

AUTHORIZATION TO DISCHARGE UNDER THE  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended (33 U.S.C. §§1251 et seq.; the “CWA”), and the Massachusetts Clean Waters Act, as amended (M.G.L. Chap. 21, §§26-53),

**Town of Spencer  
Sewer Commission**

is authorized to discharge from a facility located at

**Spencer Wastewater Treatment Plant  
Route 9  
Spencer, MA**

to receiving waters named

**Cranberry Brook**

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

This permit will become effective on the first day of the month following 60 days after signature.

This permit and the authorization to discharge expire at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on February 4, 2003 and expired on April 5, 2006.

This permit consists of 12 pages in Part I including effluent limitations, monitoring requirements, and state permit conditions; 25 pages in Part II, Standard Conditions; Attachment A - Freshwater Chronic Toxicity Test Procedure and Protocol, and Attachment B - Sludge Compliance Guidance.

**Signed this 27<sup>th</sup> day of September, 2007.**

/S/ SIGNATURE ON FILE

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Stephen S. Perkins, Director  
Office of Ecosystem Protection  
Environmental Protection Agency  
Boston, MA

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Glenn Haas, Director  
Division of Watershed Management  
Department of Environmental Protection  
Commonwealth of Massachusetts  
Boston, MA

**PART I**

Page

**A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

1. During the period beginning with the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall number 001. Such discharge shall be limited and monitored as specified below:

Effluent Characteristic	Units	Discharge Limitation			Monitoring Requirement	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Influent Flow – Annual Average <sup>1</sup>	MGD	1.08	----	-----	Continuous	Recorder
Influent Flow <sup>1</sup>	MGD	Report	----	Report	Continuous	Recorder
Effluent Flow – Annual Average <sup>1</sup>	MGD	Report	----	-----	Continuous	Recorder
Effluent Flow <sup>1</sup>	MGD	Report	----	Report	Continuous	Recorder
BOD ( <i>May 1- October 31</i> )  ( <i>November 1 - April 30</i> )	mg/l lbs/day mg/l lbs/day	5.6 50 30 270	7.5 68 45 405	Report Report Report Report	1/Week <sup>2</sup>	24-Hour Composite <sup>3</sup>
TSS ( <i>May 1- October 31</i> )  ( <i>November 1 - April 30</i> )	mg/l lbs/day mg/l lbs/day	5.6 50 30 270	7.5 68 45 405	Report Report Report Report	1/Week <sup>2</sup>	24-Hour Composite <sup>3</sup>
PH	S.U.	(See Condition I.A.1.a on page 6)			1/Day	Grab
Fecal Coliform Bacteria <sup>4,5</sup>	cfu/100 ml	200	----	400	1/Week	Grab
Escherichia Coli Bacteria <sup>4,5</sup>	cfu/100ml	126	----	669	1/Week <sup>5</sup>	Grab

Effluent Characteristic	Units	Discharge Limitation			Monitoring Requirement	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Ammonia-Nitrogen (May 1- October 31)	mg/l	0.56	0.84	Report	1/week	24-Hour Composite <sup>3</sup>
(December 1- April 30)	lbs/day	5.0	7.5	Report	2/Month	
(November 1-30)	mg/l	15.2	----	----	1/week	
	lbs/day	136	----	----		
	mg/l	8.5	----	----		
	lbs/day	76	----	----		
Total Nitrogen <sup>6</sup>	mg/l	Report	----	----	4/year	24-Hour Composite <sup>3</sup>
	lbs/day	Report				
Total Phosphorus (May 1-October 31) <sup>7</sup>	mg/l	0.2	-----	Report	3/week	24-Hour Composite <sup>3</sup>
	lbs/day	Report	-----	Report	1/year	
	lbs/day	0.79 <sup>7</sup>	-----	-----		
(November 1- April 30) <sup>8</sup>	mg/l	0.3	1.0	Report	1/week	24-Hour Composite <sup>3</sup>
	lbs/day	Report	-----	Report	1/year	
	lbs/day	1.19 <sup>8</sup>	-----	-----		
Copper <sup>9</sup>	µg/l	10.3	----	15.3	1/Month	24-Hour Composite <sup>3</sup>
LC <sub>50</sub> <sup>10, 11, 13</sup>	%	100%			2/year	24-Hour Composite <sup>3</sup>
Chronic NOEC <sup>10, 12, 13</sup>	%	92%			2/Year	24-Hour Composite <sup>3</sup>
Dissolved Oxygen	mg/l	>6.0	>6.0	----	1/week	Grab

(May 1- October 31)

## Footnotes:

1. Report annual average, monthly average, and the maximum daily influent and effluent flow. The 1.08 MGD flow limit is an annual average of the influent flow, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average influent flow for the reporting month and the monthly average flows of the previous eleven months. For the purpose of calculating the mass of pollutants in the discharge, effluent flow shall be used.
2. Sampling required for influent and effluent.
3. 24-hour composite samples will consist of at least twenty four (24) grab samples taken during one consecutive 24 hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.
4. This is a state certification requirement.
5. The fecal coliform monitoring and limits will be in effect for the period April 1 - October 31. Fecal coliform discharges shall not exceed a monthly geometric mean of 200 colony forming units (cfu) per 100 ml, nor shall exceed 400 cfu per 100 ml as a daily maximum. The fecal coliform limits and monitoring requirement will end one year from the effective date of the permit.

The Escherichia Coli (E. coli) limits will become effective one year from the effective date of the permit and will be in effect for the period from April 1 - October 31. E. coli discharges shall not exceed a monthly geometric mean of 126 cfu/100 ml, nor shall exceed 669 cfu as a daily maximum. E.coli monitoring frequency will increase to 1/week when the limits become effective. During the first year of the permit, when both fecal coliform and E.coli sampling are required, E. coli samples shall be taken at the same time as a fecal coliform sample.

6. Total Nitrogen shall be determined by performing the "Total Kjeldahl Nitrogen (as N)" test and the "Nitrate-Nitrite (as N)" test and adding the two test results together to produce a value for mg/l of Total Nitrogen.
7. The 0.79 lbs/day total phosphorus limit is a seasonal average limit for the period *May 1 – October 31*. The seasonal mass total phosphorus load shall be calculated as the arithmetic mean of the six monthly average total phosphorus loads for the months of *May 1 – October 31*, and shall be reported in November of each year.
8. The 1.19 lbs/day total phosphorus limit is a seasonal average limit for the period *November 1 – April 30*. The seasonal mass total phosphorus load shall be calculated as the arithmetic mean of the six monthly average total phosphorus load for the months of *November 1 – April 30*, and shall be reported in May of each year.

9. The minimum level (ML) for copper is defined as 3.0 µg/l. This value is the minimum level for copper using the furnace atomic absorption analytical method. Sample results of 3 µg/l or less shall be reported as zero on the discharge monitoring report.
  
10. The permittee shall conduct chronic (and modified acute) toxicity tests two times per year. The chronic test may be used to calculate the acute LC<sub>50</sub> at the 48 hour exposure interval. The permittee shall test the daphnid, Ceriodaphnia dubia, only. Toxicity test samples shall be collected during the second week of the months of February and August. The test results shall be submitted by the last day of the month following the completion of the test. The results are due March 31 and September 30, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit. If the results of any acute or chronic test fail to comply with the LC<sub>50</sub> and Chronic NOEC limits, the permittee must perform an additional test on an effluent sample collected within fourteen days of the date on which failed test sample was collected.

Test Dates	Submit Results By:	Test Species	Acute Limit LC <sub>50</sub>	Chronic Limit C-NOEC
February August	March 31 September 30	<u>Ceriodaphnia dubia</u> (daphnid)  See Attachment A	≥ 100%	≥ 92%

11. The LC<sub>50</sub> is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limits means that a sample of 100 % effluent (no dilution) shall cause no more that a 50% mortality rate.
  
12. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The “92% or greater” is defined as a sample which is composed of 92% (or greater) effluent, the remainder being dilution water.
  
13. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachment A Section IV.**,

**DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water. In lieu of an individual approval for alternate dilution water required in **Attachment A**, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called "Guidance Document") which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. If this Guidance document is revoked, the permittee shall revert to obtaining approval as outlined in **Attachment A**. The "Guidance Document" has been sent to all permittees with their annual set of DMRs and Revised Updated Instructions for Completing EPA's Pre-Printed NPDES Discharge Monitoring Report (DMR) Form 3320-1 and is not intended as a direct attachment to this permit. Any modification or revocation to this "Guidance Document" will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

**Part I.A.1. (Continued)**

- a. The discharge shall not cause a violation of the water quality standards of the receiving waters.
  - b. The pH of the effluent shall not be less than 6.5 or greater than 8.3 at any time.
  - c. The discharge shall not cause objectionable discoloration of the receiving waters.
  - d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.
  - e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.
  - f. If the average annual influent flow in any calendar year exceeds 80% of the facilities design flow, **the permittee shall submit a report to MassDEP by March 31** of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.
  - g. The results of sampling for any parameter above its required frequency must also be reported.
2. All POTWs must provide adequate notice to the Director of the following:
- a. Any new introduction of pollutants into that POTW from an indirect discharger in a primary industry category discharging process water; and

- b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
- c. For purposes of this paragraph, adequate notice shall include information on:
  - (1) The quantity and quality of effluent introduced into the POTW; and
  - (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

3. Prohibitions Concerning Interference and Pass Through:

- a. Pollutants introduced into POTW's by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

4. Toxics Control

- a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.
- b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

**B. UNAUTHORIZED DISCHARGES**

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall listed in Part I A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) are not authorized by this permit and shall be reported in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting). [Note: SSO Reporting Form (which includes MassDEP Regional Office telephone numbers) for submittal of written report to MassDEP is available on-line at <http://www/mass.gov/dep/water/approvals/surffms.htm#sso>.]

Flow in excess of the plant's treatment capacity which does not receive full secondary treatment is not a permissible bypass under 40 CFR §122.41(m) and is not authorized by this permit.

### C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions:

#### 1. Maintenance Staff

The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

#### 2. Preventative Maintenance Program

The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges.

#### 3. Infiltration/Inflow Control Plan:

The permittee shall develop and implement a plan to control infiltration and inflow (I/I) to the separate sewer system. The plan shall be submitted to EPA and MassDEP **within six months of the effective date of this permit** (see page 1 of this permit for the effective date) and shall describe the permittee's program for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow.

The plan shall include:

- An ongoing program to identify and remove sources of infiltration and inflow. The program shall include the necessary funding level and the source(s) of funding.
- An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.
- Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the

system.

- An educational public outreach program for all aspects of I/I control, particularly private inflow.

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and MassDEP annually, **by March 31**. The summary report shall, at a minimum, include:

- A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.
- Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year
- A map with areas identified for I/I-related investigation/action in the coming year.
- A calculation of the annual average I/I and the maximum month I/I for the reporting year.
- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

4. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR §122.2).

**D. SLUDGE CONDITIONS**

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.
2. The permittee shall comply with the more stringent of either the state or federal (40 CFR part 503), requirements.
3. The requirements and technical standards of 40 CFR part 503 apply to facilities which perform one or more of the following use or disposal practices.

- a. Land application - the use of sewage sludge to condition or fertilize the soil
  - b. Surface disposal - the placement of sewage sludge in a sludge only landfill
  - c. Sewage sludge incineration in a sludge only incinerator
4. The 40 CFR part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions also do not apply to facilities which do not dispose of sewage sludge during the life of the permit but rather treat the sludge (lagoons- reed beds), or are otherwise excluded under 40 CFR 503.6.
5. The permittee shall use and comply with the attached compliance guidance document to determine appropriate conditions. Appropriate conditions contain the following elements.
- General requirements
  - Pollutant limitations
  - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
  - Management practices
  - Record keeping
  - Monitoring
  - Reporting

Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year:

less than 290	1/ year
290 to less than 1500	1 /quarter
1500 to less than 15000	6 /year
15000 +	1 /month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR 503.8.
8. The permittee shall submit an annual report containing the information specified in the guidance by **February 19**. Reports shall be submitted to the address contained in the reporting section of the permit. Sludge monitoring is not required by the permittee when the permittee is not responsible for the ultimate sludge disposal. The permittee must be

assured that any third party contractor is in compliance with appropriate regulatory requirements. In such case, the permittee is required only to submit an annual report by **February 19** containing the following information:

- Name and address of contractor responsible for sludge disposal
- Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

## E. MONITORING AND REPORTING

### 1. Reporting

Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the following month.

Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency  
Water Technical Unit (SEW)  
P.O. Box 8127  
Boston, Massachusetts 02114

The State Agency is:

Massachusetts Department of Environmental Protection  
Central Regional Office - Bureau of Resource Protection  
627 Main Street  
Worcester, MA 01608

Signed and dated Discharge Monitoring Report Forms and toxicity test reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection  
Division of Watershed Management  
Surface Water Discharge Permit Program  
627 Main Street, 2nd Floor  
Worcester, Massachusetts 01608

## G. STATE PERMIT CONDITIONS

This Discharge Permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) under Federal and State law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MassDEP pursuant to M.G.L. Chap.21, §43.

Each Agency shall have the independent right to enforce the terms and conditions of this Permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of this permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this Permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this Permit is declared invalid, illegal or otherwise issued in violation of Federal law, this Permit shall remain in full force and effect under State law as a Permit issued by the Commonwealth of Massachusetts.

NPDES PART II STANDARD CONDITIONS  
(January, 2007)

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NPDES PART II STANDARD CONDITIONS  
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PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

- a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.
- b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed \$25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than 3 years, or both.
- c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed \$10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$25,000. Penalties for Class II violations are not to exceed \$10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$125,000.

Note: See 40 CFR §122.41(a)(2) for complete “Duty to Comply” regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator 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 Regional Administrator, upon request, copies of records required to be kept by this permit.

NPDES PART II STANDARD CONDITIONS  
(January, 2007)

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including “sludge-only facilities”), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

- a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words “confidential business information” on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).
- b. Claims of confidentiality for the following information will be denied:
  - (1) The name and address of any permit applicant or permittee;
  - (2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).
- c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

NPDES PART II STANDARD CONDITIONS  
(January, 2007)

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a 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.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

- (1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

## NPDES PART II STANDARD CONDITIONS

(January, 2007)

- (2) *Severe property damage* 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 be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

### b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

### c. Notice

- (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
- (2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

### d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

- (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- (2) There were no feasible alternatives to the bypass, such as the 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; and
- (3)
  - i) The permittee submitted notices as required under Paragraph 4.c. of this section.
  - ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

## 5. Upset

- a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit 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. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

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administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

- c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
  - (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
  - (2) The permitted facility was at the time being properly operated;
  - (3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
  - (4) The permittee complied with any remedial measures required under B.3. above.
- d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
- b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.
- c. Records of monitoring information shall include:
  - (1) The date, exact place, and time of sampling or measurements;
  - (2) The individual(s) who performed the sampling or measurements;
  - (3) The date(s) analyses were performed;
  - (4) The individual(s) who performed the analyses;
  - (5) The analytical techniques or methods used; and
  - (6) The results of such analyses.
- d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.
- e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by

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imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

### 2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

## PART II. D. REPORTING REQUIREMENTS

### 1. Reporting Requirements

- a. **Planned Changes.** The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:
  - (1) 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
  - (2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
  - (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
- b. **Anticipated noncompliance.** The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- c. **Transfers.** This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

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incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

- d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
- (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.
  - (2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.
  - (3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.
- e. Twenty-four hour reporting.
- (1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.  
  
A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
  - (2) The following shall be included as information which must be reported within 24 hours under this paragraph.
    - (a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
    - (b) Any upset which exceeds any effluent limitation in the permit.
    - (c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)
  - (3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

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- f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
  - g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.
  - h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.
2. Signatory Requirement
- a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)
  - b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.
3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

## PART II. E. DEFINITIONS AND ABBREVIATIONS

### 1. Definitions for Individual NPDES Permits including Storm Water Requirements

*Administrator* means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

*Applicable standards and limitations* means all, State, interstate, and Federal standards and limitations to which a “discharge”, a “sewage sludge use or disposal practice”, or a related activity is subject to, including “effluent limitations”, water quality standards, standards of performance, toxic effluent standards or prohibitions, “best management practices”, pretreatment standards, and “standards for sewage sludge use and disposal” under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

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*Application* means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in “approved States”, including any approved modifications or revisions.

*Average* means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

*Average monthly discharge limitation* means the highest allowable average of “daily discharges” over a calendar month calculated as the sum of all “daily discharges” measured during a calendar month divided by the number of “daily discharges” measured during that month.

*Average weekly discharge limitation* means the highest allowable average of “daily discharges” measured during the calendar week divided by the number of “daily discharges” measured during the week.

*Best Management Practices (BMPs)* means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of “waters of the United States.” BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

*Best Professional Judgment (BPJ)* means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

*Coal Pile Runoff* means the rainfall runoff from or through any coal storage pile.

