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

June 3, 2014

Honorable Chris Thompson
City Mayor
P.O. Box 325
109 West Main St.
Byrdstown, TN 38549

Subject: **NPDES Permit No. TN0062626**
**Byrdstown STP**
**Byrdstown, Pickett County, Tennessee**

Dear Mayor Thompson:

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 Cookeville Environmental Field Office at 1-888-891-TDEC; or, at this office, please contact Mr. Wade Murphy at (615) 532-0666 or by E-mail at *Wade.Murphy@tn.gov*.

Sincerely,

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Permit File
Cookeville Environmental Field Office
Ms. Dana L. Wright, Director of Policy and Legislative Affairs, Tennessee Clean Water Network, dana@tcwn.org
Mr. Dennis South, Facility Superintendent, Byrdstown Watertreatment Plant, wwtp@twlakes.net

# STATE OF TENNESSEE

# NPDES PERMIT

## No. TN0062626

**Revoke & Reissue**

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

Issued By

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

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

| | |
|---|---|
| Discharger: | **Byrdstown STP** |
| is authorized to discharge: | **treated municipal wastewater from Outfall 001** |
| from a facility located: | **in Byrdstown, Pickett County, Tennessee** |
| to receiving waters named: | **unnamed tributary at mile 0.4 to Town Creek at mile 0.1** |

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

| | |
|---|---|
| This permit shall become effective on: | **July 01, 2014** |
| This permit shall expire on: | **June 30, 2019** |
| Issuance date: | **June 01, 2014** |

for Sandra K. Dudley, Ph.D., P.E.
Director

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TN0062626PMT.DOC

# 1.0. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

## 1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

The City of Byrdstown is authorized to discharge treated municipal wastewater from Outfall 001 to the unnamed tributary at mile 0.4 to Town Creek at mile 0.1. Discharge 001 consists of municipal wastewater from a treatment facility with a design capacity of .6 MGD. Discharge 001 shall be limited and monitored by the permittee as specified below:

**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 | <= | 15 | mg/L | Composite | Weekly | Monthly Average |
| CBOD, 5-day, 20 C | <= | 20 | mg/L | Composite | Weekly | Weekly Average |
| CBOD, 5-day, 20 C | <= | 30 | mg/L | Composite | Weekly | Daily Maximum |
| CBOD, 5-day, 20 C | <= | 31 | lb/d | Composite | Weekly | Monthly Average |
| CBOD, 5-day, 20 C | <= | 42 | lb/d | Composite | Weekly | Weekly Average |
| Nitrogen, Ammonia total (as N) | <= | 1.3 | mg/L | Composite | Weekly | Monthly Average |
| Nitrogen, Ammonia total (as N) | <= | 2 | mg/L | Composite | Weekly | Weekly Average |
| Nitrogen, Ammonia total (as N) | <= | 2.6 | mg/L | Composite | Weekly | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 2.7 | lb/d | Composite | Weekly | Monthly Average |
| Nitrogen, Ammonia total (as N) | <= | 4.2 | lb/d | Composite | Weekly | Weekly Average |
| Total Suspended Solids (TSS) | <= | 30 | mg/L | Composite | Weekly | Monthly Average |
| Total Suspended Solids (TSS) | <= | 40 | mg/L | Composite | Weekly | Weekly Average |
| Total Suspended Solids (TSS) | <= | 45 | mg/L | Composite | Weekly | Daily Maximum |
| Total Suspended Solids (TSS) | <= | 63 | lb/d | Composite | Weekly | Monthly Average |
| Total Suspended Solids (TSS) | <= | 83 | lb/d | Composite | Weekly | Weekly Average |
| E. coli | <= | 487 | #/100 mL | Grab | Three Per Week | Daily Maximum |
| E. coli | <= | 126 | #/100 mL | Grab | Three Per Week | Monthly Geometric Mean |
| Oxygen, dissolved (DO) | >= | 5 | mg/L | Grab | Five Per Week | Instantaneous Minimum |
| pH | >= | 6 | SU | Grab | Five Per Week | Minimum |
| pH | <= | 9 | SU | Grab | Five Per Week | Maximum |

| | | | | | | |
|---|---|---|---|---|---|---|
| Settleable Solids | <= | 1 | mL/L | Grab | Five Per Week | Daily Maximum |
| Flow | Report | - | Mgal/d | Continuous | Daily | Monthly Average |
| Flow | Report | - | Mgal/d | Continuous | Daily | Daily Maximum |
| Nitrogen, total (as N) | Report | - | mg/L | Composite | Quarterly | Quarterly Average |
| Nitrogen, total (as N) | Report | - | lb/d | Composite | Quarterly | Quarterly Average |
| Nitrogen, total (as N) | <= | 26.7 | lb/d | See Notes | Quarterly | Rolling Average |
| Phosphorus, total (as P) | Report | - | mg/L | Composite | Quarterly | Quarterly Average |
| Phosphorus, total (as P) | Report | - | lb/d | Composite | Quarterly | Quarterly Average |
| Phosphorus, total (as P) | <= | 3.6 | lb/d | See Notes | Quarterly | Rolling Average |

**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 | % | Composite | Weekly | Monthly Average Minimum |
| CBOD, 5-day, 20 C, % removal | >= | 40 | % | Composite | Weekly | Daily Minimum |
| TSS, % removal | >= | 85 | % | Composite | Weekly | Monthly Average Minimum |
| TSS, % removal | >= | 40 | % | Composite | Weekly | 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 | Weekly | Daily Maximum |
| CBOD, 5-day, 20 C | Report | - | mg/L | Composite | Weekly | Monthly Average |
| Flow | Report | - | Mgal/d | Continuous | Daily | Monthly Average |
| Flow | Report | - | Mgal/d | Continuous | Daily | Daily Maximum |
| Nitrogen, total (as N) | Report | - | mg/L | Composite | Quarterly | Quarterly Average |
| Nitrogen, total (as N) | Report | - | lb/d | Composite | Quarterly | Quarterly Average |
| Phosphorus, total (as P) | Report | - | lb/d | Composite | Quarterly | Quarterly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Composite | Quarterly | Reported Average |
| Total Suspended Solids (TSS) | Report | - | mg/L | Composite | Weekly | Daily Maximum |
| Total Suspended Solids (TSS) | Report | - | mg/L | Composite | Weekly | Monthly 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 | Continuous | 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 | Continuous | Monthly Total |

**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 | Continuous | Monthly Total |

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

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

See Part 1.2.3 for test procedures.

**The annual rolling average (lb/day) is calculated as the average of the samples (minimum of once quarterly) collected during a twelve month monitoring period beginning from the permit effective date. From this point forward, the annual load limit will apply quarterly on the basis of the samples collected during the most recent twelve months. The permittee may sample more frequently than quarterly. The average lb/d shall be calculated as the arithmetic average of the loads measured during the reporting period. Load values for each sample shall be determined using the average effluent flow rate for the facility on the date of the sample.**

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

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

specified maximum amount. A maximum daily limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

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

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

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

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

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

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

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

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

## 1.2. MONITORING PROCEDURES

### 1.2.1. Representative Sampling

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:

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

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

**STATE OF TENNESSEE**
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**
**DIVISION OF WATER RESOURCES**
**Cookeville Environmental Field Office**
**1221 South Willow Avenue**
**Cookeville, Tennessee 38506**

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.

