STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

October 31, 2018

Mr. Brian Skelton, President
Tullahoma Utilities Board
e-copy: rskelton@tub.net
901 S. Jackson St.
Tullahoma, TN 37388

Subject: **NPDES Permit No. TN0023469**
Tullahoma Utilities Authority
Tullahoma, Coffee County, Tennessee

Dear Mr. Skelton:

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

Please be advised that a petition for permit appeal may be filed, pursuant to T.C.A. Section 69-3-105, subsection (i), by the permit applicant or by any aggrieved person who participated in the public comment period or gave testimony at a formal public hearing whose appeal is based upon any of the issues that were provided to the commissioner in writing during the public comment period or in testimony at a formal public hearing on the permit application. Additionally, for those permits for which the department gives public notice of a draft permit, any permit applicant or aggrieved person may base a permit appeal on any material change to conditions in the final permit from those in the draft, unless the material change has been subject to additional opportunity for public comment. Any petition for permit appeal under this subsection (i) shall be filed with the Technical Secretary of the Water Quality, Oil and Gas Board within thirty (30) days after public notice of the commissioner's decision to issue or deny the permit. A copy of the filing should also be sent to TDEC's Office of General Counsel.

If you have questions, please contact the Columbia Environmental Field Office at 1-888-891-TDEC; or, at this office, please contact Miss Julie Harse, P.E. at (615) 532-0682 or by E-mail at *Julie.Harse@tn.gov*.

Sincerely,

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Permit File
Columbia Environmental Field Office
Mr. William J. Meinert, PE, Vice President, O'Brien & Gere, bill.meinert@obg.com
Mr. Scott A. Young, P.E., Vice President, Water/Wastewater Systems, Tullahoma Utilities Board, syoung@tub.net
Mr. Jeff Totherow, Plant Supervisor, Tullahoma Utilities Board, jtotherow@tub.net
Ms. Saya A. Qualls, P.E., Engineer, Hazen and Sawyer, P.C., squalls@hazenandsawyer.com
NPDES Permit Section, EPA Region IV, r4npdespermits@epa.gov
Ms. Kathy Hawes, Interim Executive Director, TCWN, kathy@tcwn.org
Ms. Sherry H Wang, Fellow, TDEC Division of Water Resources, Sherry.Wang@tn.gov

STATE OF TENNESSEE

NPDES PERMIT

Modified

No. TN0023469

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

Issued By

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

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

Discharger:	**Tullahoma Utilities Authority**
is authorized to discharge:	**treated municipal wastewater from Outfall 001**
from a facility located:	**in Tullahoma, Coffee County, Tennessee**
to receiving waters named:	**Rock Creek at mile 11.0**

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

This permit shall become effective on:	**December 1, 2018**
This permit shall expire on:	**June 30, 2022**
Issuance date:	**November 1, 2018**

for Jennifer Dodd
Director

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TN0023469PMT.DOC

1.0. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

The City of Tullahoma is authorized to discharge treated municipal wastewater from Outfall 001 to the Rock Creek at mile 11.0. Discharge 001 consists of municipal wastewater from a treatment facility with a design capacity of 5 MGD. Discharge 001 shall be limited and monitored by the permittee as specified below:

Description : External Outfall, Number : 001, Monitoring : Downstream Monitoring, Season : All Year
Location: Latitude 35.342755 Longitude -86.210373

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
00139	Hydrogen peroxide	Report	-	mg/L	Grab	Two Per Week	Daily Maximum
00139	Hydrogen peroxide (Alert Level)	<=	.63	mg/L	Grab	Two Per Week	Monthly Average
51674	Peracetic Acid (PAA)	Report	-	mg/L	Grab	Two Per Week	Daily Maximum
51674	Peracetic Acid (PAA) (Alert Level)	<=	.38	mg/L	Grab	Two Per Week	Monthly Average

The reporting of instream PAA and hydrogen peroxide results will be an enforceable requirement. The PAA and hydrogen peroxide values of 0.38 mg/L and 0.63 mg/L will be alerts instead of being enforceable values. If the sampled result exceeds the alert value, the facility shall initiate corrective action measures such as reducing the PAA dose to reduce the instream concentration below the alert value. The corrective action measures shall be detailed in a monthly report which is attached to the monthly discharge monitoring report in NETDMR.

Description : External Outfall, Number : 001, Monitoring : All Weather, Season : All Year

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
80998	Bypass of Treatment	Report	-	occur/mo	Occurrences	Continuous	Monthly Total

Description : External Outfall, Number : 001, Monitoring : Dry Weather, Season : All Year

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
74062	Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total

Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
00139	Hydrogen peroxide	Report	-	mg/L	Grab	Five Per Week	Monthly Average
00139	Hydrogen peroxide	Report	-	mg/L	Grab	Five Per Week	Daily Maximum
00300	Oxygen, dissolved (DO)	>=	6.0	mg/L	Grab	Five Per Week	Instantaneous Minimum
00400	pH	>=	6.0	SU	Grab	Five Per Week	Daily Minimum

00400	pH	<=	9.0	SU	Grab	Five Per Week	Daily Maximum
00530	Total Suspended Solids (TSS)	<=	45	mg/L	Composite	Weekly	Daily Maximum
00530	Total Suspended Solids (TSS)	<=	30	mg/L	Composite	Weekly	Monthly Average
00530	Total Suspended Solids (TSS)	<=	40	mg/L	Composite	Weekly	Weekly Average
00530	Total Suspended Solids (TSS)	<=	1668	lb/d	Composite	Weekly	Weekly Average
00530	Total Suspended Solids (TSS)	<=	1251	lb/d	Composite	Weekly	Monthly Average
00545	Settleable Solids	<=	1.0	mL/L	Grab	Weekly	Daily Maximum
00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Quarterly	Monthly Average
00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Quarterly	Daily Maximum
00640	Nitrogen, inorganic total	<=	121910	lb/yr	Composite	Twice Per Month	Rolling Average
00665	Phosphorus, total (as P)	Report	-	lb/d	Composite	Quarterly	Monthly Average
00665	Phosphorus, total (as P)	Report	-	lb/d	Composite	Quarterly	Daily Maximum
00665	Phosphorus, total (as P)	<=	15221	lb/yr	Composite	Twice Per Month	Rolling Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
50060	Chlorine, total residual (TRC)	<=	.02	mg/L	Grab	Five Per Week	Daily Maximum
51040	E. coli	<=	126	#/100mL	Grab	Weekly	Monthly Geometric Mean
51040	E. coli	<=	941	#/100mL	Grab	Weekly	Daily Maximum
51674	Peracetic Acid (PAA)	Report	-	mg/L	Grab	Five Per Week	Daily Maximum
51674	Peracetic Acid (PAA)	<=	.41	mg/L	Grab	Five Per Week	Monthly Average
80082	CBOD, 5-day, 20 C	<=	20	mg/L	Composite	Weekly	Daily Maximum
80082	CBOD, 5-day, 20 C	<=	417	lb/d	Composite	Weekly	Monthly Average
80082	CBOD, 5-day, 20 C	<=	15	mg/L	Composite	Weekly	Weekly Average

80082	CBOD, 5-day, 20 C	<=	626	lb/d	Composite	Weekly	Weekly Average
80082	CBOD, 5-day, 20 C	<=	10	mg/L	Composite	Weekly	Monthly Average
TRP3B	IC25 Static Renewal 7 Day Chronic Ceriodaphnia	>	92	%	Composite	Semiannual	Minimum
TRP6C	IC25 Static Renewal 7 Day Chronic Pimephales promelas	>	92	%	Composite	Semiannual	Minimum

Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : Summer

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
00610	Nitrogen, Ammonia total (as N)	<=	94	lb/d	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	63	lb/d	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	2.25	mg/L	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	1.5	mg/L	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	3	mg/L	Composite	Weekly	Daily Maximum

Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : Winter

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
00610	Nitrogen, Ammonia total (as N)	<=	136	lb/d	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	6.5	mg/L	Composite	Weekly	Daily Maximum
00610	Nitrogen, Ammonia total (as N)	<=	4.9	mg/L	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	3.25	mg/L	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	204	lb/d	Composite	Weekly	Weekly Average

Description : External Outfall, Number : 001, Monitoring : Percent Removal, Season : All Year

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring	Statistical Base

						Frequency	
80358	CBOD, 5-day, 20 C, % removal	>=	40	%	Calculated	Weekly	Daily Minimum
80358	CBOD, 5-day, 20 C, % removal	>=	85	%	Calculated	Weekly	Monthly Average Minimum
81011	TSS, % removal	>=	85	%	Calculated	Weekly	Monthly Average Minimum
81011	TSS, % removal	>=	40	%	Calculated	Weekly	Daily Minimum

Description : External Outfall, Number : 001, Monitoring : Raw Sewage Influent, Season : All Year

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Weekly	Daily Maximum
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Weekly	Monthly Average
00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Quarterly	Monthly Average
00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Quarterly	Daily Maximum
00665	Phosphorus, total (as P)	Report	-	lb/d	Composite	Quarterly	Daily Maximum
00665	Phosphorus, total (as P)	Report	-	lb/d	Composite	Quarterly	Monthly Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Weekly	Monthly Average
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Weekly	Daily Maximum

Description : External Outfall, Number : 001, Monitoring : Wet Weather, Season : All Year

Code	Parameter	Qualifier	Value	Unit	Sample Type	Monitoring Frequency	Statistical Base
74062	Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total

Narrative Condition Description	Schedule Date	Schedule Event Description	Status	Description
Receiving Water Monitoring Requirements	01-DEC-20	Other (See Comments)	Active - Permit Requirement	Two years after the modification effective date, the facility will need to submit a request to discontinue the instream monitoring sampling for peracetic acid and hydrogen peroxide.

Notes: The permittee shall achieve 85% removal of $CBOD_5$ and TSS on a monthly average basis. The permittee shall report all instances of overflow and/or bypasses. See Part 2.3.3.a for the definition of overflow and Part 1.3.5.1 for reporting requirements.

Unless elsewhere specified, summer months are May through October; winter months are November through April.

See Part 1.2.3 for test procedures.

See Part 3.4 for biomonitoring test and reporting requirements. See next page for percent removal calculations.

Total residual chlorine (TRC) monitoring shall be applicable when chlorine, bromine, or any other oxidants are added. The acceptable methods for analysis of TRC are any methods specified in Title 40 CFR, Part 136 as amended. The method detection level (MDL) for TRC shall not exceed 0.05 mg/l unless the permittee demonstrates that its MDL is higher. The permittee shall retain the documentation that justifies the higher MDL and have it available for review upon request. In cases where the permit limit is less that the MDL, the reporting of TRC at less than the MDL shall be interpreted to constitute compliance with the permit.

The wastewater discharge must be disinfected to the extent that viable coliform organisms are effectively eliminated. The concentration of the *E. coli* group after disinfection shall not exceed 126 cfu per 100 ml as the geometric mean calculated on the actual number of samples collected and tested for *E. coli* within the required reporting period. The permittee may collect more samples than specified as the monitoring frequency. Samples may not be collected at intervals of less than 12 hours. For the purpose of determining the geometric mean, individual samples having an *E. coli* group concentration of less than one (1) per 100 ml shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the *E. coli* group in any individual sample shall not exceed a specified maximum amount. A maximum daily limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

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

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

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

Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act. (40 C.F.R. 125.98(b)(1))

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

For $CBOD_5$ and TSS, the treatment facility shall demonstrate a minimum of 85% removal efficiency on a monthly average basis. This is calculated by determining an average of all daily influent concentrations and comparing this to an average of all daily effluent concentrations. The formula for this calculation is as follows:

$$\left[1 - \frac{\text{average of daily effluent concentration}}{\text{average of daily influent concentration}}\right] \times 100\% = \%\ \text{removal}$$

The treatment facility will also demonstrate 40% minimum removal of the $CBOD_5$ and TSS based upon each daily composite sample. The formula for this calculation is as follows:

$$\left[1 - \frac{\text{daily effluent concentration}}{\text{daily influent concentration}}\right] \times 100\% = \%\ \text{removal}$$

1.2. MONITORING PROCEDURES

1.2.1. Representative Sampling

Samples and measurements taken in compliance with the monitoring requirements specified herein shall be representative of the volume and nature of the monitored discharge, and shall be taken after treatment and prior to mixing with uncontaminated storm water runoff or the receiving stream. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than plus or minus 10% from the true discharge rates throughout the range of expected discharge volumes.

Samples and measurements taken in compliance with the monitoring requirements specified above shall be representative of the volume and nature of the monitored discharge, and shall be taken at the following location(s):

Influent samples must be collected prior to mixing with any other wastewater being returned to the head of the plant, such as sludge return. Those systems with more than one influent line must collect samples from each and proportion the results by the flow from each line.

Effluent samples must be representative of the wastewater being discharged and collected prior to mixing with any other discharge or the receiving stream. This can be a different point for different parameters, but must be after all treatment for that parameter or all expected change:

a. The chlorine residual must be measured after the chlorine contact chamber and any dechlorination. It may be to the advantage of the permittee to measure at the end of any long outfall lines.

b. Samples for *E. coli* can be collected at any point between disinfection and the actual discharge.

c. The dissolved oxygen can drop in the outfall line; therefore, D.O. measurements are required at the discharge end of outfall lines greater than one mile long. Systems with outfall lines less than one mile may measure dissolved oxygen as the wastewater leaves the treatment facility. For systems with dechlorination, dissolved oxygen must be measured after this step and as close to the end of the outfall line as possible.

d. Total suspended solids and settleable solids can be collected at any point after the final clarifier.

e. Biomonitoring tests (if required) shall be conducted on final effluent.

1.2.2. Sampling Frequency

Where the permit requires sampling and monitoring of a particular effluent characteristic(s) at a frequency of less than once per day or daily, the permittee is precluded from marking the “No Discharge” block on the Discharge Monitoring Report if there has been any discharge from that particular outfall during the period which coincides with the required monitoring frequency; i.e. if the required monitoring frequency is once per month or 1/month, the monitoring period is one month, and if the discharge occurs during only one day in that period then the permittee must sample on that day and report the results of analyses accordingly.

1.2.3. Test Procedures

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

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

c. Composite samples must be proportioned by flow at time of sampling. Aliquots may be collected manually or automatically. The sample aliquots must be maintained at ≤ 6 degrees Celsius during the compositing period.

d. In instances where permit limits established through implementation of applicable water criteria are below analytical capabilities, compliance with those limits will be determined using the detection limits described in the TN Rules, Chapter 0400-40-03-.05(8).

e. All sampling for total mercury at the municipal wastewater plant (application, pretreatment, etc.) shall use Methods 1631, 245.7 or any additional method in 40 CFR 136 with a maximum detection limit of 5 ng/L. For test methods requiring collection of a grab sample, the analysis may be conducted on a single grab or on a set of grabs composited in the testing lab in compliance with the quality control procedures prescribed by the method for each grab sample. When a single grab sample is analyzed, it shall be collected at such time that the treatment plant effluent would be expected to include the most likely sources of mercury in the municipal system.

1.2.4. Recording of Results

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

a. The exact place, date and time of sampling;

b. The exact person(s) collecting samples;

c. The dates and times the analyses were performed;

d. The person(s) or laboratory who performed the analyses;

e. The analytical techniques or methods used, and;

f. The results of all required analyses.

1.2.5. Records Retention

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

1.3. REPORTING

1.3.1. Monitoring Results

Monitoring results shall be recorded monthly and submitted monthly using NETDMR. Submittals shall be no later than 15 days after the completion of the reporting period. If NETDMR is not functioning, a completed DMR with an original signature shall be submitted to the following address:

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
COMPLIANCE & ENFORCEMENT SECTION
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

If NETDMR is not functioning, a copy of the completed and signed DMR shall be mailed to the Columbia Environmental Field Office (EFO) at the following address:

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
Columbia Environmental Field Office
1421 Hampshire Pike
Columbia, Tennessee 38401

A copy should be retained for the permittee's files. In addition, any communication regarding compliance with the conditions of this permit must be sent to the two offices listed above.

The first DMR is due on the 15th of the month following permit effectiveness.

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

The electronic submission of DMR data will be accepted only if formally approved beforehand by the division. For purposes of determining compliance with this permit, data approved by the division to be submitted electronically is legally equivalent to data submitted on signed and certified DMR forms.

1.3.2. Additional Monitoring by Permittee

If the permittee monitors any pollutant specifically limited by this permit more frequently than required at the location(s) designated, using approved analytical methods as specified herein, the results of such monitoring shall be included in the

calculation and reporting of the values required in the DMR form. Such increased frequency shall also be indicated on the form.

1.3.3. Falsifying Results and/or Reports

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

1.3.4. Monthly Report of Operation

Monthly operational reports shall be submitted on standard forms to the appropriate Division of Water Resources Environmental Field Office in Jackson, Nashville, Chattanooga, Columbia, Cookeville, Memphis, Johnson City, or Knoxville. Reports shall be submitted by the 15th day of the month following data collection.

1.3.5. Bypass and Overflow Reporting

1.3.5.1. Report Requirements

A summary report of known or suspected instances of overflows in the collection system or bypass of wastewater treatment facilities shall accompany the Discharge Monitoring Report. The report must contain the date and duration of the instances of overflow and/or bypassing and the estimated quantity of wastewater released and/or bypassed.

The report must also detail activities undertaken during the reporting period to (1) determine if overflow is occurring in the collection system, (2) correct those known or suspected overflow points and (3) prevent future or possible overflows and any resulting bypassing at the treatment facility.