*Composite Sample* means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

*Construction Activities* - The following definitions apply to construction activities:

- (a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.
- (b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.
- (c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

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- (d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
- (e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

*Contiguous zone* means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

*Continuous discharge* means a “discharge” which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

*Daily Discharge* means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the “daily discharge” is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the “daily discharge” is calculated as the average measurement of the pollutant over the day.

*Director* normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

*Discharge Monitoring Report Form (DMR)* means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by “approved States” as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA’s.

*Discharge of a pollutant* means:

- (a) Any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source”, or
- (b) Any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See “Point Source” definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

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to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any “indirect discharger.”

*Effluent limitation* means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of “pollutants” which are “discharged” from “point sources” into “waters of the United States”, the waters of the “contiguous zone”, or the ocean.

*Effluent limitation guidelines* means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise “effluent limitations”.

*EPA* means the United States “Environmental Protection Agency”.

*Flow-weighted composite sample* means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

*Grab Sample* – An individual sample collected in a period of less than 15 minutes.

*Hazardous Substance* means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

*Indirect Discharger* means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

*Interference* means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- (a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- (b) Therefore is a cause of a violation of any requirement of the POTW’s NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

*Landfill* means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

*Land application unit* means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

*Large and Medium municipal separate storm sewer system* means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

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populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

*Maximum daily discharge limitation* means the highest allowable “daily discharge” concentration that occurs only during a normal day (24-hour duration).

*Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO)* is defined as “maximum concentration” or “Instantaneous Maximum Concentration” during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean “a value that shall not be exceeded” during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of “Maximum Daily Discharge” and “Average Daily Discharge” concentrations are specifically limited to the daily (24-hour duration) values.

*Municipality* means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

*National Pollutant Discharge Elimination System* means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an “approved program”.

*New Discharger* means any building, structure, facility, or installation:

- (a) From which there is or may be a “discharge of pollutants”;
- (b) That did not commence the “discharge of pollutants” at a particular “site” prior to August 13, 1979;
- (c) Which is not a “new source”; and
- (d) Which has never received a finally effective NPDES permit for discharges at that “site”.

This definition includes an “indirect discharger” which commences discharging into “waters of the United States” after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a “site” for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a “site” under EPA’s permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

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An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a “new discharger” only for the duration of its discharge in an area of biological concern.

*New source* means any building, structure, facility, or installation from which there is or may be a “discharge of pollutants”, the construction of which commenced:

- (a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or
- (b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

*NPDES* means “National Pollutant Discharge Elimination System”.

*Owner or operator* means the owner or operator of any “facility or activity” subject to regulation under the NPDES programs.

*Pass through* means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW’s NPDES permit (including an increase in the magnitude or duration of a violation).

*Permit* means an authorization, license, or equivalent control document issued by EPA or an “approved” State.

*Person* means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

*Point Source* means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

*Pollutant* means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

- (a) Sewage from vessels; or
- (b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

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*Primary industry category* means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

*Privately owned treatment works* means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a "POTW".

*Process wastewater* means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

*Publicly Owned Treatment Works (POTW)* means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

*Regional Administrator* means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

*Secondary Industry Category* means any industry which is not a "primary industry category".

*Section 313 water priority chemical* means a chemical or chemical category which:

- (1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);
- (2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and
- (3) satisfies at least one of the following criteria:
  - (i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
  - (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
  - (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

*Septage* means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

*Sewage Sludge* means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

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*Sewage sludge use or disposal practice* means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

*Significant materials* includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

*Significant spills* includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

*Sludge-only facility* means any “treatment works treating domestic sewage” whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

*State* means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

*Storm Water* means storm water runoff, snow melt runoff, and surface runoff and drainage.

*Storm water discharge associated with industrial activity* means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

*Time-weighted composite* means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

*Toxic pollutants* means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of “sludge use or disposal practices” any pollutant identified in regulations implementing Section 405(d) of the CWA.

*Treatment works treating domestic sewage* means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, “domestic sewage” includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a “treatment works treating domestic sewage”, where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

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*Waste Pile* means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

*Waters of the United States* means:

- (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;
- (b) All interstate waters, including interstate “wetlands”;
- (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands”, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
  - (1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;
  - (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) All impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;
- (f) The territorial sea; and
- (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

*Wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

*Whole Effluent Toxicity (WET)* means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

*Active sewage sludge unit* is a sewage sludge unit that has not closed.

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*Aerobic Digestion* is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

*Agricultural Land* is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

*Agronomic rate* is the whole sludge application rate (dry weight basis) designed:

- (1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and
- (2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

*Air pollution control device* is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

*Anaerobic digestion* is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

*Annual pollutant loading rate* is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

*Annual whole sludge application rate* is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

*Apply sewage sludge or sewage sludge applied to the land* means land application of sewage sludge.

*Aquifer* is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

*Auxiliary fuel* is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

*Base flood* is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

*Bulk sewage sludge* is sewage sludge that is not sold or given away in a bag or other container for application to the land.

*Contaminate an aquifer* means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

*Class I sludge management facility* is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

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classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

*Control efficiency* is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

*Cover* is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

*Cover crop* is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

*Cumulative pollutant loading rate* is the maximum amount of inorganic pollutant that can be applied to an area of land.

*Density of microorganisms* is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

*Dispersion factor* is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

*Displacement* is the relative movement of any two sides of a fault measured in any direction.

*Domestic septage* is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

*Domestic sewage* is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

*Dry weight basis* means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

*Fault* is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

*Feed crops* are crops produced primarily for consumption by animals.

*Fiber crops* are crops such as flax and cotton.

*Final cover* is the last layer of soil or other material placed on a sewage sludge unit at closure.

*Fluidized bed incinerator* is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

*Food crops* are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

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*Forest* is a tract of land thick with trees and underbrush.

*Ground water* is water below the land surface in the saturated zone.

*Holocene time* is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

*Hourly average* is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

*Incineration* is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

*Industrial wastewater* is wastewater generated in a commercial or industrial process.

*Land application* is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

*Land with a high potential for public exposure* is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

*Land with low potential for public exposure* is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

*Leachate collection system* is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

*Liner* is soil or synthetic material that has a hydraulic conductivity of  $1 \times 10^{-7}$  centimeters per second or less.

*Lower explosive limit for methane gas* is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

*Monthly average (Incineration)* is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

*Monthly average (Land Application)* is the arithmetic mean of all measurements taken during the month.

*Municipality* means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

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*Other container* is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

*Pasture* is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

*Pathogenic organisms* are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

*Permitting authority* is either EPA or a State with an EPA-approved sludge management program.

*Person* is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

*Person who prepares sewage sludge* is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

*pH* means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

*Place sewage sludge or sewage sludge placed* means disposal of sewage sludge on a surface disposal site.

*Pollutant (as defined in sludge disposal requirements)* is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

*Pollutant limit (for sludge disposal requirements)* is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

*Public contact site* is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

*Qualified ground water scientist* is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

*Range land* is open land with indigenous vegetation.

*Reclamation site* is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

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*Risk specific concentration* is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

*Runoff* is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

*Seismic impact zone* is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

*Sewage sludge* is a 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 screening generated during preliminary treatment of domestic sewage in treatment works.

*Sewage sludge feed rate* is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

*Sewage sludge incinerator* is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

*Sewage sludge unit* is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

*Sewage sludge unit boundary* is the outermost perimeter of an active sewage sludge unit.

*Specific oxygen uptake rate (SOUR)* is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

*Stack height* is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

*State* is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

*Store or storage of sewage sludge* is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

*Surface disposal site* is an area of land that contains one or more active sewage sludge units.

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*Total hydrocarbons* means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

*Total solids* are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

*Treat or treatment of sewage sludge* is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

*Treatment works* is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

*Unstable area* is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

*Unstabilized solids* are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

*Vector attraction* is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

*Volatile solids* is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

*Wet electrostatic precipitator* is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

*Wet scrubber* is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl <sub>2</sub>	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

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TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M <sup>3</sup> /day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH <sub>3</sub> -N	Ammonia nitrogen as nitrogen
NO <sub>3</sub> -N	Nitrate as nitrogen
NO <sub>2</sub> -N	Nitrite as nitrogen
NO <sub>3</sub> -NO <sub>2</sub>	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

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Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	“Whole effluent toxicity” is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	“Chronic (Long-term Exposure Test) – No Observed Effect Concentration”. The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	“Acute (Short-term Exposure Test) – No Observed Effect Concentration” (see C-NOEC definition).
LC <sub>50</sub>	LC <sub>50</sub> is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC <sub>50</sub> = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

# FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL USEPA Region 1

## I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

## II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition, October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at <http://www.epa.gov/waterscience/WET/> . Exceptions and clarification are stated herein.

## III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6° C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

#### IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2, Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director  
Office of Ecosystem Protection (CAA)  
U.S. Environmental Protection Agency, Region 1  
Five Post Office Square, Suite 100  
Mail Code OEP06-5  
Boston, MA 02109-3912

and

Manager  
Water Technical Unit (SEW)  
U.S. Environmental Protection Agency  
Five Post Office Square, Suite 100  
Mail Code OES04-4  
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

*See the most current annual DMR instructions which can be found on the EPA Region 1 website at <http://www.epa.gov/region1/enforcementandassistance/dmr.html> for further important details on alternate dilution water substitution requests.*

## **V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA**

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

### **V.1. Use of Reference Toxicity Testing**

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

#### V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e.  $\geq 3$  standard deviations for IC25 values and  $\geq$  two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

## VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

<u>Parameter</u>	Effluent	Receiving Water	ML (mg/l)
Hardness <sup>1, 4</sup>	x	x	0.5
Total Residual Chlorine (TRC) <sup>2, 3, 4</sup>	x		0.02
Alkalinity <sup>4</sup>	x	x	2.0
pH <sup>4</sup>	x	x	--
Specific Conductance <sup>4</sup>	x	x	--
Total Solids <sup>6</sup>	x		--
Total Dissolved Solids <sup>6</sup>	x		--
Ammonia <sup>4</sup>	x	x	0.1
Total Organic Carbon <sup>6</sup>	x	x	0.5
Total Metals <sup>5</sup>			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02

Other as permit requires

#### Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
    - Method 2340B (hardness by calculation)
    - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
    - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
      - Method 4500-CL E Low Level Amperometric Titration
      - Method 4500-CL G DPD Colorimetric Method
    - USEPA 1983. Manual of Methods Analysis of Water and Wastes
      - Method 330.5
  3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
  4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
  5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
  6. Analysis to be performed on initial samples only

## **VII. TOXICITY TEST DATA ANALYSIS AND REVIEW**

### A. Test Review

#### 1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at <http://water.epa.gov/scitech/methods/cwa/> . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

#### 2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value, for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.
- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: [Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program](#) can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater than the PMSD lower bound, then the treatment is considered statistically significant.
- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

## B. Statistical Analysis

### 1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

### 2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

### 3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

## VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

# **EPA REGION I**

## **NPDES PERMIT SLUDGE COMPLIANCE GUIDANCE**

**04 NOVEMBER 1999**

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## **1. LAND APPLICATION**

This section applies to sewage sludge from the permittee's facility which is applied to the land for the purpose of enriching the soil. The permittee should answer the following questions. The answers to these questions need to be evaluated to determine which permitting scenario for sewage sludge land application applies. After the permitting scenario is determined, the permittee must comply with the directives contained in the chosen scenario.

### **1.1 Question Algorithm**

The permittee should review and answer the following questions. The information gathered from answering these questions will aid the permittee to determine the appropriate land application scenario which applies to the sludge generated at the permittee's waste water treatment facility. The scenario selected will detail which specific Use or Disposal of Sewage Sludge, Part 503, regulations must be complied with for the land application method used by the permittee.

1. What type of land is the sewage sludge being applied to?

If the sewage sludge/material is to be sold or given away, or applied to a lawn or home garden, the sewage sludge **MUST** meet Class A pathogen reduction requirements.

2. Is all the sludge generated at the facility used in the same manner?

If all the sludge is not used the same way, the permittee needs to determine what amounts are used in what manner. Different scenarios may apply to the different portions.

3. Is the sewage sludge in bulk or is it a bagged material?

Scenario No.1 and No.6 can be applied to bagged materials. All other scenarios apply to bulk sewage sludge only. Bulk material is an amount of sewage sludge greater than one metric ton (2200 lbs).

4. What is the metals content in the sewage sludge for the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc?

If any of the concentrations in Table 1 of 40 CFR §503.13 (b) (1) are exceeded on a dry weight basis, the sewage sludge cannot be land applied. Table 1 is summarized below:

**§503.13 Table 1**

**Maximum Pollutant Concentrations**

Arsenic	75 mg/kg
Cadmium	85 mg/kg
Copper	4300 mg/kg
Lead	840 mg/kg
Mercury	57 mg/kg
Molybdenum	75 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	7500 mg/kg

5. Does the sludge qualify for “exceptional quality” criteria in accordance with Table 3, 40 CFR §503.13(b)(3) on a dry weight basis? Table 3 is summarized:

**§503.13 Table 3**

**Exceptional Quality Pollutant Concentrations**

Arsenic	41 mg/kg
Cadmium	39 mg/kg
Copper	1500 mg/kg
Lead	300 mg/kg
Mercury	17 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	2800 mg/kg

In addition, Class A pathogen reduction (see Section 4), and achievement of one of the vector attraction reduction alternatives 1 through 8 (see Section 5) must be attained.

**NOTHING ELSE QUALIFIES AS EXCEPTIONAL QUALITY**

6. What is the level of pathogen reduction achieved, Class A or Class B?

Refer to Section 4, Pathogen Reduction, to select the appropriate method that is used to reduce the pathogens in the sewage sludge produced at the facility.

7. What is the method for vector attraction reduction?

Refer to Section 5, Vector Attraction Reduction, to select the appropriate method that is used to reduce the pathogens in the sewage sludge produced at the facility.

8. What is the amount of sewage sludge used in dry metric tons/365 day period?

This determines the frequency of monitoring (see Section 6) for the pollutants, pathogens and vectors. Use the table below to make the determination:

**Sampling Frequency Table**

<b>SEWAGE SLUDGE PRODUCED</b> (metric tons per 365 day period)	<b>SAMPLING FREQUENCY</b>
$0 < \text{Sludge (tons)} < 290$	Once Per year
$290 \leq \text{Sludge (tons)} < 1500$	Once Per Quarter (four times per year)
$1500 \leq \text{Sludge (tons)} < 15000$	Once Per 60 days (six times per year)
$\text{Sludge (tons)} \leq 15000$	Once Per Month (12 times per year)

**1.2 Scenario Determination**

After the information is gathered and evaluated from the questions in the preceding section, the permittee can select the appropriate land application scenario from the table on page 1.4.

**Land Application Scenario Selection Table**

<b>SCENARIO</b>	<b>LAND TYPE</b>	<b>BULK/BAGGED</b>	<b>POLLUTANT LIMITS<sup>2</sup></b>	<b>PATHOGENS<sup>3</sup></b>	<b>VECTORS<sup>3</sup></b>
No .1	ANY TYPE	BOTH (EQ)	TABLE 3	CLASS A	1-8 ONLY
No .2	SEE BELOW <sup>1</sup>	BULK	TABLE 3	CLASS A	9 OR 10
No .3	SEE BELOW <sup>1</sup>	BULK	TABLE 3	CLASS B	1-10
No .4	SEE BELOW <sup>1</sup>	BULK	TABLE 2	CLASS A	1-10
No .5	SEE BELOW <sup>1</sup>	BULK	TABLE 2	CLASS B	1-10
No .6	ANY TYPE	BAGGED	TABLE 4	CLASS A	1-8 ONLY

1. Land types: Agricultural land, forest, reclamation site or public contact site
2. Refer to 40 CFR §503.13 Table 2, Table 3 and Table 4
3. The Pathogen Reduction Section (Section 4) and Vector Attraction Reduction Section (Section 5) are located after the Scenario section.

**1.3. Scenarios**

This section contains the sewage sludge land application scenarios. One of these scenarios has been selected by the permittee, based on reading and answering the questions in Section 1.2, to regulate their treatment facility’s sewage sludge land application.

**1.3.1. Scenario No. 1**

This applies to bulk or bagged sewage sludge and materials derived from sewage sludge meeting the pollutant concentrations at §503.13(b)(3); one of the Class A pathogen reduction alternatives at §503.32(a); one of the vector attraction reduction requirements at §503.33(b)(1) through (b)(8). Materials meeting these characteristics are considered “Exceptional Quality” materials and are exempt from the general requirements at §503.12 and the management practices at §503.14. Sludges of this quality may be applied to any type of land.

