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

August 7, 2015

Mr. W. Rick McClanahan
Director of Utilities and Engineering
e-copy: rmcclanahan@cityofbartlett.org
City of Bartlett
6382 Stage Rd.
Bartlett, TN 38134

Subject: **NPDES Permit No. TN0066800**
Bartlett STP No. 1
Bartlett, Shelby County, Tennessee

Dear Mr. McClanahan:

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 Memphis Environmental Field Office at 1-888-891-TDEC; or, at this office, please contact Ms. Maybelle T. Sparks at (615) 532-0651 or by E-mail at *Maybelle.Sparks@tn.gov*.

Sincerely,

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Permit File
Memphis Environmental Field Office
Mr. Larry A. Gamblin, Wastewater Treatment Plant Operator, City of Bartlett, lgamblin@cityofbartlett.org
Ms. Dana L. Wright, Director of Policy and Legislative Affairs, Tennessee Clean Water Network, dana@tcwn.org
NPDES Permit Section, EPA Region IV, r4npdespermits@epa.gov
Mr. J. Andrew (Drew) Goddard, Attorney at Law, Bass, Barry and Sims, PLC, DGoddard@bassberry.com

STATE OF TENNESSEE

NPDES PERMIT

No. TN0066800

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

Issued By

Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass TN Tower, 11th Fl
312 Rosa L. Parks Ave
Nashville, Tennessee 37243

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:	**Bartlett STP No. 1**
is authorized to discharge:	**treated municipal wastewater from Outfall 001**
from a facility located:	**in Bartlett, Shelby County, Tennessee**
to receiving waters named:	**Loosahatchie River Mile 18.4**

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

This permit shall become effective on:	**August 1, 2015**
This permit shall expire on:	**September 30, 2017**
Issuance date:	**August 1, 2015**

For Tisha Calabrese Benton
Director

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MTS
TN0066800.DOC

1.0. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

The City of Bartlett is authorized to discharge treated municipal wastewater from Outfall 001 to the Loosahatchie River at mile 18.4. Discharge 001 consists of municipal wastewater from a treatment facility with a design capacity of 2.2 MGD. Discharge 001 shall be limited and monitored by the permittee as specified below:

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

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

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

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

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

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
CBOD, 5-day, 20 C	<=	367	lb/d	Composite	Three Per Week	Monthly Average
CBOD, 5-day, 20 C	<=	459	lb/d	Composite	Three Per Week	Weekly Average
CBOD, 5-day, 20 C	<=	20	mg/L	Composite	Three Per Week	Monthly Average
CBOD, 5-day, 20 C	<=	25	mg/L	Composite	Three Per Week	Weekly Average
CBOD, 5-day, 20 C	<=	30	mg/L	Composite	Three Per Week	Daily Maximum
E. coli	<=	941	#/100mL	Grab	Three Per Week	Daily Maximum
E. coli	<=	126	#/100mL	Grab	Three Per Week	Monthly Geometric Mean
Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
IC25 Static Renewal 7 Day Chronic Ceriodaphnia	>=	5.9	%	Composite	Annual	Minimum
IC25 Static Renewal 7 Day Chronic Pimephales	>=	5.9	%	Composite	Annual	Minimum
Nitrogen, Ammonia total (as N)	<=	183	lb/d	Composite	Three Per Week	Weekly Average
Nitrogen, Ammonia total (as N)	<=	10	mg/L	Composite	Three Per Week	Weekly Average
Nitrogen, Ammonia total (as N)	<=	5	mg/L	Composite	Three Per Week	Monthly Average
Nitrogen, Ammonia total	<=	10	mg/L	Composite	Three Per	Daily Maximum

(as N)					Week	
Nitrogen, Ammonia total (as N)	<=	92	lb/d	Composite	Three Per Week	Monthly Average
Nitrogen, total (as N)	Report	-	mg/L	Composite	Quarterly	Daily Maximum
Nitrogen, total (as N)	Report	-	lb/d	Composite	Quarterly	Daily Maximum
Oxygen, dissolved (DO)	>=	3	mg/L	Grab	Five Per Week	Instantaneous Minimum
Phosphorus, total (as P)	Report	-	lb/d	Composite	Weekly	Daily Maximum
Phosphorus, total (as P)	Report	-	mg/L	Composite	Weekly	Daily Maximum
Phosphorus, total (as P)	<=	65	lb/d	Calculated	Weekly	Rolling Average
Settleable Solids	<=	1	mL/L	Composite	Three Per Week	Daily Maximum
Total Suspended Solids (TSS)	<=	45	mg/L	Composite	Three Per Week	Daily Maximum
Total Suspended Solids (TSS)	<=	30	mg/L	Composite	Three Per Week	Monthly Average
Total Suspended Solids (TSS)	<=	734	lb/d	Composite	Three Per Week	Weekly Average
Total Suspended Solids (TSS)	<=	40	mg/L	Composite	Three Per Week	Weekly Average
Total Suspended Solids (TSS)	<=	550	lb/d	Composite	Three Per Week	Monthly Average
pH	>=	6	SU	Grab	Five Per Week	Minimum
pH	<=	9	SU	Grab	Five Per Week	Maximum

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

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
CBOD, 5-day, 20 C, % removal	>=	85	%	Calculated	Three Per Week	Monthly Average Minimum
CBOD, 5-day, 20 C, % removal	>=	40	%	Calculated	Three Per Week	Daily Minimum
TSS, % removal	>=	85	%	Calculated	Three Per Week	Monthly Average Minimum
TSS, % removal	>=	40	%	Calculated	Three Per Week	Daily Minimum

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

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Three Per Week	Daily Maximum
CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Three Per Week	Monthly Average
Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Three Per Week	Monthly Average

Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Three Per Week	Daily Maximum

Description : External Outfall, Number : 001, Monitoring : See Comments, Season : All Year

Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
Phosphorus, total (as P)	Report	-	mg/L	Composite	Monthly	Daily Maximum
Phosphorus, total (as P)	Report	-	lb/d	Composite	Monthly	Daily Maximum
Phosphorus, total (as P)	<=	65	lb/d	Calculated	Monthly	Rolling Average

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

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

Note: 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.

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

Note: See Part 1.2.3 for test procedures.

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

Note: The semiannual, daily average, total phosphorus load limit is the arithmetic average of the daily loads measured during the reporting period.

Phosphorus, total (as P) Note: Monitoring for total phosphorus shall be conducted weekly and reported monthly, as described in the "External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year" chart above, until 12 months after the later of approval by the Division of the Nutrient Optimization Plan required by this permit or full implementation of the approved plan, after which the monitoring frequency becomes monthly, as described in the "External Outfall, Number : 001, Monitoring : See Comments, Season : All Year" chart above.

Rolling Average Note: The rolling average is the average of the 12 most recent months of data. On each appropriate reporting period DMR, the average of all total phosphorus samples taken during that month will be that month's average value; it will be averaged with the monthly average values from the 11 previous months; and that average will be reported as the annual rolling average for that reporting period DMR. For the first 11 months of the permit cycle, the value reported will not be truly 'annual' or 'rolling.' For those months, only the monthly average values for months with relevant data will be averaged.

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.

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:

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

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

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 1200-4-3-.05(8).

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 Discharge Monitoring Report (DMR) forms supplied by the Division of Water Resources. Submittals shall be postmarked no later than 15 days after the completion of the reporting period. A completed DMR with an original signature shall be submitted to the following address:

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER RESOURCES
ENFORCEMENT & COMPLIANCE SECTION
WILLIAM R. SNODGRASS TN TOWER, 11TH FL
312 ROSA L. PARKS AVE
NASHVILLE TN 37243

A copy of the completed and signed DMR shall be mailed to the Memphis Environmental Field Office (EFO) at the following address:

TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER RESOURCES
MEMPHIS ENVIRONMENTAL FIELD OFFICE
8383 WOLF LAKE DRIVE
BARTLETT TN 38133

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

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 1200-4-3-.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.

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.

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

d. None of the foregoing affects any notice and comment requirements or appeal rights.