On the DMR, the permittee must report the number of sanitary sewer overflows, dry-weather overflows and in-plant bypasses separately. Three lines must be used on the DMR form, one for sanitary sewer overflows, one for dry-weather overflows and one for in-plant bypasses.

1.3.5.2. Anticipated Bypass Notification

If, because of unavoidable maintenance or construction, the permittee has need to create an in-plant bypass which would cause an effluent violation, the permittee must notify the division as soon as possible, but in any case, no later than 10 days prior to the date of the bypass.

1.3.6. Reporting Less Than Detection; Reporting Significant Figures

A permit limit may be less than the accepted detection level. If the samples are below the detection level, then report “BDL” or “NODI =B” on the DMRs. The permittee must use the correct detection levels in all analytical testing required in the permit. The required detection levels are listed in the Rules of the Department of

Environment and Conservation, Division of Water Resources, Chapter 0400-40-03-.05(8).

For example, if the limit is 0.02 mg/l with a detection level of 0.05 mg/l and detection is shown; 0.05 mg/l must be reported. In contrast, if nothing is detected reporting "BDL" or "NODI =B" is acceptable.

Reported results are to correspond to the number of significant figures (decimal places) set forth in the permit conditions. The permittee shall round values, if allowed by the method of sample analysis, using a uniform rounding convention adopted by the permittee.

1.4. COMPLIANCE WITH SECTION 208

The limits and conditions in this permit shall require compliance with an area-wide waste treatment plan (208 Water Quality Management Plan) where such approved plan is applicable.

1.5. REOPENER CLAUSE

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 307(a)(2) and 405(d)(2)(D) of the Clean Water Act, as amended, if the effluent standard, limitation or sludge disposal requirement so issued or approved:

a. Contains different conditions or is otherwise more stringent than any condition in the permit; or

b. Controls any pollutant or disposal method not addressed in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

1.6. SCHEDULE OF COMPLIANCE

Full compliance and operational levels shall be attained from the effective date of this permit.

2.0. GENERAL PERMIT REQUIREMENTS

2.1. GENERAL PROVISIONS

2.1.1. Duty to Reapply

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

2.1.2. Right of Entry

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

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

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

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

2.1.3. Availability of Reports

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

2.1.4. Proper Operation and Maintenance

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

b. Dilution water shall not be added to comply with effluent requirements to achieve BCT, BPT, BAT and or other technology based effluent limitations such as those in State of Tennessee Rule 0400-40-05-.09.

2.1.5. Treatment Facility Failure (Industrial Sources)

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

2.1.6. Property Rights

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

2.1.7. Severability

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

2.1.8. Other Information

If the permittee becomes aware of failure to submit any relevant facts in a permit application, or of submission of incorrect information in a permit application or in any report to the director, then the permittee shall promptly submit such facts or information.

2.2. CHANGES AFFECTING THE PERMIT

2.2.1. Planned Changes

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

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

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

2.2.2. Permit Modification, Revocation, or Termination

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

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

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

d. The filing of a request by the permittee for a modification, revocation, reissuance, termination, or notification of planned changes or anticipated noncompliance does not halt any permit condition.

2.2.3. Change of Ownership

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

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

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

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

Pursuant to the requirements of 40 CFR 122.61, concerning transfer of ownership, the permittee must provide the following information to the division in their formal notice of intent to transfer ownership: 1) the NPDES permit number of the subject permit; 2) the effective date of the proposed transfer; 3) the name and address of the

transferor; 4) the name and address of the transferee; 5) the names of the responsible parties for both the transferor and transferee; 6) a statement that the transferee assumes responsibility for the subject NPDES permit; 7) a statement that the transferor relinquishes responsibility for the subject NPDES permit; 8) the signatures of the responsible parties for both the transferor and transferee pursuant to the requirements of 40 CFR 122.22(a), "Signatories to permit applications"; and, 9) a statement regarding any proposed modifications to the facility, its operations, or any other changes which might affect the permit limits and conditions contained in the permit.

2.2.4. Change of Mailing Address

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

2.3. NONCOMPLIANCE

2.3.1. Effect of Noncompliance

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

2.3.2. Reporting of Noncompliance

a. 24-Hour Reporting

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

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

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

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

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

b. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph 2.3.2.a above, the permittee shall report the noncompliance on the Discharge Monitoring Report. The report shall contain all information concerning the steps taken, or planned, to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

2.3.3. Overflow

a. "**Overflow**" means any release of sewage from any portion of the collection, transmission, or treatment system other than through permitted outfalls.

b. Overflows are prohibited.

c. The permittee shall operate the collection system so as to avoid overflows.

d. No new or additional flows shall be added upstream of any point in the collection system, which experiences chronic overflows (greater than 5 events per year) or would otherwise overload any portion of the system. Unless there is specific enforcement action to the contrary, the permittee is relieved of this requirement after: 1) an authorized representative of the Commissioner of the Department of Environment and Conservation has approved an engineering report and construction plans and specifications prepared in accordance with accepted engineering practices for correction of the problem; 2) the correction work is underway; and 3) the cumulative, peak-design, flows potentially added from new connections and line extensions upstream of any chronic overflow point are less than or proportional to the amount of inflow and infiltration removal documented upstream of that point. The inflow and infiltration reduction must be measured by the permittee using practices that are customary in the environmental engineering field and reported in an attachment to a Monthly Operating Report submitted to the local TDEC Environmental Field Office. The data measurement period shall be sufficient to account for seasonal rainfall patterns and seasonal groundwater table elevations.

e. In the event that more than 5 overflows have occurred from a single point in the collection system for reasons that may not warrant the self-imposed moratorium or completion of the actions identified in this paragraph, the permittee may request a meeting with the Division of Water Resources EFO staff to petition for a waiver based on mitigating evidence.

2.3.4. Upset

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

designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

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

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

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

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

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

2.3.5. Adverse Impact

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

2.3.6. Bypass

a. "***Bypass***" is the intentional diversion of waste streams from any portion of a treatment facility. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypasses are prohibited unless all of the following 3 conditions are met:

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

   ii. There are no feasible alternatives to bypass, such as the construction and use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the

exercise of reasonable engineering judgment to prevent a bypass, which occurred during normal periods of equipment downtime or preventative maintenance;

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

c. Bypasses not exceeding permit limitations are allowed **only** if the bypass is necessary for essential maintenance to assure efficient operation. All other bypasses are prohibited. Allowable bypasses not exceeding limitations are not subject to the reporting requirements of 2.3.6.b.iii, above.

2.3.7. Washout

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

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

2.4. LIABILITIES

2.4.1. Civil and Criminal Liability

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

2.4.2. Liability Under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established

pursuant to any applicable state law or the Federal Water Pollution Control Act, as amended.

3.0. PERMIT SPECIFIC REQUIREMENTS

3.1. CERTIFIED OPERATOR

The waste treatment facilities shall be operated under the supervision of a certified wastewater treatment operator and the collection system shall be operated under the supervision of a certified collection system operator in accordance with the Water Environmental Health Act of 1984.

3.2. POTW PRETREATMENT PROGRAM GENERAL PROVISIONS

As an update of information previously submitted to the division, the permittee will undertake the following activity.

a. The permittee has been delegated the primary responsibility and therefore becomes the "control authority" for enforcing the 40 CFR 403 General Pretreatment Regulations. Where multiple plants are concerned the permittee is responsible for the Pretreatment Program for all plants within its jurisdiction. The permittee shall implement and enforce the Industrial Pretreatment Program in accordance with Section 403(b)(8) of the Clean Water Act, the Federal Pretreatment Regulations 40 CFR 403, Tennessee Water Quality Control Act Part 69-3-123 through 69-3-128, and the legal authorities, policies, procedures, and financial provisions contained in its approved Pretreatment Program, except to the extent this permit imposed stricter requirements. Such implementation shall require but not limit the permittee to do the following:

   i. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user (IU), whether the IU is in compliance with the pretreatment standards;

   ii. Require development, as necessary, of compliance schedules for each IU for the installation of control technologies to meet applicable pretreatment standards;

   iii. Require all industrial users to comply with all applicable monitoring and reporting requirements outlined in the approved pretreatment program and IU permit;

   iv. Maintain and update, as necessary, records identifying the nature and character of industrial user discharges, and retain such records for a minimum of three (3) years;

v. Obtain appropriate remedies for noncompliance by an IU with any pretreatment standard and/or requirement;

vi. Publish annually, pursuant to 40 CFR 403.8 (f)(2)(viii), a list of industrial users that have significantly violated pretreatment requirements and standards during the previous twelve-month period.

vii. Maintain an adequate revenue structure for continued operation of the pretreatment program.

viii. Update its Industrial Waste Survey at least once every five years. Results of this update shall be submitted to the Division of Water Resources, Pretreatment Section within 120 days of the effective date of this permit, unless such a survey has been submitted within 3 years of the effective date.

ix. Submit a written technical evaluation of the need to revise local limits within 120 days of the effective date of this permit to the state pretreatment program coordinator. The evaluation shall include the most recent pass-through limits proposed by the division. The technical evaluation shall be based on practical and specialized knowledge of the local program and not be limited by a specified written format.

b. The permittee shall enforce 40 CFR 403.5, "prohibited discharges". Pollutants introduced into the POTW by a non-domestic source shall not cause pass through or interference as defined in 40 CFR Part 403.3. These general prohibitions and the specific prohibitions in this section apply to all non-domestic sources introducing pollutants into the POTW whether the source is subject to other National Pretreatment Standards or any state or local pretreatment requirements.

Specific prohibitions. Under no circumstances shall the permittee allow introduction of the following wastes in the waste treatment system:

i. Pollutants which create a fire or explosion hazard in the POTW;

ii. Pollutants which will cause corrosive structural damage to the treatment works, but in no case discharges with pH less than 5.0 unless the system is specifically designed to accept such discharges.

iii. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the treatment system resulting in interference.

iv. Any pollutant, including oxygen-demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the treatment works.

v. Heat in amounts which will inhibit biological activity in the treatment works resulting in interference, but in no case heat in such quantities that the

temperature at the treatment works exceeds 40°C (104°F) unless the works are designed to accommodate such heat.

vi. Any priority pollutant in amounts that will contaminate the treatment works sludge.

vii. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

viii. Pollutants which result in the presence of toxic gases, vapors or fumes within the POTW in a quantity that may cause acute worker health and safety problems;

ix. Any trucked or hauled pollutants except at discharge points designated by the POTW.

c. The permittee shall notify the Tennessee Division of Water Resources of any of the following changes in user discharge to the system no later than 30 days prior to change of discharge:

i. New introductions into such works of pollutants from any source which would be a new source as defined in Section 306 of the Act if such source were discharging pollutants.

ii. New introductions of pollutants into such works from a source which would be subject to Section 301 of the "Federal Water Quality Act as Amended" if it were discharging such pollutants.

iii. A substantial change in volume or character of pollutants being introduced into such works by a source already discharging pollutants into such works at the time the permit is issued.

This notice will include information on the quantity and quality of the wastewater introduced by the new source into the publicly owned treatment works, and on any anticipated impact on the effluent discharged from such works. If this discharge necessitates a revision of the current NPDES permit or pass-through guidelines, discharge by this source is prohibited until the Tennessee Division of Water Resources gives final authorization.

d. Reporting Requirements

The permittee shall provide a semiannual report briefly describing the permittee's pretreatment program activities over the previous six-month period. Reporting periods shall end on the last day of the months of March and September. The report shall be submitted to the Division of Water Resources, Central Office and a copy to the appropriate Environmental Field Office no later than the 28th day of the month following each reporting period. For control authorities with multiple STPs, one report should be submitted with a separate Form 1 for each STP.

Each report shall conform to the format set forth in the State POTW Pretreatment Semiannual Report Package which contains information regarding:

i. An updated listing of the permittee's industrial users.

ii. Results of sampling of the influent and effluent of the wastewater treatment plant. At least once each reporting period, the permittee shall analyze the wastewater treatment plant influent and effluent for the following pollutants, using the prescribed sampling procedures:

Pollutant	**Sample Type**
chromium, trivalent	24-hour composite
chromium, hexavalent	24-hour composite
copper	24-hour composite
lead	24-hour composite
nickel	24-hour composite
zinc	24-hour composite
cadmium	24-hour composite
mercury	Per method requirements
silver	24-hour composite
total phenols	grab
cyanide	grab

If any particular pollutant is analyzed more frequently than is required, the permittee shall report the maximum and average values on the semiannual report. All upsets, interferences, and pass-through violations must also be reported on the semiannual report, the actions that were taken to determine the causes of the incidents and the steps that have been taken to prevent the incidents from recurring.

At least once during the term of this permit, the permittee shall analyze the effluent from the STP (and report the results in the next regularly scheduled report) for the following pollutants:

chromium III	cyanide	phthalates, sum of the following: bis (2-ethylhexyl) phthalate butyl benzylphthalate di-n-butylphthalate diethyl phthalate
chromium VI	silver	
copper	benzene	
lead	carbon tetrachloride	
nickel	chloroform	
zinc	ethylbenzene	1,2 trans-dichloroethylene
cadmium	methylene chloride	tetrachloroethylene
mercury	naphthalene	toluene
phenols, total	1,1,1 trichloroethane	trichloroethylene

iii. Compliance with categorical and local standards, and review of industrial compliance, which includes a summary of the compliance status for all permitted industries. Also included is information on the number and type of major violations of pretreatment regulations, and the actions taken by the POTW to obtain compliance. The effluent from all significant industrial users must be analyzed for the appropriate pollutants at least once every 12 months.

iv. A list of industries in significant non-compliance as published in local newspapers in accordance with the requirements set forth in 40 CFR 403.8(f)(2)(viii).

v. A description of all substantive changes made to the permittee's pretreatment program. Any such changes shall receive prior approval. Substantive changes include, but are not limited to, any change in any ordinance, major modification in the program's administrative structure, local limits, or a change in the method of funding the program.

vi. Summary of permittee's industrial user inspections, which includes information on the number and type of industry inspected. All significant industrial users must be inspected at least once per year.

3.3. BIOSOLIDS MANAGEMENT PRACTICES

All sludge and/or biosolids use or disposal must comply with 40 CFR 503 et seq. Biosolids shall be sampled and analyzed at a frequency dependent on the amount used annually.

Any facility that land applies non-exceptional quality biosolids must obtain an appropriate permit from the division in accordance with Chapter 0400-40-15.

a. Reopener: If an applicable "acceptable management practice" or numerical limitation for pollutants in sewage sludge promulgated under Section 405(d)(2) of the Clean Water Act, as amended by the Water Quality Act of 1987, is more stringent than the sludge pollutant limit or acceptable management practice in this permit, or controls a pollutant not limited in this permit, this permit shall be promptly modified or revoked and reissued to conform to the requirements promulgated under Section 405(d)(2). The permittee shall comply with the limitations by no later than the compliance deadline specified in the applicable regulations as required by Section 405(d)(2) of the Clean Water Act.

b. Notice of change in sludge disposal practice: The permittee shall give prior notice to the director of any change planned in the permittee's sludge disposal practice. If land application activities are suspended permanently and sludge disposal moves to a municipal solid waste landfill, the permittee shall contact the local Division of Solid Waste Management office address for other permitting and approvals (see table below):

Division of Solid Waste Management			
Office	**Location**	**Zip Code**	**Phone No.**
Chattanooga	1301 Riverfront Parkway, Suite 206	37402	(423) 634-5745
Jackson	1625 Hollywood Drive	38305	(731) 512-1300
Cookeville	1221 South Willow Avenue	38506	(931) 432-4015
Columbia	1421 Hampshire Pike	38401	(931) 380-3371
Johnson City	2305 Silverdale Road	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive, Bartlett	38133	(901) 371-3000
Nashville	711 R.S. Gass Boulevard	37243	(615) 687-7000

3.4. BIOMONITORING REQUIREMENTS, CHRONIC

The permittee shall conduct a 3-Brood *Ceriodaphnia dubia* Survival and Reproduction Test and a 7-Day Fathead Minnow *(Pimephales promelas)* Larval Survival and Growth Test on samples of final effluent from Outfall 001.

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

Test shall be conducted and its results reported based on appropriate replicates of a total of five serial dilutions and a control, using the percent effluent dilutions as presented in the following table:

Serial Dilutions for Whole Effluent Toxicity (WET) Testing					
100% Effluent	**Permit Limit (PL)**	**0.50 X PL**	**0.25 X PL**	**0.125 X PL**	**Control**
% effluent					
100	**92**	**46**	**23**	**11.5**	**0**

The dilution/control water used will be moderately hard water as described in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013 (or the most current edition). A chronic standard reference toxicant quality assurance test shall be conducted with each species used in the toxicity tests and the results submitted with the discharge monitoring report. Additionally, the analysis of this multi-concentration test shall include review of the concentration-response relationship to ensure that calculated test results are interpreted appropriately.

Toxicity will be demonstrated if the IC_{25} is less than or equal to the permit limit indicated for each outfall in the above table(s). Toxicity demonstrated by the tests specified herein constitutes a violation of this permit.

All tests will be conducted using a minimum of three 24-hour flow-proportionate composite samples of final effluent collected on days 1, 3 and 5. **When the**

composite samples are added to the containers containing the test organisms, the container shall be sampled for hydrogen peroxide. The concentrations of hydrogen peroxide shall be reported in the final lab report. If, in any control more than 20% of the test organisms die in 7 days, the test (control and effluent) is considered invalid and the test shall be repeated within two (2) weeks. Furthermore, if the results do not meet the acceptability criteria in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013 (or the most current edition), or if the required concentration-response review fails to yield a valid relationship per guidance contained in Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing, EPA-821-B-00-004 (or the most current edition), that test shall be repeated. Any test initiated but terminated before completion must also be reported along with a complete explanation for the termination.