## SLUDGE CONDITIONS

### 1. Pollutant Limitations

- a. The maximum concentrations of metals in the sewage sludge that is applied to the land shall not exceed the following (dry weight basis):

Arsenic	75 mg/kg
Cadmium	85 mg/kg
Copper	4300 mg/kg
Lead	840 mg/kg
Mercury	57 mg/kg
Molybdenum	75 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	7500 mg/kg

- b. The sewage sludge shall not be applied to the land if any of the pollutant concentrations in Paragraph 1a. are exceeded.
- c. The monthly average concentration of metals in the sewage sludge shall not exceed the following (dry weight basis):

Arsenic	41 mg/kg
Cadmium	39 mg/kg
Copper	1500 mg/kg
Lead	300 mg/kg
Mercury	17 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	2800 mg/kg

2. The permittee shall meet Class A pathogen requirements utilizing one of the methods specified in 40 CFR §503.32.
3. The permittee shall meet one of the vector attraction reduction requirements specified in 40CFR §503.33. The permittee may only utilize alternatives 1 through 8. If the permittee meets one of the vector attraction reduction alternatives 1 through 5, the Class A pathogen requirements must be met either prior to or at the same time as the vector attraction reduction requirement.
4. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 1a, the pathogen density and the vector attraction reduction requirements at the frequency specified in sludge condition 6 of the permit.
5. The permittee shall develop and retain the following information for five years:
  - a. The concentration of each pollutant listed in Paragraph 1a..
  - b. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in §503.32(a) and the vector attraction reduction requirements in [insert one of the vector attraction reduction requirements in §503.33(b)(1) through (b)(8)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”
  - c. A description of how the Class A pathogen requirements are met.
  - d. A description of how the vector attraction reduction requirements are met.
6. The permittee shall report the information in Paragraphs 5a, b, c, and d annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of this permit.
7. All sewage sludge sampling and analysis procedures shall be in accordance with the procedures detailed in 40 CFR §503.8.

### **1.3.2. Scenario No.2**

This scenario applies to bulk sewage sludge or materials derived from bulk sewage sludge meeting the following criteria: the pollutant concentrations in §503.13(b)(3); Class A pathogen requirements in §503.32(a); and vector attraction §503.33(b)(9) or (b)(10). Sludge of this quality

may be applied to agricultural land, forest land, public contact site or reclamation site. This scenario has specific requirements for the preparer and the applier.

## **SLUDGE CONDITIONS**

1. The permittee and the applier of the bulk sewage sludge shall comply with the following general requirements:
  - a. Bulk sewage sludge shall not be applied the land except in accordance with 40 CFR Part 50J, Subpart B.
  - b. The permittee shall provide the person who applies the bulk sewage sludge written notification of the concentration of total nitrogen (as N on a dry weight basis) in the bulk sewage sludge.
  - c. The person who applies the bulk sewage sludge shall obtain notice and necessary information from the permittee to comply with the requirements of 40 CFR Part 503, Subpart B.
  - d. When the permittee provides the bulk sewage sludge to a person who applies the bulk sewage sludge, the permittee shall provide the person who applies the bulk sewage sludge notice and necessary information to comply with 40 CFR part 503, Subpart B.
  - e. When the permittee provides the bulk sewage sludge to a person who prepares the bulk sewage sludge the permittee shall provide the preparer notice and necessary information to comply with 40 CFR Part 503, Subpart B.
  - f. The person who applies the bulk sewage sludge shall provide the owner or lease holder of the land on which the bulk sewage sludge is applied notice and necessary information to comply with 40 CFR Part 503, Subpart B.
  - g. When bulk sewage sludge is applied in another state, the person who prepares the sewage sludge shall provide notice to the permitting authority for the state in which the sewage sludge will be applied. Notice shall be given prior to the initial application and shall contain the following information:
    - i. The location of each site by either street address or latitude and longitude.
    - ii. The approximate period of time the bulk sewage sludge will be applied to each site.

- iii. The name, address, telephone number and National Pollutant Discharge Elimination System permit number (if applicable) for the person who prepares the bulk sewage sludge.
- iv. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if applicable) for the person who applies the bulk sewage sludge.

2. Pollutant Limitations

- a. The maximum concentration of metals in the sewage sludge that is applied to the land shall not exceed the following (dry weight basis):

Arsenic	75 mg/kg
Cadmium	85 mg/kg
Copper	4300 mg/kg
Lead	840 mg/kg
Mercury	57 mg/kg
Molybdenum	75 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	7500 mg/kg

- b. The sewage sludge shall not be applied to the land if any of the pollutant concentrations in Paragraphs 2a are exceeded.
- c. The monthly average concentration of metals in the sewage sludge shall not exceed the following (dry weight basis):

Arsenic	41 mg/kg
Cadmium	39 mg/kg
Copper	1500 mg/kg
Lead	300 mg/kg
Mercury	17 mg/kg

Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	2800 mg/kg

3. The permittee shall meet Class A pathogen requirements utilizing one of the methods specified in 40 CFR §503.32
4. The person who applies the bulk sewage sludge shall meet either vector attraction reduction requirement 9 or 10 as specified in 40 CFR §503.33.
5. The bulk sewage sludge shall be injected below the surface of the land, or incorporated into the soil within 8 hours after discharge from the pathogen treatment process.
6. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2a and the pathogen density requirements at the frequency specified in sludge condition 6 of the permit.
7. The person who applies the bulk sewage sludge to the land shall comply with the following management practices:
  - a. The bulk sewage sludge shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated habitat.
  - b. The bulk sewage sludge shall not be applied to agricultural land, forest land, a public contact site or a land reclamation site that is frozen, snow-covered or flooded so that the bulk sewage sludge enters a wetland or other water of the United States as defined in 40 CFR §122.2, except as provided in a permit issued pursuant to Section 402 or 404 of the Clean Water Act.
  - c. Bulk sewage sludge shall not be applied to agricultural land, forest land, and public contact site, or land reclamation site that is less than 10 meters (33 feet) from waters of the United States, as defined in 40 CFR §122.2.
  - d. The whole sludge application rate shall be applied at an agronomic rate designed to (i) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (ii) minimize the amount of nitrogen that passes below the root zone for the crop or vegetation grown of the land into the groundwater.

8. The permittee shall develop and retain the following information for five years:
  - a. The pollutant concentration for each pollutant listed in Paragraph 2a. of this section.
  - b. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in §503.32 (a) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility for fine and imprisonment.”
  - c. A description of how the pathogen requirements are met.
9. The person who applies the bulk sewage sludge shall develop and retain the following information for five years:
  - a. The following certification requirement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in §503.14 and the vector attraction reduction requirement in [insert either §503.33 (b)(9) or (b)(10)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including fine and imprisonment.”
  - b. A description of how the management practices in §503.14 are met for each site on which the bulk sewage sludge is applied.
  - c. A description of how the vector attraction reduction requirements are met for each site on which bulk sewage sludge is applied, including a description of how the requirement in Paragraph 5 is met.
10. The permittee shall report the information in paragraphs 8a, b and c annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of this permit.
11. All sludge sampling and analysis shall be in accordance with the procedures detailed in 40 CFR §503.8.

12. The permittee shall supply the following information/requirements to the person who applies the bulk sewage sludge:
  - a. Information in Paragraph 1b.
  - b. Requirements in Paragraphs 1f and 5.
  - c. Management Practices in Paragraphs 7a through d.
  - d. Record keeping requirements in Paragraphs 9a through c.
  
13. If the permittee intends to apply sludge to land application sites not identified at the time of permit issuance, the permittee shall submit a land application plan 180 days prior to initial application at the new site. The plan shall:
  - a. Describe the geographic area covered by the plan;
  - b. Identify site selection criteria;
  - c. Describe how sites will be managed; and
  - d. Provide for advance public notice as required by state and local laws, and notice to landowners and occupants adjacent to or abutting the proposed land application site.

### **1.3.3. Scenario No. 3**

This scenario applies to bulk sewage sludge meeting the following criteria: pollutant concentrations at §503.13(b); Class B pathogens at §503.32(b); and one of the vector attraction reduction requirements found at §503.33(b). Bulk sewage sludge of this quality may be applied to agricultural land, forest land, public contact site or a reclamation site. There are specific requirements for the preparer and applier.

#### **SLUDGE CONDITIONS**

1. The permittee and the applier of the bulk sewage sludge shall comply with the following general requirements:
  - a. Bulk sewage sludge shall not be applied to the land except in accordance with 40 CFR Part 503 Subpart B.
  - b. The permittee shall provide the person who applies the bulk sewage sludge written notification of the concentration of total nitrogen (as N on a dry weight basis) in the bulk sewage sludge.
  - c. The person who applies the bulk sewage sludge shall obtain notice and necessary information from the permittee to comply with the requirements of 40 CFR Part 503 Subpart B.

- d. When the permittee provides the bulk sewage sludge to a person who applies the bulk sewage sludge, the permittee shall provide the person who applies the bulk sewage notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- e. When the permittee provides the bulk sewage sludge to a person who prepares the bulk sewage sludge, the permittee shall provide the person who prepares the bulk sewage sludge notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- f. The person who applies the bulk sewage sludge shall provide the owner or lease holder of the land on which the bulk sewage sludge is applied notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- g. When bulk sewage sludge is applied in another state, the person who prepares the sewage sludge shall provide notice to the permitting authority for the state in which the sewage sludge will be applied. Notice shall be given prior to the initial application and shall contain the following information:
  - i. The location of each site by either street address or latitude and longitude.
  - ii. The approximate period of time the bulk sewage sludge will be applied to each site.
  - iii. The name, address, telephone number and National Pollutant Discharge Elimination System permit number (if applicable) for the person who prepares the bulk sewage sludge.
  - iv. The name, address, telephone number, and national Pollutant Discharge Elimination System permit number (if applicable) for the person who applies the bulk sewage sludge.

2. Pollutant Limitations

- a. The maximum concentration of metals in the sewage sludge that is applied to the land shall not exceed the following (dry weight basis):

Arsenic	75 mg/kg
Cadmium	85 mg/kg
Copper	4300 mg/kg

Lead	840 mg/kg
Mercury	57 mg/kg
Molybdenum	75 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	7500 mg/kg

- b. The sewage sludge shall not be applied to the land if any of the pollutant concentrations in Paragraph 2a are exceeded
- c. The monthly average concentration of metals in the sewage sludge shall not exceed the following (dry weight basis):

Arsenic	41 mg/kg
Cadmium	39 mg/kg
Copper	1500 mg/kg
Lead	300 mg/kg
Mercury	17 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	2800 mg/kg

- 3. The permittee shall meet Class B pathogen requirements utilizing one of the methods specified in 40CFR §503.32
- 4. The permittee shall meet one of vector attraction reduction requirements specified in 40CFR §503.33
- 5. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2a, the pathogen density requirements and the vector attraction reduction requirements at the frequency specified in sludge condition 6 of the permit.
- 6. The person who applies the bulk sewage sludge to the land shall comply with the following management practices:

- a. The bulk sewage sludge shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated habitat.
  - b. The bulk sewage sludge shall not be applied to agricultural land, forest land, a public contact site or a land reclamation site that is frozen, snow-covered or flooded so that the bulk sewage sludge enters a wetland or other water of the United States as defined in 40 CFR 122.2, except as provided in a permit issued pursuant to Section 402 or 404 of the Clean Water Act.
  - c. Bulk sewage sludge shall not be applied to agricultural land, forest land, a public contact site or a land reclamation site that is less than 10 meters (33 feet) from waters of the United States, as defined in 40 CFR §122.2.
  - d. The whole sludge application rate shall be applied at an agronomic rate designed to (i) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (ii) minimize the amount of nitrogen that passes below the root zone for the crop or vegetation grown of the land into the groundwater.
7. The person who applies the bulk sewage sludge shall insure that the following site restrictions are met for each site on which the bulk sewage sludge is applied:
- a. Food crops with harvested parts that touch the sewage sludge/soil mixture and are not totally above the land surface shall not be harvested for 14 months after application of sewage sludge.
  - b. Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of sewage sludge when the sewage sludge remains on the land surface for four months or longer prior to incorporation into the soil.
  - c. Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than four months prior to incorporation into soil.
  - d. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of sewage sludge.
  - e. Animals shall not be grazed on the land for 30 days after application of sewage sludge.

- f. Turf grown on land where sewage sludge is applied shall not be harvested for one year after application of the sewage sludge when the harvested turf is placed on either land with high potential for public exposure or a lawn.
  - g. Public access to land with a high potential for public exposure shall be restricted for one year after application of sewage sludge.
  - h. Public access to land with a low potential for public exposure shall be restricted for 30 days after application of sewage sludge.
8. The permittee shall develop and retain the following information for five years:
- a. The concentration of each pollutant listed in Paragraph 2a of this section.
  - b. The following certification statement:  
  
 “I certify, under penalty of law, that the information that will be used to determine compliance with the Class B pathogen requirement in §503.32(b) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in §503.33 (b)(1) through (b)(8), if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information I am aware that there are significant penalties for false certification including the possibility of fine or imprisonment.”
  - c. A description of how the Class B pathogen requirements are met.
  - d. When the permittee is responsible for meeting the vector attraction reduction requirements, a description of how the vector attraction reduction requirements are met.

9. The person who applies the bulk sewage sludge shall develop and maintain the following information for five years:
- a. The following certification statement:  
  
 “I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in §503.14, the site restrictions in §503.32(b)(5), and the vector attraction reduction requirements in [insert either §503.33(b)(9) or (b)(10), if one of those requirements is met] was prepared for each site on which sewage sludge is applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including

the possibility of fine and imprisonment.”

- b. A description of how the management practices in Paragraphs 6a through d are met for each site.
  - c. A description of how the site restrictions in Paragraphs 7a through h are met for each site.
  - d. When the applier is responsible for meeting the vector attraction reduction requirements, a description of how the vector attraction reduction requirements in either §503.33(b)(9) or (b)(10) is met.
10. The permittee shall report the information in Paragraph 8a, b, c and d annually on February 19. Reports shall be submitted to the address in the Monitoring and Reporting section of this permit.
  11. All sludge sampling and analysis shall be in accordance with the procedures detailed in 40CFR §503.8
  12. The permittee shall notify the person who applies the bulk sewage sludge of the following information/requirements:
    - a. Information in Paragraph 1b.
    - b. Requirement in Paragraph 1f.
    - c. Management practices in Paragraph 6a through d.
    - d. Site Restrictions in Paragraph 7a through h.
    - e. Record keeping requirements in Paragraphs 9a through d.
  13. If the permittee intends to apply sludge to land application sites not identified at the time of permit issuance, the permittee shall submit a land application plan 180 days prior to initial application at the new site. The plan shall:
    - a. Describe the geographic area covered by the plan;
    - b. Identify site selection criteria;
    - c. Describe how sites will be managed; and
    - d. Provide for advance public notice as required by state and local laws, and notice to landowners and occupants adjacent to or abutting the proposed land application site.

#### **1.3.4. Scenario No. 4**

This scenario applies to bulk sewage sludge meeting the following criteria: pollutant concentrations at §503.13(b)(2); Class A pathogen requirements at §503.32(a); and one of the

vector attraction reduction requirement found at §503.33(b). Bulk sewage sludge of this quality may be applied to agricultural land, forest land, public contact site or a reclamation site. There are specific requirements for the preparer and the applier.

## SLUDGE CONDITIONS

1. The permittee and the applier of the bulk sewage sludge shall comply with the following general requirements:
  - a. Bulk sewage sludge shall not be applied to the land except in accordance with 40 CFR Part 503 Subpart B.
  - b. Bulk sewage sludge shall not be applied if any of the cumulative pollutant loading rates in Paragraph 2c have been reached on the site.
  - c. The permittee shall provide the person who supplies the bulk sewage sludge written notification of the concentration of total nitrogen (as N on a dry weight basis) in the bulk sewage sludge.
  - d. The person who applies the bulk sewage sludge shall obtain notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart b.
  - e. The person who applies the bulk sewage sludge shall obtain the following information:
    - i. Prior to the application of bulk sewage sludge, the person who proposes to apply the bulk sewage shall contact the permitting authority for the state in which the bulk sewage sludge will be applied to determine whether bulk sewage sludge subject to the cumulative pollutant loading rates in §503.13(b)(2) has been applied to the site since July 20, 1993.
    - ii. If bulk sewage sludge subject to the cumulative pollutant loading rates has not been applied to the site, the cumulative amount for each pollutant listed in Paragraph 2c may be applied.
    - iii. If bulk sewage sludge subject to the cumulative pollutant loading rates has been applied to the site since July 20, 1993, and the cumulative amount of each pollutant applied to the site since that date is known, the cumulative amount of each pollutant applied to the site shall be used to determine the additional amount of each pollutant that can be applied to the site such that the loading rates in Paragraph 2c are not exceeded.
    - iv. If bulk sewage sludge subject to the cumulative pollutant loading rates has been applied to the site since July 20, 1993, and the cumulative amount of

each pollutant applied to the site since that date is not known, an additional amount of any pollutant may not be applied to the site.