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 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 1200-4-5-.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. 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.

d. 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 shall submit the results of an Industrial Waste Survey (IWS) in accordance with 40 CFR 403.8(f)(2)(i), including any industrial users (IU) covered under Section 301(i)(2) of the Act. As much information as possible must be obtained relative to the character and volume of pollutants contributed to the POTW by the IUs. This information will be submitted to the Division of Water Resources, Pretreatment Section within one hundred twenty (120) days of the effective date of this permit, unless such a survey has been submitted within 3 years of the effective date. Development of a pretreatment program may be required after completion of the industrial user review. All requirements and conditions of the pretreatment program are enforceable through the NPDES permit.

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, nonbiodegradable 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.

3.3. SLUDGE MANAGEMENT PRACTICES

a. The permittee must comply with 40 CFR 503 et seq. Sludge shall be sampled and analyzed at a frequency dependent both on the amount of sludge generated annually and on the disposal practice utilized. Whenever sampling and analysis are required by 40 CFR 503, the permittee shall report to the division the quantitative data for the following parameters:

1)	Arsenic	7)	Nickel
2)	Cadmium	8)	Selenium
3)	Copper	9)	Zinc
4)	Lead	10)	Nitrite plus Nitrate, NO_2, + NO_3 as N
5)	Mercury	11)	Total Kjeldahl Nitrogen, as N
6)	Molybdenum	12)	Ammonia, NH_3, as N

This sludge analysis must be submitted by February 19th of each calendar year. This information shall be submitted to the Division of Water Resources, Central Office, William R. Snodgrass TN Tower, 312 Rosa L. Parks Ave, Nashville TN 37243-1534, Attention: Sludge Coordinator, Municipal Facilities Section.

b. Land application of sludge shall halt immediately if any of the following concentrations are exceeded:

POLLUTANT	CONCENTRATION (mg/kg[1])
Arsenic	75
Cadmium	85
Zinc	7500
Copper	4300
Lead	840

POLLUTANT	CONCENTRATION (mg/kg[1])
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100

1 Dry Weight Basis

Monthly average pollutant concentrations shall not exceed Table 3 of 40 CFR §503.13. If they are exceeded cumulative pollutant loading rates are to be calculated and recorded and shall not exceed Table 2 of 40 CFR §503.13 for the life of the land application site.

c. If land application is the final disposition of the wasted sludge, the permittee shall provide pathogen reduction, sludge stabilization and comply with land and crop usage controls as listed in 40 CFR Part 503, as authorized by the Clean Water Act. Records must be maintained by the permittee that indicate compliance or non-compliance with this rule. If the permittee is required to report to EPA, copies of all reports should be sent to the division, at the address listed in paragraph 1 of this section.

d. Before land applying municipal sludge the permittee must obtain approvals for each site(s) in writing from the division using the latest revision of Guidelines for

Land Application or Surface Disposal of Biosolids, unless the sludge being land applied meets the pollutant concentrations of 40 CFR 503.13(b)(3), the Class A pathogen requirements in 40 CFR 503.32(a), and one of the vector attraction reduction requirements in 40 CFR 503.33 (b)(1) through (b)(8).

e. 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.

f. 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	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	2484 Park Plus Drive	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

3.4. 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					
4 X PL	**2 X PL**	**Permit Limit (PL)**	**0.50 X PL**	**0.25 X PL**	**Control**
% effluent					
23.6	**11.8**	**5.9**	**3**	**1.48**	**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. 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.

The toxicity tests specified herein shall be conducted yearly (1/yr) for Outfall 001 and begin no later than 90 days from the effective date of this permit.

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

In the event of 2 consecutive test failures or 3 test failures within a 12-month period for the same outfall, the permittee must initiate a Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) study within 30 days and so notify the division by letter. This notification shall include a schedule of activities for the initial investigation of that outfall. **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.

Two copies of biomonitoring reports (including follow-up reports) shall be submitted to the division. One copy of the report shall be submitted along with the discharge monitoring report (DMR). The second copy shall be submitted to the local Division of Water Resources office address (see table below):

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	2484 Park Plus Drive	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
Bartlett STP No. 1
(901) 385-6499
NPDES Permit NO. TN0066800
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Memphis

NPDES Permitted Municipal/Sanitary Outfall:

TREATED MUNICIPAL/SANITARY WASTEWATER
Bartlett STP No. 1
(901) 385-6499
NPDES Permit NO. TN0066800
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Memphis

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 1200-4-3-.06, titled “Tennessee Antidegradation Statement,” which prohibits the degradation of high quality surface 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 PLANT OPTIMIZATION AND COMPLIANCE SCHEDULE

Within 12 months of the date of issuance of this permit the permittee shall prepare a Nutrient Optimization Plan for the wastewater treatment facility to minimize discharges of total phosphorus. The purpose of the plan is to determine and specify operational methods of optimizing phosphorus removal that will be put in practice at the plant utilizing existing technology at the facility. The plan shall be prepared following investigation of potential optimization methods and selection of operational changes that are found from the investigations to be feasible. The plan will use as a reference the items presented in Appendix 5 to the Rationale. The Nutrient Optimization Plan shall be submitted to the division's central office (Water-based Systems Unit) within 12 months of the date of issuance of this permit for review and comment. Neither consideration nor implementation of capital projects is required. If any portions of the plan are not implemented when it is submitted, the plan shall include a schedule for implementation of those portions.

The plan shall be prepared following investigation of potential optimization methods and selection of operational and other changes that are found from the investigations to be feasible. The plan will use as a reference the items presented in Appendix 5 to the Rationale. The Nutrient Optimization Plan shall be submitted to the division central office (Water-based Systems Unit) within 12 months of the date of issuance of this permit for review and comment.

The permittee will continue weekly phosphorus sampling until 12 months after the later of approval of the Nutrient Optimization Plan by the Division or full implementation of the approved plan. No later than three months after the end of this 12-month sampling period, the division and the permittee will meet to discuss whether a reduction in the phosphorus limit in this permit is appropriate based on the effects of this plan or other efforts by the permittee, and the Division will not seek to implement any reduction of the phosphorus limit in this permit until after that meeting or upon the expiration date of this permit.

The permittee shall provide a brief annual update on progress toward nutrient optimization/management with the Discharge Monitoring Reports submitted for the 12th month of permit modification effectiveness. This brief one-or-two page report must address the updated information on monitoring and nutrient management planning activities completed and actions planned for the coming year, and the Permittee may include additional items.

Wastewater characterization conducted internally by the permittee for nutrient optimization purposes may deviate from approved methods contained in 40 CFR Part 136. However, effluent characterization conducted for monthly DMR reporting shall use approved methods in 40 CFR Part 136.

4.0. DEFINITIONS AND ACRONYMS

4.1. DEFINITIONS

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 or removal of habitat.

"***De Minimis***" - Alterations, other than those resulting in the condition of pollution or new domestic wastewater discharges, that represent either a small magnitude or a short duration shall be considered a de minimis impact and will not be considered degradation for purposes of implementing the antidegradation policy. Discharges other than domestic wastewater will be considered de minimis if they are temporary or use less than five percent of the available assimilative capacity for the substance being discharged. Water withdrawals will be considered de minimis if less than five percent of the 7Q10 flow of the stream is removed (the calculations of the low flow shall take into account existing withdrawals). Habitat alterations authorized by an Aquatic Resource Alteration Permit (ARAP) are de minimis if the division finds that

the impacts are offset by a combination of impact minimization and/or insystem mitigation.

If more than one activity has been authorized in a segment and the total of the impacts uses no more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow, they are presumed to be de minimis. Where total impacts use more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow they may be treated as de minimis provided that the division finds on a scientific basis that the additional degradation has an insignificant effect on the resource and that no single activity is allowed to consume more than five percent of the assimilative capacity, available habitat or 7Q10 low flow.

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 nth 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.

