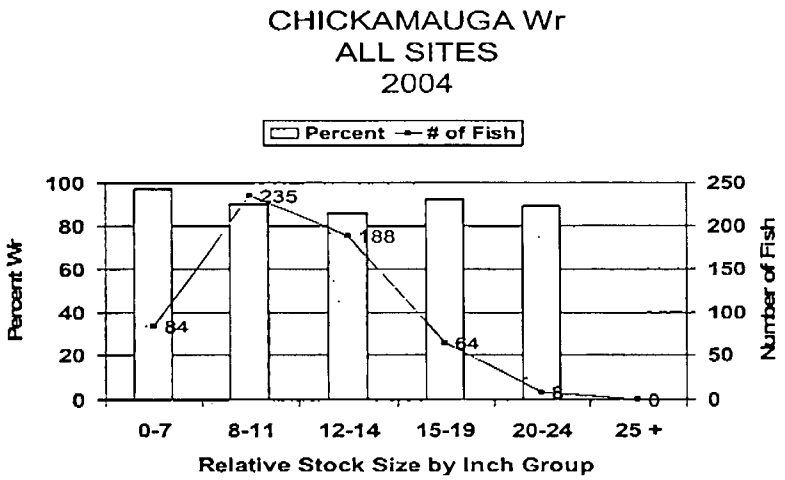

Figure 9. Chickamauga Reservoir mean relative weights (Wr) for largemouth bass broken out by RSD category and fish numbers.

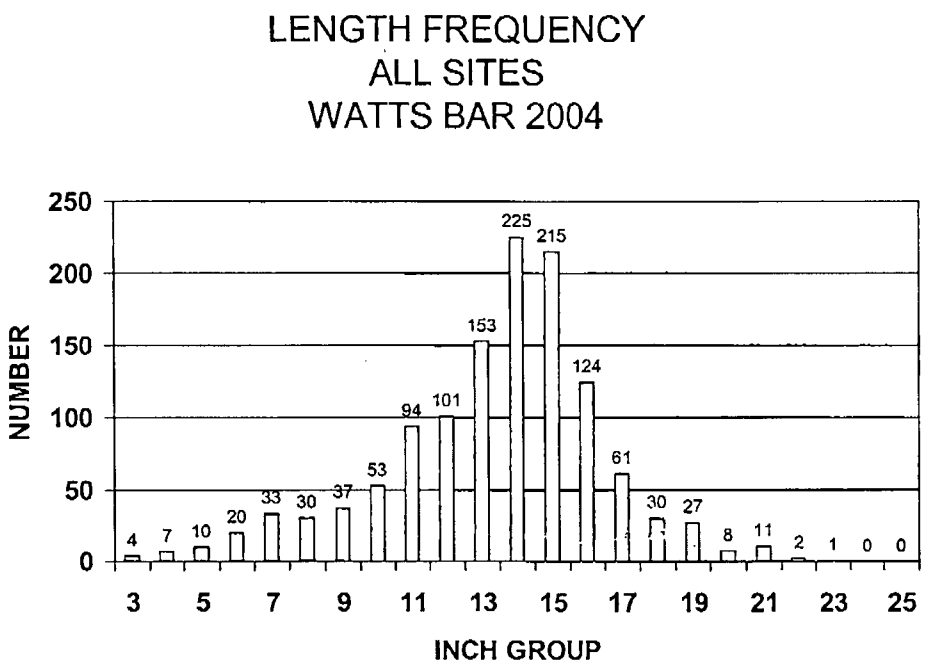

Figure 10. Watts Bar Reservoir length frequency histogram, (all sites) spring 2004.

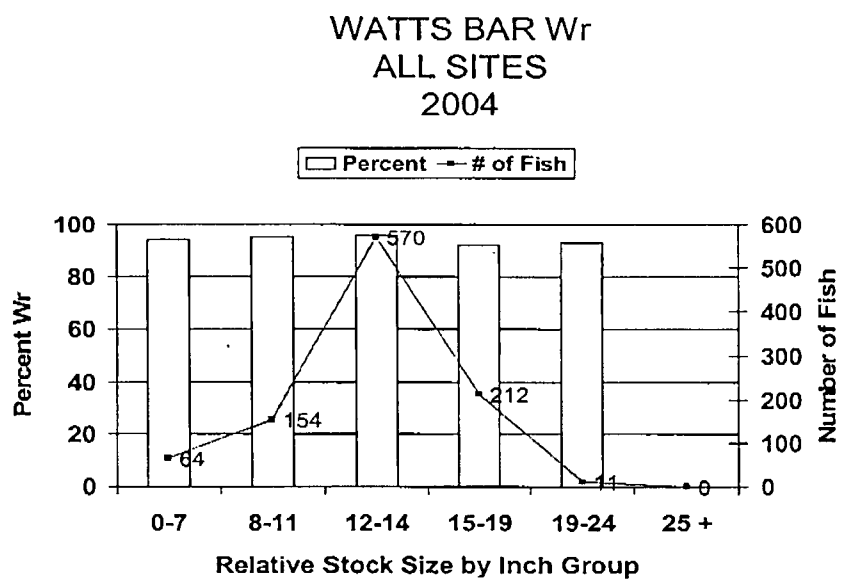

Figure 11. Watts Bar Reservoir mean relative weights (Wr) for largemouth bass.