- f. When the permittee provides the bulk sewage sludge to a person who applies the bulk sewage sludge, the permittee shall provide the person who applies the bulk sewage notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- g. When the permittee provides the bulk sewage sludge to a person who prepares the bulk sewage sludge, the permittee shall provide the person who prepares the bulk sewage sludge notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- h. The person who applies the bulk sewage sludge shall provide the owner or lease holder of the land on which the bulk sewage sludge is applied notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- i. When the bulk sewage sludge is applied in another state, the person who prepares the sewage sludge shall provide notice to the permitting authority for the state in which the sewage sludge will be applied. Notice shall be given prior to the initial application and shall contain the following information:
  - i. The location of each site by either street address or latitude and longitude.
  - ii. The approximate period of time the bulk sewage sludge will be applied to each site.
  - iii. The name, address, telephone number and National Pollutant Discharge Elimination System permit number (if applicable) for the person who prepares the bulk sewage sludge.
  - iv. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if applicable) for the person who applies the bulk sewage sludge.
- j. The person who applies the bulk sewage sludge shall provide written notice, prior to the initial application of the bulk sewage sludge, to the permitting authority for the State in which the bulk sewage sludge will be applied. The notice shall include:
  - i. The location, by either street address or latitude and longitude, of the land application site.

- ii. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) of the person who will apply the bulk sewage sludge.

2. Pollutant limitations

- a. The maximum concentration of metal in the sewage sludge that is applied to the land shall not exceed the following (dry weight basis):

Arsenic	75 mg/kg
Cadmium	85 mg/kg
Copper	4300 mg/kg
Lead	840 mg/kg
Mercury	57 mg/kg
Molybdenum	75 mg/kg
Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	7500 mg/kg

- b. The sewage sludge shall not be applied to the land if any of the pollutant concentrations in Paragraph 2a are exceeded.
- c. The cumulative pollutant loading rates for each site shall not exceed the following (kilograms per hectare):

Arsenic	41 kilograms/hectare
Cadmium	39 kilograms/hectare
Copper	1500 kilograms/hectare
Lead	300 kilograms/hectare
Mercury	17 kilograms/hectare
Nickel	420 kilograms/hectare
Selenium	100 kilograms/hectare
Zinc	2800 kilograms/hectare

- d. Bulk sewage sludge shall not be applied to a site on which any of the cumulative pollutant loading rates have been reached.
3. The permittee shall meet Class A pathogen requirements utilizing one of the methods specified in 40CFR §503.32
4. The permittee shall meet one of the vector attraction reduction requirements specified in 40CFR §503.33. The permittee may only utilize alternatives 1 through 8. If the permittee meets one of the vector attraction reduction alternatives 1 through 5, the Class A pathogen requirements must be met either prior to or at the same time as the vector attraction reduction requirement.
5. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2a, the pathogen density requirements and the vector attraction reduction requirements at the frequency specified in sludge condition 6 of the permit.
6. The person who applies the bulk sewage sludge to the land shall comply with the following management practices:
  - a. The bulk sewage sludge shall not be applied to the land if it is likely to adversely affect threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated habitat.
  - b. The bulk sewage sludge shall not be applied to agricultural land, forest land, a public contact site or a land reclamation site that is frozen, snow-covered or flooded so that the bulk sewage sludge enters a wetland or other water of the United States as defined in 40 CFR §122.2, except as provided in a permit issued pursuant to Section 402 or 404 of the Clean Water Act.
  - c. Bulk sewage sludge shall not be applied to agricultural land, forest land, a public contact site, or a land reclamation site that is less than 10 meters (33 feet) from waters of the United States, as defined in 40 CFR §122.2.
  - d. The whole sludge application rate shall be applied at an agronomic rate designed to (i) provide the amount of nitrogen needed by the crop or vegetation grown on the land and (ii) minimize the amount of nitrogen that passed below the root zone for the crop or vegetation grown on the land into the groundwater.
  - e. The permittee shall develop and maintain the following information for five years:
  - f. The concentration of each pollutant listed in paragraph 2a in the bulk sewage sludge.

g. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirement in §503.32(a) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in §503.33(b)(1) through (b)(8), if one of the those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine or imprisonment.”

h. A description of how the Class A pathogen requirements are met.

i. When the permittee is responsible for meeting the vector attraction reduction requirements, a description of how the vector attraction reduction requirements are met.

7. The person who applies the bulk sewage sludge shall develop and retain the following information indefinitely:

a. The location, by either street address or latitude and longitude, of each site on which bulk sewage sludge is applied.

b. The number of hectares in each site on which bulk sewage sludge is applied.

c. The date bulk sewage sludge is applied to each site.

d. The cumulative amount of each pollutant listed in Paragraph 2a in the bulk sewage sludge applied to each site, including the amount in Paragraph 1e(iii) of this section (in kilograms).

e. The amount of sewage sludge applied to each site (in metric tons).

f. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the requirements to obtain information in §503.12(e)(2) {Paragraphs 1e (i) through iv) of this permit} was prepared for each site on which sewage sludge was applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including fine and imprisonment.”

g. A description of how the requirements to obtain the information in Paragraph 1e

(i through iv) are met.

8. The person who applies the bulk sewage sludge shall develop and maintain the following information for five years:
  - a. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in §503.14 was prepared for each site on which sewage sludge was applied my direction and supervision in accordance with the system designed to ensured that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”
  - b. A description of how the management practices in Paragraphs 6a through d are met for each site.
  - c. When the applier is responsible for meeting the vector attraction reduction requirements, the following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the vector attraction reduction requirement in [insert either §503.33(b)(9) or (b)(10)] was prepared under my direction and supervision in accordance with the system designed to endure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”
  - d. When the applier is responsible for meeting the vector attraction reduction requirements, a description of how the vector attraction reduction requirement in either §503.33(b)(9) or (b)(10) is met.
  - e. The permittee shall report the information in Paragraphs 7a, b, c and d annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of this permit.
9. When 90 percent or more of any of the cumulative pollutant loading rates are reached, the person who applies the bulk sewage sludge shall report the information in Paragraphs 10a through d annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of this permit.
10. All sludge sampling and analysis shall be in accordance with the procedures detailed in 40CFR §503.8.

11. The permittee shall notify the applier of the following information/requirements:
  - a. Requirements in paragraphs 1b, 1d, 1e, 1j, 2c and 2d.
  - b. Information in Paragraph 1c.
  - c. The management practices in Paragraphs 6a through d.
  - d. Record keeping requirements in Paragraph 8a through g and Paragraphs 9a through d.
  - e. Reporting requirements in Paragraph 11.
  
12. If the permittee intends to apply sludge to land application sites not identified at the time of permit issuance, the permittee shall submit a land application plan 180 days prior to initial application at the new site. The plan shall:
  - a. Describe the geographic area covered by the plan;
  - b. Identify site selection criteria;
  - c. Describe how sited will be managed; and
  - d. Provide for advance public notice as required by state and local laws, and notice to landowners and occupants adjacent to or abutting the proposed land application site.

### **1.3.5 Scenario No.5**

This scenario applies to bulk sewage sludge meeting the following criteria: pollutant concentrations at §503.13(b)(2); Class B pathogen requirements at §503.32(b); and one of the vector attraction reduction requirements found at §503.33(b). Bulk sewage sludge of this quality may be applied to agricultural land, forest land, public contact site or a reclamation site. There are specific requirements for the preparer and the applier.

#### **SLUDGE CONDITIONS**

1. The permittee and the applier of the bulk sewage sludge shall comply with the following general requirements:
  - a. Bulk sewage sludge shall not be applied to the land except in accordance with 40 CFR Part 503 Subpart B.
  - b. Bulk sewage sludge shall not be applied if any of the cumulative pollutant loading rates in Paragraph 2c have been reached on the site.
  - c. The permittee shall provide the person who applies the bulk sewage sludge written notification of the concentration of total nitrogen (as N on a dry weight basis) in the bulk sewage sludge.
  - d. The person who applies the bulk sewage sludge shall obtain notice and necessary

information to comply with the requirements of 40 CFR Part 503 Subpart B.

- e. The person who applies the bulk sewage sludge shall obtain the following information:
  - i. Prior to application of bulk sewage sludge, the person who propose to apply the bulk sewage shall contact the permitting authority for the state in which the bulk sewage sludge will be applied to determine whether bulk sewage sludge subject to the cumulative pollutant loading rates in §503.13(b)(2) has been applied to the site since July 20, 1993.
  - ii. If bulk sewage sludge subject to the cumulative pollutant loading rates has not been applied to the site, the cumulative amount for each pollutant listed in Paragraph 2c may be applied.
  - iii. If bulk sewage sludge subject to the cumulative pollutant loading rates has been applied to the site since July 20, 1993, and the cumulative amount of each pollutant applied to the site since that date is known, the cumulative amount of each pollutant applied to the site shall be used to determine the additional amount of each pollutant that can be applied to the site such that the loading rates in Paragraph 2c are not exceeded.
  - iv. If bulk sewage sludge subject to the cumulative pollutant loading rates has been applied to the site since July 20, 1993, and the cumulative amount of each pollutant applied to the site since that date is not known, an additional amount of any pollutant may not be applied to the site.
- f. When the permittee provides the bulk sewage sludge to a person who applies the bulk sewage sludge, the permittee shall provide the person who applies the bulk sewage notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- g. When the permittee provides the bulk sewage sludge to a person who prepares the bulk sewage sludge, the permittee shall provide the person who prepares the bulk sewage sludge notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- h. The person who applies the bulk sewage sludge shall provide the owner or lease holder of the land on which the bulk sewage sludge is applied notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.
- i. When bulk sewage sludge is applied in another state, the person who prepares the

sewage sludge shall provide notice to the permitting authority for the state in which the sewage sludge will be applied. Notice shall be given prior to the initial application and shall contain the following information:

- i. The location of each site by either street address or latitude and longitude.
  - ii. The approximate period of time the bulk sewage sludge will be applied to each site.
  - iii. The name, address, telephone number and National Pollutant Discharge Elimination System permit number (if applicable) for the person who prepares the bulk sewage sludge.
  - iv. The name, address, telephone number and National Pollutant Discharge Elimination System permit number (if applicable) for the person who applies the bulk sewage sludge.
- j. The person who applies the bulk sewage sludge shall provide written notice, prior to the initial application of the bulk sewage sludge, to the permitting authority for the State in which the bulk sewage sludge will be applied. The notice shall include:
- i. The location, by either street address or latitude and longitude, of the land application site.
  - ii. The name, address, telephone number and National Pollutant Discharge Elimination System permit number (if appropriate) of the person who will apply the bulk sewage sludge.

2. Pollutant limitations

- a. The maximum concentration of metals in the sewage sludge that is applied to the land shall not exceed the following (dry weight basis):

Arsenic	75 mg/kg
Cadmium	85 mg/kg
Copper	4300 mg/kg
Lead	840 mg/kg
Mercury	57 mg/kg
Molybdenum	75 mg/kg

Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	7500 mg/kg

- c. The sewage sludge shall not be applied to the land if any of the pollutant concentration in Paragraph 2a are exceeded.
- d. The cumulative pollutant loading rates for each site shall not exceed the following (kilograms per hectare):

Arsenic	41 kilograms/hectare
Cadmium	39 kilograms/hectare
Copper	1500 kilograms/hectare
Lead	300 kilograms/hectare
Mercury	17 kilograms/hectare
Nickel	420 kilograms/hectare
Selenium	100 kilograms/hectare
Zinc	2800 kilograms/hectare

- d. Bulk sewage sludge shall not be applied to a site on which any of the cumulative pollutant loading rates have been reached.
3. The permittee shall meet Class B pathogen requirements utilizing one of the methods specified in 40 CFR §503.32
  4. The permittee shall meet one of vector attraction reduction requirements specified in 40 CFR §503.33
  5. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2a, the pathogen density requirements and the vector attraction reduction requirements at the frequency specified in sludge condition 6 of the permit.
  6. The person who applies the bulk sewage sludge shall insure that the following site restrictions are met for each site on which the bulk sewage sludge is applied:
    - a. Food crops with harvested parts that touch the sewage sludge/soil mixture and are

not totally above the land surface shall not be harvested for 14 months after application of sewage sludge.

- b. Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of sewage sludge when the sewage sludge remains on the land surface for four months or longer prior to incorporation into the soil.
  - c. Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than four months prior to incorporation into the soil.
  - d. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of sewage sludge.
  - e. Animals shall not be grazed on the land for 30 days after application of sewage sludge.
  - f. Turf grown on land where sewage sludge is applied shall not be harvested for one year after application of the sewage sludge when the harvested turf is placed on either land with a high potential for public exposure or a lawn.
  - g. Public access to land with a high potential for public exposure shall be restricted for one year after application of sewage sludge.
  - h. Public access to land with a low potential for public exposure shall be restricted for 30 days after application of sewage sludge.
7. The person who applies the bulk sewage sludge to the land shall comply with the following management practices:
- a. The bulk sewage sludge shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated habitat.
  - b. The bulk sewage sludge shall not be applied to agricultural land, forest land, a public contact site or a land reclamation site that is frozen, snow-covered or flooded so that the bulk sewage sludge enters a wetland or other water of the United States as defined in 40 CFR §122.2, except as provided in a permit issued pursuant to Section 402 or 404 of the Clean Water Act.
  - c. Bulk sewage sludge shall not be applied to agricultural land, forest land, a public

contact site, or a land reclamation site that is less than 10 meters (33 feet) from waters of the United States, as defined in 40 CFR §122.2.

- d. The whole sludge application rate shall be applied at an agronomic rate designated to (i) provide the amount of nitrogen needed by the crop or vegetation grown on that land; and (ii) minimize the amount of nitrogen that passes below the root zone for the crop or vegetation grown of the land into the groundwater.
8. The permittee shall develop and maintain the following information for five years:
- a. The concentration of each pollutant listed in Paragraph 2a in the bulk sewage sludge.
  - b. The following certification statement:  
  
“I certify, under penalty of law, that the information that will be used to determine compliance with the Class B pathogen requirement in §503.32(b) and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in §503.33(b)(1) through (b)(8), if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility fo fine or imprisonment.”
  - c. A description of how the Class B pathogen requirements are met.
  - d. When the permittee is responsible for meeting the vector attraction reduction requirements, a description of how the vector attraction reduction requirements are met.
9. The person who applies the bulk sewage sludge shall develop and retain the following information indefinitely:
- a. The location, by either street address of latitude and longitude, of each site on which bulk sewage sludge is applied.
  - b. The number of hectares in each site on which bulk sewage sludge is applied.
  - c. The date bulk sewage sludge is applied to each site.

- d. The cumulative amount of each pollutant listed in Paragraph 2a in the bulk sewage sludge applied to each site, including the amount in Paragraph 1e(iii) of this section. (in kilograms)
- e. The amount of sewage sludge applied to each site (in metric tons).
- f. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the requirement to obtain information in §503.12(e)(2){Paragraphs 1e (i through iv) of this permit.} was prepared for each site on which bulk sewage sludge was applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including fine and imprisonment.”

- g. A description of how the requirements to obtain information Paragraphs 1.e. (i through iv) are met.

- 10. The person who applies the bulk sewage sludge shall develop and maintain the following information for five years:

- a. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in §503.14 was prepared for each site on which bulk sewage sludge was applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

- b. A description of how the management practices in Paragraphs 7a through d are met for each site.

- c. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the site restriction in §503.32(b)(5) for each site on which Class B sewage sludge was applied was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including fine and imprisonment.”

- d. A description of how the site restrictions are met for each site.

- e. When the applier is responsible for meeting the vector attraction reduction requirements, the following certification statement:  
  
“I certify, under penalty of law, that the information that will be used to determine compliance with the vector attraction reduction requirement in [insert either §503.33(b)(9) or (b)(10)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”
  - f. When the applier is responsible for meeting the vector attraction reduction requirements, a description of how the vector attraction reduction requirement in either §503.33(b)(9) or (b)(10) is met.
- 11. The permittee shall report the information in Paragraphs 8a, b, c and annually on February 19. Reports shall be submitted to the address in the Monitoring and Reporting section of this permit.
  - 12. When 90 percent or more of any of the cumulative pollutant loading rates are reached, the person who applies the bulk sewage sludge shall report the information in Paragraphs 10a through d annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of this permit.
  - 13. All sludge sampling and analysis shall be in accordance with the procedures detailed in 40 CFR §503.8
  - 14. The permittee shall notify the applier of the following information/requirements:
    - a. Requirements in Paragraphs 1b, 1d, 1e, 1j, 2c and 2d.
    - b. Information in Paragraph 1c.
    - c. The management practices in Paragraphs 7a through d.
    - d. The site restrictions in paragraphs 6a through h.
    - e. Record keeping requirements is Paragraph 9a through g and Paragraphs 10a through d.
    - f. Reporting requirements in Paragraph 12.
  - 15. If the permittee intends to apply sludge to land application sites not identified at the time of permit issuance, the permittee shall submit a land application plan 180 days prior to initial application at the new site. The plan shall:

- a. Describe the geographic area covered by the plan;
- b. Identify site selection criteria;
- c. Describe how sites will be managed; and
- d. Provide for advance public notice as required by state and local laws, and notice to landowners and occupants adjacent to or abutting the proposed land application site.