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

NOEC – no observed effect concentration

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

MODIFICATION RATIONALE

Bartlett STP No. 1
NPDES PERMIT No. TN0066800
DATE: 01/14/15
Permit Writer: Wade D. Murphy

MODIFICATIONS TO RESOLVE THIRD-PARTY APPEAL

Provisions of this permit, issued October 1, 2012, were appealed by a third party pursuant to statutory and regulatory provisions that provide the public due process of law. Without attempting to paraphrase or summarize the entire content of the appeal letter signed October 30, 2012, and received October 31, 2012, the major concern is that the terms and conditions of the permit do not require sufficient terms and conditions on effluent phosphorus to protect water quality. The division has negotiated with the Tennessee Clean Water Network (petitioner) and Bartlett (permittee) to resolve this appeal by modifying this permit to include additional terms and conditions related to the treatment and removal of phosphorus. In summary, the permit increases the monitoring frequency for effluent phosphorus and imposes conditions regarding plant optimization for phosphorus removal. The more specific details and rationale follow.

At the date the permit modification becomes effective, monitoring for total phosphorus will increase from quarterly to 1/week during preparation and implementation of a Nutrient Optimization Plan (NOP) for phosphorus, and monthly thereafter. The ultimate purpose of the increased monitoring frequency is to obtain monthly load for calculating an annual rolling average load. In the interim, the increased information is expected to be useful for plant optimization considerations. The existing 65 lb/d daily average limit was based on a statistically-derived 95th percentile limit (see second addendum to rationale below) and will continue to apply at least until the end of the 12-months of post-NOP weekly phosphorus sampling required by Section 3.7 of the permit.

Load limits, versus concentration limits, give credit for any waste water diverted from the outfall for reuse and thereby encourages reuse alternatives. Since the treatment facility is not specifically designed to remove nutrients and also since incidental biological removals of nutrients are functions of other variables (e.g. detention time, inflow/infiltration), annual rolling average loads allow operational flexibility in achieving the load limits. The monitoring frequency is once per week for discharge monitoring report purposes. The permittee may sample more often at its discretion.

Plant optimization is required in Section 3.7 of the permit. The optimization intends that the facility seek to achieve as much phosphorus removal as feasible with the currently installed equipment. New information learned through the optimization operations may factor into revised permit terms and conditions pursuant to the anti-backsliding provisions in the division permit regulation. Stream characterization is not imposed in this permit due to it expiring in September 2017.

SECOND ADDENDUM TO RATIONALE

Bartlett STP No. 1
NPDES PERMIT No. TN0066800
DATE: 10/1/12
Permit Writer: Maybelle T. Sparks

WATER QUALITY-BASED EFFLUENT LIMITS FOR TOTAL PHOSPHORUS

By letter dated June 4, 2012, the TCWN requested that the division establish water quality based effluent limits for total phosphorus. For the purposes of this permit, impairment means that the division has assessed the need for additional phosphorus controls on discharges to the Loosahatchie River at mile 18.4. The division's biological assessments of the receiving stream have not met ecoregional target goals. More specifically, streams with nutrient levels higher than the reference stream database range will be considered in violation of the narrative criteria and these streams are identified for future TMDL development. Degradation is the alteration of the properties of waters by the addition of pollutants or removal of habitat. Therefore, new or increased discharges of a substance that would cause or contribute to the condition of impairment cannot be allowed. Based on facility data, the proposed phosphorus load limit maintains phosphorus at its current level thereby limiting degradation. More stringent limits may apply once a TMDL or nutrient reduction strategy are developed and implemented.

SETTLEABLE SOLIDS AND PHOSPHORUS

By letter dated August 1, 2012, the City of Bartlett requests the (1) settleable solids parameter be changed from 5 grab samples per week to 3 composite samples per week as it will yield a more representative sample analysis and (2) phosphorus limit be based on the permitted design flow of 2.2 MGD not the actual flow.
The division has changed the monitoring frequency and sample type for settleable solids as requested. Pursuant to the antidegradation statement in the state water quality standards, 1200-4-3-.06, in unavailable conditions, new or increased discharges of a substance that would cause or contribute to a condition of impairment will not be allowed. Maintaining the existing phosphorus load complies with this requirement. If the current phosphorus limit does not accurately reflect the loading discharged by this facility, the limit is subject to revision based on additional effluent characterization data via permit modification.

STATISTCALLY-DERIVED 95TH PERCENTILE LIMIT

By email dated August 9, 2012, the EPA recommends that the 95th percentile of the effluent be based on a statistical approach that takes into account the variability of the effluent. The limit is imposed for the purpose of demonstrating that the facility is not increasing the discharge of a substance that would contribute to a condition of impairment pursuant to the anti-backsliding statement in the state water quality standards. The state's interpretative guidance document incorporated into the state narrative nutrient standard defines phosphorus impairment as a stream having phosphorus levels in excess of the 95th percentile values for comparable eco-region reference streams and further adds that such streams are identified for TMDL

development. More importantly, the state permit regulation allows applicants, via public participation opportunity, to provide input on the value representative of their current nutrient removal practice and beyond which the alternatives analysis requirements of the anti-degradation policy will apply. This allowance is important since facilities receiving such limits have neither been designed nor operated to remove the pollutants of concern.

Calculations of the loading via Microsoft Excel approach and the TSD statistical approach suggested by the EPA results in values of 62 and 65 mg/L respectively. Both values are valid for the purposes of establishing a loading threshold for anti-degradation purposes, so on EPA's recommendation, the value resulting from their suggested statistical approach is incorporated to the final permit.

	TP	Flow	TP Load
Units	mg/l	MGD	lb/day
Date			
09/30/2008	6.41	0.883	47.205
11/30/2008	2.8	0.844	19.709
02/28/2009	3.8	0.855	27.097
06/30/2009	4.5	0.923	34.640
09/30/2009	3	0.978	24.470
02/28/2010	3.4	1.048	29.717
06/30/2010	1.5	0.988	12.360
09/30/2010	3.6	0.868	26.061
12/31/2010	9.9	0.943	77.860
03/31/2011	4.3	1.002	35.934
06/30/2011	6	1.027	51.391
09/30/2011	5.2	0.948	41.113
12/31/2011	5.8	1.106	53.499
03/31/2012	5.6	0.997	46.564
Total	14.0	14.0	14.0
Average	4.7	1.0	37.7
Std dev	2.0	0.1	16.9
95th percentile	7.6		62.0

from pgs E-5 & E-6 in the TSD:

$x_p = \mu + z_p\sigma$

where:

μ = mean of monthly averages

σ = standard deviation of monthly averages

z_p = pth percentage point for std normal dist

x_{95} = 95th %ile n-day monthly average limit

$= \mu + 1.645\sigma$

Note: $z_p = 1.645$

x95 (mg/l)= 8.07

x95 (lb/day)= 65.42

ADDENDUM TO RATIONALE

Bartlett STP No. 1
NPDES PERMIT No. TN0066800
DATE: 7/1/12
Permit Writer: Maybelle T. Sparks

WATER QUALITY-BASED EFFLUENT LIMITS FOR TOTAL PHOSPHORUS

The draft permit public noticed on May 14, 2012, is based on an incorrect waterbody segment identification and water quality assessment. The correct segment identification, revised assessment and resulting permit terms and conditions are provided in the addendum to rationale below.

Stream determinations for this permit action are associated with the waterbody segment identified by the division as segment ID# TN08010209002_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. STPs are sources of pathogens, but must meet water quality standards at the end of the discharge pipe by disinfecting the effluent. Sediments/silts are produced as a result of stream channelization and bank erosion from land development or redevelopment. The TSS component of wastewater treatment facility discharges is generally composed of primarily organic material and is considered to be different in nature than the sediments produced from erosional processes. Therefore, TSS discharges from wastewater treatment facilities are not sources of sediment/silt. This permit does not authorize physical substrate habitat alterations to the stream.

The division's assessments of the receiving stream reflect elevated phosphorus from municipal point source discharges and discharges from MS4s. Streams with nutrient levels higher than the reference stream database range will be considered in violation of the narrative criteria and these streams are assessed as "impaired" or in need of additional controls on nutrients. Such streams are identified for development of a total maximum daily load (TMDL). The TMDL and alternative state-wide nutrient reduction strategy are not ready for implementation at this time. However, until such implementation, the state water quality standards prohibit increased discharges of substances that will contribute to a condition of impairment. The division proposes an effluent limit achievable 95 percent of the time based on existing total phosphorus data reported on the DMR. The limit is applied as seasonal loads (average daily load, May 1 – October 31 & November 1 – April 30) since TMDLs will likely establish wasteload allocations for nutrients as seasonal loads.