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

In the event of 2 consecutive test failures or 3 test failures within a 12-month period for the same outfall, the permittee must initiate a Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) study within 30 days and so notify the division by letter. This notification shall include a schedule of activities for the initial investigation of that outfall. **During the term of the TIE/TRE study, the frequency of biomonitoring shall be once every three months.** Additionally, the permittee shall submit progress reports once every three months throughout the term of the TIE/TRE study. The toxicity must be reduced to allowable limits for that outfall within 2 years of initiation of the TIE/TRE study. Subsequent to the results obtained from the TIE/TRE studies, the permittee may request an extension of the TIE/TRE study period if necessary to conduct further analyses. The final determination of any extension period will be made at the discretion of the division.

The TIE/TRE study may be terminated at any time upon the completion and submission of 2 consecutive tests (for the same outfall) demonstrating compliance. Following the completion of TIE/TRE study, the frequency of monitoring will return to a regular schedule, as defined previously in this section as well in Part I of the permit. **During the course of the TIE/TRE study, the permittee will continue to conduct toxicity testing of the outfall being investigated at the frequency of once every three months but will not be required to perform follow-up tests for that outfall during the period of TIE/TRE study.**

Test procedures, quality assurance practices, determinations of effluent survival/reproduction and survival/growth values, and report formats will be made in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013, or the most current edition.

Results of all tests, reference toxicant information, copies of raw data sheets, statistical analysis and chemical analyses shall be compiled in a report. The report will be written in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, EPA-821-R-02-013, or the most current edition.

Three copies of biomonitoring reports (including follow-up reports) shall be submitted to the division. One copy of the report shall be submitted along with the discharge monitoring report (DMR). The second copy shall be submitted to the local Division of Water Resources office address (see table below). **The third copy shall be submitted to the water based system's group in the central office.**

Division of Water Resources			
Office	**Location**	**Zip Code**	**Phone No.**
Chattanooga	540 McCallie Avenue, Suite 550	37402-2013	(423) 634-5745
Jackson	1625 Hollywood Drive	38305	(731) 512-1300
Cookeville	1221 South Willow Avenue	38506	(931) 432-4015
Columbia	1421 Hampshire Pike	38401	(931) 380-3371
Johnson City	2305 Silverdale Road	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	(901) 371-3000
Nashville	711 R.S. Gass Boulevard	37243-1550	(615) 687-7000

3.5. PLACEMENT OF SIGNS

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

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

Permitted CSO or unpermitted bypass/overflow point:

UNTREATED WASTEWATER DISCHARGE POINT
Tullahoma Utilities Authority
(931) 455-4515
NPDES Permit NO. TN0023469
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Columbia

NPDES Permitted Municipal/Sanitary Outfall:

TREATED MUNICIPAL/SANITARY WASTEWATER
Tullahoma Utilities Authority
(931) 455-4515
NPDES Permit NO. TN0023469
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Columbia

No later than sixty (60) days from the effective date of this permit, the permittee shall have the above sign(s) on display in the location specified.

3.6. ANTIDEGRADATION

Pursuant to the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06, titled "Tennessee Antidegradation Statement," which prohibits the degradation of exceptional Tennessee waters and the increased discharges of substances that cause or contribute to impairment, the permittee shall further be required, pursuant to the terms and conditions of this permit, to comply with the effluent limitations and schedules of compliance required to implement applicable water quality standards, to comply with a State Water Quality Plan or other state or federal laws or regulations, or where practicable, to comply with a standard permitting no discharge of pollutants.

3.7. BIOLOGICAL MONITORING

The permittee shall develop and implement a biological monitoring plan to define the biological impact of its discharges on the receiving stream(s) from the utilization of peracetic acid. To complete this, monitoring will be required to determine the biological integrity and diversity of the receiving streams, pursuant to the relevant Tennessee Water Quality Criteria for those streams. Specifically, this permit requires assessment of the biological integrity of the receiving streams in accordance with the Tennessee Water Quality Criteria for all streams classified for Fish and Aquatic life per Rule 0400-40-03-.03(k). The receiving streams of interest are located in Ecoregion 71g, known as the Upper Elk Watershed.

The permittee must perform stream monitoring as specified below. Adherence by the permittee or its consultant at the time of the assessment to any modifications of these specified procedures recommended in writing by either division biologists or division permit or assessment staff shall not be construed as a violation of this part.

Pursuant to the permittee's coordination with the division's Columbia Environmental Field Office (EFO) regarding sampling location(s) and timing, the permittee shall within 90 days from the effective date of the permit, submit a monitoring plan to the division central office permit section for review and comment in coordination with its field biologists. The permittee shall proceed with its plan if no written comments are received on the plan within 60 days of its receipt by the division.

Reports of the final results at minimum will include the raw data, taxa lists, and biometric calculations. Final study reports shall be submitted to two locations: 1) WPC central office along with a DMR, 2) WPC Columbia EFO along with an MOR prior to submission of a permit application.

1. Frequency

Biological monitoring shall be conducted in late summer 2017 with samples collected during low flow, high temperature conditions. (Exceptions are for specific streams that are dry in low flow). For intermittent or batch discharges, sampling should take place within 30 days of discharge in lowest flow conditions.

2. Location

DWR Station ID	Stream Name	Location	Lat	Long
ROCK011.0CE	Rock Creek	Just U/S Tullahoma Utilities Authority	35.34425	-86.21212
ROCK0010.9CE	Rock Creek	Approx 500 feet downstream Tullahoma Utilities Authority	35.34299	-86.21047
ROCK010.4CE	Rock Creek	South Franklin Street. Approx. 2000 ft d/s Tullahoma Utilities Authority	35.3385	-86.2088

The sites selected must provide appropriate habitat and must be generally comparable. Prior to sampling, all selected sampling points shall be marked on a topographical map, submitted to and approved by the EFO.

3. Sampling

The survey will be conducted by a qualified biologist. The permittee will notify the appropriate EFO, Division of Water Resources, at least two weeks prior to conducting the biological survey.

The biosurvey will consist of a single habitat semi-quantitative macroinvertebrate sample and a habitat survey. Habitat assessments, sample collection, subsampling, taxonomy and metric calculation must adhere exactly to the methodology found in the most recent revision of the State of Tennessee Department of Environment and Conservation, Division of Water Resources, Quality System Standard Operting Procedure for Macroinvertebrate Stream Surveys (referred to as TDEC QSSOP).

a. Habitat Assessment

Appropriate habitat assessment forms will be completed concurrent with each biological survey. These forms can be found in Appendix B in the TDEC QSSOP. The High Gradient Form will be used in conjunction with riffle kick collections and the Low Gradient Form will be used in conjunction with rooted bank collections.

b. Macroinvertebrate Sample Collection

A semi-quantitative single habitat macroinvertebrate sample will be collected at each site following Protocol G in the TDEC QSSOP. The habitat to be sampled will be appropriate for ecoregion 71g.

In ecoregions 65j, 66d, 66e, 66f, 66g, 67f, 67g, 67h, 67i, 68a, 68b, 68c,69d, 71e, 71f, 71g, 71h, appropriate 71i and 74a; 2 one meter square riffle kicks using a 500 micron mesh net will be collected . Additional kicks are collected if needed to insure at least 200 organisms. The debris from all kicks will be composited and preserved. All sorting and identification is to be conducted in the laboratory.

In ecoregions 65a, 65b, 65e, 65i, appropriate 71i, 73a and 74b; 3 rooted bank jabs will be collected using a 500 micron mesh triangular dip net. These are to include at least one jab from each bank, jabs from different velocities and incorporate different bank types when available. Approximately one meter is to be sampled during each jab. Additional banks jabs are collected if needed to insure at least 200 organisms. The debris from all jabs will be composited and preserved. All sorting and identification is to be conducted in the laboratory.

c. Subsampling

All samples will be reduced to 200+/- 20% organisms following subsampling protocols detailed in Protocol I of the TDEC QSSOP.

d. Taxonomy

All taxa in the subsample will be identified to genus level.

e. Biometrics

The following biometrics will be calculated for each subsample (without extrapolation).

- Taxa Richness (TR)
- EPT Richness (EPT)
- EPT Abundance (%EPT)
- Chironomidae and Oligochaeta Abundance (%OC)
- North Carolina Biotic Index (NCBI) using values found in Appendix C of the TDEC QSSOP
- Percent Contribution of Nutrient Tolerant Organisms (%NUTOL)
- Percent Clingers (%CLINGERS) using designations found in Appendix C of the TDEC QSSOP

4. Station Information

The following information will be recorded at each station during the biosurvey

a. Water temperature (C◦)
b. Dissolved Oxygen (mg/l)
c. pH (S.U.)
d. Conductivity (dS/m)
e. Stream Flow (MGD)
f. Peracetic Acid
g. Hydrogen peroxide

5. Reporting

Results of the biological stream sampling including complete taxa lists and habitat assessments shall be submitted to each of the addresses listed below:

Division of Water Resources
Columbia Environmental Field Office
1421 Hampshire Pike
Columbia, TN 38401

Division of Water Resources
Attn: Water-Based Systems
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102
Division of Water Resources
Attn: Planning & Standards Section
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

4.0. DEFINITIONS AND ACRONYMS

4.1. DEFINITIONS

"***Biosolids***" are treated sewage sludge that have contaminant concentrations less than or equal to the contaminant concentrations listed in Table 1 of subparagraph (3)(b) of Rule 0400-40-15-.02, meet any one of the ten vector attraction reduction options listed in part (4)(b)1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of Rule 0400-40-15-.04, and meet either one of the six pathogen reduction alternatives for Class A listed in part (3)(a)3, 4, 5, 6, 7, or 8, or one of the three pathogen reduction alternatives for Class B listed in part (3)(b)2, 3, or 4 of Rule 0400- 40-15-.04.

A "***bypass***" is defined as the intentional diversion of waste streams from any portion of a treatment facility.

A "***calendar day***" is defined as the 24-hour period from midnight to midnight or any other 24-hour period that reasonably approximates the midnight to midnight time period.

A "***composite sample***" is a combination of not less than 8 influent or effluent portions, of at least 100 ml, collected over a 24-hour period. Under certain circumstances a lesser time period may be allowed, but in no case, less than 8 hours.

The "***daily maximum concentration***" is a limitation on the average concentration in units of mass per volume (e.g. milligrams per liter), of the discharge during any calendar day. When a proportional-to-flow composite sampling device is used, the daily concentration is the concentration of that 24-hour composite; when other sampling means are used, the daily concentration is the arithmetic mean of the concentrations of equal volume samples collected during any calendar day or sampling period.

"***Discharge***" or "discharge of a pollutant" refers to the addition of pollutants to waters from a source.

A "***dry weather overflow***" is a type of sanitary sewer overflow and is defined as one day or any portion of a day in which unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall occurs and is not directly related to a rainfall event. Discharges from more than one point within a 24-hour period shall be counted as separate overflows.

"Degradation" means the alteration of the properties of waters by the addition of pollutants, withdrawal of water, or removal of habitat, except those alterations of a short duration.

“***De Minimis***” - Degradation of a small magnitude, as provided in this paragraph.

(a) Discharges and withdrawals

1. Subject to the limitation in part 3 of this subparagraph, a single discharge other than those from new domestic wastewater sources will be considered de minimis if it uses less than five percent of the available assimilative capacity for the substance being discharged.
2. Subject to the limitation in part 3 of this subparagraph, a single water withdrawal will be considered de minimis if it removes less than five percent of the 7Q10 flow of the stream.
3. If more than one activity described in part 1 or 2 of this subparagraph has been authorized in a segment and the total of the authorized and proposed impacts uses no more than 10% of the assimilative capacity, or 7Q10 low flow, they are presumed to be de minimis. Where the total of the authorized and proposed impacts uses 10% of the assimilative capacity, or 7Q10 low flow, additional degradation may only be treated as de minimis if the Division finds on a scientific basis that the additional degradation has an insignificant effect on the resource.

(b) Habitat alterations authorized by an Aquatic Resource Alteration Permit (ARAP) are de minimis if the Division finds that the impacts, individually and cumulatively are offset by impact minimization and/or in-system mitigation, provided however, in ONRWs the mitigation must occur within the ONRW.

An “***ecoregion***” is a relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.

The "***geometric mean***" of any set of values is the n^{th} root of the product of the individual values where “n” is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For the purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

A "***grab sample***" is a single influent or effluent sample collected at a particular time.

The "***instantaneous maximum concentration***" is a limitation on the concentration, in milligrams per liter, of any pollutant contained in the wastewater discharge determined from a grab sample taken from the discharge at any point in time.

The "***instantaneous minimum concentration***" is the minimum allowable concentration, in milligrams per liter, of a pollutant parameter contained in the wastewater discharge determined from a grab sample taken from the discharge at any point in time.

The "***monthly average amount***", shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

The "***monthly average concentration***", other than for *E. coli* bacteria, is the arithmetic mean of all the composite or grab samples collected in a one-calendar month period.

A "***one week period***" (or "***calendar-week***") is defined as the period from Sunday through Saturday. For reporting purposes, a calendar week that contains a change of month shall be considered part of the latter month.

"***Pollutant***" means sewage, industrial wastes, or other wastes.

A "***quarter***" is defined as any one of the following three-month periods: January 1 through March 31, April 1 through June 30, July 1 through September 30, and/or October 1 through December 31.

A "***rainfall event***" is defined as any occurrence of rain, preceded by 10 hours without precipitation that results in an accumulation of 0.01 inches or more. Instances of rainfall occurring within 10 hours of each other will be considered a single rainfall event.

A "***rationale***" (or "fact sheet") is a document that is prepared when drafting an NPDES permit or permit action. It provides the technical, regulatory and administrative basis for an agency's permit decision.

A "***reference site***" means least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.

A "***reference condition***" is a parameter-specific set of data from regional reference sites that establish the statistical range of values for that particular substance at least-impacted streams.

A **"*sanitary sewer overflow (SSO*)"** is defined as an unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall.

"***Sewage***" means water-carried waste or discharges from human beings or animals, from residences, public or private buildings, or industrial establishments, or boats, together with such other wastes and ground, surface, storm, or other water as may be present.

"***Severe property damage***" when used to consider the allowance of a bypass or SSO means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence

of a bypass or SSO. Severe property damage does not mean economic loss caused by delays in production.

"***Sewerage system***" means the conduits, sewers, and all devices and appurtenances by means of which sewage and other waste is collected, pumped, treated, or disposed.

"***Sludge***" or "***sewage sludge***" is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

A "***subecoregion***" is a smaller, more homogenous area that has been delineated within an ecoregion.

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

The term, "***washout***" is applicable to activated sludge plants and is defined as loss of mixed liquor suspended solids (MLSS) of 30.00% or more from the aeration basin(s).

"***Waters***" means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through, or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.

The "***weekly average amount***", shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar week when the measurements were made.

The "***weekly average concentration***", is the arithmetic mean of all the composite samples collected in a one-week period. The permittee must report the highest weekly average in the one-month period.

4.2. ACRONYMNS AND ABBREVIATIONS

1Q10 – 1-day minimum, 10-year recurrence interval

30Q20 – 30-day minimum, 20-year recurrence interval

7Q10 – 7-day minimum, 10-year recurrence interval

BAT – best available technology economically achievable

BCT – best conventional pollutant control technology

BDL – below detection level

BOD_5 – five day biochemical oxygen demand

BPT – best practicable control technology currently available

$CBOD_5$ – five day carbonaceous biochemical oxygen demand

CEI – compliance evaluation inspection

CFR – code of federal regulations

CFS – cubic feet per second

CFU – colony forming units

CIU – categorical industrial user

CSO – combined sewer overflow

DMR – discharge monitoring report

D.O. – dissolved oxygen

E. coli – *Escherichia coli*

EFO – environmental field office

LB(lb) - pound

IC_{25} – inhibition concentration causing 25% reduction in survival, reproduction and growth of the test organisms

IU – industrial user

IWS – industrial waste survey

LC_{50} – acute test causing 50% lethality

MDL – method detection level

MGD – million gallons per day

MG/L(mg/l) – milligrams per liter

ML – minimum level of quantification

ml – milliliter

MLSS – mixed liquor suspended solids

MOR – monthly operating report

NODI – no discharge

NPDES – national pollutant discharge elimination system

PL – permit limit

POTW – publicly owned treatment works

RDL – required detection limit

SAR – semi-annual [pretreatment program] report

SIU – significant industrial user

SSO – sanitary sewer overflow

STP – sewage treatment plant

TCA – Tennessee code annotated

TDEC – Tennessee Department of Environment and Conservation

TIE/TRE – toxicity identification evaluation/toxicity reduction evaluation

TMDL – total maximum daily load

TRC – total residual chlorine

TSS – total suspended solids

WQBEL – water quality based effluent limit

ADDENDUM TO RATIONALE
Tullahoma STP
PERMIT NO. TN0023469

10/29/2018
Addendum prepared by: Miss Julie Harse

The facility commented on the proposed modification. In the comment letter they stated the following:

> "TUA does not object to the twice per week instream sampling, however TUA requests that the monitoring be discontinued after two years if the measurements demonstrate concentrations below the "alert" concentrations. Additionally, TUA request that the alert concentrations be listed in a footnote to the table as opposed to being listed within the table."