**1.3.6. Scenario No.6**

This scenario applies to bagged materials sold or given away meeting the annual pollutant loading rates at §503.32(a); and one of the vector attraction reduction requirements at §503.33(b)(1) through (b)(8).

**SLUDGE CONDITIONS**

- 1. The permittee and the applier shall meet the following requirements:
  - a. The sewage sludge shall be applied in accordance with 40 CFR Part 503 Subpart B.
  - b. The person who applies the sewage sludge shall obtain the information needed to comply with 40 CFR Part 503 Subpart B.
  - c. When the permittee provides the sewage sludge to a person who prepares the sewage sludge, the permittee shall provide the person who prepares the sewage sludge notice and necessary information to comply with 40 CFR Part 503 Subpart B.
- 2. Pollutant Limitations
  - a. The maximum concentration of metals in the sewage sludge that is applied to the land shall not exceed the following (dry weight basis):

Arsenic	75 mg/kg
Cadmium	85 mg/kg
Copper	4300 mg/kg
Lead	840 mg/kg
Mercury	57 mg/kg
Molybdenum	75 mg/kg

Nickel	420 mg/kg
Selenium	100 mg/kg
Zinc	7500 mg/kg

- b. The sewage sludge shall not be applied to the land if any of the pollutant concentrations in Paragraphs 2a are exceeded.
- c. The product of the concentration of each pollutant in the sewage sludge and the annual whole sludge application rate for the sewage sludge shall not cause the annual pollutant loading rate for the pollutant loading rates are specified below (kilograms per hectare per 365 day period):

Arsenic	2.0
Cadmium	1.9
Copper	75
Lead	15
Mercury	0.85
Nickel	21
Selenium	5.0
Zinc	140

- d. The annual whole sludge application rate shall be determined in the following manner:
- i. Analyze a sample of the sewage sludge to determine the concentration for each pollutant listed in Paragraph 2a.
  - ii. Using the pollutant concentrations from Paragraph 2d(i) and the annual pollutant loading rates from Paragraph 2c, calculate the annual whole sludge application rate using the following equation:

$$\text{AWSAR} = \frac{\text{APLR}}{C \times 0.001}$$

Where:

AWSAR = Annual whole sludge application rate in metric tons per

hectare per 365 day period (dry weight basis)

APLR = Annual pollutant loading rate in kilograms per hectare per 365 day period.

C = Pollutant concentration in milligrams per kilogram of total solids (dry weight basis)

0.001 = Conversion factor

iii The AWSAR for the sewage sludge is the lowest AWSAR calculated in Paragraph 2d(ii).

### 3. Label Requirements

a. Either a label shall be affixed to the bag or other container in which the sewage sludge is sold or given away or an information sheet shall be provided to any person who receives the sewage sludge.

b. The label information sheet shall contain the following information:

i. The name and address of the person who prepared the sewage sludge.

ii. A statement that application of sewage sludge to the land is prohibited except in accordance with the instructions on the label or information sheet.

iii. The annual whole sludge application rate which does not cause the annual pollutant loading rates in Paragraph 2c to be exceeded.

4. The permittee shall meet Class A pathogen requirements utilizing one of the methods specified in 40 CFR §503.32

5. The permittee shall meet one of the vector attraction reduction requirements specified in 40 CFR §503.33. The permittee may only utilize alternatives 1 through 8. If the permittee meets one of the vector attraction reduction alternatives 1 through 5, the Class A pathogen requirements must be met either prior to or at the same time as the vector attraction reduction requirement.

6. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2a, the pathogen density, and the vector attraction reduction requirement at the frequency specified in sludge condition 6 of the permit.

7. The permittee shall develop and retain the following information for five years:
  - a. The annual whole sludge application rate that does not cause the annual pollutant loading rates in Paragraph 2c to be exceeded.
  - b. The concentration of each pollutant in Paragraph 2a in the sewage sludge.
  - c. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the management practice in §503.14(e), the Class A pathogen requirement in §503.32(a), and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in §503.33(b)(1) through (b)(8)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine or imprisonment.”
  - d. A description of how the Class A pathogen requirements are met.
  - e. A description of how the vector attraction reduction requirements are met.
8. The permittee shall report the information in Paragraphs 7a through e annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting Section of this permit.
9. All sewage sludge sampling and analysis procedures shall be in accordance with procedures detailed in 40 FR §503.8.

## **2. SURFACE DISPOSAL**

This section applies to sewage sludge from the permittee's facility which is by surface disposed. The permittee should answer the following questions. The answer to these questions need to be evaluated to determine which permitting scenario for sewage sludge surface disposal applies. After the permitting scenario is determined, the permittee must comply with the directives contained in the chosen scenario. The permittee must also note the run-off from surface disposal units may be subject to stormwater regulations.

### **2.1 Question Algorithm**

The permittee should review and answer the following questions. The information gathered from answering these questions will aid the permittee in determine the appropriate surface disposal scenario which applies to the sludge generated at the permittee's wastewater treatment facility. The scenario selected will detail which specific Use or Disposal of Sewage Sludge, Part 503, regulations must be complied with for the land application method used by the permittee.

1. Is the facility regulated under 40 CFR §503?

If the facility disposes of its sludge at a municipal solid waste landfill (MSWLF), 40 CFR §503 regulations do not apply. However, the permittee still has some responsibilities. Permit language is in Scenario No.4.

The 40 CFR §503 regulations also do not apply in the case of storage of sewage sludge. An EPA rule of thumb is sludge stored on the land for longer than two years is defined as surface disposal. If a permittee claims storage, or treatment, the permittee's facility must be specifically equipped to support sewage sludge storage. Further, the permittee must ultimately have a clear, final disposition for the sewage sludge.

2. Does the following situations exist at a permittee's active sewage sludge disposal unit?
  - a. The unit is located within 60 meters (200 feet) of a fault that has had displacement in the Holocene time (10,000 years);
  - b. A unit located in a unstable area; or
  - c. A unit located in a wetland without a Section 402 or 404 permit.

If any of these situations exist, the active sewage sludge unit should have closed by March 22, 1994. If the active sewage sludge disposal unit is still operating, but one of the previous situations does apply to the unit, that unit must be closed.

3. Can the permittee's sewage sludge disposal unit demonstrate they are designed to withstand seismic impacts? If this demonstration cannot be made, the unit must close. This demonstration should be made prior to permit issuance.
4. Does the facility have a liner and leachate collection system?

The liner must have a hydraulic conductivity of  $1 \times 10^{-7}$  centimeters per second or less. If the liner does not meet the specified hydraulic conductivity, the sludge disposal unit is regulated as an **unlined** sewage sludge disposal site. There are no pollutant limitations for lined units.

5. What is the distance from the property boundary to the boundary of the active sewage sludge unit? Use the tables below to determine appropriate pollutant limitations for units without a liner or leachate collection on a dry weight basis.

**§503.23 TABLE 1**  
**Active Unit Boundary is 150 Meters or More**  
**From Property Boundary**

Arsenic	73 mg/kg
Chromium	600 mg/kg
Nickel	420 mg/kg

**§503.23 TABLE 2**  
**Active Unit Boundary is Less Than 150 Meters**  
**From Property Boundary**

Distance (meters)	Pollutant Concentrations (mg/kg)		
	Arsenic	Chromium	Nickel
0<Distance<25	30	200	210
25<Distance<50	34	220	240
50<Distance<75	39	260	270
75<Distance<100	46	300	320
100<Distance<125	53	360	390
125<Distance<150	62	450	420

6. Does the facility cover the sewage sludge placed in the unit daily?

This practice is considered to achieve both pathogen reduction and vector attraction reduction. If a facility covers the sludge, the permittee must monitor for methane gas.

## 2.2. Scenario Determination

After the information is gathered and evaluated from the questions in the preceding section, the permittee can select the appropriate surface disposal scenario.

**Surface Disposal Scenario Selection Table**

<b>SCENARIO</b>	<b>LINED/UNLINED</b>	<b>DISTANCE TO UNIT BOUNDARY</b>
No.1	Unlined	<150m
No.2	Unlined	0 to 150m
No.3	Lined	NA
No.4	Disposed in Municipal Solid Waste Land Fill	NA

## 2.3. Scenarios

### 2.3.1. Scenario No.1

Active sewage sludge unit without a liner and leachate collection system with active sewage sludge unit boundary 150 meters or more from the property boundary.

### SLUDGE CONDITIONS

1. The permittee and the owner/operator of an active sewage sludge unit shall comply with the following requirements:
  - a. Sewage sludge shall not be placed in an active sewage sludge unit unless the requirement of 40 CFR Part 503, Subpart C are met.
  - b. An active sewage sludge unit located within 60 meters of a fault that has had displacement in Holocene time; located in an unstable area; or located in a wetland, except as provided in a permit issued pursuant to Section 402 or 404 of the Clean Water Act, shall close by March 22, 1994, unless, in the case of an active sewage sludge unit located within 60 meters of a fault that has displacement in Holocene time, otherwise specified by the permitting authority.

- i. The owner/operator of an active sewage sludge unit shall submit a written closure and post closure plan to EPA 180 days prior to the date an active sewage sludge unit closes.
- ii. The closure plan shall consider the elements outlined in Section 6. If an element is not applicable, the owner/operator shall state the reasons in the plan.
- c. The owner of a surface disposal site shall provide written notification to the subsequent owner of the site that sewage sludge was placed on the site. The notice should include elements outlined in Section 7. A copy of the notification shall be submitted to the EPA.

2. Pollutant limitations

- a. The maximum concentration of pollutants in the sewage sludge placed in an active sewage sludge unit shall not exceed the following:

Arsenic	73 mg/kg
Chromium	600 mg/kg
Nickel	420 mg/kg

- b. Sewage sludge with metals concentrations which exceed the limitations in Paragraph 2a. shall not be placed in a surface disposal unit.

3. The permittee and the owner/operator shall comply with the following management practices:

- a. The sewage sludge shall not be placed on an active sewage sludge unit if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated critical habitat.
- b. The run-off from an active sewage sludge unit shall be collected and disposed in accordance with applicable stormwater regulations.
- c. The run-off collection system for an active sewage sludge unit shall have the capacity to control run-off from a 24 hour - 25 year storm event.

- d.
  - i. When a daily cover is placed on an active sewage sludge unit, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent of the lower explosive limit, 1.25 percent by volume, for methane gas during the period that the sewage sludge unit is active.
  - ii. The concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit, 5 percent by volume, for methane gas during the period that the sewage sludge unit is active.
- e.
  - i. When a final cover is placed on a sewage sludge unit at closure, and for three years after closure, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent by volume, for methane gas.
  - ii. The concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit, 5 percent by volume, for methane gas for three years after the sewage sludge unit closes.
- f. A food crop, a feed crop, or a fiber crop shall not be grown on an active sewage sludge unit. The owner/operator of the sewage sludge unit must demonstrate to EPA that public health and the environment are protected from reasonably anticipated adverse effects of pollutants in sewage sludge when crops are grown on a sewage sludge unit.
- g. Animals shall not be grazed on an active sewage sludge unit. The owner/operator of the sewage sludge unit must demonstrate to EPA that public health and the environment are protected from reasonably anticipated adverse effects of pollutants in sewage sludge when animals are grazed on a sewage sludge unit.
- h. Public access to a surface disposal site shall be restricted for the period that the surface disposal site contains an active sewage sludge unit and for three years after the last sewage sludge unit closes.
- i.
  - i. Sewage sludge placed in an active sewage sludge unit shall not contaminate an aquifer.
  - ii. The permittee shall demonstrate that sewage sludge placed in an active sewage sludge unit does not contaminate an aquifer by either (1) submission of results of a groundwater monitoring program developed by a qualified groundwater scientist; or (2) submission of a certification by a

qualified groundwater scientist that the sewage sludge does not contaminate and aquifer.

4. The following conditions must be documented by the permittee and owner/operator:
  - a. An active sewage sludge unit shall not restrict the flow of a base flood.
  - b. If a surface disposal site is located in a seismic impact zone, an active sewage sludge unit shall be designated to withstand the maximum recorded horizontal ground level acceleration.
  - c. An active sewage sludge unit shall be located 60 meters or more from a fault that has displacement in Holocene time.
  - d. An active sewage sludge unit shall not be located in an unstable area.
  - e. An active sewage sludge unit shall not be located in a wetland.
5. If the active sewage sludge unit is not covered daily, the permittee shall meet either Class A or Class B pathogen reduction utilizing one of the methods in Section 4, and one of the vector attraction reduction requirements in Section 5.
6. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2, the pathogen density, and the vector attraction reduction requirements at the following frequency:

<b>SEWAGE SLUDGE PRODUCED (metric tons per 365 day period)</b>	<b>SAMPLING FREQUENCY</b>
$0 < \text{Sludge(tons)} < 290$	Once per year
$0 \leq \text{Sludge(tons)} < 1500$	Once per quarter (four times per year)
$1500 \leq \text{Sludge(tons)} < 15000$	Once per 60 days (six times per year)
$\text{Sludge(tons)} \leq 15000$	Once per Month (12 times per year)

7. When a daily cover is placed on an active sewage sludge unit, the air in the structures within a surface disposal site and at the property line of the surface disposal site shall be monitored continuously for methane gas during the time that the surface disposal site contains an active sewage sludge unit and for three years after the sewage sludge unit closes.

8. The permittee shall develop and retain the following information for five years:

a. The concentration for each pollutant listed in Paragraph 2a.

b. The following certification statement:

“I, certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in [insert §503.32(a), §503.32(b)(3) or §503.32(b)(4) when one of those requirements is met] and the vector attraction reduction requirements in [insert one of the vector attraction reduction requirements in §503.33(b)(1) through §503.33(b)(8) when one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including that possibility of fine or imprisonment.”

c. A description of how the pathogen requirements are met.

d. When the permittee is responsible for the vector attraction reduction requirements, a description of how the vector attraction reduction requirements are met.

9. The owner/operator of the surface disposal site shall develop and retain the following information for five years:

a. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in §503.24 and the vector attraction reduction requirement in [insert one of the requirements in §503.33(b)(9) through (b)(11) if one of those requirements is met] was prepared under my direct supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

b. A description of how the management practices in Paragraphs 3a through 3i are met.

c. Documentation that the requirements in Paragraphs 4a through 4e are met.

d. A description of how the vector attraction reduction requirements are met, if the owner/operator is responsible for vector attraction reduction requirements.

10. The permittee shall report the information in Paragraphs 7a through 7d annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of the permit.
11. All sewage sludge sampling and analysis procedures shall be in accordance with the procedures detailed in Section 7.
12. If the permittee is not the owner/operator of the surface disposal site, the permittee shall notify the owner/operator of the following:
  - a. The requirements in Paragraphs 1a through 1c;
  - b. The management practices in Paragraphs 3a through 3i;
  - c. The requirements in Paragraphs 4a through 4e;
  - d. The requirement in Paragraph 7; and
  - e. The record keeping requirements in Paragraph 9a through 9d.

### **2.3.2. Scenario No.2**

Active sewage sludge unit without a liner and leachate collection system located less than 150 meters from the property line. The permittee is directed to §503.33 TABLE 2, Active Unit Boundary is Less Than 150 Meters From Property Boundary in order to determine the maximum concentrations pollutants for the appropriate distant to the units boundary.

#### **SLUDGE CONDITIONS**

1. The permittee and the owner/operator of an active sewage sludge unit shall comply with following requirements:
  - i. Sewage sludge shall not be placed in an active sewage sludge unit unless the requirement of 40 CFR Part 503, Subpart C are met.
  - ii. An active sewage sludge unit located within 60 meters of a fault that has had displacement in Holocene time; located in an unstable area; or located in a wetland, except as provided in a permit issued pursuant to Section 402 or 404 of the Clean Water Act, shall close by March 22, 1994, unless, in the case of an active sewage sludge unit located within 60 meters of a fault that has displacement in Holocene time, otherwise specified by the permitting authority.
    - i. The owner/operator of an active sewage sludge unit shall submit a written closure and post closure plan to EPA 180 days prior to the date an active sewage sludge unit closes.

ii The closure plan shall consider the elements outlined in Section 6. If an element is not applicable, the owner/operator shall state the reasons in the plan.

c. The owner of a surface disposal site shall provide written notification to the subsequent owner of the site that sewage sludge was placed on the site. The notice should include elements outlined in Section 7. A copy of the notification shall be submitted to the EPA.

2. Pollutant limitations

a. The maximum concentration of pollutant in the sewage sludge placed in an active sewage sludge unit shall not exceed the following:

**§503.23 TABLE  
Active Unit Boundary is Less Than 150 Meters  
From Property Boundary**

Distance (meters)	Pollutant concentrations (mg/kg)		
	Arsenic	Chromium	Nickel
0<Distance<25	30	200	210
25<Distance<50	34	220	240
50<Distance<75	39	260	270
75<Distance<100	46	300	320
100<Distance<125	53	360	390
125<Distance<150	62	450	420

b. Sewage sludge with metals concentrations which exceed the limitations in Paragraph 2a. shall not be placed in a surface disposal unit.