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

# 2.0. GENERAL PERMIT REQUIREMENTS

## 2.1. GENERAL PROVISIONS

### 2.1.1. Duty to Reapply

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

### 2.1.2. Right of Entry

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

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

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

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

### 2.1.3. Availability of Reports

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

### 2.1.4. Proper Operation and Maintenance

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

b. Dilution water shall not be added to comply with effluent requirements to achieve BCT, BPT, BAT and or other technology based effluent limitations such as those in State of Tennessee Rule 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 current pretreatment program is in the inactive stage. The program will remain inactive as long as no significant industries discharge into the collection system. Should a significant industrial user request permission to discharge into the Byrdstown system, then the City must request that the division reactivate the pretreatment program. This must be done prior to the industrial discharge taking place.

   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. BIOSOLIDS MANAGEMENT PRACTICES

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

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

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

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

| Division of Solid Waste Management | | | |
|---|---|---|---|
| **Office** | **Location** | **Zip Code** | **Phone No.** |
| Chattanooga | 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. 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**
**Byrdstown STP**
**(931) 864-6215**
**NPDES Permit NO. TN0062626**
**TENNESSEE DIVISION OF WATER RESOURCES**
**1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Cookeville**

**NPDES Permitted Municipal/Sanitary Outfall:**

**TREATED MUNICIPAL/SANITARY WASTEWATER**
**Byrdstown STP**
**(931) 864-6215**
**NPDES Permit NO. TN0062626**
**TENNESSEE DIVISION OF WATER RESOURCES**
**1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Cookeville**

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.

## 3.5. 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.

## 3.6. STREAM BIOLOGICAL ASSESSMENT

Beginning from permit issuance for the duration of the permit cycle, the permittee shall develop and implement a biological monitoring plan to define the biological impact of its discharge on the receiving stream downstream of the Outfall. To complete this, monitoring will be required to determine the biological integrity and diversity of the receiving streams, pursuant to the relevant Tennessee Water Quality Criteria for those streams. Specifically, this permit requires assessment of the biological integrity of the receiving streams in accordance with the Tennessee Water Quality Criteria for all streams classified for Fish and Aquatic life per Rule 0400-40-03-.03(k). The receiving stream of interest is located in ecoregion 71g and in the Obey River Watershed.

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

Pursuant to the permittee's coordination with the division's Cookeville Environmental Field Office (EFO) regarding sampling location(s) and timing, the permittee shall submit a monitoring plan to the division central office (Water-based Systems Unit) for review and comment in coordination with its field biologists no later than 180 days from permit issuance. The permittee shall proceed with its plan if no written comments are received on the plan within 60 days of its receipt by the division.

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

### 1. Frequency

Biological monitoring shall be conducted once in each of two consecutive calendar years and collected during low flow, high temperature conditions. (Exceptions are for specific streams that are dry in low flow). The tests shall be conducted during two consecutive years between 2014 and 2017 inclusive so data will be available for assessment at the next permit reissue. For intermittent or batch discharges, sampling should take place within 30 days of discharge in lowest flow conditions.

### 2. Location

The facility will sample at one site upstream of the outfall and one site downstream of the outfall. The sites selected must provide appropriate habitat and must be generally comparable. Prior to sampling, all selected sampling points shall be marked on a topographical map, submitted to and approved by the EFO.

## 3. Sampling

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

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

a. Habitat Assessment

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

b. Macroinvertebrate Sample Collection

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

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

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

c. Subsampling

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

d. Taxonomy

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

e. Biometrics

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

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

**4. Station Information**

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

a. Water temperature (oC)

b. Dissolved Oxygen (mg/l)

c. pH (S.U.)

d. Conductivity (umhos)

e. Stream Flow (cfs)

**5. Reporting**

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

Division of Water Resources
Cookeville Environmental Field Office
1221 South Willow Avenue
Cookeville, Tennessee 38506

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

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

# 4.0. DEFINITIONS AND ACRONYMS

## 4.1. DEFINITIONS

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

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

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

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

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

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

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

"***Degradation***" means the alteration of the properties of waters by the addition of pollutants 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 $n^{th}$ root of the product of the individual values where "n" is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For the purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

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

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

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

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

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

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

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

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

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

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

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

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

A "***rolling average, annual***" is the average of the last *n* values in a data set, applied to successive monitoring periods, so that you get a series of averages. For the purpose of this permit, the minimum data set is 12 months of sampling data and the rolling average annual load (lb/yr) is calculated by averaging all the individual load values collected during the rolling reporting period. The reported value shall average individual load values for each sample derived using the daily average flow rate associated with that sample (the flow for that day on the monthly operating report).

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

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

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

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

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

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

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

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

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

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

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

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

## 4.2. ACRONYMNS AND ABBREVIATIONS

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

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

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

BAT – best available technology economically achievable

BCT – best conventional pollutant control technology

BDL – below detection level

$BOD_5$ – five day biochemical oxygen demand

BPT – best practicable control technology currently available

$CBOD_5$ – five day carbonaceous biochemical oxygen demand

CEI – compliance evaluation inspection

CFR – code of federal regulations

CFS – cubic feet per second

CFU – colony forming units

CIU – categorical industrial user

CSO – combined sewer overflow

DMR – discharge monitoring report

D.O. – dissolved oxygen

*E. coli* – *Escherichia coli*

EFO – environmental field office

LB(lb) - pound

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

IU – industrial user

IWS – industrial waste survey

$LC_{50}$ – acute test causing 50% lethality

MDL – method detection level

MGD – million gallons per day

MG/L(mg/l) – milligrams per liter

ML – minimum level of quantification

ml – milliliter

MLSS – mixed liquor suspended solids

MOR – monthly operating report

NODI – no discharge

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

# RATIONALE

**Byrdstown STP**
**NPDES Permit No. TN0062626**
**Date: 04/21/14**
**Permit Writer: Wade Murphy**

## 1. FACILITY INFORMATION

**Byrdstown STP**
**Honorable Chris Thompson - City Mayor**
**Byrdstown, Pickett County, Tennessee**
**(931) 864-6215**
**Treatment Plant Average Design Flow: .6 MGD**
**Percentage Industrial Flow: Zero%**
**Treatment Description: Sequencing batch reactor activated sludge with post equalization, ultraviolet disinfecting, step aeration. Biosolids are land applied.**
**Certified Operator Grades: STP: II; CS: I; Date Rated: 04/01/99**

## 2. RECEIVING STREAM INFORMATION

**unnamed tributary at mile 0.4 to Town Creek at mile 0.1**
**Watershed Group: Obey**
**Hydrocode: 5130105**
**Low Flow: 7Q10 = 0 MGD (0 CFS)**
**Low Flow Reference:**
**BPJ based on limited drainage area**
**Water Quality Designation: Exceptional Tennessee Waters**
**Stream Classification Categories:**

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

**Water Quality Assessment: Partially Supporting/ Not Supporting**

## 3. CURRENT PERMIT STATUS

| | |
|---|---|
| **Permit Type:** | **Municipal** |
| **Classification:** | **Minor** |
| **Issuance Date:** | **28-MAY-10** |
| **Expiration Date:** | **31-DEC-14** |
| **Effective Date:** | **01-JUN-10** |

## 4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

This permit is revoked and reissued at the applicant's request so that reduced monitoring frequencies can begin as soon as possible.

Monitoring Frequency Reduction

EPA allows for reduction in monitoring frequencies per the guidance document, "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies, April 1996". Reductions in the monitoring frequency are allowed in situations where facilities are discharging in compliance with their permit terms and conditions. The reductions in frequency are a function of both the significance of non-compliance and the level that the long term average effluent concentrations are below the permit limits. Non-compliance greater than or equal to 1.2 times the limit is considered significant for conventional pollutants (CBOD5, and TSS), and 1.4 times the permit limits considered significant for non-conventional pollutants (ammonia and settleable solids).