A narrative requirement has been added to the permit with a date of December 1, 2020. The facility shall submit a letter to the enforcement/compliance section requesting that the monitoring be removed from the permit. The alert concentrations are provided as line items in the XML tables because alerts are required to be set up as line items in ICIS.

ADDENDUM TO RATIONALE
Tullahoma STP
PERMIT NO. TN0023469

6/18/2018
Addendum prepared by: Miss Julie Harse

The division limited peracetic acid at Outfall 001 and required the reporting of hydrogen peroxide in the 2017 permit reissuance. The division verified prior to permit issuance that the hydrogen peroxide was disassociating into oxygen and water at a rate which rendered it below the limited available ECOTOX hydrogen peroxide toxicity data for the daphnia magna (0.340 mg/L LOEL Growth) at a location 0.1 miles downstream from the outfall.

H2O2 IMP4 - RM 10.9	
Date	H2O2 mg/L
5/4/2016	0.090
5/17/2016	0.000
6/7/2016	0.000
6/20/2016	0.080
7/5/2016	0.040
7/25/2016	0.000
8/2/2016	0.040
8/15/2016	0.000
9/7/2016	0.070
9/19/2016	0.000
10/5/2016	0.060
10/19/2016	0.200

The permit required in the fall of 2017 an instream bioassessment which indicated that the downstream section of the stream was not meeting the division's bioassessment standards. Section 2.2.2(b) of the permit allows the division to modify the permit based on new information that was not available at the permit reissuance. The division does not have a water quality criteria standard for hydrogen peroxide so the EPA ECOTOX database hydrogen peroxide toxicity data for the water flea daphnia magna was utilized in the 2017 permit reissuance. The division purchased a copy of the paper to obtain more detailed information on the toxicity results. The technical paper is titled "Chronic toxicity of hydrogen peroxide to Daphnia magna in a continuous exposure, flow-through test system" by Jeffery R. Meinertz, Shari L. Greseth, Mark P. Gaikowski, Larry J. Schmidt at the U.S. Geological Survey, Upper Midwest Environmental Sciences Center, Biological Resources Division, 2630 Fanta Reed Road, La Crosse, Wisconsin 54603, United States. The technical article was published in Science of The Total Environment, Volume 392, Issues 2–3, 25 March 2008, Pages 225-232. The toxicity results for survival, growth, and reproduction provided in the technical paper are presented below for reference.

Table 1 – The hydrogen peroxide concentrations in pooled samples from test chambers where *Daphnia magna* were continuously exposed to hydrogen peroxide for 21 days

Nominal hydrogen peroxide concentration ($mg\ L^{-1}$)	*n*	Mean hydrogen peroxide ($mg\ L^{-1}$)	SD ($mg\ L^{-1}$)	Minimum daily measurement ($mg\ L^{-1}$)	Maximum daily measurement ($mg\ L^{-1}$)
0.0	21	0.02	0.01	0.01	0.03
0.32	21	0.34	0.02	0.30	0.38
0.63	21	0.63	0.06	0.47	0.73
1.25	21	1.27	0.26	0.56	1.88
2.5	19	2.61	0.24	2.03	2.90
5.0	9	5.00	0.53	4.45	5.90

Table 2 – Hazard ratios and survival of first generation *Daphnia magna* continuously exposed to hydrogen peroxide for 21 days

Nominal hydrogen peroxide concentration ($mg\ L^{-1}$)	Hazard ratio	95% confidence limits	Adult survival (%)
0	ND*		100
0.32	NA#		90
0.63	1.102[a]	0.069 17.621	90
1.25	1.066[a]	0.067 17.052	80@
2.5	25.904[b]	3.145 213.345	0
5.0	776.316[c]	40.751 14789.12	0

A hazard ratio gives an estimate of the expected length of time until death; the larger ratio, the sooner death is expected to occur. Hazard ratios with the same letter are not statistically different ($P>0.05$).
*ND = data not included in statistical analysis to prevent model failure.
#NA = not applicable; data from the group were used as the baseline reference.
@One chamber overflowed after day 20. The adult *Daphnia* was not recovered.

Table 3 – Body length of first generation *Daphnia magna* continuously exposed to hydrogen peroxide for 21 days

Nominal hydrogen peroxide concentration ($mg\ L^{-1}$)	Mean length (mm)	95% confidence limits (mm)	Range (mm)
0	4.616[a]	4.512 4.721	4.408 to 4.791
0.32	4.455[b]	4.344 4.565	4.143 to 4.715
0.63	4.391[b]	4.281 4.502	4.052 to 4.662
1.25	3.901[c]	3.784 4.018	3.675 to 4.206
2.5	NA#	NA	NA
5.0	NA	NA	NA

Mean lengths with the same letter are not statistically different ($P>0.05$).
#NA = not applicable.

Table 4 – The days to production of the first brood and number of young produced in the first brood for *Daphnia magna* continuously exposed to hydrogen peroxide for 21 days

Nominal hydrogen peroxide concentration ($mg\ L^{-1}$)	Mean and range of days to first brood	Mean and range of number of young in first brood
0.0	11 (8–13)[a,b]	20 (1–45)
0.32	12 (10–16)[a,c]	22 (1–44)
0.63	10 (9–13)[b]	16 (2–34)
1.25	10 (8–13)[b]	8 (1–32)
2.5	16 (none)[c]	1 (none)
5.0	NA*	NA

Mean days to first brood with the same letter are not statistically different ($P>0.05$).
*NA = not applicable, no young produced.

Table 5 – Second generation production from *Daphnia magna* continuously exposed to hydrogen peroxide for 21 days

Nominal hydrogen peroxide concentration ($mg\ L^{-1}$)	Mean number of broods per test chamber	Total number of broods produced in the test group	Total number of young produced in the test group
0.0	4.1	41[a]	1516[a]
0.32	4.0	40[a]	1564[a]
0.63	3.9	39[a]	1388[a]
1.25	4.0	40[a]	1000[b]
2.5	0.1	1[b]	1[c]

Total number of broods and total number of young produced with the same letter are not statistically different ($P>0.05$).

The stream that the facility discharges to was previously listed as an impaired waterbody due to causes other than the discharge of peracetic acid. Although the stream is listed as impaired, the spring 2018 site visit observations revealed fathead minnows were present and reproducing in the 100% effluent channel prior to entering the stream. The division expects that some facilities which request to utilize PAA for disinfection will discharge to small creeks that have historically failed the bioassessments. Conversations with the facilities indicate that the PAA dose and contact time vary based on the season and flow rate. In order to allow the facilities the flexibility to vary the PAA dose and the contact time while discharging to a creek that is failing its bioassessments, the division will require instream sampling to confirm that the aquatic life are not being exposed to harmful concentrations of the disinfectant. The instream monitoring point will be at the following location: Latitude 35.342755 Longitude -86.210373 (IMP 4). The reporting of instream PAA and hydrogen peroxide results will be an enforceable requirement. The PAA and hydrogen peroxide values of 0.38 mg/L and 0.63 mg/L will be alerts instead of an enforceable value. If the sampled result exceeds the alert value, the facility shall initiate corrective action measures such as reducing the PAA dose to reduce the instream concentration below the alert value. The corrective action measures shall be detailed in a monthly report which is attached to the monthly discharge monitoring report in NETDMR.

ADDENDUM TO RATIONALE
Tullahoma STP
PERMIT NO. TN0023469

July 28, 2017
Addendum prepared by: Miss Julie Harse

The coordinates provided in the final issued permit for instream sampling locations were verified by the facility after permit issuance. The coordinates have been adjusted based on field verification.

RATIONALE

Tullahoma Utilities Authority
NPDES Permit No. TN0023469
Date: 10/31/2018
Permit Writer: Julie Harse

1. FACILITY INFORMATION

Tullahoma Utilities Authority
Mr. Brian Skelton - President
Tullahoma, Coffee County, Tennessee
(931) 455-4515
Treatment Plant Average Design Flow: 5 MGD
Percentage Industrial Flow: <1%
Treatment Description: Equalization lagoon, sequencing batch reactor, and peracetic acid disinfection
Certified Operator Grades: STP: 4; CS: 2; Date Rated: 07/09/03

2. RECEIVING STREAM INFORMATION

Rock Creek at mile 11.0
Watershed Group: Elk-Upper
Hydrocode: 06030003
Low Flow: 7Q10 = 0.452 MGD (0.70 CFS)
Low Flow Reference:
USGS Scientific Investigations Report 2009-5159
Station #03579620

Stream Classification Categories:

Domestic Wtr Supply	Industrial	Fish & Aquatic	Recreation
	X	X	X
Livestock Wtr & Wlife	**Irrigation**	**Navigation**	
X	X		

Water Quality Assessment: Partially supporting

3. CURRENT PERMIT STATUS

Permit Type:	**Municipal**
Classification:	**Major**
Issuance Date:	**01-FEB-15**
Expiration Date:	**30-JUN-17**
Effective Date:	**01-MAR-15**

4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

a. The division has removed the silver sampling from the monitoring requirements at Outfall 001. Monitoring will still be required for silver in the pretreatment program. The instream monitoring for nutrients and hydrogen peroxide will be removed from the draft permit.

b. Compliance Schedule Summary

Description of Report to be Submitted	Reference Section in Permit
Monthly Discharge Monitoring Reports	1.3.1
Monthly Operational Reports	1.3.4
Monthly Bypass and Overflow Summary Report	1.3.5.1
Industrial Waste Survey Report within 120 days of the effective permit date	3.2.a
Technical review of the need to recalculate local limits within 120 days of the permit effective date	3.2.a
Biomonitoring Report beginning within 90 days of the effective permit date	3.4

c. For comparison, this rationale contains a table depicting the previous permit limits and effluent monitoring requirements in Appendix 1.

5. PREVIOUS PERMIT DISCHARGE MONITORING REPORT REVIEW

A review of the DMR summary from January 2013 - January 2017 reveals that the City of Tullahoma had five permit exceedances. A complete discharge monitoring report and the permit exceedances are located in Appendix 2. The inspection reports for the facility can be found on the public data viewer at the below link. The inspection reports indicate that the facility is generally in compliance with the permit.

http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34051:::NO:34051:P34051_PERMIT_NUMBER:TN0023469

6. PROPOSED EFFLUENT LIMITS AND RATIONALE

PARAMETERS	MONTHLY AVERAGE CONCENTRATION (MG/L)	MONTHLY AVERAGE AMOUNT (LB/DAY)	WEEKLY AVERAGE CONCENTRATION (MG/L)	WEEKLY AVERAGE AMOUNT (LB/DAY)	DAILY MAXIMUM CONCENTRATION (MG/L)	DAILY MINIMUM PERCENT REMOVAL	RATIONALE
$CBOD_5$	10	417	15	626	20	40	D.O. protection, Refer to 6.1 below
NH_3-N (May 1- Oct. 31)	1.2	50	1.8	75	2.4	—	Ammonia Toxicity, Refer to 6.2 below
NH_3-N (Nov. 1- April 30)	2.2	92	3.3	138	4.4	—	Ammonia Toxicity, Refer to 6.2 below
Total Suspended Solids	30	1251	40	1668	45	40	T.C.A. 0400-40-05-.09
Dissolved Oxygen (mg/l)	6.0 (daily minimum) instantaneous	—	—	—	—	—	D.O. protection, Refer to 6.1 below
Total Chlorine Residual (mg/l)	—	—	—	—	0.02 (daily maximum)	—	Refer to 6.3 below
Peracetic Acid(mg/l)	Report	—	—	—	0.41 (daily maximum)	—	Refer to 6.3 below
Hydrogen Peroxide(mg/l)	Report	—	—	—	Report (daily maximum)	—	Refer to 6.3 below
Total Nitrogen	Refer to 6.4 below						
Total Phosphorous							
E. coli (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	T.C.A. 0400-40-03-.03, Refer to 6.5 below
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	T.C.A. 0400-40-05-.09
pH (standard units)	6.0-9.0	—	—	—	—	—	T.C.A. 0400-40-03-.03
Flow (MGD):							
Influent	Report	—	—	—	Report	—	Used to quantify pollutant load
Effluent	Report	—	—	—	Report	—	Used to quantify pollutant load
Whole Effluent Toxicity:							
IC_{25}	92% per sample	—	—	—	—	—	Refer to 6.6 below
Metals & Toxics:							Refer to 6.7 below
Sanitary Sewer Overflows, Total Occurrences			Report				Refer to 6.9 below
Dry Weather Overflows, Total Occurrences			Report				Refer to 6.9 below
Bypass of Treatment, Total Occurrences			Report				Refer to 6.9 below

Note: Weekly limitations on $CBOD_5$ and TSS concentrations are given as required per 40 CFR 133.102(a)(2) or 133.102(a)(4)(2) & 133.102 (b)(2) respectively; daily $CBOD_5$ and TSS limitations are authorized by T.C.A. 0400-40-05-.09; monthly and weekly mass loads are limited per 40 CFR 122.45(f) and based on the design flow as per 40 CFR 122.45(b); monthly average percent removal rates for $CBOD_5$ and TSS are required per 40 CFR 133.102(a)(3) or 133.102(a)(4)(iii) and 133.102 (b)(3) respectively. A minimum 40% daily removal rate is required as equivalent to a daily mass load limitation.

6.1. $CBOD_5$, DISSOLVED OXYGEN, AND PERCENT REMOVALS REQUIREMENTS

a. The current plant was constructed in the mid-eighties to replace a trickling filter wastewater plant. The trickling filter plant had the secondary technology limit of 30 mg/L for BOD_5. A review of the December 1982 preliminary engineering report for the current wastewater plant indicates that the value engineering team suggested a BOD_5 limit of 20 mg/L in the summer and 30 mg/L in the winter (Page 18). The BOD_5 limit recommended by the Division of Water Quality Control was 15 mg/L in the summer and 30 mg/L in the winter. The actual NPDES $CBOD_5$ limit for the current plant had been the secondary technology limit of 25 mg/L as a monthly average concentration. While a review of the file does not provide clarification regarding the retainment of secondary technology limits instead of water based limits, the stream assessments conducted by the division and the facility's consultant from 1999 to 2006 demonstrates that the technology-based permit limits contributed to the current conditions in the stream.

The model that has been historically utilized to determine the $CBOD_5$ limit is Streeter Phelps. The Streeter Phelps model assumes a continuous discharge and does not account for the effects of instream algae created from discharges containing nutrients. Since the facility's treatment system has traditionally produced effluent with low $CBOD_5$ and ammonia concentrations and elevated nutrients, the effect of algae and nutrients would be considered in a more sophisticated model than Streeter Phelps. Additionally, the facility's intermittent discharges contribute to the impairment of the stream. At the time of this draft permit, the facility has conducted nutrient instream sampling and a bioassessment with diurnal dissolved oxygen sampling. The division's modeling group and the city will prepare a more sophisticated model for the current conditions in the stream. The updated model will be utilized to fine tune the permit limits developed from the Streeter Phelps model.

b. The treatment facility is required to remove 85% of the $CBOD_5$ and TSS that enter the facility on a monthly basis. This is part of the minimum requirement for all municipal treatment facilities contained in Code of Federal Regulations 40 Part 133.102. The reasons stated by the U.S.E.P.A. for these requirements are to achieve these two basic objectives:

(1) To encourage municipalities to correct excessive inflow and infiltration (I/I) problems in their sanitary sewer systems, and
(2) To help prevent intentional dilution of the influent wastewater as a means of meeting permit limits.

The treatment facility is required to remove 40% of the $CBOD_5$ and TSS that enter the facility on a daily basis. This percent removal will be calculated three times per week and recorded on the Monthly Operation Report. The number of excursions (days when $CBOD_5$ and/or TSS removal is less than 40%) will be reported on the Discharge Monitoring Report.

6.2. NH_3-N TOXICITY

To access toxicity impacts, the state utilizes the EPA document, 1999 Update to Ambient Water Quality Criteria for Ammonia, pursuant to 0400-40-03-.0-3(3)(j), and assumed stream temperatures of 27°C and 17°C and pH of 8.0 to derive an allowable instream protection value protective of chronic exposure to a continuous discharge. A mass balance equation with sewage treatment facility and stream flows and this allowable value determines the monthly average permit limit. The criteria document states that a 30Q5 flow value is protective in deriving allowable values. Where the division has 30Q5 flow values, the division may use them. Otherwise, the division utilizes the available 7Q10 or 1Q10 values that are generally more conservative. The criteria continuous concentrations (CCC) derived from assumed temperature and pH values are as follows:

CCC values based on temperature and pH, in mg/L:

Temperature (°C)	7.5 pH	8.0 pH
25	2.22	1.24
27	1.94	1.09
30	1.61	0.90

Temperature (°C)	7.5 pH	8.0 pH
15	4.22	2.36
17	3.72	2.07
20	3.06	1.71

The mass balance equation is as follows:

$$CCC = \frac{Q_S C_S + Q_{STP} C_{STP}}{Q_S + Q_{STP}} \qquad \text{or,} \qquad C_{STP=} \frac{CCC(Q_S + Q_{STP}) - (Q_S C_S)}{Q_{STP}}$$

where:

CCC = Criteria continuous concentration (mg/l)
Q_S = 7Q10 flow of receiving stream (MGD)
Q_{STP} = Design flow of STP (MGD)
C_S = Assumed/Measured instream NH_3 (mg/l)
C_{STP} = Allowable STP discharge of NH_3 (mg/l)

$$C_{STP} = \frac{1.09\ (0.452\ MGD + 5\ MGD) - (0.452\ MGD \times 0.1 mg/l)}{5\ MGD} = 1.2\ mg/l\ (summer)$$

$$C_{STP} = \frac{2.07\ (0.452\ MGD + 5\ MGD) - (0.452\ MGD \times 0.1 mg/l)}{5\ MGD} = 2.2\ mg/l\ (winter)$$

Because the NH_3-N concentration limits calculated to protect dissolved oxygen are less restrictive than the toxicity limits calculated above, the monthly average limits for NH_3-N (1.2 mg/l-summer, 2.2 mg/l-winter) will be based on the ammonia toxicity standards.