3. The permittee and the owner/operator shall comply with the following management practices:

a. The sewage sludge shall not be placed on an active sewage sludge unit if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated critical habitat.

b. The run-off from an active sewage sludge unit shall be collected and disposed in accordance with applicable stormwater regulations.

- c. The run-off collection system for an active sewage sludge unit shall have the capacity to control run-off from a 24 hour - 25 year storm event.
- d.
  - i. When a daily cover is placed on an active sewage sludge unit, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent of the lower explosive limit, 1.25 percent by volume, for methane gas during the period that the sewage sludge unit is active.
  - 2. The concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit, 5 percent by volume, for methane gas during the period that the sewage sludge unit is active.
- e.
  - i. When a final cover is placed on a sewage sludge unit at closure, and for three years after closure, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent of the lower explosive limit, 1.25 percent by volume, for methane gas.
  - 2. The concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit, 5 percent by volume, for methane gas for three years after the sewage sludge unit closes.
- f. A food crop, a feed crop or fiber crop shall not be grown on an active sewage sludge unit. The owner/operator of the sewage sludge unit must demonstrate to EPA that public health and the environment are protected from reasonably anticipated adverse effects of pollutants in sewage sludge when crops are grown on a sewage sludge unit.
- g. Animals shall not be grazed on an active sewage sludge unit. The owner/operator of the sewage sludge unit must demonstrate to EPA that public health and the environment are protected from reasonably anticipated adverse effects of pollutants in sewage sludge when animals are grazed on a sewage sludge unit.
- h. Public access to a surface disposal site shall be restricted for the period that the surface disposal site contains an active sewage sludge unit and for site contains an active sewage sludge unit and for three years after the last sewage unit closes.
- i.
  - i. Sewage sludge placed in an active sewage sludge unit shall not contaminate an aquifer.

2. The permittee shall demonstrate the sewage sludge place in an active sewage sludge unit does not contaminate an aquifer by either (i) submission of results of a groundwater monitoring program developed by a qualified groundwater scientist; or (2) submission of certification by a qualified groundwater scientist that the sewage sludge does not contaminate an aquifer.
  
4. The following conditions must be documented by the permittee and owner/operator:
  - a. An active sewage sludge unit shall not restrict the flow of a base flood.
  - b. If a surface disposal site is located in seismic impact zone, an active sewage sludge unit shall be designed to withstand the maximum recorded horizontal ground level acceleration.
  - c. A active sewage sludge unit shall be located 60 meters or more from a fault that has displacement in Holocene time.
  - d. An active sewage sludge unit shall not be located in an unstable area.
  - e. An active sewage sludge unit shall not be located in a wetland.
  
5. If the active sewage sludge unit is not covered daily, the permittee shall meet either Class A or Class B pathogen reduction utilizing one of the methods in Section 4, and one of the vector attraction reduction requirements in Section 5.
  
6. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2, the pathogen density, and the vector attraction reduction requirements at the following frequency:

**Sampling Frequency Table**

<b>SEWAGE SLUDGE PRODUCED</b> (metric tons per 365 day period)	<b>SAMPLING FREQUENCY</b>
$0 < \text{Sludge(tons)} < 290$	Once per Year
$0 \leq \text{Sludge(tons)} < 1500$	Once Per Quarter (four times per year)
$1500 \leq \text{Sludge(tons)} < 15000$	Once per 60 Days (six times per year)
$\text{Sludge(tons)} \leq 15000$	Once per Month (12 times per year)

7. When a daily cover is placed on an active sewage sludge unit, the air in the structures within a surface disposal site and at the property line of the surface disposal site shall be monitored continuously for methane gas during the time that the surface disposal site contains an active sewage sludge unit and for three years after the sewage sludge unit closes.
  
8. The permittee shall develop and retain the following information for five years:
  - a. The following certification statement:

“I, certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in [insert §503.32(a), §503.32(b)(2), §503.32(b)(4) when one of those requirements is met] and the vector attraction reduction requirements in [insert one of the vector attraction reduction requirements in §503.33(b)(1) through §503.33(b)(8) when one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine or imprisonment.”
  - b. A description of how the pathogen requirements are met.
  - c. When the permittee is responsible for the vector attraction reduction requirements, description of how the vector attraction reduction requirements are met.
  
9. The owner/operator of the surface disposal site shall develop and retain the following information for five years:
  - a. The concentration of each pollutant listed in Paragraph 2a.
  - b. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in §503.24 and the vector attraction reduction requirement in [insert one of the requirements in §503.33(b)(9) through (b)(11) if one of those requirements is met] was prepared under my direct supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”
  - c. A description of how the management practices in Paragraphs 3a through 3i are met.

- d. Documentation that the requirements in Paragraphs 4a through 4e are met.
  - e. A description of how the vector attraction reduction requirements are met, if the owner/operator is responsible for vector attraction reduction requirements.
10. The permittee shall report the information in Paragraphs 7a through 7d annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of the permit.
  11. All sewage sludge sampling and analysis procedures shall be in accordance with the procedures detailed in Section 7.
  12. If the permittee is not the owner/operator of the surface disposal site, the permittee shall notify the owner/operator of the following:
    - a. The requirements in Paragraphs 1a through 1c;
    - b. The management practices in Paragraphs 3a through 3i;
    - c. The requirements in Paragraphs 4a through 4e;
    - d. The requirement in Paragraph 7; and
    - e. The record keeping requirements in Paragraph 9a through 9e.

### **2.3.3. Scenario No.3**

This applies to an active sewage sludge unit with a liner and a leachate collection system.

#### **SLUDGE CONDITIONS**

1. The permittee and the owner/operator of an active sewage sludge unit shall comply with the following requirements:
  - a. Sewage sludge shall not be placed in an active sewage sludge unless the requirement of 40 CFR Part 503, Subpart C are met.
  - b. An active sewage sludge unit located within 60 meters of a fault that has had displacement in Holocene time; located in an unstable area; or located in a wetland, except as provided in a permit issued pursuant to Section 402 or 404 of the Clean Water Act, shall close by March 22, 1994, unless, in the case of an active sewage sludge unit located within 60 meters of fault that has displacement in Holocene time, otherwise specified by the permitting authority.
    - i. The owner/operator of an active sewage sludge unit shall submit a written closure and post closure plan to EPA 180 days prior to the

date an active sewage sludge unit closes.

- ii. The closure plan shall consider the elements outlined in Section 6. If an element is not applicable, the owner/operator shall state the reasons in the plan.
  - c. The owner of a surface disposal site shall provide written notification to the subsequent owner of the site that sewage sludge was placed on the site. The notice should include elements outlined in Section 7. A copy of the notification shall be submitted to the EPA.
2. The permittee shall comply with the following management practices:
- a. The sewage sludge shall not be placed on an active sewage sludge unit if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated critical habitat.
  - b. The run-off from an active sewage sludge unit shall be collected and disposed in accordance with applicable stormwater regulations.
  - c. The run-off collection system for an active sewage sludge unit shall have the capacity to handle run-off from a 24 hour - 25 year storm event.
  - d. The leachate collection system for an active sewage sludge unit shall be operated and maintained during the period the sewage sludge unit is active and for three years the sewage sludge unit closes.
  - e. The leachate shall be collected and disposed of in accordance with applicable regulations during the period the sewage sludge unit is active and for three years after it closes.
  - f.
    - i. When a daily cover is placed on an active sewage sludge unit, the concentration of methane gas in air in any structure within the surface disposal site shall not exceed 25 percent of the lower explosive limit, 1.25 percent by volume, for methane gas during the period that the sewage sludge unit is active.
    - ii. The concentration of methane gas in air at the property line of the surface disposal site shall not exceed the lower explosive limit, 5 percent by volume, for methane gas during the period that the sewage sludge unit is active.



- c. A active sewage sludge unit shall be located 60 meters or more from a fault that has displacement in Holocene time.
  - d. An active sewage sludge unit shall not be located in an unstable area.
  - e. An active sewage sludge unit shall not be located in a wetland.
4. If the active sewage sludge unit is not covered daily, the permittee shall meet either Class A or Class B pathogen reduction utilizing one of the methods in Section 4, and one of the vector attraction reduction requirements in Section 5.
  5. The permittee shall monitor the sewage sludge for the pollutants in Paragraph 2, the pathogen density, and the vector attraction reduction requirements at the following frequency:

**Sampling Frequency Table**

<b>SEWAGE SLUDGE PRODUCED</b> (metric tons per 365 day period)	<b>SAMPLING FREQUENCY</b>
0<Sludge(tons)<290	Once per Year
0<Sludge(tons)<1500	Once Per Quarter (four times per year)
1500<Sludge(tons)<15000	Once per 60 Days (six times per year)
Sludge(tons)<15000	Once per Month (12 times per year)

6. When a daily cover is placed on an active sewage sludge unit, the air in the structures within a surface disposal site and at the property line of the surface disposal site shall be monitored continuously for methane gas during the time that the surface disposal site contains an active sewage sludge unit and for three years after the sewage sludge unit closes.
7. The permittee shall develop and retain the following information for five years:
  - a. The following certification statement:

“I, certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in §503.32(a), §503.32(b)(2), §503.32(b)(3) or §503.32(b)(4) when one of those requirements is

met] and the vector attraction reduction requirements in [insert one of the vector attraction reduction requirements in §503.33(b)(1) through §503.33(b)(8) when one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine or imprisonment.”

- b. A description of how the pathogen requirements are met.
- c. When the permittee is responsible for the vector attraction reduction requirements, a description of how the vector attraction reduction requirements are met.

8. The owner/operator of the surface disposal site shall develop and retain the following information for five years:

- a. The following certification statement:

“I certify, under penalty of law, that the information that will be used to determine compliance with management practices in §503.24 and the vector attraction reduction requirement in [insert one of the requirements in §503.33(b)(9) through (b)(11) if one of those requirements is met] was prepared under my direct supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.”

- b. A description of how the management practices in Paragraphs 2a through 2k are met.
- c. Documentation that the requirements in Paragraphs 3a through e are met.
- d. A description of how the vector attraction reduction requirements are met, if the owner/operator is responsible for vector attraction reduction requirements.

9. The permittee shall report the information in Paragraphs 8a through c annually on February 19. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of the permit.

10. All sewage sludge sampling and analysis procedures shall be in accordance with the procedures detailed in Section 7.

11. If the permittee is not the owner/operator of the surface disposal site, the permittee shall notify the owner/operator of the following:
  - a. The requirements in Paragraphs 1a through e;
  - b. The management practices in Paragraphs 2a through k;
  - c. The requirements in Paragraph 3a through e;
  - d. The requirement in Paragraph 6; and
  - e. The record keeping requirements in Paragraphs 8a through d.

#### **2.3.4. Scenario No.4**

A permittee who dispose of their sludge in a municipal solid waste land fill are regulated under 40 CFR Part 258.

#### **SLUDGE CONDITIONS**

1. The permittee must dispose of the sewage sludge in a landfill which is in compliance with 40 CFR Part 258.
2. Sewage sludge disposed of in a municipal solid waste landfill shall not be hazardous. The Toxicity Characterization Leachate Protocol (TCLP) shall be used as demonstration that the sludge is non-hazardous.
3. The sewage sludge must not be liquid as determined by the Paint Filter Liquids Test method (Method 9095 as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA publication No. SW-846).

### **3. Incineration**

Each facility that incinerates sewage sludge is still subject to 40 CFR Part 503 regulations. Implementation of these regulations are site specific. A facility which incinerates sewage sludge will have specific conditions for that incineration process included in the facility's NPDES permit.

## 4. Pathogens Reduction

Allowable pathogen reduction alternatives are listed in this section. The corresponding reference to the regulation is listed in parenthesis.

### 4.1 Class A Pathogen Reduction

#### 4.1.1. Class A – Alternative 1 (503.32(a)(3))

i. Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10(b), §5.3.10(c), §503.10(e) or §503.10(f).

ii. The temperature of the sewage sludge that is used or disposed shall be maintained at a specific value for a period of time.

a. When the percent solids of the sewage sludge is seven percent or higher, the temperature of the sewage sludge shall be 50 degrees Celsius or higher; the time period shall be 20 minutes or longer; and the temperature and time period shall be determined using equation (3), except when small particles of sewage sludge are heated by either warmed gases or an immiscible liquid.

$$D = \frac{13,700,000}{10^{0.1400t}} \quad (3)$$

Where,

D = time in days

T = temperature in degrees Celsius

b. When the percent solids of the sewage sludge is seven percent or higher and small particles of sewage sludge are heated by either warmed gases or an immiscible liquid, the temperature of the sewage sludge shall be 50 degrees Celsius or higher; the time period shall be 15 seconds or longer; and the temperature and time period shall be determined using equation (3).

c. When the percent solids of the sewage sludge is less than seven percent and the time period is at least 15 seconds, but less than 30 minutes, the temperature and time period shall be determined using equation (3).

- d. When the percent solids of the sewage sludge is less than seven percent; the temperature of the sewage sludge is 50 degrees Celsius or higher; and the time period is 30 minutes or longer, the temperature and time period shall be determined using equation (4).

$$D = \frac{50,070,000}{10^{0.1400t}} \quad (4)$$

Where,

D = time in days.

t = temperature in degrees Celsius.

#### 4.1.2. Class A - Alternative 2 (503.32(a)(4))

i. Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge shall be less than Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10(b), §503.10(c), §503.10(e) or §503.10(f).

ii a.. The pH of the sewage sludge that is used or disposal shall be raised to above 12 and shall remain above 12 for 72 hours.

b. The temperature of the sewage sludge shall be above 52 degrees Celsius for 12 hours or longer during the period that the pH of the sewage sludge is above 12.

c. At the end of the 72 hour period during which the pH of the sewage sludge is above 12, the sewage sludge shall be air dried to achieve a percent solids in the sewage sludge greater than 50 percent.

#### 4.1.3. Class A - Alternative 3 (503.32(a)(5))

i. Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10(b), §503.10(c), §503.10(e) or §503.10(f).

- ii.
  - a. The sewage sludge shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains enteric viruses.
  - b. When the density of enteric values in the sewage sludge prior to pathogen treatment is less than one Plaque-forming Unit per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to enteric viruses until the next monitoring episode for the sewage sludge.
  - c. When the density of enteric viruses in the sewage sludge prior to pathogen treatment is equal to or greater than one Plaque-forming Unit per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to enteric viruses in the sewage sludge after pathogen treatment is less than one Plaque-forming Unit per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meets the enteric virus density requirement are documented.
  - d. After the enteric virus reduction in ii.c. of this subsection is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to enteric viruses when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in ii.c. of this subsection.
- iii.
  - a. The sewage sludge shall be analyzed prior to pathogen treatment to determine Whether the sewage sludge contains viable helminth ova.
  - b. When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is less than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova until the next monitoring episode for the sewage sludge.
  - c. When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is equal to or greater than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova when the density of viable helminth ova in the sewage sludge after pathogen treatment is less than one per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meet the viable helminth ova density requirement are documented.
  - d. After the viable helminth ova reduction in iii.c. of this subsection is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to viable helminth ova when the values for the pathogen

treatment process operating parameters are consistent with the values of ranges of values documented in (iii)(c) of this subsection.

**4.1.4. Class A - Alternative 4 (503.32(a)(6))**

- i. Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10 (b), §503.10(c), §503.10(f).
- ii. The density of enteric viruses in the sewage sludge shall be less than one Plaque-forming Unit per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10(b), §503.10(c), §503.10(e) or §503.10(f), unless otherwise specified by the permitting authority.
- iii. The density of viable helminth ova in the sewage sludge shall be less than one per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10(b),§503.10(c), §503.10(e) or §503.10(f), unless otherwise specified by the permitting authority.

**4.1.5. Class A - Alternative 5 (503.32(a) (8))**

- i. Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the sludge shall be less than three Most Probable Number per four grams of total (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10(b), §503.10(c), §503.10(e) or §503.10(f).
- ii. Sewage sludge that is used or disposed shall be treated in one of the Processes to Further Reduce Pathogens described in Section 4.3.

#### **4.1.6. Class A - Alternative 6 (503.32(a)(8))**

- i. Either the density of fecal coliform in the sewage sludge shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella, sp. bacteria in the sewage sludge shall be less than three Most Probable number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land; or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10(b), §503.10(c), §503.10(e) or §503.10(f).
- ii. Sewage sludge that is used or disposed shall be treated in a process that is equivalent to a Process to Further Reduce Pathogens, as determined by the permitting authority.

#### **4.2 Class B Pathogen Reduction**

##### **4.2.1. Class B - Alternative 1 (503.32(b)(2))**

- i. Seven representative samples of the sewage sludge that is used or disposed shall be collected.
- ii. The geometric mean of the density of fecal coliform in the samples collected in (2) (i) of this subsection shall be less than either 2,000,000 Most Probable Number per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units per gram of total solids (dry weight basis).