Pollution Source Information

Cause Name	Source Name
Escherichia coli	Discharges from Municipal Separate Storm Sewer Systems (MS4)
Phosphorus (Total)	Municipal Point Source Discharges
Phosphorus (Total)	Discharges from Municipal Separate Storm Sewer Systems (MS4)
Sedimentation/Siltation	Site Clearance (Land Development or Redevelopment)
Physical substrate habitat alterations	Channelization
Sedimentation/Siltation	Channelization

	TP	Flow	TP Load
Units	mg/l	MGD	lb/day
Date			
09/30/2008	6.41	0.883	47.205
11/30/2008	2.8	0.844	19.709
02/28/2009	3.8	0.855	27.097
06/30/2009	4.5	0.923	34.640
09/30/2009	3	0.978	24.470
02/28/2010	3.4	1.048	29.717
06/30/2010	1.5	0.988	12.360
09/30/2010	3.6	0.868	26.061
12/31/2010	9.9	0.943	77.860
03/31/2011	4.3	1.002	35.934
06/30/2011	6	1.027	51.391
09/30/2011	5.2	0.948	41.113
12/31/2011	5.8	1.106	53.499
03/31/2012	5.6	0.997	46.564
Total	14.0	14.0	14.0
Average	4.7	1.0	37.7
Std dev	2.0	0.1	16.9
95th percentile	7.6		62.0

RATIONALE

Bartlett STP No. 1
NPDES PERMIT No. TN0066800
DATE: 5/4/12
Permit Writer: Maybelle T. Sparks

1. FACILITY INFORMATION

Bartlett STP No. 1
Mr. W. Rick McClanahan - Director of Utilities and Engineering
Bartlett, Shelby County, Tennessee
(901) 385-6499
Treatment Plant Average Design Flow: 2.2 MGD
Percentage Industrial Flow: 0%
Treatment Description: Extended aeration activated sludge plant with two oxidation ditches, two clarifiers and UV disinfection.

2. RECEIVING STREAM INFORMATION

Loosahatchie River Mile 18.4
Watershed Group: Loosahatchie
Hydrocode: 8010209
Low Flow: 7Q10 = 37.03 MGD (57.3 CFS)
Low Flow Reference:
USGS Water-Resource Investigation Report 95-4293
Station #07030280
Tier Designation: Unavailable conditions waters
Stream Classification Categories:

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

Water Quality Assessment: Not supporting

3. CURRENT PERMIT STATUS

Permit Type:	**Municipal**
Classification:	**Major**
Issuance Date:	**30-JUN-07**
Expiration Date:	**30-JUN-12**
Effective Date:	**01-AUG-07**

4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

a. 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
Sludge analysis must be submitted by February 19th of each calendar year	3.3.a
Biomonitoring Report beginning within 90 days of the effective permit date	3.4

b. 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 August 2007- March 2012 reveals that the City of Bartlett has exceeded permit limits for settleable solids, ammonia and *E. coli*.

A complete discharge monitoring report summary is located in Appendix 2.

6. PROPOSED EFFLUENT LIMITS & 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
$CBOD_5$	20	367	25	459	30	40	D.O. protection, Refer to 6.1 below
NH_3-N	5	92	10	183	10	—	D.O. protection, Refer to 6.2 below
Total Suspended Solids	30	550	40	734	45	40	T.C.A. 1200-4-5-.09
Dissolved Oxygen (mg/l)	3.0 (daily minimum) instantaneous	—	—	—	—	—	D.O. protection, Refer to 6.1 below
Total Nitrogen	—	—	—	—	Report (qtr avg)	Report (qtr load)	Refer to 6.4 below
Total Phosphorous	—	—	—	—	Report (qtr avg)	Report (qtr load)	Refer to 6.4 below
E. coli (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	T.C.A. 1200-4-3-.03, Refer to 6.5 below
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	T.C.A. 1200-4-5-.09
pH (standard units)	6.0-9.0	—	—	—	—	—	T.C.A. 1200-4-3-.03
Flow (MGD):							
Influent	Report	—	—	—	Report	—	Used to quantify pollutant load
Effluent	Report	—	—	—	Report	—	Used to quantify pollutant load
Whole Effluent Toxicity:							
IC_{25}	5.9% per sample	—	—	—	—	—	Refer to 6.6 below
Sanitary Sewer Overflows, Total Occurrences			Report				Refer to 6.8 below
Dry Weather Overflows, Total Occurrences			Report				Refer to 6.8 below
Bypass of Treatment, Total Occurrences			Report				Refer to 6.8 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. 1200-4-5-.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. Streeter-Phelps modeling in conjunction with an assimilative capacity study[1] was performed at various conditions to determine allowable organic loadings. The monthly average limits for $CBOD_5$ (20 mg/l), NH_3-N (5 mg/l), and D.O. (3 mg/l) still apply and are considered sufficient to result in an instream dissolved oxygen concentration that remains above the required minimum of 5.0 mg/l. Modeling results are located in the permit file administrative record.

   In addition to $CBOD_5$, NH_3-N undergoes biological oxidation in a receiving stream thereby utilizing in stream oxygen and potentially reducing oxygen levels below water quality standards. Ammonia as N is also a pollutant that exhibits toxicity to fish and other aquatic life. The two affects are analyzed separately and the division imposes the most stringent limit in the permit.

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 1200-4-3-.0-3(3)(j), and assumed stream temperatures of 30°C and 20°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:

[1] Loosahatchie River Water Quality Study, February 21, 2005.

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)

$$C_{STP} = \frac{0.90\ (37.03\ \text{MGD} + 2.2\ \text{MGD}) - (37.03\ \text{MGD} \times 0.1\text{mg/l})}{2.2\ \text{MGD}} = 14.4\ \text{mg/l (summer)}$$

$$C_{STP} = \frac{1.71\ (37.03\ \text{MGD} + 2.2\ \text{MGD}) - (37.03\ \text{MGD} \times 0.1\text{mg/l})}{2.2\ \text{MGD}} = 28.8\ \text{mg/l (winter)}$$

Because the NH_3-N concentration limits calculated to protect dissolved oxygen are more restrictive than the toxicity limits calculated above, the monthly average limits for NH_3-N (5 mg/l) is applied to the permit.

6.3. CHLORINATION

A residual chlorine limit is not needed since the STP uses ultraviolet disinfection.

6.4. TOTAL NITROGEN AND TOTAL PHOSPHOROUS LIMITATIONS

Quarterly monitoring for Total Nitrogen and Total Phosphorous is imposed in support of the joint State/Federal Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico. Monitoring results from major municipal and industrial facilities discharging within the Mississippi River Basin will help assess current point source loadings to the Gulf and enable the task force to track changes in loadings across the basin over time. EPA believes that Section 308(a) of the Clean Water Act provides broad authority to require nutrient monitoring, even where there is no reasonable potential for a particular facility to cause or contribute to excursions of criteria within the immediate receiving waterbody. Quarterly results are to be reported as typical averages (sum of results divided by the number of samples within

the reporting period; average concentration with average flow for the reporting period).

6.5. *E. COLI* REQUIREMENTS

Disinfection of wastewater is required to protect the receiving stream from pathogenic microorganisms. Fecal coliform and *E. coli* are indicator organisms used as a measure of bacteriological health of a receiving stream and the effectiveness of disinfection.

As of September 30, 2004, the criterion for fecal coliform has been removed from the State's Water Quality Standards. Thus, the division imposes an *E. coli* limit on discharges of treated sewage for the protection of recreational use of the stream in lieu of the fecal coliform limit. 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.

Because the design capacity of the facility exceeds 1.0 MGD, the facility is considered to have the reasonable potential to violate the narrative water quality criterion, "no toxics in toxic amounts". Even though the facility may not operate at or above 1.0 MGD initially, this discharge permit authorizes discharge up to 2.2 MGD. Therefore, permit conditions relevant to major dischargers will apply.