6.3. CHLORINATION AND PERACETIC ACID

Total Residual Chlorine

The residual chlorine limit is derived using the mass balance formula and the EPA instream protection value of 0.019 mg/l for fish and aquatic life. Applying this formula yields the following calculation:

$$\frac{0.019\ (Qd + Qs)}{Qd} = \text{Limit (mg/l)} = \frac{0.019(5 + 0.452)}{5} = 0.02 \text{ mg/l}$$

where:

0.019	=	instream protection value (acute)
5	=	Qd, design flow of STP (MGD)
0.452	=	Qs, 7Q10 flow of receiving stream (MGD)

Peracetic Acid

The division received a request in the previous permit period for a permit modification to allow the permanent use of a peracetic acid based product instead of chlorine as the wastewater plant's primary disinfection method. The facility is utilizing PeroxyChem's VigorOx® WWT II peracetic acid solution which contains 15% peracetic acid by weight and 23% hydrogen peroxide as delivered. The IC25 toxic concentration for Ceriodaphnia dubia was 0.38 mg/L (reproduction), based on the June 29, 2015, report from PeroxyChem. The permit limitation for PAA, based on the stream dilution factor of 1.09, is 0.41 mg/L.

The results of pilot testing at the plant indicated that the hydrogen peroxide component of the product was consistently present at the outfall. Since a majority of the outfall samples for PAA are non-detect, the division does not believe that hydrogen peroxide analysis was affected through PAA interference. Since the limited available ECOTOX hydrogen peroxide toxicity data for the daphnia magna (0.340 mg/L LOEL Growth) indicated that these levels could be toxic to aquatic life, the previous permit had instream sampling for H2O2 at Rock Creek river mile 10.9. The instream sampling was performed to confirm that the H2O2 is disassociating into O2 and H2O. The results are in the below table.

H2O2 IMP4 - RM 10.9	
Date	H2O2 mg/L
5/4/2016	0.090
5/17/2016	0.000
6/7/2016	0.000
6/20/2016	0.080
7/5/2016	0.040
7/25/2016	0.000
8/2/2016	0.040
8/15/2016	0.000
9/7/2016	0.070
9/19/2016	0.000
10/5/2016	0.060
10/19/2016	0.200

The chronic biomonitoring currently required in the permit requires the samples to be tested for H2O2 at the lab on days one, three, and five. The instream sampling and chronic biomonitoring was intended to address the potential for toxicity from the H2O2 without unnecessarily requiring neutralization at the outfall. If the chronic biomonitoring in conjunction with the stream indicates toxicity to fish and aquatic life, the division reserves the right to limit H2O2.

The facility conducted a bioassessment relative to peracetic acid in the fall of 2016. However, the sampling was not conducted in correct downstream locations. Also, the available biomonitoring tests reports did not indicate that hydrogen peroxide testing was performed at the lab. The facility will need to redo the instream bioassessment during the low flow hot weather season at one upstream location and the following downstream locations:

DWR Station ID	Stream Name	Location	Lat	Long
ROCK0010.9CE	Rock Creek	Approx 500 feet downstream Tullahoma Utilities Authority	35.34499	-86.21255
ROCK010.4CE	Rock Creek	South Franklin Street. Approx. 2000 ft d/s Tullahoma Utilities Authority	35.3385	-86.2088

The biomonitoring reports will need to be submitted to the enforcement and water based sections in the central office with the results of the hydrogen peroxide testing included in the lab report.

6.4. TOTAL NITROGEN AND TOTAL PHOSPHOROUS MONITORING/REPORTING

Nutrients are naturally occurring and essential components of healthy aquatic systems. Excessive amounts of nutrients, however, can impact water quality. The enrichment of a waterbody with nutrients, called eutrophication, can result in dense, rapidly multiplying growths, or blooms, of algal species and other nuisance aquatic plants. These have potential for negatively impacting the habitat for fish and aquatic life and degrading the water quality for drinking water supply and recreation uses. These impacts can present both locally from an individual activity and much further downstream from the cumulative impact of multiple activities. The receiving stream does not support its designated uses in part due to nutrients. The facility completed the following items regarding nutrients in the previous permit cycle.

1. Quarterly instream nutrient monitoring at three locations (See following page).
2. A stream bioassessments that included diurnal dissolved oxygen monitoring in the fall of 2015 and 2016.
3. A nutrient removal alternatives study which discussed plant improvements.
4. The permit was limited with an annual loading rate for total nitrogen and total phosphorous based on the technology limits of 8 mg/L TN and 1 mg/L TP.

Copies of the stream bioassessments (September 17, 2015 and October 21, 2016) and the nutrient removal alternatives study (May 4, 2016) are available on the public data viewer at the following link:

http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34051:::NO:34051:P34051_PERMIT_NUMBER:TN0023469

The new permit will continue to require the annual loadings for total nitrogen and total phosphorous. The new permit will require the reporting the influent and effluent poundage for total phosphorous and total nitrogen. The reporting of this data will characterize the nutrient removal of the plant. Since the modeling of the stream has not been performed at the time of this draft permit, the treatment plant improvements will not be required until the results of the modeling are known.

Instream Monitoring Data
IMP1 - Upstream of RM 11.9, IMP2 – RM 10.9, IMP3 – RM 9.4

	Temperature (Celcius)			Instantaneous Flow (MGD)			CBOD5 (mg/L)			Conductivity (dS/m)			E.coli (CFU/100 ml)			Hardness, total (mg/L)			Nitrite plus nitrate as N (mg/L)		
	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3
12/31/2014	9.4	10.5	10.7	107.8	162.6	557.1	0.7	0.6	0.6	0.1433	0.2195	0.1623	70	40	80	44	78	72	0.3	2.1	1.4
01/31/2015																					
02/28/2015	6.6	7.4	7.9	54	160	372	0.8	1	1.2	106	238	182	60	40	50	48	112	104	0.38	2	1.6
03/31/2015																					
04/30/2015	14.8	15	15.2	101	118	544	0.3	0.4	0.2	1057.7	191.8	161.6	70	90	140	62	78	80	0.38	1.6	1.4
05/31/2015																					
06/30/2015																					
07/31/2015	23.1	22.3	21.8	36.7	85.3	258.9	0.5	0.6	0.6	140.3	237	174	390	110	140	66	86	68	0.56	3.8	2
08/31/2015																					
09/30/2015																					
10/31/2015	15.4	16.1	15.2	46.9	92.7	147.5	0.63	0.5	0.6	139.9	296	194.4	90	260	210	62	98	78	0.35	3.19	1.51
11/30/2015																					
12/31/2015																					
01/31/2016																					
02/29/2016	7.2	9.3	8.7	126	116	135	1.5	1.3	1.5	90.4	303	186.9	90	20	40	42	92	68	0.4	2.3	0.25
03/31/2016																					
04/30/2016	19	19.3	18.9	48	240	183	0.5	0.6	0.6	52.1	106	115.6	240	100	80	58	72	72	0.583	1.09	1.28
05/31/2016																					
06/30/2016																					
07/31/2016																					
08/31/2016	22.4	24	23.3	26.4	26.6	46	0.6	0.6	0.6	60.4	170.7	159	298.7	107.1	0.6	66	118	275.5	0.528	3.6	0.531
09/30/2016																					
10/31/2016	17.2	19.2	17.5	17.9	16	28.9	0.4	0.5	0.4	59.1	176.4	167.2	613.1	90.6	235.9	66	96	88	0.5	4.81	4.49

	Ammonia as N (mg/L)			TKN as N (mg/L)			Dissolved Oxygen (mg/L)			Orthophosphate (mg/L)			Total Phosphorous (as P)			TSS (mg/L)			pH (SU)		
	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3	IMP 1	IMP 2	IMP 3
12/31/2014	0.004	0.01	0.01	0.44	0.56	0.33	10	9.4	10	0.025	0.14	0.67	0.1	0.16	0.1	2.4	1.6	2	7.1	7.2	7.3
01/31/2015																					
02/28/2015	0.003	0.24	0	0.25	0.49	0.25	12.4	12.4	13	0.025	0.19	0.074	0.1	0.16	0.1	1.2	0.8	1.2	7.3	7.2	7.7
03/31/2015																					
04/30/2015	0.02	0.03	0.02	0.25	0.25	0.25	9.3	9.3	9.5	0.025	0.13	0.067	0.1	0.1	0.1	3.2	2	2.4	7.2	7.4	7.4
05/31/2015																					
06/30/2015																					
07/31/2015	0.01	0.01	0.01	0.25	0.25	0.34	7.2	7.1	8.1				0.1	0.33	0.15	2.4	2	1.6	7.3	7.3	7.3
08/31/2015																					
09/30/2015																					
10/31/2015	0.01	0.02	0.01	0.25	0.25	0.25	8.2	7.5	9.1	0.025	0.447	0.215	0.1	0.429	0.227	0.4	1.2	2	7.1	7.2	7.4
11/30/2015																					
12/31/2015																					
01/31/2016																					
02/29/2016	0.01	0.05	0.02	0.25	0.328	0.328	11.6	11.1	11.7	0.1	0.332	0.143	0.1	0.373	0.15	1.2	2.4	2	7.2	7.1	7.2
03/31/2016																					
04/30/2016	0.02	0.06	0.03	0.25	0.536	0.442	8	7.8	8.1	0.025	0.684	0.93	0.1	0.57	0.69	1.2	0.8	0.8	7.1	7.1	7.1
05/31/2016																					
06/30/2016																					
07/31/2016																					
08/31/2016	0.01	0.05	0.03	0.25	0.364	0.25	6.9	6	6.8	0.025	0.7	0.531	0.1	0.67	110	2.4	1.2	1.6	7.1	7.3	7.3
09/30/2016																					
10/31/2016	0.002	0.04	0.012	0.1	0.252	0.29	7.9	6.2	6.4	0.1	0.845	0.739	0.1	0.7	0.75	0.8	2.4	2.4	7.2	7.2	7.2

6.5. *E. COLI* REQUIREMENTS

Disinfection of wastewater is required to protect the receiving stream from pathogenic microorganisms. *E. coli* is an indicator organism used as a measure of bacteriological health of a receiving stream and the effectiveness of disinfection. The *E. coli* daily maximum limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

6.6. BIOMONITORING

The division evaluates all dischargers for reasonable potential to exceed the narrative water quality criterion, "no toxics in toxic amounts". The division has determined that for municipal facilities with stream dilutions of less than 500 to 1, any of the following conditions may demonstrate reasonable potential to exceed this criterion.

a. Toxicity is suspected or demonstrated.
b. A pretreatment program is required.
c. The design capacity of the facility is greater than 1.0 MGD.

The following calculation is the required dilution at which chronic toxicity testing must meet permit requirements.

$$IC_{25}\ \% = \frac{\text{Design Flow}}{\text{Low Flow+ Design Flow}} * 100 \geq \frac{5}{0.452+5} * 100 > 92\%$$

where:

0.452	=	Low Flow - 7Q10 (MGD)
5	=	Design Flow Capacity (MGD)
IC_{25}	=	Concentration causing 25% reduction in survival, reproduction and growth of test organisms

6.7. METALS AND TOXICS

Pass-through limitations for heavy metals and other toxic substances have been recalculated as part of the permit issuance process and/or due to changes in industrial waste contribution to the POTW. This POTW is required to implement/maintain a pretreatment program. More frequent monitoring will be required **in the permit** if (a) the reported concentrations approach or exceed calculated allowable values, (b) significant amounts of particular pollutants are present which may impact the treatment process sludge character or the receiving stream, or (c) minimum information is lacking to accurately calculate water quality protection values, in which case additional stream monitoring may also be required.

A summary of the semi-annual report data does not indicate that the potential exists for the water quality criteria for any parameter to be exceeded. Appendix 3 lists the metal and toxic parameters calculations and the procedure used to derive the results. The silver limit that was required in the previous permit will be removed in the draft permit.

6.8. VOLATILE ORGANIC, ACID-EXTRACTABLE, AND BASE-NEUTRAL COMPOUNDS

The division evaluated effluent concentrations of volatile organic, acid-extractable, and base-neutral compounds and antimony, arsenic, beryllium, selenium and thallium for potential to violate water quality criteria using the following mass balance equation:

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

where:

Cm = resulting in-stream concentration after mixing
Cw = concentration of pollutant in wastewater
Cs = stream background concentration
Qw = wastewater flow, (STP design flow)
Qs = stream low flow

to protect water quality:

$$Cw \leq Ca$$

where:

Ca = STP effluent concentration allowable

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

and (S_A) = the percent “Stream Allocation”.

The reasonable potential evaluation uses the following assumptions and procedures:

a. Stream background concentrations, Cs, for all volatile organic, acid-extractable, and base-neutral compounds equal zero unless actual stream data exists to show otherwise. Use of the effluent concentrations of such pollutants contributed by upstream dischargers as background is not justifiable due to the volatility and reactivity of these pollutants.

b. The stream allocation, S_A , is 90% and is used as a factor of safety.

c. A mass balance uses the STP design flow, the receiving stream critical low flow (7Q10 or 1Q10), the state water quality numeric criteria, and the stream allocation safety factor to derive the allowable effluent concentrations.

d. When pollutants have potential to violate standards because the concentrations are below the scan detection levels but could be above the allowable water quality based effluent concentrations, the pollutants are handled one of three (3) ways:

   i. Additional testing of detected and non-detected pollutants is required if contributing industrial processes are likely to contain them and the effluent scans have not met the minimum required detection levels (RDL) in the state water quality standards or approximated the method detection limits (MDL) of the approved test methods for the pollutants in 40 CFR Part 136.
   ii. If the required RDL has been used and resulted in non-detection, or if an MDL has been used with non-detection and the contributing industrial processes do not reasonably contain that pollutant, the division drops the pollutant from further consideration.
   iii. Pollutants detected at levels high enough to violate standards are limited in the permit to the allowable concentration, Cw, based on STP design flow.

Calculations for this permit have been done using a standardized spreadsheet, titled "WQ Based Effluent Calculations- Other Compounds", and are located in Appendix 4. All metals other than antimony, arsenic, beryllium, selenium, and thallium have been evaluated using procedures described in the rationale, or fact sheet, section headed, “METALS & TOXICS”.

The evaluation indicates that volatile organic, acid extractable, and base neutral compounds and antimony, arsenic, beryllium, selenium, and thallium do not exhibit the potential to violate water quality criteria and thus will not be given effluent limitations and monitoring requirements in the permit.

6.9. OVERFLOW AND BYPASS REPORTING

For the purposes of demonstrating proper operation of the collection, transmission, and treatment system, the permit defines overflow as any release of sewage other than through permitted outfalls. This definition includes, but is not necessarily limited to, sanitary sewer overflows and dry weather overflows as defined. For example, a collection system blockage or hydraulic overload that causes backup and release of sewage into a building during a wet weather event may not clearly fit either the definition of a sanitary sewer overflow or a dry weather overflow. Still, any unpermitted release potentially warrants permittee mitigation of human health and/or water quality impacts via direct or indirect contact and demonstrates a hydraulic problem in the system that warrants permittee consideration as part of proper operation and maintenance of the system.

However, for the more typical, unpermitted, releases into the environment, this permit intends interchangeable use of the terms, “overflow” and “sanitary sewer overflow” for compliance reporting purposes.

7. OTHER PERMIT REQUIREMENTS AND CONDITIONS

7.1. CERTIFIED WASTEWATER TREATMENT OPERATOR

The waste treatment facilities shall be operated under the supervision of a Grade 4 certified wastewater treatment operator in accordance with the Water Environmental Health Act of 1984. Operator grades are under jurisdiction of the Water and Wastewater Operators Certification Board. This NPDES permit is under jurisdiction of the Tennessee Board of Water Quality, Oil and Gas. Operator grades are rated and recommended by the Division of Water Resources pursuant to Rule 0400-49-01 (formerly 1200-05-03) and are included in this fact sheet for reference. The grades are intentionally not specified in the permit so that the operation certification board can authorize changes in grade without conflicting with this permit.

7.2. COLLECTION SYSTEM CERTIFIED OPERATOR

The collection system shall be operated under the supervision of a Grade 2 certified collection system operator in accordance with the Water Environmental Health Act of 1984.

7.3. PRETREATMENT PROGRAM

The Tullahoma Utilities Authority has an approved pretreatment program. An updated Industrial Waste Survey must be completed within 120 days of the effective date of the permit, unless such a survey has been submitted within 3 years of the effective date.

At least once each reporting period, all permittees with approved pretreatment programs are required to analyze the STP influent and effluent for the following pollutant parameters: chromium (trivalent and hexavalent and total if drinking water use applies), copper, lead, nickel, zinc, silver, cadmium, mercury, total phenols, and cyanide. These pollutants were selected because, historically, they are the ones that tend to be predominant in industrial wastewaters. Other pollutants may be added to the list, as required.

During preparation of this permit, data from ten previous semiannual reports were analyzed. Based on our review of the semiannual reports and other documents, sampling for additional pollutants is not required at this time.