The division considers monitoring frequency reductions for parameters that serve as indicators of the treatment process performance such as $CBOD_5$ and TSS even if the limits are water-quality based. It does not consider such reductions for parameters whose limits are imperative for protecting the fishable and swimmable uses of the stream. For the two-year reporting period reviewed, there were no effluent violations for $CBOD_5$, TSS, and ammonia. Additionally, the long term average of the effluent concentrations of these parameters were all less than 25% of the permit limit. Therefore, monitoring frequencies for $CBOD_5$, TSS, and ammonia are being reduced to once per week. More frequent sampling to demonstrate compliance with effluent limitations are at the discretion of the permittee. Settleable solids is not considered for a reduction. The sequencing batch reactor process does not have a separate settling process and this facility is subject to inflow and infiltration which can reduce effective settling. The test primarily requires only the time to collect and read a sample.

The data and analysis are shown in Appendix 4.

Nutrient Permit Strategy

This permit imposes effluent limitations for nutrients in Part 1 and stream biological integrity monitoring in Part 3.6 consistent with the division's permit strategy for nutrient impaired streams. The limit ensures that the discharge complies with the anti-degradation provision of the state water quality standards. Refer to Section 8.0 and Appendix 3 in this fact sheet (rationale) for additional discussion and limit development.

Biosolids Requirements

This permit contains updated permit language in Part 3.3 consistent with the state's biosolids rule, 0400-04-15, effective June 30, 2013.

b. Compliance Schedule Summary

| Description of Report to be Submitted | Reference Section in Permit |
|---|---|
| Monthly Discharge Monitoring Reports | 1.3.1 |
| Monthly Operational Reports | 1.3.4 |
| Monthly Bypass and Overflow Summary Report | 1.3.5.1 |
| Industrial Waste Survey Report within 120 days of the effective permit date | 3.2.a |
| Stream Monitoring Plan within 180 days of effective permit date | 3.6 |
| Macro-invertebrate surveys downstream of Outfall 001, Two consecutive calendar years from 2014-2017 | 3.6 |

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

## 5. PREVIOUS PERMIT DISCHARGE MONITORING REPORT REVIEW

A review of the DMR summary from June 2010 through January 2014 reveals that the City of Byrdstown generally meets its effluent limitations. The notable exception to this is daily maximum *E.coli* with an effluent limit violation in 21 of the 44 months in the summarized reporting period. The reported values indicate that the wastewater is being disinfected but in a manner that does not consistently achieve the permit limits. The operator verbally reports that the facility design and flow rate contributes to the problem. This design incorporates an equalization basin between the sequencing batch reactors and the UV disinfecting. There are times when the inflow and infiltration flows do not allow for emptying and cleaning of the equalization basin and algae that grows there reduces the effectiveness of the ultraviolet disinfecting.

The DMR summary indicates that inflow and infiltration are the sewerage system's primary problem. Influent CBOD5 averages 117 mg/L and influent TSS averages 157 mg/L which are both relatively weak for municipal wastewater. Influent BOD5 and TSS concentrations have been reported as low as 41 mg/l and 62 mg/L respectively. The sequencing batch reactor is amenable to treating a variable flow rate, however, the technology does require the post equalization in order to minimize negative impacts of batch discharges on the stream's biological integrity.

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

## 6. PROPOSED EFFLUENT LIMITS AND RATIONALE

| PARAMETERS | MONTHLY AVERAGE CONCENTRATION (MG/L) | MONTHLY AVERAGE AMOUNT (LB/DAY) | WEEKLY AVERAGE CONCENTRATION (MG/L) | WEEKLY AVERAGE AMOUNT (LB/DAY) | DAILY MAXIMUM CONCENTRATION (MG/L) | DAILY MINIMUM PERCENT REMOVAL | RATIONALE |
|---|---|---|---|---|---|---|---|
| $CBOD_5$ | 15 | 31 | 20 | 42 | 30 | 40 | D.O. protection, Refer to 6.1 |
| $NH_3$-N | 1.3 | 2.7 | 2.0 | 4.2 | 2.6 | — | D.O. protection, Refer to 6.2 below |
| Total Suspended Solids | 30 | 63 | 40 | 83 | 45 | 40 | T.C.A. 1200-4-5-.09 |
| Dissolved Oxygen (mg/l) | 5.0 (daily minimum) instantaneous | — | — | — | — | — | D.O. protection, Refer to 6.1 below |
| Total Chlorine Residual (mg/l) | NA | NA | NA | NA | NA | — | Refer to 6.3 below |
| Total Nitrogen | — | — | — | — | Report (qtr avg) | Report (qtr load) | Refer to 6.4 below |
| Total Nitrogen | 26.7 lb/d as annual rolling average | | | | | | Refer to 8.0 below |
| Total Phosphorous | — | — | — | — | Report (qtr avg) | Report (qtr load) | Refer to 6.4 below |
| Total Phosphorous | 3.6 lb/d as annual rolling average | | | | | | Refer to 8.0 below |
| *E. coli* (colonies/100ml) | 126/100 ml | — | — | — | 487/100 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 |
| Sanitary Sewer Overflows, Total Occurrences | | | Report | | | | Refer to 6.7 below |
| Dry Weather Overflows, Total Occurrences | | | Report | | | | Refer to 6.7 below |
| Bypass of Treatment, Total Occurrences | | | Report | | | | Refer to 6.7 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 was performed at various conditions in 1997 to determine "planning limits" for design of a proposed increase in discharge from 0.25 MGD to 0.6 MGD. Reasons for the increase in treatment capacity were potential demand from industrial contributors being sought by the town and demand from inflow and infiltration in the collection system. The division's Notice of Violation dated 8/31/99 reported correlation between rainfall and influent flow on monthly operating report data. The wasteload allocation modeling projected that monthly average limits for $CBOD_5$ (15 mg/L), $NH_3$-N (1.3 mg/L), and D.O. (5.0 mg/l) would result in an instream dissolved oxygen concentration that remains above the required minimum of 5.0 mg/L. These modeling results are located in the permit file administrative record.

The facility upgrades were constructed and operational as July 2001. However, because the stream is an exceptional water, additional degradation cannot be allowed without additional documentation. State rule defines degradation as the alteration of the properties of water by the addition of pollutants or removal of habitat. Since this discharge is large relative to the unnamed tributary flow and roughly equal to the low flow in Town Branch, any increase in the discharge flow will result in measurable additions of pollutants to the waters.

Because the facility was upgraded in part to process wet weather flows through the facility for treatment thereby minimizing the bypass of treatment and collection system overflows, the division considered increasing weekly average and daily maximum permit limits for $BOD_5$ and TSS. However, review of the DMR monitoring data indicates that the SBR system accommodates the peak flows very well. So, no changes are being made to the $BOD_5$ and TSS permit limits with this permit reissue.