The relatively low dilution of the effluent when mixed with the receiving stream at its 7Q10 low flow potentially creates a chronic exposure to toxicity. So, chronic whole effluent toxicity testing is retained in this permit. Because some forms of toxicity are temperature dependent, monitoring and reporting quarterly provides the permittee with the means of viewing any seasonal toxicity trends in its wastewater characteristics and the means of defending its compliance with water quality criteria year round.

Because the low flow condition provides the least amount of effluent dilution, the solution of effluent at low flow will be the highest concentration of effluent ever available to provide a chronically toxic exposure. This concentration becomes the calculated IC_{25} endpoint as shown below. Therefore, to demonstrate the absence of chronic toxicity potential, an effluent solution causing a 25% or more reduction in mortality, reproduction and/or growth effects of the organisms in a laboratory test

must be in excess of the maximum effluent concentration occurring at the condition of least dilution (the calculated endpoint). Reasonable potential for toxicity will be demonstrated if the IC_{25} established in the laboratory is less than or equal to the endpoint.

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

$$IC_{25}\ \% = \frac{\text{Design Flow}}{\text{Low Flow}} * 100 \geq \frac{2.2}{37.03} * 100 > 5.9\%$$

where:

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

6.7. 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 “Other Metals”, and are located in Appendix 4.

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

6.8. 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 REQUIREMENTS AND CONDITIONS

7.1. CERTIFIED WASTEWATER TREATMENT OPERATOR

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

7.2. COLLECTION SYSTEM CERTIFIED OPERATOR

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.

7.3. PRETREATMENT PROGRAM

The Bartlett STP No. 1 has received an exemption from development of a pretreatment program due to the lack of any significant industrial users. To keep the exemption, the City of Bartlett must complete an updated Industrial Waste Survey within 120 days of the effective date of the permit, unless such a survey has been submitted within 3 years of the effective date. The City of Bartlett must notify the division immediately of its intent to connect a significant industrial user to the sewage system.

7.4. PERMIT TERM

This permit modification will expire on September 30, 2017 in order to coordinate its reissuance with other permits located within the Loosahatchie Watershed.

8. ANTIDEGRADATION STATEMENT/WATER QUALITY STATUS

Tennessee’s Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Chapter 1200-4-3-.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# TN08010209004_1000. 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. This permit does not authorize physical substrate habitat alterations to the stream.

TMDLs have been developed and approved for this waterbody segment on the following parameter and date:

Parameter	TMDL Approval Date
E coli	7/27/2011

The proposed terms and conditions of this permit comply with the wasteload allocations of these TMDLs.

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
$CBOD_5$	20	367	25	459	30	40	3/week
NH_3-N	5	92	10	183	10	—	3/week
Total Suspended Solids	30	550	40	734	45	40	3/week
Dissolved Oxygen (mg/l)	3.0 (daily minimum) instantaneous	—	—	—	—	—	5/week
Total Nitrogen		—	—	—	Report	—	1/quarter
Total Phosphorous		—	—	—	Report	—	1/quarter
E. coli (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	3/week
Settleable Solids (ml/l)		—	—	—	1.0 (daily maximum)	—	5/week
pH (standard units)	6.0-9.0	—	—	—	—	—	5/week
Flow (MGD):							
Effluent	Report	—	—	—	Report	—	7/week
Whole Effluent Toxicity:							
IC_{25}	5.9% per sample	—	—	—	—	—	1/quarter
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

	Flow (MGD)		Biochemical Oxygen Demand				Suspended Solids				Effluent (mg/l)									By-passing
			Influent	Effluent (mg/l)		%	Influent	Effluent (mg/l)		%	Settleable	pH		Cl_2	Ammonia		D.O.	E. coli		
	Monthly Average	Daily Max	(mg/l)	Monthly Average	Daily Max	Removal	(mg/l)	Monthly Average	Daily Max	Removal	Solids (ml/l)	(std. units) Min	Max	Daily Max	Monthly Average	Daily Max	Daily Min	Monthly Average	Daily Max	
Limits	Report	Report	Report			85	Report			85	1.0	6.0	9.0				3.0	126	941	
Summer				20	30			30	45						5.0	10.0				
Winter				20	30			30	45						5.0	10.0				
Average	0.977	1.492	149	5	6	96	243.6	10	18	95	0.3	6.6	7.2		0.6	2.0	5.6	45	1389	
Maximum	1.244	3.645	198	8	16	97	503.0	19	35	99	10.0	7.1	7.8		7.0	11.2	7.5	553	15200	
Minimum	0.841	0.946	95	5	5	94	145.0	3	7	89	0.1	6.0	6.4		0.1	0.1	3.0	10	10	
+ = Exceedence											1				1	2		2	12	
Date																				
Aug/07	0.951	1.116	151.43	5	5	96.7	266.57	9	12	96.78	0.1	6.6	7.0		0.68	2.16	4.9	23.15		
Sep/07	0.911	1.118	179.83	5	5	97.22	345.75	6	10	98.14	0.1	6.8	6.9		0.15	0.63	4.9	23.39		
Oct/07	0.965	1.326	172.79	5	5	97.11	280.57	5	8	98.22	0.1	6.7	7.1		0.11	0.17	6.2	14.08		
Nov/07	0.919	1.284	193.85	5	5	97.42	267.92	7	10	97.39	0.1	6.5	7.1		0.19	0.54	6.2	42.25		
Dec/07	0.965	1.378	183	5	6	97.22	282.17	10	16	96.51	0.1	6.7	6.9		0.21	0.77	6.6	49.77		
Jan/08	1.037	1.506	184.8	6	12	96.93	302.93	9	13	97.1	0.1	6.6	7.0		1.79	9.04	5.1	76.26		
Feb/08	0.920	1.092	161.67	6	15	96.39	270.33	12	16	95.5	0.2	6.3	6.8		0.21	0.40	5.3	553.2 +		
Mar/08	1.064	1.696	154.42	8	16	95.14	259.67	19	29	92.55	0.1	6.3	6.8		0.97	3.44	4.7	87.06		
Apr/08	1.036	1.991	150	6	7	96	238	15	22	94	0.1	6.3	6.8		1.80	4.20	4.4	96	2800 +	
May/08	0.916	1.648	177	5	5	97	294	12	23	96	0.1	6.2	6.8		0.50	1.70	4.5	15		
Jun/08	0.879	1.150	153	5	5	97	267	6	10	98	0.1	6.3	6.7		0.30	1.40	5.6	10		
Jul/08	0.844	0.946	154	5	5	97	233	13	26	94	0.1	6.0	6.4		0.30	2.20	5.7	11		
Aug/08	0.953	1.588	140	5	5	96	204	13	27	94	0.3	6.0	6.8		0.50	1.80	5.3	25	15200 +	
Sep/08	0.883	1.089	159	5	6	97	241	9	16	96	0.1	6.4	6.9		0.20	0.30	5.3	18	450	
Oct/08	0.841	1.135	152	5	5	97	226	7	10	97	0.1	6.5	6.8		0.20	0.40	5.3	12	140	
Nov/08	0.844	1.024	174	5	5	97	249	6	10	97	0.1	6.6	6.8		0.10	0.10	5.9	13	80	
Dec/08	1.000	2.194	169	5	7	97	273	19	27	92	0.1	6.4	7.0		0.40	0.90	5.9	110	2200 +	
Jan/09	0.914	1.579	150	5	8	96	278	16	23	94	0.1	6.6	6.9		0.40	1.10	5.7	494 +	3200 +	
Feb/09	0.855	0.958	178	5	6	97	290	9	18	97	0.1	6.4	6.9		0.20	0.30	5.2	81	4800 +	
Mar/09	0.975	1.438	162	5	5	97	243	6	10	97	0.1	6.4	7.0		0.10	0.20	5.7	24	3600 +	
Apr/09	0.930	1.491	155	5	5	97	210	8	12	96	0.1	6.1	7.0		0.10	0.20	5.1	48	270	
May/09	1.018	1.471	139	5	5	96	244	8	14	96	0.1	6.6	7.1		0.20	0.40	5.0	54	900	
Jun/09	0.923	1.546	157	5	5	97	246	12	18	95	0.1	6.5	7.2		0.80	3.90	5.4	18	70	
Jul/09	0.978	1.704	141	5	5	96	232	9	21	96	0.1	7.0	7.7		0.20	0.30	5.3	30	3600 +	
Aug/09	0.996	1.480	142	5	5	96	236	8	12	96	0.1	6.9	7.1		0.30	0.70	5.0	14	30	
Sep/09	0.978	1.513	141	5	5	96	204	7	9	96	0.1	6.6	7.1		0.30	1.20	5.1	16	90	
Oct/09	1.026	1.748	110	5	5	95	163	12	35	91	0.1	6.7	7.5		0.10	0.30	6.8	25	210	
Nov/09	0.940	1.180	134	5	5	96	285	12	22	94	0.1	6.8	7.0		0.10	0.20	7.2	48	1200 +	
Dec/09	1.012	1.610	137	5	5	96	183	12	24	93	0.1	6.6	7.0		0.20	0.30	7.5	43	580	
Jan/10	1.025	1.399	132	5	5	96	184	13	20	93	0.1	6.9	7.2		0.20	0.30	5.4	53	8400 +	
Feb/10	1.048	1.439	128	5	5	96	222	8	12	96	0.1	6.9	7.3		0.40	3.80	7.0	21	90	
Mar/10	0.991	1.361	140	5	6	96	194	10	16	95	0.1	7.0	7.4		0.20	0.90	6.6	15	410	
Apr/10	0.969	1.357	121	5	5	96	176	10	18	93	0.1	7.0	7.6		0.30	2.20	6.0	15	50	
May/10	1.244	3.645	101	5	5	95	191	8	22	96	0.1	6.4	7.4		0.30	0.80	5.7	11	20	
Jun/10	0.988	1.288	95	5	5	94	161	7	22	93	0.1	7.1	7.8		0.20	0.80	5.6	11	20	
Jul/10	1.017	1.786	103	5	5	94	216	9	18	95	0.1	6.9	7.4		0.80	4.20	5.2	16	120	
Aug/10	0.999	1.227	122	5	5	95	184	16	34	89	0.1	7.1	7.4		0.50	2.40	5.5	15	80	
Sep/10	0.868	0.983	149	6	15	95	197	12	26	91	0.1	6.9	7.3		0.70	3.30	5.9	15	1200 +	
Oct/10	0.897	1.137	157	5	5	97	287	9	20	96	0.1	6.5	7.0		0.20	0.20	6.1	14	110	
Nov/10	0.945	1.277	187	5	5	97	344	11	17	96	0.1	6.6	7.3		0.20	0.40	5.9	10	10	
Dec/10	0.943	1.326	152	5	5	96	280	8	13	97	0.1	7.0	7.3		0.30	1.50	6.3	11	30	
Jan/11	0.965	1.369	107	5	5	95	145	11	31	91	0.1	7.1	7.5		0.20	0.60	5.9	12	20	
Feb/11	0.887	1.205	126	5	5	96	201	7	11	96	0.1	7.0	7.3		7.00 +	11.00 +	6.1	15	140	
Mar/11	1.002	1.543	149	5	5	95	201	8	14	95	0.1	6.2	7.3		0.70	4.70	4.2	11	60	
Apr/11	1.218	3.029	102	5	5	95	197	12	24	93	0.1	6.4	7.5		1.10	3.40	5.4	30	5500 +	
May/11	1.220	3.118	137	5	8	96	246	11	16	93	0.1	6.1	7.3		1.20	5.60	5.1	27	5000 +	
Jun/11	1.027	1.311	139	5	7	96	198	8	16	95	10.0 +	6.7	7.3		1.80	11.20 +	3.0	14	730	
Jul/11	1.015	1.206	118	5	5	95	192	11	21	94	0.1	7.1	7.4		0.80	3.60	5.3	10	10	
Aug/11	1.016	1.163	177	5	5	97	292	10	24	96	0.1	6.4	7.6		0.40	1.60	5.6	12	70	
Sep/11	0.948	1.243	168	5	5	97	224	8	16	96	0.1	6.7	7.3		0.40	2.80	5.9	12	110	
Oct/11	0.916	1.090	176	5	5	97	222	5	12	97	0.1	6.8	7.4		0.50	3.00	6.1	10	10	
Nov/11	1.021	1.466	169	5	5	97	315	9	23	96	0.1	6.5	7.2		0.30	1.00	6.2	13	310	
Dec/11	1.106	2.557	198	5	5	97	415	7	24	96	0.1	6.8	7.3		0.40	2.10	4.6	15	430	
Jan/12	0.968	1.262	197	5	5	97	503	5	7	99	0.1	6.9	7.3		0.20	0.60	6.2	12	80	
Feb/12	0.994	1.304	127	5	5	96	175	3	7	97	0.1	6.9	7.4		0.10	0.30	6.8	12	50	
Mar/12	0.997	1.474	115	5	5	95	165	5	8	96	0.1	6.7	7.3		0.20	0.70	5.9	10	10	