7.4. BIOSOLIDS MANAGEMENT PRACTICES

The Clean Water Act (CWA) requires that any NPDES permit issued to a publicly owned treatment works or any other treatment works treating domestic sewage shall comply with 40 CFR Part 503, the federal regulation governing the use and disposal of sewage sludge. It is important to note that “biosolids” are sewage sludge that have been treated to a level so that they can be land applied.

The language in subpart 3.3 of the permit, relative to biosolids management, a CWA requirement, allows the “permitting authority” under 40 CFR Part 503.9(p) to be able

to enforce the provisions of Part 503. The "permitting authority" relative to Part 503 is either a state that has been delegated biosolids management authority or the applicable EPA Region; in the case of Tennessee it is EPA-Region 4.

Tennessee regulates the land application of non-exceptional quality biosolids under state rules, Chapter 0400-40-15. The state rules became effective on June 30, 2013. Under these state rules, all facilities that land apply non-exceptional quality biosolids must obtain a biosolids permit from the division. The land application of non-exceptional quality biosolids under state rules is regulated through either a general permit or by an individual permit. Questions about the division's biosolids regulations and permitting program should be directed to the State Biosolids Coordinator at:

State of Tennessee
Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102
(615) 532-0625

7.5. PERMIT TERM

This permit is being reissued for 5 years in order to coordinate its reissuance with other permits located within the Elk-Upper Watershed.

7.6. ELECTRONIC REPORTING

Starting on December 21, 2016, all Individual NPDES Permit holders will be required to submit Discharge Monitoring Reports (DMRs) electronically through NetDMR. Prior to 21 December 2016, the permittee may elect to electronically submit DMRs instead of mailing paper DMRs.

EPA published the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, which will modernize Clean Water Act reporting for municipalities, industries and other facilities. The rule was published in the Federal Register on October 22, 2015 and became effective on December 22, 2015. The rule replaces most paper-based NPDES reporting requirements with electronic reporting.

More information is available at: http://www.tn.gov/environment/article/wr-netdmr-electronic-reporting:

- Getting Started on NetDMR,
- Electronic reporting schedule,
- Training Opportunities,
- NetDMR User Guide and other supporting information.

8. ANTIDEGRADATION STATEMENT/WATER QUALITY STATUS

Tennessee's Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06. It is the purpose of Tennessee's standards to fully protect existing uses of all surface waters as established under the Act. Stream determinations for this permit action are associated with the waterbody segment identified by the division as segment ID# TN06030003053-2000. The division has made a water quality assessment of the receiving waters associated with the subject discharge(s) and has found the receiving stream to be neither an exceptional nor outstanding national resource water. The stream is partially supportive of its designated uses due to the items listed in the table on the following page. The measures taken by the facility in regards to nutrients are described in Section 6.4 of the rationale.

ID305b (GIS Link) : TN06030003053_2000, Use Desc : Fish and Aquatic Life						
Water Name	**Location Description**	**Cause Name**	**Source Name**	**Attainment Desc**	**Assmnt Date**	**User Flag**
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	Low flow alterations	Municipal Point Source Discharges	Not Supporting	08-FEB-10	-
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	Oxygen, Dissolved	Municipal Point Source Discharges	Not Supporting	08-FEB-10	-
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	Sedimentation/Siltation	Discharges from Municipal Separate Storm Sewer Systems (MS4)	Not Supporting	08-FEB-10	-
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	Sedimentation/Siltation	Site Clearance (Land Development or Redevelopment)	Not Supporting	08-FEB-10	-
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	Temperature, water	Municipal Point Source Discharges	Not Supporting	08-FEB-10	-
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	Nitrate/Nitrite (Nitrite + Nitrate as N)	Municipal Point Source Discharges	Not Supporting	08-FEB-10	-
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	Phosphorus (Total)	Municipal Point Source Discharges	Not Supporting	08-FEB-10	-
ID305b (GIS Link) : TN06030003053_2000, Use Desc : Industrial Water Supply						
Water Name	**Location Description**	**Cause Name**	**Source Name**	**Attainment Desc**	**Assmnt Date**	**User Flag**
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	-	-	Fully Supporting	08-FEB-10	-
ID305b (GIS Link) : TN06030003053_2000, Use Desc : Irrigation						
Water Name	**Location Description**	**Cause Name**	**Source Name**	**Attainment Desc**	**Assmnt Date**	**User Flag**
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	-	-	Fully Supporting	08-FEB-10	-
ID305b (GIS Link) : TN06030003053_2000, Use Desc : Livestock Watering and Wildlife						
Water Name	**Location Description**	**Cause Name**	**Source Name**	**Attainment Desc**	**Assmnt Date**	**User Flag**
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	-	-	Fully Supporting	08-FEB-10	-
ID305b (GIS Link) : TN06030003053_2000, Use Desc : Recreation						
Water Name	**Location Description**	**Cause Name**	**Source Name**	**Attainment Desc**	**Assmnt Date**	**User Flag**
Rock Creek	Rock Creek from Poorhouse Creek to headwaters. Ecoregion 71g Franklin County Coffee County	-	-	Not Assessed	-	-

APPENDIX 1
PREVIOUS PERMIT LIMITS

PARAMETERS	MONTHLY AVERAGE CONCENTRATION (MG/L)	MONTHLY AVERAGE AMOUNT (LB/DAY)	WEEKLY AVERAGE CONCENTRATION (MG/L)	WEEKLY AVERAGE AMOUNT (LB/DAY)	DAILY MAXIMUM CONCENTRATION (MG/L)	DAILY MINIMUM PERCENT REMOVAL	MEASUREMENT FREQUENCY
$CBOD_5$	10	417	15	626	20	40	5/week
NH_3-N (May 1- Oct. 31)	1.5	63	2.25	94	3.0	—	5/week
NH_3-N (Nov. 1- April 30)	3.25	136	4.9	204	6.5	—	5/week
Total Suspended Solids	30	1251	40	1668	45	40	5/week
Dissolved Oxygen (mg/l)	6.0 (daily minimum) instantaneous	—	—	—	—	—	5/week
Total Chlorine Residual (mg/l)	—	—	—	—	0.02 (daily maximum)	—	5/week
Peracetic Acid(mg/l)	Report	—	—	—	0.41 (daily maximum)	—	5/week
Hydrogen Peroxide(mg/l)	Report	—	—	—	Report (daily maximum)	—	5/week
Total Nitrogen	121,910 lb/yr Annual Rolling Average						2/month
Total Phosphorous	15,221 lb/yr Annual Rolling Average						2/month
E. coli (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	5/week
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	5/week
pH (standard units)	6.0-9.0	—	—	—	—	—	5/week
Flow (MGD):							
Influent	Report	—	—	—	Report	—	7/week
Effluent	Report	—	—	—	Report	—	7/week
Whole Effluent Toxicity:							
IC_{25}	92.8% per sample	—	—	—	—	—	1/quarter
Metals & Toxics:							
Silver, Total	0.0025						2/year
Sanitary Sewer Overflows, Total Occurrences			Report				continuous
Dry Weather Overflows, Total Occurrences			Report				continuous
Bypass of Treatment, Total Occurrences			Report				continuous

APPENDIX 2
Discharge Monitoring Report Summary and Permit Exceedances

	Overflow		Bypass	Flow				CBOD						Total Suspended Solids					
				Influent		Effluent		Monthly				Daily		Monthly				Daily	
Date	# (Wet)	# (Dry)	# of Bypass	Monthly Average	Daily Max.	Monthly Average	Daily Max.	Influent Conc.	Effluent Conc.	Percent Removal	Average Amount	Influent Conc.	Effluent Conc.	Influent Conc.	Effluent Conc.	Percent Removal	Average Amount	Influent Conc.	Effluent Conc.
				MGD	MGD	MGD	MGD	mg/L	mg/L	%	lb/day	mg/L	mg/L	mg/L	mg/L	%	lb/day	mg/L	mg/L
01/31/2013	1	0	0	7.60	18.86	6.07	11.20	59	1	96	66	116	3	97	2	97	105	204	6
02/28/2013	0	0	0	4.19	9.28	3.62	8.31	95	1	99	36	160	3	131	2	98	70	270	9
03/31/2013	0	0	0	4.83	8.48	4.02	7.00	89	2	97	87	187	5	112	4	95	170	360	12
04/30/2013	1	0	0	6.79	17.88	6.18	14.64	69	2	97	73	107	3	92	3	96	148	162	6
05/31/2013	1	0	0	4.89	14.78	5.11	14.06	94	2	97	114	236	4	142	3	96	166	288	9
06/30/2013	2	0	0	4.83	12.71	4.90	14.16	84	2	97	86	175	3	103	5	94	243	228	27
07/31/2013	3	0	0	5.69	19.09	5.62	13.26	77	2	97	67	158	4	110	4	96	176	172	12
08/31/2013	0	0	0	1.94	3.63	1.83	3.60	163	2	99	23	282	3	207	2	99	23	360	4
09/30/2013	0	0	0	1.70	4.91	1.52	4.42	191	2	99	18	250	3	234	2	99	26	428	3
10/31/2013	0	1	0	1.46	2.86	1.32	2.56	197	2	99	16	257	5	250	2	99	19	456	4
11/30/2013	0	0	0	2.29	8.73	1.99	6.94	158	2	99	32	241	4	214	4	98	121	332	18
12/31/2013	0	0	0	4.44	11.09	4.10	12.46	100	2	98	56	206	3	174	3	98	110	500	12
01/31/2014	0	0	0	4.49	11.67	3.63	8.25	94	2	98	54	167	3	151	4	97	99	290	6
02/28/2014	0	0	0	5.61	17.83	5.02	18.32	78	2	98	75	132	3	119	3	96	153	214	7
03/31/2014	0	0	0	3.64	7.77	3.01	6.03	98	2	98	52	191	4	173	4	97	101	356	7
04/30/2014	0	0	0	4.46	11.21	3.99	10.46	90	2	98	65	155	3	153	4	97	142	294	9
05/31/2014	0	0	0	2.66	6.99	2.28	7.11	135	1	98	26	288	2	191	3	98	60	356	7
06/30/2014	0	0	0	2.10	4.82	2.07	6.43	151	1	99	23	260	2	229	2	99	42	486	6
07/31/2014	0	0	0	1.94	5.22	1.72	5.16	140	1	99	19	323	2	250	2	99	32	764	8
08/31/2014	0	0	0	2.44	8.08	2.06	6.80	122	1	99	16	162	2	226	3	99	35	274	3
09/30/2014	1	0	0	2.21	4.28	1.78	3.16	122	1	99	19	176	2	174	2	99	30	220	4
10/31/2014	0	0	0	3.67	13.11	3.30	12.80	149	1	99	26	223	1	296	2	99	46	692	2
11/30/2014	0	0	0	3.29	11.59	2.92	9.46	125	3	98	77	156	5	252	5	97	134	576	8
12/31/2014	0	0	0	5.47	11.97	4.71	12.00	91	2	97	87	133	4	207	4	98	161	338	7
01/31/2015	0	1	0	5.37	14.39	4.58	11.63	59	1	95	78	93	2	198	2	99	105	429	5
02/28/2015	0	0	0	4.71	9.73	4.17	10.45	90	3	95	131	145	4	148	6	93	275	210	9
03/31/2015	0	0	0	6.77	18.89	6.63	13.77	67	2	97	59	135	3	110	3	97	118	192	6
04/30/2015			0	5.24	11.35	4.75	9.81	95	2	98	69	124	3	135	4	97	134	186	5
05/31/2015	0	0	0	3.14	3.71	1.73	2.27	217	2	99	30	371	3	333	10	96	161	576	34
06/30/2015	0	0	0	2.55	8.35	1.96	6.55	196	2	99	23	238	3	210	5	97	61	274	8
07/31/2015	0	0	0	3.29	11.93	2.68	10.06	157	2	98	56	241	2	183	3	98	108	230	4
08/31/2015	0	0	0	2.68	6.94	2.19	6.16	214	2	99	45	273	3	217	4	98	72	332	6
09/30/2015	0	0	0	2.52	6.15	2.08	5.00	190	2	99	24	244	3	282	3	99	40	480	4
10/31/2015	0	0	0	2.58	5.18	2.11	4.96	173	1	99	24	173	2	189	2	99	28	260	3
11/30/2015	1	0	0	3.33	13.28	2.64	12.40	140	2	98	67	227	3	172	5	97	134	324	7
12/31/2015	3	0	1	7.32	20.00	7.44	22.47	82	2	96	96	137	3	226	5	96	293	516	11
01/31/2016	0	0	0	5.40	17.09	4.69	11.08	88	1	98	50	112	2	95	3	97	93	130	6
02/29/2016	0	0	0	6.79	13.91	6.63	13.66	94	1	98	43	126	2	170	4	96	129	432	6
03/31/2016	0	0	0	2.91	5.23	2.31	4.63	149	2	99	28	182	2	203	4	979	66	242	10
04/30/2016	0	0	0	3.38	8.89	2.69	8.30	164	2	99	27	191	2	220	2	99	32	260	4
05/31/2016	0	0	0	2.64	3.55	1.82	3.14	200	2	99	24	215	2	234	3	99	45	270	6
06/30/2016	0	0	0	2.81	5.05	2.21	4.36	184	2	99	24	230	3	173	4	98	75	200	9
07/31/2016	0	0	0	2.52	3.32	1.52	2.68	202	2	99	19	322	2	218	2	99	20	286	3
08/31/2016	0	0	0	3.00	7.40	1.86	5.08	215	2	99	26	347	2	251	2	98	50	552	4
09/30/2016	0	0	0	2.46	5.31	1.61	4.33	269	2	99	21	205	2	322	9	97	110	360	34
10/31/2016	0	0	0	2.14	2.82	1.23	1.88	303	3	99	27	349	4	383	5	99	49	448	10
11/30/2016				2.57	11.73	1.45	8.12	281	3	99	28	382	4	302	5	99	50	362	9
12/31/2016	0	0	0	5.32	12.43	3.73	8.28	76	2	97	86	117	3	124	4	96	179	210	8
01/31/2017				5.71	14.63	4.00	10.65	142	3	98	88	227	3	167	4	97	165	220	7
Standard Dev.	**1**	**0**	**0**	**1.63**	**4.94**	**1.65**	**4.44**	**60**	**0**	**1**	**29**	**74**	**1**	**66**	**2**	**126**	**66**	**141**	**7**
Minimum	**0**	**0**	**0**	**1.46**	**2.82**	**1.23**	**1.88**	**59**	**1**	**95**	**16**	**93**	**1**	**92**	**2**	**93**	**19**	**130**	**2**
Maximum	**3**	**1**	**1**	**7.60**	**20.00**	**7.44**	**22.47**	**303**	**3**	**99**	**131**	**382**	**5**	**383**	**10**	**979**	**293**	**764**	**34**
Average	**0**	**0**	**0**	**3.87**	**9.96**	**3.30**	**8.58**	**139**	**2**	**98**	**49**	**207**	**3**	**195**	**4**	**115**	**102**	**339**	**8**
Permit Limit	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**10**	**85%**	**417**	**Report**	**20**	**Report**	**30**	**85%**	**1251**	**Report**	**45**
Count	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**	**49**