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 25°C and 15°C and pH of 7.5 to derive an allowable instream protection value protective of chronic exposure to a continuous discharge. A mass balance equation with sewage treatment facility and stream flows and this allowable value determines the monthly average permit limit. The criteria document states that a 30Q5 flow value is protective in deriving allowable values. Where the division has 30Q5 flow values, the division may use them. Otherwise, the division utilizes the available 7Q10 or 1Q10 values that are generally more conservative. The criteria continuous concentrations (CCC) derived from assumed temperature and pH values are as follows:

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

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

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

The mass balance equation is as follows:

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

where:

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

$$C_{STP} = \frac{CCC\ (MGD + .6\ MGD) - (MGD \times 0.1 mg/l)}{.6\ MGD} = 1.94\ mg/l\ (summer)$$

$$C_{STP} = \frac{CCC\ (MGD + .6\ MGD) - (MGD \times 0.1 mg/l)}{.6\ MGD} = 3.72\ mg/l\ (winter)$$

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 (1.3 year-round) are applied to the permit.

## 6.3. CHLORINATION

The permit does not impose an effluent limit on total residual chlorine since the facility now disinfects via ultraviolet radiation.

## 6.4. TOTAL NITROGEN AND TOTAL PHOSPHOROUS LIMITATIONS

This permit continues to impose the quarterly influent and effluent monitoring established in the previous permit. The reporting enables Byrdstown to demonstrate that its nutrient load to Town Creek is relatively low. Additionally, this permit imposes effluent limitations on the current nutrient load level for purposes of anti-degradation. Anti-degradation is a provision in the state water quality standards that regulates activities causing degradation of public waters. Degradation is the alteration of the properties of water by the addition of pollutants or removal of habitat. The provision requires that persons engaged in activities that result in degradation to take actions to prevent degradation. For point source dischargers, the actions can either be non-discharging alternatives or higher levels of treatment. For additional discussion on the limit development, refer to Section 8.0 and Appendix 3.

## 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.

This facility does not have reasonable potential to discharge in toxic amounts if it discharges in compliance with its permit terms and conditions. This facility design flow is less than 1.0 MGD, the facility has no industrial contribution, does not use chlorine, and limits effluent to protect water quality criteria.

## 6.7. OVERFLOW AND BYPASS REPORTING

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

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

# 7. OTHER PERMIT REQUIREMENTS AND CONDITIONS

## 7.1. CERTIFIED WASTEWATER TREATMENT OPERATOR

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

## 7.2. COLLECTION SYSTEM CERTIFIED OPERATOR

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

## 7.3. PRETREATMENT PROGRAM

The current pretreatment program is in the inactive stage. The program will remain inactive as long as no significant industries discharge into the collection system. Should a significant industrial user request permission to discharge into the Byrdstown system, then the City must request that the division reactivate the

pretreatment program. This must be done prior to the industrial discharge taking place.

The City of Byrdstown must complete an updated Industrial Waste Survey (IWS) and submit it to the division's Central Office Pretreatment Coordinator within 120 days of the effective date, unless such a survey has been submitted within 3 years of the effective date. Otherwise, completion and submission of the next IWS shall be as directed by law.

## 7.4. BIOSOLIDS/SLUDGE MANAGEMENT

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

The language in subpart 3.3 of the permit, relative to biosolids management, a CWA requirement, allows the "permitting authority" under 40 CFR Part 503.9(p) to be able to enforce the provisions of Part 503. The "permitting authority" relative to Part 503 is either a state that has been delegated biosolids management authority or the applicable EPA Region; in the case of Tennessee it is EPA-Region 4.

Tennessee regulates the land application of biosolids under state rules, Chapter 0400-40-15. The state rules became effective on June 30, 2013. Under these state rules, all facilities that land apply biosolids must obtain a biosolids permit from the division. The land application of biosolids under state rules will be regulated through either a general permit or by an individual permit. It is anticipated that the permitting of biosolids land application will begin near the beginning of calendar year 2014. Questions about the division's biosolids regulations and permitting program should be directed to the division's Biosolids Coordinator at:

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

## 7.5. PERMIT TERM

This permit is being reissued for 5 years in order to coordinate its reissuance with other permits located within the Obey 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# TN05130105033_1400.

The division has made a determination of the receiving waters associated with the subject discharge(s) and has found the (stream or river) to be a high quality water due to being habitat for exceptional biological diversity. No permanent degradation of water quality will be allowed unless the applicant demonstrates to the Water Quality Control Board that the degradation is for necessary economic or social development and will not interfere with or become injurious to any existing uses. The specific requirements for this demonstration are described in the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06(4).

Additionally, the division assesses Town Creek to not support its recreational use due to the presence of *E. coli* and to partially support its fish and aquatic life use due to nitrates and phosphorus from point sources and sedimentation and siltation from unknown sources. This permit imposes effluent limitations on *E. coli* equal to the in-stream water quality standard. Compliance with the effluent limit will be protective of water quality standards. In its assessment of Town Creek, the division notes that discharges from the facility have improved such that the biological assessment conducted in 2012 met the biological integrity target score. The assessment score was 32 and the target is 32. The division cannot determine that nutrient controls are no longer needed on the basis of a single score just meeting the target. However, the division believes that Byrdstown needs to continue providing the same quality of treatment currently being attained in order to maintain the biological integrity. Therefore, this permit imposes effluent load limits for this purpose. Limit derivation and rationale are provided in Appendix 3.

TMDLs have been developed and approved for this waterbody segment on the following parameters and dates:

| Parameter | TMDL Approval Date |
|---|---|
| *E. coli* | March 08, 2008 |

The wasteload allocation developed for WWTFs in that TMDL is expressed as *E. coli* loads (CFU/day) and further requires that all current and future WWTFs must meet water quality standards at the point of discharge as specified in their NPDES permit and at no time shall concentration be greater than the appropriate *E. coli* standard (487 CFU/100 mL or 941 CFU/100 mL). Therefore, terms and conditions of this permit comply with TMDL approved by EPA on 3/11/08.

On April 11, 2014, the permittee submitted a determination that continued discharge into the unnamed tributary at mile 0.4 to Town Creek at mile 0.1 is the only feasible alternative available at this time.