APPENDIX 3
Metal and Toxic Parameter Calculations

The following procedure is used to calculate the allowable instream concentrations for permit limitations.

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

   * 7Q10 of receiving stream (37.03 MGD, USGS)
   * Calcium hardness (25 mg/l, default)
   * Total suspended solids (10 mg/l, default)
   * Background metals concentrations (½ water quality criteria)
   * Other dischargers impacting this segment
   * 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 1200-4-3-.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 1200-4-3-.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.

APPENDIX 4
WQ Based Effluent Calculations- Other Compounds

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY: Bartlett STP #1
PERMIT #: TN0066800
DATE: 5/4/2012

Stream (7Q10)	Stream (30Q5)	Waste Flow	Ttl. Susp. Solids	Hardness (as CaCO3)	Margin of Safety
[MGD]	[MGD]	[MGD]	[mg/l]	[mg/l]	[%]
37.03	47.82	2.2	10	25	90

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Stream	Dectection Levels			F & AL- instream allowable		Calc. Effluent Concentration		Human Health Water Quality Criteria (30Q2)						avg. daily	
	Bckgrnd.	Scan	WQC RDL		ambient conditions (Tot)		based on F & AL, Ca		In-Stream Criteria			Calc. Effluent Concentration, Ca			effluent	
	Conc.	MDL	*EPA MDL		Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS	(<,=), Cw	
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	**PARAMETER**
ANTIMONY		10.0	3.0						4300.0	14.0	6.0	87997.0	286.5	122.8	<10	ANTIMONY
ARSENIC		10.0	1.0		190.0	360.0	3049.349	5777.71	50.0	50.0	50.0	1023.2	1023.2	1023.2	<10	ARSENIC
BERYLLIUM		1.0	1.0								4.0			81.9	<1	BERYLLIUM
SELENIUM		10.0	2.0		5.0	20.0	80.246	320.984			50.0			1023.2	<10	SELENIUM
THALLIUM		20.0	"						6.3	1.7	2.0	128.9	34.8	40.9	<20	THALLIUM
ACROLEIN	0.0	20.0	1.0						780.0	320.0		15962.2	6548.6		<20	ACROLEIN
ACRYLONITRILE	0.0	20.0	1.0						6.6	0.6		135.1	12.1		<20	ACRYLONITRILE
BENZENE	0.0	1.0	1.0						710.0	12.0	5.0	14529.7	245.6	102.3	<1	BENZENE
BROMOFORM	0.0	1.0	1.0						3600.0	43.0		73671.9	880.0		<1	BROMOFORM
CARBON TETRACHLORIDE	0.0	1.0	1.0						44.0	2.5	5.0	900.4	51.2	102.3	<1	CARBON TETRACHLORIDE
CLOROBENZENE	0.0	1.0	"						21000.0	680.0		429752.7	13915.8		<1	CLOROBENZENE
CHLORODIBROMO-METHANE	0.0	1.0	"						340.0	4.1		6957.9	83.9		<1	CHLORODIBROMO-METHANE
CHLOROETHANE	0.0	1.0	"												<1	CHLOROETHANE
2-CHLORO-ETHYLVINYL ETHER	0.0	5.0	"												<5	2-CHLORO-ETHYLVINYL ETHER
CHLOROFORM	0.0	5.0	0.5						4700.0	57.0		96182.8	1166.5		6.5	CHLOROFORM
DICHLOROBROMO-METHANE	0.0	1.0	1.0						460.0	5.6		9413.6	114.6		<1	DICHLOROBROMO-METHANE
1,1-DICHLOROETHANE	0.0	1.0	1.0						32.0	0.6	7.0	654.9	11.7	143.3	<1	1,1-DICHLOROETHANE
1,2-DICHLOROETHANE	0.0	1.0	1.0						990.0	3.8	5.0	20259.8	77.8	102.3	<1	1,2-DICHLOROETHANE
TRANS 1,2-DICHLORO-ETHYLENE	0.0	1.0	"						140000	700.0	100.0	2865018.2	14325.1	2046.4	<1	TRANS 1,2-DICHLORO-ETHYLENE
1,1-DICHLOROETHYLENE	0.0	1.0	1.0												<1	1,1-DICHLOROETHYLENE
1,2-DICHLOROPROPANE	0.0	1.0	"						39.0	0.5	5.0	798.1	10.6	102.3	<1	1,2-DICHLOROPROPANE
1,3-DICHLORO-PROPYLENE	0.0	1.0	1.0						1700.0	10.0		34789.5	204.6		<1	1,3-DICHLORO-PROPYLENE
ETHYLBENZENE	0.0	1.0	1.0						29000	3100.0	700.0	593468.1	63439.7	14325.1	<1	ETHYLBENZENE
METHYL BROMIDE	0.0	1.0	"						4000.0	48.0		81857.7	982.3		<1	METHYL BROMIDE
METHYL CHLORIDE	0.0	1.0	1.0												<1	METHYL CHLORIDE
METHYLENE CHLORIDE	0.0	1.0	1.0						16000.0	47.0		327430.7	961.8		<1	METHYLENE CHLORIDE
1,1,2,2-TETRACHLORO-ETHANE	0.0	1.0	0.5						110.0	1.7		2251.1	34.8		<1	1,1,2,2-TETRACHLORO-ETHANE
TETRACHLORO-ETHYLENE	0.0	1.0	0.5						88.5	8.0	5.0	1811.1	163.7	102.3	<1	TETRACHLORO-ETHYLENE
TOLUENE	0.0	5.0	1.0						200000	6800.0	1000.0	4092883.2	139158.0	20464.4	<5	TOLUENE
1,1,1-TRICHLOROETHANE	0.0	1.0	1.0								200.0			4092.9	<1	1,1,1-TRICHLOROETHANE
1,1,2-TRICHLOROETHANE	0.0	1.0	0.2						420.0	6.0	5.0	8595.1	122.8	102.3	<1	1,1,2-TRICHLOROETHANE
TRICHLORETHYLENE	0.0	1.0	1.0						810.0	27.0	5.0	16576.2	552.5	102.3	<1	TRICHLORETHYLENE
VINYL CHLORIDE	0.0	1.0	2.0						5250.0	20.0	2.0	107438.2	409.3	40.9	<1	VINYL CHLORIDE
P-CHLORO-M-CRESOL	0.0	5.0	"												<5	P-CHLORO-M-CRESOL
2-CHLOROPHENOL	0.0	5.0	"						400.0	120.0		8185.8	2455.7		<5	2-CHLOROPHENOL
2,4-DICHLOROPHENOL	0.0	5.0	"						790.0	93.0		16166.9	1903.2		<5	2,4-DICHLOROPHENOL