	E.coli		Silver	Settleable Solids	Dissolved Oxygen	Whole Effluent Toxicity (WET) Testing		Total Residual Chlorine	Hydrogen Peroxide		Peracetic Acid		pH	
Date	Monthly Average Conc.	Daily Max. Conc.	Daily Max. Conc.	Daily Max. Conc.	Daily Min. Conc.	Ceriodaphnia	Pimephales	Daily Max. Conc.	Monthly Average Conc.	Daily Max. Conc.	Monthly Average Conc.	Daily Max. Conc.	Daily Min. Conc.	Daily Max. Conc.
	mg/L	mg/L	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	mg/L	mg/L	mg/L	SU	SU
01/31/2013	8	37		BDL	8.0	100	97.1	BDL					6.8	7.2
02/28/2013	2	6		BDL	8.3			BDL					6.9	7.1
03/31/2013	3	22		BDL	8.6			BDL					6.9	7.6
04/30/2013	4	12		BDL	8.5	100	100	BDL					7.0	7.3
05/31/2013	4	37		BDL	7.8			BDL					7.0	7.7
06/30/2013	6	124	0.0005	0.1	7.4			BDL					6.8	7.3
07/31/2013	7	47		0.1	7.4	97.5	100	BDL					6.9	7.6
08/31/2013	5	142		0.1	7.0			BDL					6.9	7.1
09/30/2013	5	13		0.1	7.4			BDL					6.7	7.0
10/31/2013	2	5		0.1	7.9	100	100	BDL					6.7	7.4
11/30/2013	2	14		0.1	8.0			BDL					6.6	7.1
12/31/2013	6	28	0.00071	0.1	8.5			BDL					6.9	7.2
01/31/2014	5	48		0.1	9.1	100	100	BDL					6.9	7.2
02/28/2014	7	40		0.1	9.1			BDL					7.0	7.3
03/31/2014	4	118		0.1	8.7			BDL					6.9	7.3
04/30/2014	3	25		0.1	8.2	100	100	BDL					6.9	7.2
05/31/2014	5	46		0.1	7.8			BDL					6.3	7.2
06/30/2014	4	880	0.0005	0.1	7.3			BDL					7.0	7.3
07/31/2014	5	25		0.1	7.1	96.6	100	BDL					6.8	7.5
08/31/2014	28	620		0.1	7.0			0.05					6.4	7.1
09/30/2014	15	34		0.1	7.2			BDL					6.8	7.1
10/31/2014	11	75		0.1	7.5	100	100	BDL					6.9	7.3
11/30/2014	25	128		0.1	7.3								6.8	7.6
12/31/2014	10	69	0.001	0.1	7.9								6.7	7.3
01/31/2015	11	37		0.1	9.3	100	100						7.0	7.3
02/28/2015	11	30		0.1	9.1								7.0	7.2
03/31/2015	21	360		0.1	8.1						0.09	0.31	7.1	7.5
04/30/2015	18	1020		0.1	8.6				0.6	1.7	0.12	0.12	7.0	7.5
05/31/2015	28	61		0.1	7.8				0.5	0.76	0.12	0.12	6.9	7.3
06/30/2015	50	58	0.001	0.1	7.3				0.7	1.4	0.13	0.38	7.0	7.5
07/31/2015	53	480		0.1	7.2	100	100		1.4	2.4	0.15	0.54	7.0	7.7
08/31/2015	40	100		0.1	7.1				0.9	2.1	0.124	0.2	7.0	7.7
09/30/2015	76	118		0.1	6.9				1	2.1	0.12	0.12	6.8	7.4
10/31/2015	38	68		0.01	7.1								7.0	7.4
11/30/2015	22	27		0.1	7.6				0.9	1.5	0.114	0.12	7.1	7.5
12/31/2015	31	66	0.001	0.1	8.5				0.6	1	0.126	0.21	7.0	7.5
01/31/2016	5	9		0.1	9.1	100	58.5		0.8	1.3	0.19	0.34	7.1	7.3
02/29/2016	12	51		0.1	8.6				0.7	1.5	0.14	0.33	7.0	7.2
03/31/2016	3	5		0.1	8.3						0.09	0.41	7.0	7.2
04/30/2016	5	16		0.1	7.7	100	100				0.13	0.41	6.9	7.2
05/31/2016	9	18		0.1	7.2				0.8	1.8	0.11	0.21	7.0	7.4
06/30/2016	58	200	0.001	0.1	7.0				0.9	1.6	0.11	0.12	7.1	7.3
07/31/2016	84	197		0.1	6.5	100	100				0.12	0.41	7.1	7.5
08/31/2016				0.1	6.9				1.4	3.2	0.02	0.07	7.1	7.3
09/30/2016	122	2420		0.1	6.9				1.4	4.1	0.09	0.34	7.0	7.5
10/31/2016	29	173		0.1	7.3				1.8	5.1	0.08	0.89	7.0	7.3
11/30/2016	108	687		0.1	7.8				1.6	2.6	0.09	0.28	7.0	7.8
12/31/2016	85	2420	0.001	0.01	7.8				0.9	1.7	0.16	0.56	6.6	7.5
01/31/2017	8	173		0.1	7.2	100			1.1	2.5	0.27	0.72	6.9	7.3
Standard Dev.	**29**	**512**	**0**	**0**	**0.7**	**1**	**11**	**#DIV/0!**	**0**	**1**	**0**	**0**	**0.2**	**0.2**
Minimum	**2**	**5**	**0.00**	**0.01**	**6.5**	**96.6**	**58.5**	**0.05**	**1**	**1**	**0.02**	**0.07**		**7.0**
Maximum	**122**	**2420**	**0.00**	**0.10**	**9.3**	**100**	**100**	**0.05**	**2**	**5.1**	**0.27**	**0.89**	**7.1**	
Average	**23**	**237**	**0.00**	**0.10**	**7.8**	**100**	**97**	**0**	**1**	**2**	**0**	**0**	**6.9**	**7.4**
Permit Limit	**126/100 ml**	**941/100 ml**	**Report**	**1.0 ml/L**	**6.0 mg/L**	**92.0**	**92.0**	**0.02**	**Report**	**Report**	**Report**	**Report**	**6.0**	**9.0**
Count	**49**	**49**	**9**	**49**	**49**	**14**	**13**	**23**	**18**	**18**	**22**	**22**	**49**	**49**

	Influent Nitrogen		Influent Phosphorous		Effluent Nitrogen		Effluent Phosphorous		Effluent Total Nitrogen	Effluent Total Phosphorous	Ammonia as N		
											Monthly		Daily
Date	Monthly Average Conc.	Daily Max. Conc.	Monthly Average Conc.	Daily Max. Conc.	Monthly Average Conc.	Daily Max. Conc.	Monthly Average Conc.	Daily Max. Conc.			Average Conc.	Average Amount	Maximum Conc.
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/yr	lb/yr	mg/L	lb/day	mg/L
01/31/2013											0.12	7.50	0.67
02/28/2013											0.13	6.10	1.80
03/31/2013	17	17	2.4	2.4	6.9	6.9	1.2	1.2			0.08	3.10	0.36
04/30/2013											0.06	3.10	0.17
05/31/2013											0.11	7.40	1.00
06/30/2013	13	13	2.1	2.1	7.1	7.1	2	2			0.10	5.20	0.41
07/31/2013											0.06	3.50	0.25
08/31/2013											0.07	0.90	0.49
09/30/2013	44	44	6.8	6.8	14	14	2.4	2.4			0.08	1.10	0.31
10/31/2013											0.07	0.90	0.43
11/30/2013											1.23	29.80	18.10
12/31/2013	18	18	1.7	1.7	8.1	8.1	0.44	0.44			0.11	4.00	0.21
01/31/2014											0.25	6.50	0.86
02/28/2014											0.45	17.80	1.40
03/31/2014	21	21	4.9	4.9	5.7	5.7	0.24	0.24			0.54	14.50	0.81
04/30/2014											0.06	2.60	0.17
05/31/2014											0.05	1.00	0.19
06/30/2014	49	49	5.8	5.8	11	11	1	1			0.05	1.00	0.25
07/31/2014											0.06	0.80	0.14
08/31/2014											0.05	0.70	0.05
09/30/2014	31	36	4	4.5							0.04	0.60	0.05
10/31/2014											0.33	12.00	1.00
11/30/2014											0.33	9.50	0.71
12/31/2014	22	26	3.8	4							0.11	5.20	0.29
01/31/2015											0.08	3.90	0.12
02/28/2015											0.24	8.80	0.46
03/31/2015	9.6	11	1	1.2							0.17	6.50	0.40
04/30/2015											0.06	2.50	0.09
05/31/2015											0.07	1.00	0.10
06/30/2015	42	43	6	6							0.04	0.50	0.06
07/31/2015											0.03	0.80	0.06
08/31/2015									67597	8857	0.08	2.40	0.17
09/30/2015	41.1	46.7	5.4	5.7					65351	8262	0.06	0.80	0.08
10/31/2015									62420	8488	0.10	1.40	0.25
11/30/2015									60991	8690	0.04	1.40	0.05
12/31/2015	18.9	21.2	2.1	2.3					60844	8490	0.05	1.70	0.10
01/31/2016									59968	8710	0.06	2.40	0.09
02/29/2016									59260	8747	0.04	1.40	0.09
03/31/2016	22.2	24	3.2	3.2					57383	8170	0.08	1.30	0.18
04/30/2016									52309	7444	0.04	0.80	0.08
05/31/2016									50503	7908	0.05	0.70	0.06
06/30/2016	36.4	49.2	4.5	5.5					51356	8201	0.19	4.30	0.33
07/31/2016									49649	8235	0.24	2.90	0.54
08/31/2016									48096	8394	0.51	12.10	1.10
09/30/2016	23.9	28.4	3.3	3.7					47449	8379	0.62	9.20	2.00
10/31/2016									45809	8145	0.10	1.10	0.24
11/30/2016									45404	8013	0.54	5.80	1.45
12/31/2016	7.7	13	1.3	2.2					43290	7700	0.45	21.40	1.05
01/31/2017									43171	7724	0.55	17.30	1.20
Standard Dev.	**13**	**14**	**2**	**2**	**3**	**3**	**1**	**1**	**7847**	**391**	**0.21**	**6.16**	**2.83**
Minimum	**8**	**11**	**1**	**1.20**	**6**	**6**	**0**	**0.24**	**43171.00**	**7444.00**	**0.03**	**0.50**	**0.05**
Maximum	**49**	**49.2**	**7**	**6.8**	**14**	**14**	**2**	**2.4**	**67597.00**	**8857.00**	**1.23**	**29.80**	**18.10**
Average	**26**	**29**	**4**	**4**	**9**	**9**	**1**	**1**	**53936.11**	**8253.17**	**0.14**	**5.25**	**0.81**
Permit Limit	**Report**	**Report**	**Report**	**0.02**	**Report**	**Report**	**Report**	**0.02**	**Report**	**Report**	**1.5/3.25**	**63/136**	**3/6.5**
Count	**16**	**16**	**16**	**16**	**6**	**6**	**6**	**6**	**18**	**18**	**40**	**49**	**40**

NPDES ID(s): TN0023469
State: TN
Major/Minor Indicator:
Violation Date: 01/01/2013 - 05/08/2017
Violation Type(s):

Environmental Protection Agency
Integrated Compliance Information System
Violations Report

Created Date: 09/15/2010
Refresh Date: 05/08/2017
rt Version 1.5, Modified: 1/4/2017

TN0023469

Permittee Name: TULLAHOMA STP
Permittee Address: 901 SOUTH JACKSON STREET
TULLAHOMA, TN 37388
Major/Minor Indicator: Major
Compliance Track. Status On
DMR Non Receipt Flag: On
RNC Tracking Flag: On

Primary SIC Code: 4952
Primary SIC Desc: Sewerage Systems
Primary NAICS
Primary NAICS Desc:
Cognizant Official: SCOTT A. YOUNG, P.E.
Cognizant Offcl. Ph.: 931-455-4515
Receiving Body: ROCK CREEK

Permit Issued: 02/01/2015
Permit Effective: 03/01/2015
Permit Expired: 06/30/2017
Permit Status: Effective

Facility Information

Facility Name: TULLAHOMA STP
Facility Location: 901 SOUTH JACKSON STREET
TULLAHOMA, TN 37388

County: Coffee
Region: 04
State-Region: 04

FRS ID: 110009788818
Federal Facility N
Type of Ownership: Municipal or Water District

Effluent Violations

Violation Code	Monitoring Period End Date	Limit Set	Parameter	Mon. Loc.	Seas. ID	SNC Group	EA Identifier	Value Type/ Stat. Base	Reported Value/Units	% Exceed.	Limit Value/Units	RNC Det. Code/ RNC Det. Date	RNC Res. Code/ RNC Res. Date
E90	12/31/2016	001-G	51040 - E. coli	1	0			C3	2,420	157%	<=941		
E90	09/30/2016	001-G	51040 - E. coli	1	0			C3	2,420	157%	<=941		
E90	01/31/2016	001-G	TRP6C - IC25 Static Renewal 7 Day Chronic Chronimephales	1	0			C1 MINIMUM	58.5 %	36%	>92 %		
E90	04/30/2015	001-G	51040 - E. coli	1	0			C3	1,020	8%	<=941		
E90	11/30/2013	001-G	00610 - Nitrogen, ammonia total [as N]	1	1	1		C3 DAILY MX	18.1 mg/l	178%	<=6.5 mg/l		

APPENDIX 3
Metal and Toxic Parameter Calculations

The following procedure is used to calculate the allowable instream concentrations for pass-through guidelines and permit limitations.

a. The most recent background conditions of the receiving stream segment are compiled. This information includes:

   * 7Q10 of receiving stream
   * Calcium hardness
   * Total suspended solids
   * Background metals concentrations
   * Other dischargers impacting this segment (none)
   * Downstream water supplies, if applicable

b. The chronic water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel and zinc. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions.

c. The acute water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel, zinc and silver. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions for the following metals: cadmium, copper, lead, nickel and silver.

d. The resulting allowable trivalent and hexavalent chromium concentrations are compared with the effluent values characterized as total chromium on permit applications. If reported total chromium exceeds an allowable trivalent or hexavalent chromium value, then the calculated value will be applied in the permit for that form of chromium unless additional effluent characterization is received to demonstrate reasonable potential does not exist to violate the applicable state water quality criteria for chromium.

e. A standard mass balance equation determines the total allowable concentration (permit limit) for each pollutant. This equation also includes a percent stream allocation of no more than 90%.

The following formulas are used to evaluate water quality protection:

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

where:

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

to protect water quality:

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

where (S_A) is the percent “Stream Allocation”.

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

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

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

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

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

3. For criteria that are hardness dependent, chronic and acute concentrations are based on a Hardness of 25 mg/L and Total Suspended Solids (TSS) of 10 mg/L unless STORET or Water Supply intake data substantiate a different value. Minimum and maximum limits on the hardness value used for water quality calculations are 25 mg/L and 400 mg/L respectively. The minimum limit on the TSS value used for water quality calculations is 10 mg/L.

4. Background concentrations are determined from the division database, results of sampling obtained from the permittee, and/or obtained from nearby stream sampling data. If this background data is not sufficient, one-half of the chronic “In-stream Allowable” water quality criteria for fish and aquatic life is used. If the measured background concentration is greater than the chronic “In-stream Allowable” water quality criteria, then the measured background concentration is used in lieu of the chronic “In-stream Allowable” water quality criteria for the purpose of calculating the appropriate effluent limitation (Cw). Under these circumstances, and in the event the “stream allocation” is less than 100%, the calculated chronic effluent limitation for fish and aquatic life should be equal to the chronic “In-stream Allowable” water quality criteria. These guidelines should be strictly followed where the industrial source water is not the receiving stream.

Where the industrial source water is the receiving stream, and the measured background concentration is greater than the chronic “In-stream Allowable” water quality criteria, consideration may be given as to the degree to which the permittee should be required to meet the requirements of the water quality criteria in view of the nature and characteristics of the receiving stream.

The spreadsheet has fifteen (15) data columns, all of which may not be applicable to any particular characteristic constituent of the discharge. A description of each column is as follows:

Column 1: The "Stream Background" concentrations of the effluent characteristics.

Column 2: The "Chronic" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Continuous Concentration (CCC) is calculated using the equation:

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

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained *in The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent; no chronic criterion exists for silver. Published criteria are used for non-metal parameters.

Column 3: The "Acute" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, silver, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Maximum Concentration (CMC) is calculated using the equation:

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

ACF = Acute Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent. Published criteria are used for non-metal parameters.

Column 4: The “Fraction Dissolved” converts the value for dissolved metal at laboratory conditions (columns 2 & 3) to total recoverable metal at in-stream ambient conditions (columns 5 & 6). This factor is calculated

using the linear partition coefficients found in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996) and the equation:

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

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

Linear partition coefficients for streams are used for unregulated (7Q10) receiving waters, and linear partition coefficients for lakes are used for regulated (1Q10) receiving waters. For those parameters not in the dissolved form in columns 2 & 3 (and all non-metal parameters), a Translator of 1 is used.

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

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

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

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

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

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

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

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

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

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

Column 15: The Effluent Limited criteria. This upper level of allowable pollutant loading is established if (a) the calculated water quality value is greater than accepted removal efficiency values, (b) the treatment facility is properly operated, and (c) full compliance with the pretreatment program is demonstrated. This upper level limit is based upon EPA's 40 POTW Survey on levels of metals that should be discharged from a POTW with a properly enforced pretreatment program and considering normal coincidental removals.

The most stringent water quality effluent concentration from Columns 7, 8, 12, 13, 14, and 15 is applied if the receiving stream is designated for domestic water supply. Otherwise, the most stringent effluent concentration is chosen from columns 7, 8, 12, and 15 only.