# 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 |
|---|---|---|---|---|---|---|---|
| $CBOD_5$ | 15 | 31 | 20 | 42 | 30 | 40 | 3/week |
| $NH_3$-N | 1.3 | 2.7 | 2.0 | 4.2 | 2.6 | — | 3/week |
| Total Suspended Solids | 30 | 63 | 40 | 83 | 45 | 40 | 3/week |
| Dissolved Oxygen (mg/l) | 5.0 (daily minimum) instantaneous | — | — | — | — | — | 5/week |
| Total Nitrogen | Report | — | — | — | Report | — | 1/quarter |
| Total Phosphorous | Report | — | — | — | Report | — | 1/quarter |
| *E. coli* (colonies/100ml) | 126 cfu /100 ml | — | — | — | 487 cfu /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): | | | | | | | |
| Influent | Report | — | — | — | Report | — | 7/week |
| Effluent | Report | — | — | — | Report | — | 7/week |
| 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 | | | | 5.0 | 126 | 487 | |
| Summer | | | | 15 | 30 | | | 30 | 45 | | | | | | 1.3 | 2.6 | | | | |
| Winter | | | | 15 | 30 | | | 30 | 45 | | | | | | 1.3 | 2.6 | | | | |
| Average | 0.182 | 0.474 | 117 | 2 | 5 | 98 | 157.3 | 2 | 7 | 98 | 0.8 | 7.2 | 7.7 | | 0.1 | 0.4 | 8.1 | 51 | 751 | |
| Maximum | 0.631 | 0.911 | 192 | 4 | 11 | 100 | 303.0 | 4 | 32 | 100 | 1.0 | 7.7 | 8.1 | | 0.6 | 6.3 | 11.1 | 221 | 2420 | |
| Minimum | 0.075 | 0.112 | 41 | 0 | 1 | 91 | 62.0 | 1 | 1 | 94 | 0.1 | 6.1 | 7.0 | | 0.0 | 0.1 | 5.1 | 2 | 13 | |
| + = Exceedence | | | | | | | | | | | | | | | | 1 | | 3 | 21 | 3 |
| Date | | | | | | | | | | | | | | | | | | | | |
| Jun/10 | 0.097 | 0.127 | 172 | 4 | 10 | 98 | 208 | 1 | 2 | 99 | 0.1 | 7.2 | 8.0 | | 0.15 | 0.53 | 6.9 | 2.4 | 13.4 | |
| Jul/10 | 0.118 | 0.337 | 145 | 2 | 4 | 98 | 166 | 1 | 4 | 99 | 0.1 | 7.4 | 8.1 | | 0.12 | 0.49 | 6.8 | 10 | 866 + | |
| Aug/10 | 0.631 | 0.871 | 118 | 2 | 4 | 97 | 134 | 1 | 1 | 99 | 0.1 | 7.4 | 8.0 | | 0.07 | 0.11 | 6.6 | 7.9 | 62 | |
| Sep/10 | 0.104 | 0.194 | 162 | 3 | 5 | 98 | 178 | 1 | 1 | 99 | 0.1 | 7.5 | 8.0 | | 0.10 | 0.11 | 7.0 | 17.3 | 71.7 | |
| Oct/10 | 0.100 | 0.235 | 163 | 3 | 7 | 98 | 219 | 1 | 3 | 100 | 0.1 | 7.1 | 7.6 | | 0.10 | 0.13 | 7.7 | 45.6 | 328 | |
| Nov/10 | 0.168 | 0.815 | 123 | 4 | 11 | 95 | 170 | 2 | 10 | 98 | 0.1 | 6.9 | 7.4 | | 0.11 | 0.27 | 8.5 | 10 | 1300 + | |
| Dec/10 | 0.216 | 0.556 | 57 | 2 | 7 | 95 | 64 | 2 | 9 | 95 | 0.1 | 6.6 | 7.5 | | 0.61 | 6.30 + | 9.5 | 16.1 | 1046 + | |
| Jan/11 | 0.199 | 0.682 | 61 | 2 | 3 | 96 | 75 | 1 | 3 | 98 | 0.1 | 6.4 | 7.2 | | 0.05 | 0.13 | 10.5 | 5 | 35 | |
| Feb/11 | 0.227 | 0.874 | 96 | 3 | 7 | 97 | 116 | 1 | 2 | 99 | 1.0 | 6.1 | 7.0 | | 0.04 | 0.13 | 9.5 | 16.3 | 248 | |
| Mar/11 | 0.300 | 0.625 | 47 | 3 | 6 | 91 | 62 | 3 | 7 | 95 | 1.0 | 6.1 | 7.1 | | 0.10 | 0.19 | 11.1 | 29.3 | 411 | |
| Apr/11 | 0.315 | 0.774 | 41 | 2 | 6 | 93 | 79 | 4 | 7 | 95 | 1.0 | 6.3 | 8.0 | | 0.16 | 0.35 | 8.2 | 60.7 | 2420 + | |
| May/11 | 0.186 | 0.649 | 70 | 2 | 3 | 97 | 100 | 2 | 32 | 97 | 1.0 | 7.6 | 8.0 | | 0.14 | 0.30 | 7.8 | 117.4 | 921 + | |
| Jun/11 | 0.118 | 0.399 | 131 | 1 | 3 | 99 | 215 | 2 | 6 | 99 | 1.0 | 6.9 | 8.0 | | 0.10 | 0.19 | 6.9 | 37.4 | 186 | |
| Jul/11 | 0.089 | 0.154 | 192 | 1 | 1 | 100 | 217 | 1 | 2 | 99 | 1.0 | 7.7 | 8.1 | | 0.07 | 0.12 | 6.7 | 92.3 | 579 + | |
| Aug/11 | 0.075 | 0.112 | 190 | 1 | 4 | 99 | 269.3 | 2 | 5 | 99.4 | 1.0 | 7.6 | 7.8 | | 0.07 | 0.28 | 6.3 | 41.3 | 866 + | |
| Sep/11 | 0.128 | 0.428 | 135 | 2 | 8 | 98 | 176 | 3 | 9 | 98 | 1.0 | 7.5 | 7.9 | | 0.13 | 0.87 | 7.4 | 107.4 | 2420 + | |
| Oct/11 | 0.107 | 0.209 | 158 | 2 | 5 | 99 | 191 | 3 | 4 | 99 | 1.0 | 7.5 | 7.9 | | 0.05 | 0.12 | 7.8 | 36 | 308 | |
| Nov/11 | 0.235 | 0.892 | 102 | 1 | 3 | 99 | 121 | 3 | 12 | 94 | 1.0 | 7.6 | 7.9 | | 0.03 | 0.16 | 8.9 | 64.8 | 365 | |
| Dec/11 | 0.291 | 0.610 | 47 | 1 | 4 | 97 | 63 | 2 | 5 | 95 | 1.0 | 7.5 | 7.8 | | 0.08 | 0.35 | 9.5 | 27 | 461 | |
| Jan/12 | 0.256 | 0.511 | 61 | 1 | 2 | 98 | 99 | 2 | 5 | 97 | 1.0 | 7.5 | 7.9 | | 0.05 | 0.40 | 9.7 | 29 | 228 | |
| Feb/12 | 0.204 | 0.336 | 82 | 1 | 3 | 98 | 121 | 2 | 4 | 98 | 1.0 | 7.5 | 7.8 | | 0.08 | 0.46 | 9.6 | 9.4 | 69.7 | |
| Mar/12 | 0.207 | 0.634 | | 1 | 2 | 98 | 107 | 2 | 3 | 98 | 1.0 | 7.3 | 7.7 | | 0.04 | 0.06 | 8.5 | 7.4 | 78.9 | |
| Apr/12 | 0.097 | 0.133 | 160 | 1 | 2 | 99 | 217 | 2 | 2 | 99 | 1.0 | 7.3 | 7.8 | | 0.08 | 0.18 | 8.2 | 46.4 | 816 + | |
| May/12 | 0.098 | 0.197 | 158 | 2 | 8 | 99 | 197 | 3 | 19 | 98 | 1.0 | 7.4 | 7.6 | | 0.08 | 0.11 | 7.1 | 9.7 | 63.1 | |
| Jun/12 | 0.082 | 0.141 | 183 | 2 | 6 | 99 | 303 | 1 | 3 | 100 | 1.0 | 7.3 | 7.8 | | 0.07 | 0.10 | 6.9 | 4.7 | 54.6 | |
| Jul/12 | 0.137 | 0.339 | 141 | 1 | 2 | 99 | 160 | 3 | 17 | 98 | 1.0 | 7.1 | 7.8 | | 0.08 | 0.15 | 6.7 | 14.2 | 201 | |
| Aug/12 | 0.113 | 0.342 | 130 | 1 | 3 | 99 | 218 | 2 | 7 | 99 | 1.0 | 7.4 | 7.7 | | 0.04 | 0.16 | 6.9 | 16.9 | 155 | |
| Sep/12 | 0.139 | 0.580 | 114 | 1 | 2 | 99 | 169 | 3 | 9 | 98 | 1.0 | 7.3 | 7.6 | | 0.17 | 0.41 | 6.9 | 137.7 + | 1553 + | |
| Oct/12 | 0.138 | 0.602 | 120 | 2 | 7 | 98 | 209 | 2 | 6 | 99 | 1.0 | 7.5 | 7.8 | | 0.20 | 1.70 | 7.8 | 31.5 | 1046 + | |
| Nov/12 | 0.103 | 0.197 | 165 | 2 | 11 | 99 | 195 | 1 | 4 | 99 | 1.0 | 7.3 | 7.6 | | 0.09 | 0.32 | 9.0 | 82.7 | 1046 + | |
| Dec/12 | 0.161 | 0.346 | 72.3 | 1 | 7 | 97 | 107 | 2 | 4 | 97 | 1.0 | 7.2 | 7.8 | | 0.05 | 0.12 | 8.0 | 35.6 | 159 | 1 |
| Jan/13 | 0.277 | 0.741 | 83 | 1 | 2 | 98 | 120 | 3 | 7 | 97 | 1.0 | 7.3 | 7.7 | | 0.06 | 0.16 | 9.6 | 36.5 | 1733 + | |
| Feb/13 | 0.191 | 0.336 | 81 | 1 | 2 | 97 | 100 | 3 | 5 | 97 | 1.0 | 7.4 | 7.6 | | 0.09 | 0.41 | 9.8 | 79.8 | 2420 + | 1 |
| Mar/13 | 0.260 | 0.754 | 56 | 1 | 3 | 98 | 93 | 4 | 15 | 96 | 1.0 | 7.2 | 7.7 | | 0.07 | 0.19 | 9.3 | 14.2 | 291 | |
| Apr/13 | 0.251 | 0.701 | 80 | 1 | 5 | 99 | 105 | 2 | 6 | 96 | 1.0 | 7.4 | 7.6 | | 0.12 | 0.31 | 8.7 | 31.5 | 435 | |
| May/13 | 0.225 | 0.911 | 93 | 1 | 3 | 98 | 126 | 3 | 12 | 97 | 1.0 | 7.4 | 7.6 | | 0.10 | 0.23 | 7.6 | 220.6 + | 2420 + | |
| Jun/13 | 0.102 | 0.135 | 180 | 1 | 1 | 99 | 296 | 2 | 4 | 99 | 1.0 | 7.3 | 7.7 | | 0.07 | 0.17 | 6.8 | 66.5 | 2420 + | |
| Jul/13 | 0.264 | 0.845 | 79 | 0 | 1 | 99 | 141 | 2 | 6 | 98 | | 7.4 | 7.9 | | 0.05 | 0.23 | 7.0 | 115.3 | 488 + | |
| Aug/13 | 0.182 | 0.531 | 98 | 1 | 2 | 99 | 138 | 2 | 4 | 98 | | 7.4 | 7.7 | | 0.14 | 1.20 | 5.1 | 68 | 345 | 1 |
| Sep/13 | 0.104 | 0.152 | 157 | 1 | 1 | 100 | 209 | 1 | 3 | 99 | | 7.3 | 7.7 | | 0.04 | 0.07 | 6.8 | 114.8 | 866 + | |
| Oct/13 | 0.098 | 0.130 | 182 | 1 | 6 | 100 | 229 | 1 | 5 | 99 | 1.0 | 7.3 | 7.5 | | 0.03 | 0.05 | 7.5 | 85.3 | 866 + | |
| Nov/13 | 0.107 | 0.336 | 164 | 2 | 7 | 98 | 262 | 2 | 7 | 99 | | 7.2 | 7.6 | | 0.06 | 0.10 | 8.3 | 180.4 + | 1553 + | |
| Dec/13 | 0.286 | 0.809 | 94 | 1 | 1 | 99 | 90 | 3 | 7 | 95 | 1.0 | 7.4 | 7.6 | | 0.05 | 0.12 | 9.2 | 13.2 | 62 | |
| Jan/14 | 0.221 | 0.592 | 86 | 2 | 8 | 98 | 87 | 2 | 4 | 97 | 1.0 | 7.2 | 7.8 | | 0.07 | 1.25 | 9.8 | 52.8 | 770 + | |
| Feb/14 | | | | | | | | | | | | | | | | | | | | |
| Mar/14 | | | | | | | | | | | | | | | | | | | | |