2,4-DIMETHYLPHENOL	0.0	5.0	"						2300.0	540.0		47068.2	11050.8		<5	2,4-DIMETHYLPHENOL
4,6-DINITRO-O-CRESOL	0.0	10.0	24.0						765.0	13.4		15655.3	274.2		<10	4,6-DINITRO-O-CRESOL
2,4-DINITROPHENOL	0.0	5.0	42.0						14000.0	70.0		286501.8	1432.5		<5	2,4-DINITROPHENOL
2-NITROPHENOL	0.0	5.0	"												<5	2-NITROPHENOL
4-NITROPHENOL	0.0	20.0	"												<20	4-NITROPHENOL
PENTACHLOROPHENOL	0.0	5.0	5.0		13.000	20.000	208.6	321.0	82.0	2.8	1.0	1678.1	57.3	20.5	<5	PENTACHLOROPHENOL
PHENOL	0.0	5.0	"						4600000	21000.0		94136313.6	429752.7		<5	PHENOL
2,4,6-TRICHLOROPHENOL	0.0	5.0	2.7						65.0	21.0		1330.2	429.8		<5	2,4,6-TRICHLOROPHENOL
ACENAPHTHENE	0.0	2.0	"						2700.0	1200.0		55253.9	24557.3		<2	ACENAPHTHENE
ACENAPHTHYLENE	0.0	2.0	2.3												<2	ACENAPHTHYLENE
ANTHRACENE	0.0	2.0	0.7						110000	9600.0		2251085.8	196458.4		<2	ANTHRACENE
BENZIDINE	0.0	20.0	"						0.0054	0.0012		0.111	0.0		<20	BENZIDINE
BENZO(A)ANTHRACENE	0.0	2.0	0.3						0.49	0.044		10.0	0.9		<2	BENZO(A)ANTHRACENE
BENZO(A)PYRENE	0.0	2.0	0.3						0.49	0.044	0.2	10.0	0.9	4.1	<2	BENZO(A)PYRENE
3,4 BENZO-FLUORANTHENE	0.0	2.0	0.3						0.49	0.044		10.0	0.9		<2	3,4 BENZO-FLUORANTHENE
BENZO(GHI)PERYLENE	0.0	2.0	"												<2	BENZO(GHI)PERYLENE
BENZO(K)FLUORANTHENE	0.0	2.0	0.3						0.49	0.044		10.0	0.9		<2	BENZO(K)FLUORANTHENE
BIS (2-CHLOROETHOXY) METHANE	0.0	5.0	"												<5	BIS (2-CHLOROETHOXY) METHANE
BIS (2-CHLOROETHYL)-ETHER	0.0	5.0	1.0						14.0	0.31		286.5	6.3		<5	BIS (2-CHLOROETHYL)-ETHER
BIS (2-CHLOROISO-PROPYL) ETHER	0.0	5.0	"						170000	1400.0		3478950.7	28650.2		<5	BIS (2-CHLOROISO-PROPYL) ETHER
BIS (2-ETHYLHEXYL) PHTHALATE	0.0	10.0	2.5						59.0	18.0	6.0	1207.4	368.4	122.8	<10	BIS (2-ETHYLHEXYL) PHTHALATE
4-BROMOPHENYL PHENYL ETHER	0.0	5.0	"												<5	4-BROMOPHENYL PHENYL ETHER
BUTYL BENZYL PHTHALATE	0.0	5.0	"						5200.0	3000.0		106415.0	61393.2		<5	BUTYL BENZYL PHTHALATE
2-CHLORONAPHTHALENE	0.0	5.0	"						4300.0	1700.0		87997.0	34789.5		<5	2-CHLORONAPHTHALENE
4-CHLORPHENYL PHENYL ETHER	0.0	5.0	"												<5	4-CHLORPHENYL PHENYL ETHER
CHRYSENE	0.0	2.0	2.5						0.49	0.044		10.0	0.9		<2	CHRYSENE
DI-N-BUTYL PHTHALATE	0.0	5.0	2.5						12000.0	2700.0		245573.0	55253.9		<5	DI-N-BUTYL PHTHALATE
DI-N-OCTYL PHTHALATE	0.0	5.0	"												<5	DI-N-OCTYL PHTHALATE
DIBENZO(A,H) ANTHRACENE	0.0	2.0	"						0.49	0.044		10.0	0.9		<2	DIBENZO(A,H) ANTHRACENE
1,2-DICHLOROBENZENE	0.0	5.0	2.0						17000.0	2700.0		347895.1	55253.9		<5	1,2-DICHLOROBENZENE
1,3-DICHLOROBENZENE	0.0	5.0	2.0						2600.0	400.0		53207.5	8185.8		<5	1,3-DICHLOROBENZENE
1,4-DICHLOROBENZENE	0.0	5.0	2.0						2600.0	400.0		53207.5	8185.8		<5	1,4-DICHLOROBENZENE
3,3-DICHLOROBENZIDINE	0.0	5.0	"						0.77	0.4		15.8	8.2		<5	3,3-DICHLOROBENZIDINE
DIETHYL PHTHALATE	0.0	5.0	1.9						120000	23000.0		2455729.9	470681.6		<5	DIETHYL PHTHALATE
DIMETHYL PHTHALATE	0.0	5.0	1.6						2900000	313000.0		59346806.4	6405362.2		<5	DIMETHYL PHTHALATE
2,4-DINITROTOLUENE	0.0	5.0	1.0						91.0	1.1		1862.3	22.5		<5	2,4-DINITROTOLUENE
2,6-DINITROTOLUENE	0.0	5.0	"												<5	2,6-DINITROTOLUENE
1,2 DIPHENYLHYDRAZINE	0.0	5.0	"						5.4	0.4		110.5	8.2		<5	1,2 DIPHENYLHYDRAZINE
FLUORANTHENE	0.0	2.0	2.2						370.0	300.0		7571.8	6139.3		<2	FLUORANTHENE
FLUORENE	0.0	2.0	0.3						14000.0	1300.0		286501.8	26603.7		<2	FLUORENE
HEXACHLOROBENZENE	0.0	5.0	1.9						0.0077	0.0075	1.0	0.158	0.2	20.5	<5	HEXACHLOROBENZENE
HEXACHLOROBUTADIENE	0.0	5.0	5.0						500.0	4.4		10232.2	90.0		<5	HEXACHLOROBUTADIENE
HEXACHLOROCYCLO-PENTADIENE	0.0	5.0	"						17000.0	240.0	5.0	347895.1	4911.5	102.3	<5	HEXACHLOROCYCLO-PENTADIENE
HEXACHLOROETHANE	0.0	5.0	0.5						89.0	19.0		1821.3	388.8		<5	HEXACHLOROETHANE
INDENO(1,2,3-CD)PYRENE	0.0	2.0	"						0.49	0.044		10.0	0.9		<2	INDENO(1,2,3-CD)PYRENE
ISOPHORONE	0.0	5.0	"						26000	360.0		532074.8	7367.2		<5	ISOPHORONE
NAPHTHALENE	0.0	5.0	"												<5	NAPHTHALENE
NITROBENZENE	0.0	5.0	10.0						1900.0	17.0		38882.4	347.9		<5	NITROBENZENE
N-NITROSODI-N-PROPYLAMINE	0.0	5.0	"						1.4	0.005		28.7	0.1		<5	N-NITROSODI-N-PROPYLAMINE
N-NITROSODI- METHYLAMINE	0.0	5.0	"						81.0	0.0069		1657.6	0.1		<5	N-NITROSODI- METHYLAMINE
N-NITROSODI-PHENYLAMINE	0.0	10.0	"						160.0	50.0		3274.3	1023.2		<10	N-NITROSODI-PHENYLAMINE
PHENANTHRENE	0.0	2.0	0.7												<2	PHENANTHRENE
PYRENE	0.0	2.0	0.3						11000.0	960.0		225108.6	19645.8		<2	PYRENE
1,2,4-TRICHLOROBENZENE	0.0	5.0	"								70.0			1432.5	<5	1,2,4-TRICHLOROBENZENE