##### **4.2.2. Class B - Alternative 2 (503.32 (b)(3))**

Sewage sludge that is used or diagnosed shall be treated in one of the Processes to Significantly Reduce Pathogens described in Section 4.3.

##### **4.2.3. Class B - Alternative 3 (503.32(b)(4))**

Sewage sludge that is used or disposed shall be treated in a process that is equivalent to a Process to Significantly Reduce Pathogens, as determined by the permitting authority.

#### **4.3 Pathogen Reduction Processes**

##### **4.3.1. Process to Significantly Reduce Pathogens**

**1. Aerobic Digestion** - Sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for

the mean cell residence time and temperature shall be between 40 days at 20 degrees Celsius and 60 days at 15 degrees Celsius.

**2. Air Drying** - Sewage sludge is dried on sand beds or on paved or unpaved basins. The sewage sludge dries for a minimum of three months. During two of the three months, the ambient average daily temperature is above zero degrees Celsius.

**3. Anaerobic Digestion** - Sewage sludge is treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius.

**4. Composting** - Using either the within vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge is raised to 40 degrees Celsius or higher and remains at 40 degrees Celsius or higher for five days. For four hours during the five days, the temperature in the compost pile exceeds 55 degrees Celsius.

**5. Lime Stabilization** - Sufficient lime is added to the sewage sludge to raise the pH of the sewage sludge to 12 after two hours of contact.

#### **4.3.2. Process to Further Reduce Pathogens**

**1. Composting** - Using either the within vessel composting method or the static aerated pile composting method, the temperature of the sewage sludge is maintained at 55 degrees Celsius or higher for three days.

Using the windrow composting method, the temperature of the sewage sludge is maintained at 55 degrees or higher for 15 days or longer. During the period when the compost is maintained at 55 degrees or higher, there shall be a minimum of five turnings of the windrow.

**2. Heat Drying** - Sewage sludge is dried by direct or indirect contact with hot gases to reduce the moisture content of the sewage sludge to 10 percent or lower. Either the temperature of the sewage sludge particles exceeds 80 degrees Celsius or the wet bulb temperature of the gas in contact with sewage sludge as the sewage sludge leaves the dryer exceeds 80 degrees Celsius.

**3. Heat Treatment** - Liquid sewage sludge is heated to temperature of 180 degrees Celsius or higher for 30 minutes.

**4. Thermophilic Aerobic Digestion** - Liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the sewage

sludge is 10 days at 55 to 60 degrees Celsius.

**5. Beta Ray Irradiation** - Sewage sludge is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20 degrees Celsius).

**6. Gamma Ray Irradiation** - Sewage sludge is irradiated with gamma rays for certain isotopes, such as <sup>60</sup>Cobalt and <sup>137</sup>Cesium, at dosages of at least 1.0 megarad at room temperature (ca. 20 degrees Celsius).

**7. Pasteurization** - The temperature of the sewage sludge is maintained at 70 degrees Celsius or higher for 30 minutes or longer.

## **5. Vector Attraction Reduction**

The various vector attraction reduction means are listed in this section. The 40 CFR Part 503 section from which each reduction was excerpted is referenced in parenthesis.

### **5.1. Alternative 1 (503.33(b)(1))**

The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent.

### **5.2. Alternative 2 (503.33(b)(2))**

When the 38 percent volatile solids reduction requirement in §503.33(b)(1) cannot be met for an anaerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37 degrees Celsius. When at the end of the 40 days, the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 17 percent, vector attraction reduction is achieved.

### **5.3. Alternative 3 (503.33(b)(3))**

When the 38 percent volatile solids reduction requirement in §503.33(b)(1) cannot be met for an aerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge that has a percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. When at the end 30 days, the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 15 percent, vector attraction reduction is achieved.

### **5.4. Alternative 4 (503.33(b)(4))**

The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20 degrees Celsius.

### **5.5. Alternative 5 (503.33(b)(5))**

Sewage sludge shall be treated in an aerobic process for 14 days or longer. During time, the temperature of the sewage sludge shall be higher than 40 degrees Celsius and the average temperature of the sewage sludge shall be higher than 45 degrees Celsius.

**5.6. Alternative 6 (503.33(b)(6))**

The pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours.

**5.7. Alternative 7 (503.33(b)(7))**

The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials.

**5.8. Alternative 8 (503.33 (b)(8))**

The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials.

**5.9. Alternative 9 (503.33(b)(9))**

- i. Sewage sludge shall be injected below the surface of the land.
- ii. No significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected.

**5.10. Alternative 10 (503.33(b)(10))**

- i. Sewage sludge applied to the land surface or placed on an active sewage sludge unit shall be incorporated into the soil within six hours after application to or placement on the land unless otherwise specified by the permitting authority.
- ii. When sewage sludge that is incorporated into the soil is Class A with respect to pathogens, the sewage sludge shall be applied to or place on the land within eight hours after being discharged from the pathogen treatment program.

**5.11. Alternative 11 (503.33(b)(11))**

Sewage sludge placed on an active sewage sludge unit shall be covered with soil or other material at the end of each operating day.

## **6. CLOSURE AND POST CLOSURE PLAN**

The closure and post closure plan shall describe how the sewage sludge unit will close and how it will be maintained for three years after closure.

### **6.1. Minimum Elements**

The following items are the minimum elements that should be addressed in the closure plan.

#### **6.1.1. General Information**

- a. Name, address, and telephone number of the owner/operator
- b. Location of the site including size
- c. Schedule for final closure

#### **6.1.2. Leachate collection system**

- a. How the system will be operated and maintained for three years after closure
- b. Treatment and disposal of the leachate

#### **6.1.3. Methane Monitoring**

- a.. Description of the system to monitor methane within the structures at the property line
- b. Maintenance of the system

#### **6.1.4. Restriction of Public Access**

- a. Describe method of restricting public access for three years after the last surface disposal unit closes

#### **6.1.5. Other Activities**

- a. Groundwater monitoring
- b. Maintenance and inspection schedules
- c. Discussion of land use after cover
- d. Copy of notification to subsequent land owner

## **6.2. Notification to Land Owner**

The notification to the subsequent land owner shall include the following information:

- a. Name, address, and telephone number of the owner/operator of the owner/operator of the surface disposal site.
- b. A map and description of the surface disposal site including locations of surface disposal units.
- c. An estimate of the amount of sewage sludge placed on the site and a description of the quality of the sludge.
- d. Results of the methane gas monitoring and groundwater monitoring
- e. Discussion of the leachate collection system, if appropriate
- f. Demonstration that the site was closed in accordance with closure plan

## 7. SAMPLING AND ANALYSIS

### 7.1 Sampling

Representatives samples of sewage sludge that is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator shall be collected and analyzed.

### 7.2 Analytical Methods

The following methods shall be used to analyze samples of sewage sludge.

#### a. Enteric Viruses

ASTM Method D 499-89, "Standard Practice for Recovery of Viruses from Wastewater Sludge", Annual Book of ASTM Standards: Section 11, Water and Environmental Technology, 1992.

#### b. Fecal Coliform

Part 9221 E or Part 9222 D, "Standard Methods for the Examination of Water and Wastewater", 18<sup>th</sup> edition, American Public Health Association, Washington, D.C., 1992.

#### c. Helminth Ova

Yanko, W.A., "Occurrence of Pathogens in Distribution and Marketing Municipal Sludges", EPA 600/1-87-014, 1987. NTIS PB 88-154273/AS, National Technical Information Service, Springfield, Virginia.

#### d. Inorganic Pollutants

Method SW-846 in "Test Methods for Evaluating Solid Waste" U.S. Environmental Protection Agency, November 1986.

#### e. Salmonella sp. bacteria

Part 9260 D.1, "Standard Methods for the Examination of Water and Wastewater", 18<sup>th</sup> edition, American Public Health Association, Washington, D.C., 1992; or Kenner, B.B. and H.A. Clark, "Determination and Enumeration of Salmonella and Pseudomonas aeruginosa", J. Water Pollution Control Federation, 46 (9): 2163-2171, 1974.

f. Specific Oxygen Uptake Rate

Part 2710 B, “Standard Methods for the Examination of Water and Wastewater”, 18<sup>th</sup> edition, American Public Health Association, Washington, D.C., 1992.

g. Total Solids, Fixed Solids, and Volatile Solids

Part 2540 G, Standard Methods for the Examination of Water and Wastewater”, 18<sup>th</sup> edition, American Public Health Association, Washington, D.C., 1992.

**7.3 Percent Volatile Solids Reduction**

Percent volatile solids reduction shall be calculated using a procedure in “Environmental Regulations and Technology - Control of Pathogens and Vectors in Sewage Sludge”, EPA 625/R-92/013, U.S. Environmental Protection Agency, Cincinnati, Ohio, 1992.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND  
1 CONGRESS STREET  
SUITE 1100  
BOSTON, MASSACHUSETTS 02203

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES PERMIT NO.: **MA0100919**

NAME AND ADDRESS OF APPLICANT:

**Town of Spencer  
Sewer Commission  
Spencer, MA 01562**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Spencer Wastewater Treatment Plant  
Route 9  
Spencer, MA**

RECEIVING WATER: **Cranberry Brook**

CLASSIFICATION: **B: warm water fishery (Chicopee Watershed)**

**I. Proposed Action, Type of Facility, and Discharge Location**

The above named applicant has applied to the U.S. Environmental Protection Agency for the reissuance of its NPDES permit to discharge into Cranberry Brook, a tributary to the Sevenmile River. The facility is engaged in the collection and treatment of municipal and commercial wastewater. Figure 1 shows the facility location.

The draft permit contains monthly average total phosphorus limits of 0.2 mg/l (May 1- October 31) and 0.3 mg/l (November 1 – April 30) which are more stringent than the limits in the existing permit. Also, seasonal average mass total phosphorus limits of 0.79 lbs/day (May 1 – October 31) and 1.19 lbs/day (November 1 – April 30) are included in the draft permit. These seasonal average mass total phosphorus limits are based on wasteload allocations established in the final phosphorus TMDLs developed by MassDEP for Quaboag and Quacumquasit Ponds (dated May 16, 2006). The basis for the new phosphorus limits are discussed in the *Phosphorus* Section of this Fact Sheet.

This draft permit continues to include detailed requirements regarding the control of inflow and infiltration (I/I) (see Section C.2. of the draft permit) and explicitly prohibits treatment process bypasses that have occasionally occurred at the treatment facility during high I/I events. The copper effluent limits in the draft permit are revised from the previous limit because of new hardness data and an updated determination of the 7Q10 low-flow (7Q10) for Cranberry Brook. Winter ammonia limits are included in the draft permit and the chronic whole effluent toxicity

limitation has been revised based on the updated 7Q10 low-flow determination for Cranberry Brook.

The draft permit includes changes to the monitoring requirements for phosphorus, winter ammonia, TKN, nitrite, nitrate, and whole effluent toxicity. Additionally, monitoring requirements for *Escherichia coli* and bypass events (BOD<sub>5</sub>, TSS, and total phosphorus) have been added to the draft permit. The bases for the monitoring requirements are further discussed in the respective sections of this Fact Sheet.

***Collection System, Treatment Process and other Related Operational Information:***

The wastewater collection system consists of 18.5 miles of interceptor and collector sewers that serve portions of the Town of Spencer. The West Main Street (Route 9) interceptor picks up flows from the other collectors and interceptor sewers, as well as the Meadow Road force main and conveys them to the wastewater treatment facility. The collection system includes both new and old sewers. No combined sewers are believed to be connected to the collection system. Wastewater is comprised of mostly domestic sewage with some septage, commercial, and industrial sewage. There are two small discharges of industrial wastewater received at the WWTP consisting of (1) heated non-contact process water and boiler blowdown and (2) cleaning water used in the preparation of jam and jellies.

***Treatment Plant Flow:***

The Spencer wastewater treatment facility has a design flow of 1.08 MGD. Wastewater enters the treatment plant through a 24-inch gravity sewer directly to the screening and grit removal facilities where it receives preliminary treatment to remove large solids and grit. Flow continues to the screw pump lift station and is pumped to the aeration basins for biological treatment, including nitrification. Following aeration, the biomass flows through a chemical feed manhole where alum and lime are introduced, as needed, to enhance phosphorus removal and adjust pH, respectively. The biomass and chemicals are blended in a rapid-mix box prior to flowing into the final clarifier. Settled solids are returned to the aeration tanks. Excess sludge is removed as waste sludge. Clarifier effluent enters wetland beds for tertiary treatment and then is disinfected using ultraviolet radiation. The final effluent is aerated and replenished with dissolved oxygen as it flows down a cascade outfall to Cranberry Brook.

A review of influent and effluent flow records reveals that the influent flow typically exceeds the effluent flow at the facility, indicating that a portion of the flow that enters the facility is being lost to groundwater. The loss of flow is most likely occurring in the wetland treatment system through groundwater recharge. Table 1 and Attachment B summarize the difference in influent and effluent flows at the WWTP. The loss of flow from the wetland system to ground water has been as high as high 45 percent or 0.5 MGD (April 2005), while on average, the loss of flow to ground water has been approximately 0.2 MGD.

Occasionally, secondary treatment process bypass events occur at the facility when influent flows exceed the capacity of the screw pump lift station (5.48 MGD). Influent flows exceeding 5.48 MGD discharge to the wet weather pump station and are pumped to the last two constructed wetland beds for treatment. Bypassed flows mix with the fully treated flows prior to disinfection. There have been four bypass events since issuance of the last permit in February of 2003. For the bypass events, flow data from the facility indicate that instantaneous peak influent flows exceeding 5.48 MGD occur for only short periods of time during the day of the event. The volumes of the bypassed flow during these events have ranged between 1.2 and 6.7 percent of the

total influent flow volume received at the WWTP on the day of that the bypass occurred. In all cases, the bypass events were caused by wet weather conditions that resulted in high I/I in the collection system.

### ***Sludge Processing:***

Waste sludge from the final clarifiers is thickened by gravity to approximately 7% solids, and then pumped to the sludge holding tank for temporary storage. The sludge is then trucked to Rhode Island for incineration by SYNAGRO.

### ***Nutrient Removal:***

Phosphorus removal is accomplished by chemical precipitation using liquid alum. Alum is stored in a 6,000-gallon tank located in the south section of the solids building. The alum is injected into the process at the chemical manhole located after the aeration tanks and then mixed at the rapid mix/splitter box.

Nitrification is accomplished biologically in the aeration tanks. Lime is stored in a 2,000 cubic foot silo located outside the solids building on the southeasterly side. Lime is used for pH control to enhance nitrification, effluent pH adjustment, and to control septage odors. Lime slurry mix tanks are located inside the solids building where lime slurry is pumped to the aerated septage tank for process addition.

### ***Constructed Wetlands:***

The wetland beds were originally constructed in as sand beds, but over time, vegetation had grown in the beds creating a wetlands type of environment. As part of the treatment plant upgrade completed in 1988, six of the beds, Bed C through Bed H, were converted into constructed wetlands by removing existing vegetation and the top layer of soil, and installing inlet and outlet structures, underdrains, six inches of top sand and wetland vegetation. Four different types of vegetation were planted for phosphorus removal. Bed D and Bed F were planted with cattails and wool grass, Bed C and Bed E with reed grass and Bed G and Bed H with reed canary grass. The wetland beds are utilized throughout the year.

### ***Septage Treatment:***

Septage facilities are located just outside the eastern mid-point of the solids building. A receiving trough with a coarse bar screen empties into a 10,000 gallon aerated storage tank. Lime is added to control odors and for pH adjustment. Plant water is pumped at 20 gpm to dilute and feed the septage/lime mixture into the process through the septage tank overflow pipe which empties into the aerated grit tank.

### ***Ultraviolet Radiation - Disinfection:***

Final effluent is disinfected using ultraviolet radiation. Effluent collected by the underdrain system in the wetland cells passes under ultraviolet lamps for disinfection prior to discharge to Cranberry Brook.

**Staffing:**

Three employees staff the treatment facility full time Monday - Friday, 7:00 a.m. - 3:30 p.m. and rotate weekend shifts of 3 hours on Saturday, Sunday and holidays. Wastewater Treatment Operator Licenses held by employees are: two Grade-7 and one Grade-5. A part time clerk works at the Sewer Department Office, Monday through Thursday, processing bills, invoices, permits and phone calls.

Outside contractors are used for engineering, electrical, mechanical, welding, machine shop services and collection system cleaning, repair and replacement.

**II. Description of Discharge**

Flow and effluent quality data for the Spencer WWTP are summarized below in Table 1 for the two year period (October 2003 - September 2005). Monthly average and maximum daily values for each month during this period may be found in Attachment 1. Data are summarized to demonstrate recent performance history of the facility. As indicated, the Spencer WWTF has maintained a high quality effluent and has been in compliance with effluent limitations for all parameters except for copper. During the summer of 2006, the permittee will undertake a corrosion control program within the Town’s drinking water distribution system to help address the elevated copper levels.