# APPENDIX 3

# WQS NUTRIENT PERMIT STRATEGY (NPS)

This permit incorporates terms and conditions consistent with the state water quality standards and permit regulations. This rationale represents the permit writer's outline for analyzing conditions, evaluating options and imposing requirements to a point source discharging into a nutrient impaired waterbody. This permit strategy is not to be confused with the state's nutrient reduction strategy (NRS) currently being developed separately from individual NPDES actions. The future nutrient reduction strategy will:

- Prioritize watersheds
- Set watershed load reduction goals
- Ensure effectiveness of point source permits
- Develop implementable watershed-scale plans that maximize the effectiveness of agricultural BMPs
- Ensure nutrient reductions from non-MS4 developed communities
- Include watershed-based monitoring programs to evaluate effectiveness

The timeline for completing the NRS development is not established. Therefore, this permit incorporates every item in the outline below except for item 5):

1) Initiate NPDES Permit Action
   a) Permit renewals
   b) Permit modifications (for activity with potential to increase nutrient loading)
   c) Enforcement actions (with potential to increase nutrient loading)

2) Verify, Document and Reference Division's Water Quality Information for Nutrients
   a) Review Assessment Database (ADB) for:
      i) Any form of Nitrogen
      ii) Any form of Phosphorous
      iii) Overall characterization of the receiving discharge segment (causes, sources)
      iv) Downstream discharge segment(s) - if degraded by activity
      v) If necessary, consult with Planning and Standards staff (Greg Denton)
   b) Review Water Quality (Ambient) Monitoring Data
      i) Chemical data < 5 Years Old
      ii) Macro-invertebrate or bio-recon < 5 Years Old
      iii) Alternate assessment review/rationale if data .> 5 Years Old
      iv) Verify eco-regional goals not met
      v) If necessary, consult with planning and standards staff (Linda Cartwright)

3) Develop NPDES Permit with EPA Approved TMDL WLAs
   a) Allow three year compliance schedule unless TMDL establishes less time
   b) Consider applicability of any proposed TMDL

4) Impose Anti-Degradation Nutrient Limits (during compliance period, if applicable)
   a) Based on three samples minimum
   b) Consider facility specific factors supplied by the permittee

c) Apply as 6-month or annual load limit (discuss rationale for the decision)

5) Impose Nutrient Reduction Strategy Limits (after the compliance period)
   a) Implement Best Attainable Condition (BAC) based on USGS SPARROW-HUC 10 Model (or HUC 12 model results, if available)

6) Associate with Compliance Schedule (minimum one year for Treatment Optimization Plan, three years for construction)
   a) Impose biological and chemical stream monitoring plan to evaluate results

The water quality assessment and permit development considerations are best understood in consideration of the water quality standards and permit rules currently applicable to this discharge. Water quality standards include both a narrative criterion and an anti-degradation provision. The permit regulation imposes narrative criteria in addition to minimum treatment standards.

Water Quality Standards

State water quality standards impose a narrative nutrient criterion to protect the fish and aquatic life designated use of streams in Tennessee. This criterion requires that nutrient levels in streams do not stimulate aquatic plant and/or algae growth to the extent that aquatic habitat is substantially reduced and/or the biological integrity fails to meet regional goals. The division interprets the primary goal to be for water to support a macro-invertebrate community comparable to biological communities found in eco-region reference streams which are not subject to impacts by society activities such as farming, urban runoff and point source discharges. The measureable goal of the narrative standard is the target index score established for each set of eco-regions in the state. An eco-region is a relatively homogenous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, and other ecologically relevant variables. The index score is sum of matrix scores based on the quantity and types of macro-invertebrates in a stream biological survey.