a. Columns 7-8, and 12-14 are the effluent concentrations allowable to prevent exceedence of water quality criteria.
b. Potential to exceed criteria exists if the measured quantity in column 15 exceeds, or could exceed, the calculated allowable concentrations in columns 7-8, and 12-14.
c. Additional testing is required if the detection level used in the scan is higher than the state RDL and/or the MDL of the approved EPA scan method and industry is known to have that pollutant.
d. All background concentrations for these volatile organic, acid-extractable, and base-neutral compounds are assumed zero in the absence of supporting monitoring data.
e. Other metals for which data were provided on the application are evaluated on the Metals & Toxics spreadsheet.
f. Reasonable potential does not exist for the following reason(s):
The required MDL has been used and resulted in non-detection (BDL) or the contributing industrial processes are NOT likely to contain them.

Other Metals

WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY:	PERMIT #:	DATE:	CALC BY:
Bartlett STP #1	TN0066800	5/4/2012	MTS

unregulated stream worksheet (7Q10)

Stream (7Q10) [MGD]	Stream (30Q2) [MGD]	Waste Flow [MGD]	Ttl. Susp. Solids [mg/l]	Hardness (as CaCO3) [mg/l]	Margin of Safety [%]
37.03	47.82	2.2	10	25	90

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Stream	Fish/Aqua. Life (F & AL) WQC			F & AL- instream allowable		Calc. Effluent Concentration		Human Health Water Quality Criteria (30Q2) *						Results	
	Bckgrnd.	lab conditions		Fraction	ambient conditions (Tot)		based on F & AL		In-Stream Criteria			Calc. Effluent Concentration **			2A pmt app	
	Conc.	Chronic	Acute	Dissolved	Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS	Part D	
PARAMETER	[ug/l]	[ug/l]	[ug/l]	[Fraction]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	ug/l	**PARAMETER**
Copper (a,b)	5.202	3.617	4.801	0.348	10.404	13.812	**88.17**	**142.86**	N/A	N/A	N/A	**N/A**	**N/A**	**N/A**	**9.0**	**Copper (a,b)**
Chromium (T) (d)	50.000	100.000	N/A	1.000	100.000	N/A	**847.46**	**N/A**	N/A	N/A	100.0	**N/A**	**N/A**	**1068.22**	**<5**	**Chromium (T) (d)**
Nickel (a,b)	56.436	48.797	438.943	0.432	112.872	1015.316	**956.55**	**15440.05**	4600.0	610.0	100.0	**93032.18**	**11379.16**	**942.30**	**<5**	**Nickel (a,b)**
Cadmium (a,b)	0.756	0.382	0.821	0.252	1.513	3.252	**12.82**	**40.73**	N/A	N/A	5.0	**N/A**	**N/A**	**87.53**	**<2**	**Cadmium (a,b)**
Lead (a,b)	1.481	0.545	13.980	0.184	2.962	76.019	**25.10**	**1197.61**	N/A	N/A	5.0	**N/A**	**N/A**	**73.34**	**<6**	**Lead (a,b)**
Mercury (T) (c,e)	0.006	0.908	1.690	0.320	0.908	5.289	**14.48**	**84.79**	0.051	0.05	2.0	**0.93**	**0.91**	**40.81**	**0.0**	**Mercury (T) (c,e)**
Silver (a,b,f)	0.187	N/A	0.374	1.000	N/A	0.374	**N/A**	**3.17**	N/A	N/A	N/A	**N/A**	**N/A**	**N/A**	**<5**	**Silver (a,b,f)**
Zinc (a,b)	56.851	32.745	36.153	0.288	113.702	125.535	**963.58**	**1153.49**	N/A	N/A	N/A	**N/A**	**N/A**	**N/A**	**52.0**	**Zinc (a,b)**
Cyanide (d)	2.600	5.200	22.000	1.000	5.200	22.000	**44.07**	**313.69**	220000.0	700.0	200.0	**4502120.65**	**14274.22**	**4042.02**	**<10**	**Cyanide (d)**

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 1.26.01: Larry Bunting indicated 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 not included in river use so pick from columns 7, 8, or 12.
** Water Quality criteria for stream use classifications other than Fish & Aquatic Life are based on the 30Q2 flow.

APPENDIX 5
NUTRIENT OPTIMIZATION PLAN (NOP)

The permittee's Nutrient Optimization Plan (NOP) shall include the following information:

- Evaluation of STP historical wastewater characteristics, e.g. variations in strength and mass loadings.
- Results from literature and discussions with others, including municipalities and consultants will be evaluated in developing/implementing the STP enhanced phosphorus control program.
- Treatability/testing results from bench, pilot and/or the full-scale STP regarding nutrient control, e.g., operation at alternative food: microorganism ratios or sludge ages, total and soluble phosphorus, and benefit of chemical(s) addition and/or filtration will be addressed.
- Identification of increased STP treatment system monitoring to provide for enhanced phosphorus control.
- Ongoing correlations of STP results to provide for an increased understanding of the nature of the wastewater phosphorus and cost-effective control options for the STP.