WQ Based Effluent Calculations

2013 WQC

PASS-THROUGH LIMITATIONS FOR METALS AND OTHER TOXIC SUBSTANCES
WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Tullahoma STP **PERMIT #: TN0023469** **DATE: 3/30/2017** **CALC BY: JAH**

non-regulated stream worksheet (7Q10)

Stream (7Q10) [MGD]	Stream (30Q5) [MGD]	Waste Flow [MGD]	Ttl. Susp. Solids [mg/l]	Hardness (as CaCO3) [mg/l]	Margin of Safety [%]
0.452	0.646	5.000	10	124	90

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
	Stream Bckgrnd. Conc.	Fish/Aqua. Life (F & AL) WQC lab conditions		Fraction Dissolved	F & AL- instream allowable ambient conditions (Tot)		Calc. Effluent Concentration based on F & AL		Human Health Water Quality Criteria * In-Stream Criteria			Calc. Effluent Concentration **			effluent limited case	Average Conc.	Max. Conc.
PARAMETER	[ug/l]	Chronic [ug/l]	Acute [ug/l]	[Fraction]	Chronic [ug/l]	Acute [ug/l]	Chronic [ug/l]	Acute [ug/l]	Organisms [ug/l]	Water/Organisms [ug/l]	DWS [ug/l]	Organisms [ug/l]	Water/Organisms [ug/l]	DWS [ug/l]	ug/l	ug/l	ug/l
Copper (a,b)	1.000	10.763	16.459	0.348	30.964	47.349	**30.31**	**46.39**	N/A			**N/A**			**80.0**	7.23	23.4
Chromium III	1.100	88.393	679.527	0.202	437.015	3359.598	**428.78**	**3296.89**	N/A			**N/A**				2.84	4.4
Chromium VI	1.100	11.000	16.000	1.000	11.000	16.000	**10.71**	**15.61**	N/A			**N/A**				2.84	4.4
Chromium, Total	1.100	N/A	N/A	N/A	N/A	N/A	**N/A**	**N/A**	N/A			**N/A**			**60.0**	2.84	4.4
Nickel (a,b)	10.000	62.387	561.693	0.432	144.307	1299.250	**140.80**	**1274.22**	4600.0			**4673.73**			**180.0**	1.83	2.7
Cadmium (a,b)	1.000	0.286	2.482	0.252	1.131	9.830	**1.03**	**9.57**	N/A			**N/A**			**5.0**	0.5	0.5
Lead (a,b)	1.100	3.178	81.559	0.184	17.282	443.495	**16.87**	**435.14**	N/A			**N/A**			**45.0**	1.0	1.0
Mercury (T) (c,e)	0.006	0.770	1.400	1.000	0.770	1.400	**0.76**	**1.37**	0.051			**0.05**			**0.4**	0.2	0.2
Silver (a,b,f)	2.328	N/A	4.657	1.000	N/A	4.657	**N/A**	**4.38**	N/A			**N/A**			**5.0**	1.5	1.5
Zinc (a,b)	4.900	141.759	140.608	0.288	492.236	488.242	**482.66**	**478.74**	26000.0			**26422.71**			**200.0**	24.13	52.8
Cyanide (d)	0.000	5.200	22.000	1.000	5.200	22.000	**5.10**	**21.59**	140.0			**142.28**			**230.0**	5	5
Toluene	0.000								15000.0			**15244.20**			**15.0**	5	5
Benzene	0.000								510.0			**518.30**			**3.0**	1	1
1,1,1 Trichloroethane	0.000								N/A			**N/A**			**30.0**	1	1
Ethylbenzene	0.000								2100.0			**2134.19**			**4.0**	1	1
Carbon Tetrachloride	0.000								16.0			**16.26**			**15.0**	1	1
Chloroform	0.000								4700.0			**4776.52**			**85.0**	8.25	11
Tetrachloroethylene	0.000								33.0			**33.54**			**25.0**	1	1
Trichloroethylene	0.000								300.0			**304.88**			**10.0**	1	1
1,2 trans Dichloroethylene	0.000								10000.0			**N/A**			**1.5**	1	1
Methylene Chloride	0.000								5900.0			**5996.05**			**50.0**	5	5
Total Phenols	0.000								860000.0			**874000.80**			**50.0**	40	44
Naphthalene	0.000								N/A			**N/A**			**1.0**	10	10
Total Phthalates	0.000								N/A			**N/A**			**64.5**	NA	NA
Chlorine (T. Res.)	5.500	11.000	19.000	1.000	11.000	19.000	**11.50**	**20.22**	N/A			**N/A**			**N/A**	NA	NA

a Denotes metals for which Fish & Aquatic Life Criteria are expressed as a function of total hardness.
b The criteria for this metal is in the dissolved form at lab conditions. The calculated effluent concentration is in the total recoverable form.
c The chronic criteria for mercury is not converted to dissolved, since it is based on fish tissue data rather than toxicity.
d The criteria for this parameter is in the total form.
e Previously, the Division established that 0.006 ug/L would be maximum background default if no sample data available or if all samples were <RDL (<0.2 ug/L), based on reference stream monitoring by DOE.
f Silver limit is daily max if column 8 is most stringent.
g When columns 7 or 8 result in a negative number, use results from columns 5 or 6, respectively.
h When columns 12, 13 or 14 result in a negative number, use results from columns 9, 10 or 11, respectively, as applicable.

* Domestic supply included in river use so pick from columns 7,8,12,13,14,15 or Domestic supply not included in river use so pick from columns 7, 8, 12 or 15.
** Water Quality criteria for stream use classifications other than Fish & Aquatic Life are based on the 30Q5 flow.

SAR Summary

TN 0023469	PTL 5/13/2009	0.85 PTLs	PTL 3/1/2013	Oct-16	Apr-16	Oct-15	Apr-15	Oct-14	Apr-14	Oct-13	Apr-13	Oct-12	Apr-12
COPPER	**0.02388**	**0.01941**	**0.02284**	0.00161	0.00236	0.00710	0.01280	0.00250	0.00300	0.00170	0.00310	0.00120	0.02000
CHROMIUM III	**monitor**	**n/a**	**Report**	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.00310	0.01000	0.01000	0.01000
CHROMIUM VI	**monitor**	**0.00910**	**0.01071**	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000
CHROMIUM, TOTAL	**n/a**	**n/a**	**n/a**	0.00100	0.00100	0.00440	0.00650	0.00190	0.01000	0.02000	0.01000	0.01000	0.01000
NICKEL	**0.11161**	**0.09078**	**0.10680**	0.00100	0.00100	0.00270	0.01115	0.00260	0.00290	0.00150	0.00380	0.00210	0.02000
CADMIUM	**0.00088**	**0.00071**	**0.00084**	0.00100	0.00100	0.00100	0.00300	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
LEAD	**0.01249**	**0.00999**	**0.01175**	0.00100	0.00100	0.00200	0.00300	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
MERCURY	**0.00005**	**0.00004**	**0.00005**	8.84E-07	2.00E-07	5.00E-07	5.72E-07	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
SILVER	**0.00275**	**0.00211**	**0.00248**	0.00100	0.00100	0.00100	0.00550	0.00050	0.00071	0.00050	0.01000	0.01000	0.01000
ZINC	**0.20000**	**0.17000**	**0.20000**	0.01400	0.01550	0.02100	0.03600	0.02700	0.02900	0.02100	0.03000	0.03000	0.03000
CYANIDE	**0.00486**	**0.00416**	**0.00489**	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
TOLUENE	**0.01500**	**0.01275**	**0.01500**				0.00500					0.00500	0.00500
BENZENE	**0.00300**	**0.00255**	**0.00300**				0.00100					0.00100	0.00100
1,1,1 TRICHLOROETHANE	**0.03000**	**0.02550**	**0.03000**				0.00100					0.00100	0.00100
ETHYLBENZENE	**0.00400**	**0.00340**	**0.00400**				0.00100					0.00100	0.00100
CARBON TETRACHLORIDE	**0.01500**	**0.01275**	**0.01500**				0.00100					0.00100	0.00100
CHLOROFORM	**0.08500**	**0.07225**	**0.08500**				0.00500					0.00500	0.00500
TETRACHLOROETHYLENE	**0.02500**	**0.02125**	**0.02500**				0.00100					0.00100	0.00100
TRICHLOROETHYLENE	**0.01000**	**0.00850**	**0.01000**				0.00100					0.00100	0.00100
1,2 TRANSDICHLOROETHYL	**0.00150**	**0.00128**	**0.00150**				0.00100					0.00100	0.00100
METHYLENE CHLORIDE	**0.05000**	**0.04250**	**0.05000**				0.00500					0.00500	0.00500
TOTAL PHENOLS	**0.05000**	**0.04250**	**0.05000**	0.04000	0.04000	0.04400	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000
NAPHTHALENE	**0.00100**	**0.00085**	**0.00100**				0.00100					0.00100	0.00100
TOTAL PHTHALATES	**0.06450**	**0.05483**	**0.06450**				0.01800					0.00940	0.00940

Bolded in effluent data exceeds 85% of proposed PTLs
Shaded means detection level

APPENDIX 4
WQ Based Effluent Calculations- Other Compounds

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Tullahoma STP
PERMIT: TN0023469
DATE: 3/30/2017

Stream (7Q10)	Stream (30Q5)	Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Margin of Safety
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[%]
0.452	0.646	5.000	10	124	90

	1	2	3	5	6	7	8	9	10	11	12	13	14	15
	Stream	Dectection Levels		Fish/Aqua. Life		Calculated Effluent		Human Health Water Quality Criteria (30Q5)						Avg. daily
	Bckgrnd.	Scan	WQC RDL	Water Quality Criteria		Concentration		In-Stream Criteria			Calculated Effluent Concentration			effluent
	Conc.	MDL	*EPA MDL	Chronic	Acute	Chronic	Acute	Organisms	Water/Org	DWS	Organisms	Water/Org	DWS	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l
ANTIMONY		3.8	3.0					640.0	5.6	5.6	650.4	5.7	5.6	<1
ARSENIC		1.0	1.0	150.0	340.0	147.2	333.7	10.0			10.2			<1
BERYLLIUM		2.0	1.0							4.0			4.1	<1
SELENIUM		5.0	2.0	5.0	20.0	4.9	19.6							<1
THALLIUM		5.0	*					0.47	0.24	2.0	0.5	0.2	2.0	<1
ACROLEIN	0.0	50.0	1.0					290.0			294.7			<50
ACRYLONITRILE	0.0	50.0	1.0					2.5	0.51		2.5	0.5		<10
BENZENE	0.0	1.0	1.0					510.0			518.3			<1
BROMOFORM	0.0	1.0	1.0					1400.0	43.0		1422.8	43.7		<1
CARBON TETRACHLORIDE	0.0	1.0	1.0					16.0			16.3			<1
CHLOROBENZENE	0.0	1.0	*					1600.0	130.0		1626.0	132.1		<1
CHLORODIBROMO-METHANE	0.0	1.0	*					130.0			132.1			<1
CHLOROETHANE	0.0	1.0	*											<1
2-CHLORO-ETHYLVINYL ETHER	0.0	1.0	*											<50
CHLOROFORM	0.0	5.0	0.5					4700.0	57.0		4776.5	57.9		8.25
DICHLOROBROMO-METHANE	0.0	1.0	1.0					170.0			172.8			<1.35
1,1-DICHLOROETHANE	0.0	1.0	1.0					NA	NA	NA	NA	NA	NA	<1
1,2-DICHLOROETHANE	0.0	1.0	1.0					370.0			376.0			<1
TRANS 1,2-DICHLORO-ETHYLENE	0.0	1.0	*					10000	140.0	100.0	10162.8	142.3	101.6	<1
1,1-DICHLOROETHYLENE	0.0	1.0	1.0											<1
1,2-DICHLOROPROPANE	0.0	1.0	*					150.0	5.0	5.0	152.4	5.1	5.1	<1
1,3-DICHLORO-PROPYLENE	0.0	1.0	1.0					210.0	3.4		213.4			<1
ETHYLBENZENE	0.0	1.0	1.0					2100	530.0	700.0	2134.2	538.6	711.4	<1
METHYL BROMIDE	0.0	1.0	*					1500.0			1524.4			<1
METHYL CHLORIDE	0.0	1.0	1.0											<1
METHYLENE CHLORIDE	0.0	5.0	1.0					5900.0			5996.1			<5
1,1,2,2-TETRACHLORO-ETHANE	0.0	1.0	0.5					40.0	1.7		40.7	1.7		<1
TETRACHLORO-ETHYLENE	0.0	1.0	0.5					33.0			33.5			<1
TOLUENE	0.0	1.0	1.0					15000	1300.0	1000.0	15244.2	1321.2	1016.3	5.0
1,1,1-TRICHLOROETHANE	0.0	1.0	1.0											<1
1,1,2-TRICHLOROETHANE	0.0	1.0	0.2					160.0	5.6	5.6	162.6	5.8	5.7	<1
TRICHLORETHYLENE	0.0	1.0	1.0					300.0			304.9			<1
VINYL CHLORIDE	0.0	1.0	2.0					24.0	0.25	2.0	24.4	0.3	2.0	<1
P-CHLORO-M-CRESOL	0.0	10.0	*											<10
2-CHLOROPHENOL	0.0	10.0	*					150.0	81.0		152.4	82.3		<10
2,4-DICHLOROPHENOL	0.0	10.0	*					290.0			294.7			<10
2,4-DIMETHYLPHENOL	0.0	10.0	*					850.0	380.0		863.8	386.2		<10
4,6-DINITRO-O-CRESOL	0.0	10.0	24.0					280.0			284.6			<10
2,4-DINITROPHENOL	0.0	10.0	42.0					5300.0	69.0		5386.3	70.1		<10
2-NITROPHENOL	0.0	10.0	*											<10
4-NITROPHENOL	0.0	10.0	*											<10
PENTACHLOROPHENOL	0.0	10.0	5.0	15	19	14.7	18.6	30.0			30.5			<10
PHENOL	0.0	10.0	*					1700000	21000.0		1727676.0	21341.9		<10
2,4,6-TRICHLOROPHENOL	0.0	10.0	2.7					24.0			24.4			<10
ACENAPHTHENE	0.0	10.0	*					990.0	670.0		1006.1	680.9		<10
ACENAPHTHYLENE	0.0	10.0	2.3											<10
ANTHRACENE	0.0	10.0	0.7					40000	8300.0		40651.2	8435.1		<10

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Tullahoma STP
PERMIT: TN0023469
DATE: 3/30/2017

Stream (7Q10)	Stream (30Q5)	Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Margin of Safety
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[%]
0.452	0.646	5.000	10	124	90

	1	2	3	5	6	7	8	9	10	11	12	13	14	15
	Stream	Dectection Levels		Fish/Aqua. Life		Calculated Effluent		Human Health Water Quality Criteria (30Q5)						Avg. daily
	Bckgrnd.	Scan	WQC RDL	Water Quality Criteria		Concentration		In-Stream Criteria			Calculated Effluent Concentration			effluent
	Conc.	MDL	*EPA MDL	Chronic	Acute	Chronic	Acute	Organisms	Water/Org	DWS	Organisms	Water/Org	DWS	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l
BENZIDINE	0.0	50.0	*					0.0020			0.002			<50
BENZO(A)ANTHRACENE	0.0	10.0	0.3					0.18	0.038		0.2	0.0		<10
BENZO(A)PYRENE	0.0	10.0	0.3					0.18			0.2			<10
3,4 BENZO-FLUORANTHENE	0.0	10.0	0.3					0.18	0.038		0.2	0.0		<10
BENZO(GHI)PERYLENE	0.0	10.0	*											<10
BENZO(K)FLUORANTHENE	0.0	10.0	0.3					0.18	0.038		0.2	0.0		<10
BIS (2-CHLOROETHOXY) METHANE	0.0	10.0	*											<10
BIS (2-CHLOROETHYL)-ETHER	0.0	10.0	1.0					5.3	0.30		5.4	0.3		<10
BIS (2-CHLOROISO-PROPYL) ETHER	0.0	10.0	*					65000			66058.2			<10
BIS (2-ETHYLHEXYL) PHTHALATE	0.0	10.0	2.5					22.0	12.0	5.0	22.4	12.2	5.1	7.7
4-BROMOPHENYL PHENYL ETHER	0.0	10.0	*											<10
BUTYL BENZYL PHTHALATE	0.0	10.0	*					1900.0	1500.0		1930.9	1524.4		<10
2-CHLORONAPHTHALENE	0.0	10.0	*					1600.0			1626.0			<10
4-CHLORPHENYL PHENYL ETHER	0.0	10.0	*											<10
CHRYSENE	0.0	10.0	2.5					0.18			0.2			<10
DI-N-BUTYL PHTHALATE	0.0	10.0	2.5					4500.0	2000.0		4573.3	2032.6		<10
DI-N-OCTYL PHTHALATE	0.0	10.0	*											<10
DIBENZO(A,H) ANTHRACENE	0.0	10.0	*					0.18	0.038		0.2	0.0		<10
1,2-DICHLOROBENZENE	0.0	1.0	2.0					1300.0	420.0		1321.2			<1
1,3-DICHLOROBENZENE	0.0	5.0	2.0					960.0	320.0		975.6	325.2		<1
1,4-DICHLOROBENZENE	0.0	5.0	2.0					190.0	63.0		193.1			<1
3,3-DICHLOROBENZIDINE	0.0	10.0	*					0.28	0.2		0.3	0.2		<10
DIETHYL PHTHALATE	0.0	10.0	1.9					44000			44716.3			<10
DIMETHYL PHTHALATE	0.0	10.0	1.6					1100000	270000.0		1117908.0	274695.6		<10
2,4-DINITROTOLUENE	0.0	10.0	1.0					34.0			34.6			<10
2,6-DINITROTOLUENE	0.0	10.0	*											<10
1,2 DIPHENYLHYDRAZINE	0.0	10.0	*					2.0			2.0			<10
FLUORANTHENE	0.0	10.0	2.2					140.0	130.0		142.3	132.1		<10
FLUORENE	0.0	10.0	0.3					5300.0			5386.3			<10
HEXACHLOROBENZENE	0.0	10.0	1.9					0.0029	0.0028	1.0	0.003	0.0	1.0	<10
HEXACHLOROBUTADIENE	0.0	10.0	5.0					180.0			182.9			<10
HEXACHLOROCYCLO-PENTADIENE	0.0	10.0	*					1100.0	40.0	50.0	1117.9	40.7	50.8	<10
HEXACHLOROETHANE	0.0	10.0	0.5					33.0			33.5			<10
INDENO(1,2,3-CD)PYRENE	0.0	10.0	*					0.18	0.038		0.2	0.0		<10
ISOPHORONE	0.0	10.0	*					9600			9756.3			<10
NAPHTHALENE	0.0	10.0	*											<10
NITROBENZENE	0.0	10.0	10.0					690.0			701.2			<10
N-NITROSODI-N-PROPYLAMINE	0.0	10.0	*					5.1	0.050		5.2	0.1		<10
N-NITROSODI- METHYLAMINE	0.0	10.0	*					30.0			30.5			<10
N-NITROSODI-PHENYLAMINE	0.0	10.0	*					60.0	33.0		61.0	33.5		<10
PHENANTHRENE	0.0	10.0	0.7											<10
PYRENE	0.0	10.0	0.3					4000.0	830.0		4065.1	843.5		<10
1,2,4-TRICHLOROBENZENE	0.0		*					70.0	35.0		71.1			<10