For assessment purposes, the division also compares the ambient level of nutrients in a stream to the 90$^{th}$ percentile values seen in comparable eco-region reference streams. Whenever the ambient levels are consistently elevated above the reference stream value, the division considers that stream as having unavailable conditions for nutrients. Unavailable conditions necessitate development of effluent limitations consistent with the state anti-degradation policy. The anti-degradation policy specifically requires that discharges not further a condition of impairment.

Permit Standards

In addition to establishing minimum treatment levels for technology, the permit regulation also requires the commissioner[1] to set effluent limits in each permit which will indicate adequate operation or performance of treatment units used and which will appropriately limit harmful parameters present in the wastewater. Therefore, the permit writer considers site specific factors to determine if more stringent controls are warranted at the time of permit

[1] Rule 0400-40-05-.09

issue. Site specific factors include type of treatment, permit compliance factors, actual flow rate, design flow rate, and stream flow rate. Permit specific considerations are detailed below following discussion on the receiving stream assessment.

## Water Quality Assessment of Receiving Stream

In its assessment of Town Creek, the division notes that discharges from the facility have improved such that the biological assessment conducted in 2012 met the biological integrity target score. The assessment score was 32 and the target is 32. The division cannot determine that nutrient controls are no longer needed on the basis of a single score just meeting the target. Municipal wastewater is a source of nutrients. Therefore, effluent limitations on nutrients must be considered in this permit.

## Limit Development

Immediately, the permit imposes limits based on actual loadings to cap the loadings at their present levels. These loadings are imposed as annual rolling averages. 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 designed to remove nutrients and also since incidental biological removals of nutrients are functions of other variables, annual rolling average loads allow operational flexibility in achieving the load limits. The minimum monitoring frequency is quarterly to coincide with the frequency used to generate the dataset used to derive the limit.

These limits are imposed in Part 1 of the permit and were determined by comparing existing load limits to load limits derived from “best attainable condition” targets being used by the division in its permitting strategy. The targets are applied at a facility’s design flow rate. The data on the next page indicate that Byrdstown currently achieves levels better than the targets believed to represent a level protective of the narrative water quality standard. The existing load levels, when maintained, will represent effluent concentrations at the design flow (0.6 MGD) of 5.3 mg/L total nitrogen and 0.7 mg/L total phosphorus.

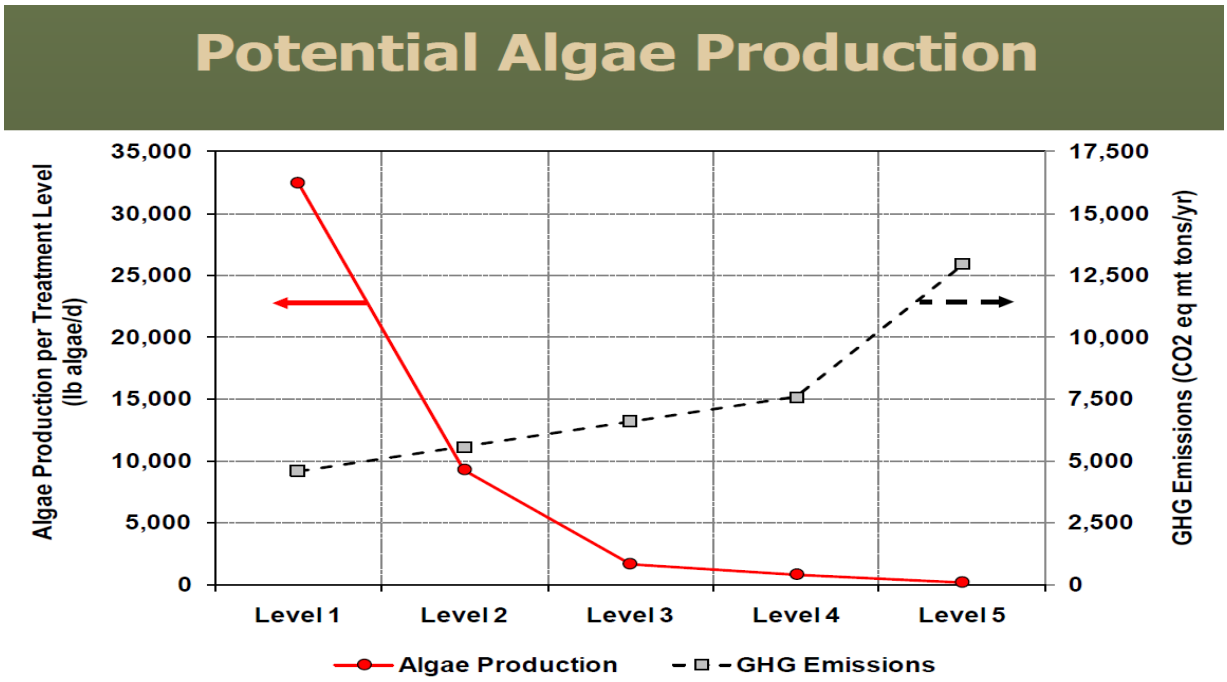
| | Total Nitrogen | | | | Total Phosphorus | | | |
|---|---|---|---|---|---|---|---|---|
| | Influent | | Effluent | | Influent | | Effluent | |
| Mo/Year | mg/l | lb/d | mg/l | lb/d | mg/l | lb/d | mg/l | lb/d |
| | | | | | | | | |
| Jun-10 | 25..2 | 12 | 13.4 | 13 | 2.55 | 1 | 2.51 | 3 |
| Sep-10 | 36.4 | 16 | 17.7 | 19 | 4.2 | 2 | 2.6 | 3 |
| Dec-10 | 18.7 | 132 | 10.6 | 72 | 2 | 14 | 1.8 | 12 |
| Mar-11 | 11.6 | 36 | 6.9 | 19 | 0.997 | 3 | 0.538 | 1 |
| Jun-11 | 38.2 | 14 | 19.8 | 14 | 3.1 | 3 | 2.7 | 2 |
| Sep-11 | 37.5 | 24.5 | 22.3 | 16.3 | 3.6 | 2.4 | 2.8 | 2 |
| Dec-11 | 14.6 | 33.6 | 7.8 | 17.8 | 0.78 | 1.79 | 0.656 | 1.5 |
| Mar-12 | 15.82 | 66.54 | 16.95 | 72.8 | 3.61 | 15.18 | 1.65 | 7.1 |
| May-12 | 29.72 | 13.2 | 17.86 | 12.8 | 4.34 | 1.9 | 3.43 | 2.5 |
| Jul-12 | 18.75 | 21 | 15.68 | 22.2 | 2.99 | 3.4 | 2.95 | 4.2 |
| Nov-12 | 35.9 | 16 | 28.52 | 24 | 6.42 | 3 | 3.27 | 3 |
| Mar-13 | 15.95 | 30.5 | 14.92 | 27.2 | 1.08 | 2.1 | 0.79 | 1.4 |
| May-13 | 33 | 19.4 | 23.4 | 21.6 | 6.8 | 4 | 1.9 | 1.8 |
| Sep-13 | 39.1 | 17.6 | 29.57 | 24 | 7.49 | 3.4 | 2.76 | 2.2 |
| Nov-13 | 23.72 | 65.97 | 22.99 | 24.4 | 3.87 | 11.01 | 2.64 | 7.4 |
| AVE | 26.35 | 34.55 | 17.89 | 26.67 | 3.59 | 4.75 | 2.20 | 3.61 |
| SD | 10.28 | 32.07 | 6.76 | 19.07 | 2.06 | 4.61 | 0.94 | 3.00 |

| LOAD COMPARISON | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total Nitrogen | | | | Total Phosphorus | | | |
| | | | | lb/d | | | | lb/d |
| Long Term Ave | | | | 26.7 | | | | 3.6 |
| Application | | | | 23.1 | | | | 2.0 |
| | | | | | | | | |
| Target | | | | | | | | |
| TN: | 0.6 MGD x 8 mg/L x 8.34 | | | 40.0 | | | | |
| TP: | 0.6 MGD x 1 mg/L x 8.34 | | | | | | | 5.0 |
| | | | | | | | | |
| Where: | | | | | | | | |
| | 0.6 = Design Flow Rate | | | | | | | |
| Rationale: | Use Long Term Average Load (based on 15 values; Application is based on only 4 values) | | | | | | | |
| | Only one effluent value above exceeds the mean plus two standard deviations. | | | | | | | |
| Equivalent Concentration: | | TN: | 26.7 mg/l ÷ (0.6 MGD x 8.34) = 5.3 mg/l | | | | | |
| | | TP: | 3.6 mg/L ÷ (0.6 MGD x 8.34) = 0.7 mg/L | | | | | |

The treatment facility incorporates sequencing batch reactor technology with post equalization. Biological treatment is capable of achieving nutrient removal. Additionally, division water quality assessments have identified situations where wastewater treatment plant optimization can allow macro-invertebrate communities to achieve index scores that achieve eco-region goals. These situations have occurred where the low stream flow still provided some dilution of the treated effluent. This permit is not imposing a nutrient optimization plan since the current loading level is less than “best attainable condition” targets of 8 mg/l TN and 1 mg/l TP used in the permitting strategy.

Research presented by the Water Environment Research Foundation (WERF) suggests a relationship between optimized removal rates and water quality impacts[2]. The research shows that a treatment level objective of 8 mg/l TN and 1 mg/l TP, results in a significant reduction in algae production level.

| Treatment Level Objectives Level | BOD (mg/L) | TSS (mg/L) | TN (mg N/L) | TP (mg P/L) |
|---|---|---|---|---|
| 1 | 30 | 30 | - | - |
| 2 | <30 | <30 | 8 | 1 |
| 3 | <30 | <30 | 4-8 | 0.1-0.3 |
| 4 | <30 | <30 | 3 | 0.1 |
| 5 | <30 | <30 | 2 | <0.02 |




To assist in determining whether more stringent levels of nutrient treatment and removal may be required, the permit requires an instream bioassessment monitoring plan and two biological assessments in consecutive years. Consecutive years allows for impacts on the stream biology associated with abnormal weather patterns.

[2] WERF 2011 Webinar Series, Water Environment Research Foundation, Nutrient Removal: Cost and Benefits, Degrees of Difficulty, and Regulatory Decision Making, October 5, 2011, A. Pramanik, PhD, BCEEM (WERF), M. Falk, PhD, J.B. Neethling, PhD, PE, BCEE, D. Reardon, PE, BCEE (HDR Engineering, Inc.)

# APPENDIX 4
# MONITORING FREQUENCY REDUCTIONS

| | Conventional pollutants | | | | | Non-conventional pollutants | |
|---|---|---|---|---|---|---|---|
| | **$CBOD_5$** | **% Removal** | **TSS** | **% Removal** | **Oil & Grease** | **Ammonia** | **Settleable Solids** |
| **Effluent limits** | 15 | 85 | 30 | 85 | NA | 1.3 | 1 |
| **SNC** | 21 | 61 | 42 | 60.7 | | 1.56 | 1.2 |
| **Date** | | | | | | | |
| 28-Feb-12 | 1 | 98 | 2 | 98 | | 0.08 | 1.0 |
| 31-Mar-12 | 1 | 98 | 2 | 98 | | 0.04 | 1.0 |
| 30-Apr-12 | 1 | 99 | 2 | 99 | | 0.08 | 1.0 |
| 31-May-12 | 2 | 99 | 3 | 98 | | 0.08 | 1.0 |
| 30-Jun-12 | 2 | 99 | 1 | 100 | | 0.07 | 1.0 |
| 31-Jul-12 | 1 | 99 | 3 | 98 | | 0.08 | 1.0 |
| 31-Aug-12 | 1 | 99 | 2 | 99 | | 0.04 | 1.0 |
| 30-Sep-12 | 0.9 | 99 | 3 | 98 | | 0.17 | 1.0 |
| 31-Oct-12 | 1.8 | 98 | 2 | 99 | | 0.2 | 1.0 |
| 30-Nov-12 | 1.5 | 99 | 1 | 99 | | 0.09 | 1.0 |
| 31-Dec-12 | 1.4 | 97 | 2 | 97 | | 0.05 | 1.0 |
| 31-Jan-13 | 1.1 | 98 | 3 | 97 | | 0.06 | 1.0 |
| 28-Feb-13 | 1.1 | 97 | 3 | 97 | | 0.09 | 1.0 |
| 31-Mar-13 | 1.2 | 98 | 4 | 96 | | 0.07 | 1.0 |
| 30-Apr-13 | 1.1 | 99 | 2 | 96 | | 0.12 | 1.0 |
| 31-May-13 | 1.1 | 98 | 3 | 97 | | 0.1 | 1.0 |
| 30-Jun-13 | 0.9 | 99 | 2 | 99 | | 0.07 | 1.0 |
| 31-Jul-13 | 0.4 | 99 | 2 | 98 | | 0.05 | |
| 31-Aug-13 | 0.7 | 99 | 1.5 | 98 | | 0.14 | |
| 30-Sep-13 | 0.6 | 100 | 1 | 99 | | 0.04 | |
| 31-Oct-13 | 1.2 | 100 | 1.4 | 99 | | 0.03 | 1.0 |
| 30-Nov-13 | 2 | 98 | 2 | 99 | | 0.06 | |
| 31-Dec-13 | 0.7 | 99 | 3 | 95 | | 0.05 | 1.0 |
| 31-Jan-14 | 1.6 | 98 | 2 | 97 | | 0.07 | 1.0 |
| Total | 24.0 | 24.0 | 24.0 | 24.0 | | 24.0 | 20.0 |
| Average | 1.2 | 98.6 | 2.2 | 97.9 | | 0.1 | 1.0 |
| Std dev | 0.4 | 0.8 | 0.8 | 1.2 | | 0.0 | 0.0 |
| C.V. | 0.4 | 0.0 | 0.3 | 0.0 | | 0.5 | 0.0 |
| Ave as % Limit | 0.1 | 1.2 | 0.1 | 1.2 | | 0.1 | 1.0 |

The reduction guidance allows reductions from 3/wk to 1/wk when long term averages are less than 25% of the permit limit. % Limit values >1 mean the limit is always met. For $CBOD_5$ and TSS removal rates, the 0.1% limit applies.

DO, pH, $Cl_2$, and *E.coli* are not considered for a reduction in monitoring frequencies since the monitoring is imperative to protect Tennessee's fish and aquatic life and human health. Reductions for parameters that serve primarily as operational indicators of the treatment facility are considered.