**Table 1. Summary of flow and effluent quality for Spencer WWTP (October 2003 – September 2005)**

<b>Parameter</b>	<b>Average monthly average (range of monthly averages)</b>	<b>Average daily maximum (range of daily maximums)</b>
Influent flow (MGD)	0.75 (0.47 – 1.28)	1.48 (0.55 - 2.90)
Effluent Flow (MGD)	0.55 (0.15 – 1.36)	1.34 (0.30 - 2.85)
BOD <sub>5</sub> (mg/l)	1.98 (0.90 – 3.50)	2.78 (1.40 – 5.60)
TSS (mg/l)	0.39 (0.20 – 1.90)	0.84 (0.20 – 6.80)
Total Phosphorus (mg P/l)	0.17 (0.13 – 0.24)	-----
Ammonia (mg N/l)	0.07 (0.03 – 0.29)	-----
Copper (µg/l)	55 (28 – 130)	-----
Effluent toxicity (%) (number of tests)		
LC50	-----	>100 (7)
C-NOEC	-----	89 (1), >100 (6)

**III. Permit Limitations and Conditions**

The effluent limitations and monitoring requirements of the draft permit may be found in the draft NPDES permit.

**IV. Permit Basis and Explanation of Effluent Limitation Derivation**

**Waterbody Classification and Usage:**

The effluent from the Spencer WWTP discharges into Cranberry Brook approximately 500 feet upstream from its confluence with the Sevenmile River. Further downstream, the Sevenmile

River joins the East Brookfield River and then eventually discharges into Quaboag Pond which, at times, is hydraulically connected to Quacumquasit Pond. Cranberry Brook, Sevenmile River, East Brookfield River, Quaboag Pond and Quacumquasit Pond are all classified in the Massachusetts Surface Water Quality Standards (314 CMR 4.00) as Class B-warm water fisheries. Class B waters are designated as habitat for fish, other aquatic life, and wildlife and for primary and secondary contact recreation. Where designated, Class B waters shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.

***Municipal Waste Water Treatment Facility [also referred to as “Publicly Owned Treatment Works” (POTW Discharges)] Effluent Limits Regulatory Basis***

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Clean Water Act (CWA) (see 40 CFR 125 Subpart A). For publicly owned treatment works, technology based requirements are effluent limitations based on secondary treatment as defined in 40 CFR Part 133.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limits based on water quality standards. The Massachusetts Surface Water Quality Standards (314 CMR 4.00) include requirements for the regulation and control of toxic constituents, and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site-specific criteria are established. The state will limit or prohibit discharge of pollutants to surface waters to assure that water quality of the receiving waters are protected and maintained and consistent with Massachusetts Surface Water Quality Standards.

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that causes, or has reasonable potential to cause, or contribute to an excursion above any water quality criterion. An excursion occurs if the projected or actual receiving water concentrations do not comply with the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and where appropriate, the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirements of the CWA. Anti-backsliding provisions are found in Sections 402(o) and 303(d)(4) of the Clean Water Act and at 40 CFR 122.44(l) and require that the limits in a reissued permit be at least as stringent as those in the previous permit, except under certain circumstances. Effluent limits based on technology standards, water quality, and state certification requirements must all meet anti-backsliding provisions.

***Flow:***

The stream flow information used to calculate effluent limits in the draft permit is presented below in Table 2. The 7-day, 10-year low flow (7Q10) and the seasonal (December 1 – April 30) 30-day, 10-year low flow (30Q10) used in the draft permit are based on continuous flow data collected at the USGS gage located on the Sevenmile River and adjusted for the drainage area at the discharge location. Flow factors, expressed as flow per square mile, for 7Q10 and 30Q10 were derived using data collected at the Sevenmile River gage. These flow factors were then

multiplied by the drainage area at the Spencer WWTP to determine 7Q10 and 30Q10 low-flow conditions at the point of discharge. As indicated in Table 2, the 7Q10 used in the draft permit is 0.15 cfs at the Spencer WWTP. The 7Q10 flow value is updated from the previous permit and reflects the daily flow record (1962-2004) for the Sevenmile gage. The 7Q10 flow value was used to calculate effluent limits for copper and chronic whole effluent toxicity, while the seasonal 30Q10 flow was used to calculate the winter ammonia effluent limit for the period of December 1 to April 30.

**Table 2. Low-flow statistics for the Sevenmile River gage (1962-2004) and Spencer WWTP.**

	Sevenmile River USGS Gage 01175670	Spencer WWTP Cranberry Brook
Drainage Area (square miles)	8.81	6.4
7Q10 flow (cfs)	0.2	0.15
7Q10 flow factor (cfs/square mile)	0.023	0.023
Seasonal 30Q10 flow (cfs) (December – April)	3.9	2.8
30Q10 flow factor (cfs/square mile)	0.443	0.443

Dilution factors, which account for the magnitude of the Spencer WWTP discharge (1.08 MGD or 1.67 cfs) and the available dilution in Cranberry Brook at the discharge location, were calculated for both 7Q10 and 30Q10 flow conditions. As discussed below, the dilution factors are used with applicable criteria to determine allowable effluent limits for ammonia and copper. The dilution factors for the Spencer WWTP are calculated as follows.

Monthly average dilution factor for 7Q10 conditions ( $DF_{7Q10}$ )

$$DF_{7Q10} = (7Q10_{\text{Cranberry Brook}} + \text{WWTP flow}) / \text{WWTP flow}$$

$$DF_{7Q10} = (0.15 \text{ cfs} + 1.67 \text{ cfs}) / 1.67 \text{ cfs}$$

$$DF_{7Q10} = 1.09$$

Monthly average dilution factor for seasonal 30Q10 conditions ( $DF_{30Q10}$ )

$$DF_{30Q10} = (30Q10_{\text{Cranberry Brook}} + \text{WWTP flow}) / \text{WWTP flow}$$

$$DF_{30Q10} = (2.8 \text{ cfs} + 1.67 \text{ cfs}) / 1.67 \text{ cfs}$$

$$DF_{30Q10} = 2.68$$

The effluent limits for the various parameters are discussed below:

***BOD<sub>5</sub> and total suspended solids:*** The limits are based upon the previous permit and vary according to seasons. During the colder weather season (November – April) the limits are technology based requirements while during the warmer weather season (May – October) the limits are water quality based. In previous permits, the limits have been reduced since the 1975 Massachusetts Water Quality Management Plan waste load allocation (WLA) based upon facility planning efforts and updates of the WLA.

***pH:*** The limit is based upon the previous permit and reflects the ambient Class B standard in Massachusetts Surface Water Quality Standard (MASWQS).

**Minimum dissolved oxygen concentration:** The limit is based upon the previous permit and is necessary to maintain an in-stream dissolved oxygen level above the MASWQS of 5.0 mg/l particularly during low flow periods.

**Fecal coliform:** The limit is based upon the previous permit and reflects the in-stream Class B standard. This is a seasonal limit (April – October).

**Escherichia coli:** The seasonal monthly monitoring requirement is based on the Escherichia coli (E. Coli) criteria proposed in the revisions to MASWQS. Massachusetts intends to adopt proposed revisions to the SWQS including changing the indicator bacteria organism from fecal coliform to E. coli by the end of 2006. Concurrent fecal coliform and E. coli data collected from the effluent are needed to ensure that MASWQS will be attained during the period between final adoption of the revised SWQS and reissuance of Spencer’s permit to include an E. coli limit.

**Ammonia:** The seasonal limit for May to October is based upon the previous permit and reflects the need to reduce the oxygen demanding component of the nitrogen cycle during nitrification and also reflects the need to reduce ammonia to prevent toxicity. The November ammonia limit is also based on the previous permit to prevent toxicity in Cranberry Brook. The draft permit includes a new winter season (December 1 – April 30) ammonia limit to prevent in-stream toxicity. EPA has promulgated water quality criteria which address ammonia toxicity including “winter” conditions. The determination of the winter ammonia ambient criterion for Cranberry Brook is dependent on pH and temperature as explained in the 1999 Update of Ambient Water Quality Criteria for Ammonia, 64 Federal Register 71973-71980.

The winter limit for ammonia is included in the draft permit to insure that the Spencer WWTP continues to maintain nitrification throughout the winter season. A review of effluent data for the discharge indicates that the Spencer WWTP does an excellent job of maintaining very low ammonia levels in its discharge throughout the year. However, if nitrification were to cease during the winter season, the discharge could potentially cause ammonia toxicity in Cranberry Brook. Therefore, as a precaution, an ammonia winter limit is included in the draft permit. Based on an in-stream pH of 7.1 and temperature of 5° C, the winter ammonia criterion to prevent chronic toxicity in Cranberry Brook at the discharge is 5.67 mg N/l. Using the seasonal (December – April) 30Q10 dilution factor, the monthly average winter effluent limit for ammonia is 15.2 mg N/l or 136 lbs N/day.

Monthly average ammonia concentration limit (C-NH<sub>3</sub>)

$$C\text{-NH}_3 = \text{chronic criterion} \times 30\text{Q}10 \text{ dilution factor}$$

$$C\text{-NH}_3 = 5.67 \text{ mg N/l} \times 2.68$$

$$C\text{-NH}_3 = 15.2 \text{ mg N/l}$$

Monthly average ammonia mass limit (M-NH<sub>3</sub>)

$$M\text{-NH}_3 = C\text{-NH}_3 \times \text{monthly average permit flow} \times \text{conversion factor}$$

$$M\text{-NH}_3 = 15.2 \text{ mg N/l} \times 1.08 \text{ MGD} \times 8.28$$

$$M\text{-NH}_3 = 136 \text{ lbs N/day}$$

While the draft permit includes winter ammonia limits, the frequency of monitoring for ammonia during the winter season (December 1 to April 30) is reduced from once per week in the existing permit to twice per month in the draft permit. Monitoring for ammonia twice per month during this period will be sufficient to determine whether the facility has continued to nitrify and remove ammonia.

**Total Nitrogen:** The need for monitoring requirements for nitrogen is based on the previous permit. It has been determined that excessive nitrogen loadings are causing significant water quality problems in Long Island Sound, including low dissolved oxygen. The State of Connecticut has begun to impose nitrogen limitations on Connecticut River discharges to Long Island Sound and its tributaries. EPA believes there is a need to determine the loadings of nitrogen from sources in Massachusetts which are tributary to Long Island Sound, to determine whether these loadings are impacting the water quality in Long Island Sound, and to help determine what limits, if any, should ultimately be imposed on discharges in Massachusetts. During operation under the existing permit, the permittee monitored for TKN, nitrite, and nitrate nitrogen once per month. The draft permit reduces the frequency of this monitoring to four times per year (February, May, August, and November). The new quarterly data along with the monthly data collected under the existing permit will be sufficient to characterize the total nitrogen loading being discharged by the Spencer WWTP. The nitrogen data will help to establish a database of nitrogen loadings, which can be used to quantitatively assess the impact of loading and transport of nitrogen to Long Island Sound. The data will be used in future decisions relating to nitrogen loadings to the Sound. No numerical limitations for these pollutants are established in the draft permit.

### **Metals**

Relatively low concentrations of trace metals in receiving waters can be toxic to resident aquatic life species. Effluent metals data submitted with toxicity test results were reviewed to determine if any of the metals in the discharge have the potential to exceed aquatic life criteria in Cranberry Brook. The data indicate that the discharge has the potential during low flow conditions to cause/and or contribute to exceedances of the ambient copper criteria as adopted in MASWQS. The copper criteria adopted in the MASWQS are set at levels to protect aquatic life from both acute and chronic toxicity. The limits for copper in the draft permit are changed from the existing permit and are based on a revised 7Q10 flow and more current hardness data. Hardness data for the effluent and Cranberry Brook submitted with toxicity test results indicate an in-stream hardness of 100 mg/l just downstream of the discharge during 7Q10 flow conditions. Based on this hardness, the acute and chronic copper criteria for Cranberry Brook used to calculate the maximum daily and monthly average copper limits are 14.0 µg/l and 9.3 µ/l, respectively. Based on the 7Q10 dilution factor, the draft permit includes a daily maximum limit equal to 15.3 µg/l and a monthly average limit of 10.3 µg/l.

Maximum daily copper limit (C-CU<sub>MD</sub>)

$$C-CU_{MD} = \text{acute criterion} \times 7Q10 \text{ dilution factor}$$

$$C-CU_{MD} = 14.0 \mu\text{g/l} \times 1.09$$

$$C-CU_{MD} = 15.3 \mu\text{g/l}$$

Monthly average copper limit (C-CU<sub>MA</sub>)

$$C-CU_{MA} = \text{acute criterion} \times 7Q10 \text{ dilution factor}$$

$$C-CU_{MA} = 9.3 \mu\text{g/l} \times 1.09$$

$$C-CU_{MA} = 10.3 \mu\text{g/l}$$

The reasonable potential analysis for other trace metals did not indicate that Spencer's discharge has a reasonable potential to cause or contribute to exceedances of metals criteria in Cranberry Brook. Metals data submitted with toxicity test reports were evaluated against potential water quality-based effluent limits based on the respective water quality criteria for each metal. The criteria were determined based on a hardness of 100 mg/l CaCO<sub>3</sub> and potential effluent limits

were calculated using the 7Q10 instream dilution (dilution factor of 1.09) for Cranberry Brook. The data show that metals levels in the discharge are low and consistently below the respective potential limits for this discharge. For example, Table 3 summarizes the criteria, potential water quality-based limits, and discharge quality for three trace metals (aluminum, lead, and zinc) that are commonly present in the effluent of POTWs. As indicated, the arithmetic means of the data are well below the criteria and there was only one reported value for each of these metals that exceeded a criterion. A review of the data indicates that the high values are outliers of the data sets and are not representative of the typical quality of the effluent.

**Table 3. Summary of Reasonable Potential Analysis for selected Trace Metals**

Metal	Acute Criterion (µg/l)	Chronic Criterion (µg/l)	Maximum Daily Limit (µg/l)	Average Monthly Limit (µg/l)	Effluent		
					Mean (µg/l) reported	Range(µg/l)	no. of exceedences
Aluminum	750.0	87.0	817.0	94.8	54.7	20 - 410	1 of 15
Lead	81.7	3.2	89.0	3.5	2.6	0.5 - 6	1 of 15
Zinc	119.8	119.8	130.6	130.6	64.6	30 - 140	1 of 15

***Whole Effluent Toxicity Testing***

Under Section 301(b)(1) of the CWA, discharges are subject to effluent limitations based on water quality standards. The State Surface Water Quality Standards (314 CMR 4.05(5)(e.)), include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

*All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife. Where the State determines that a specific pollutant not otherwise listed in 3.14 CMR 4.00 could reasonably be expected to adversely affect existing or designated uses, the State shall use the recommended limit published by EPA pursuant to 33 U.S.C. 1251 §304(a) as the allowable receiving water concentrations for the affected waters unless a site-specific limit is established. Site specific limits, human health risk levels and permit limits will be established in accordance with 314 CMR 4.05(5)(e)(1)(2)(3)(4).*

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents to POTWs above those, which may be contributed from industrial users. These pollutants include metals, chlorinated solvents, aromatic hydrocarbons and other constituents. As a result, EPA New England and the MassDEP have developed toxicity control policies. These policies require wastewater treatment facilities to perform toxicity bioassays on their effluent. Discharges having a dilution of less than 10:1 require acute and chronic toxicity limits.

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analysis; (2) bioavailability of pollutants after discharge is measured by toxicity testing including any synergistic effect of pollutants; and (3) pollutants for which there are inadequate analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in connection with pollutant-specific control procedures to control the discharge of toxic pollutants.

The draft permit continues to require toxicity testing for one specie, the daphnid, (**Ceriodaphnia dubia**). However, the frequency of testing is reduced from four times per year to two times per year. Whole effluent toxicity testing of the effluent during the past five years indicate that the discharge from the facility has exhibited no acute toxicity and has been in compliance with chronic limits. However, as a contingency, the draft permit proposes to require that if any future toxicity test should fail to comply with the limits, the permittee must re-test the effluent within fourteen days of the original test.

Differing from the existing permit, the draft permit proposes to require the permittee to use the receiving water sample collected upstream of the discharge as the test control and dilution water. A review of toxicity test results on samples collected from Cranberry Brook show that water from Cranberry Brook does not exhibit toxicity and is suitable for use as dilution water. Tests are to be conducted the second week in May and August using the protocol in the Toxicity Testing attachment.

The Chronic - No Observed Effect Concentration (C-NOEC) limitation of 92% in the draft permit prohibits chronic adverse effects (e.g., on survival, growth, or reproduction) when aquatic organisms are exposed to the POTW discharge at the calculated available dilution. This limit has changed from the existing permit because of the revised 7Q10 flow used to calculate the limit. The limit is derived by calculating the in-stream waste concentration using 7Q10 flow conditions and WWTP design flow (1.67 cfs).

C-NOEC (percent) = In-stream waste concentration= (flow WWTP/(flow WWTP + 7Q10 flow)) x 100

C-NOEC = (1.67 cfs/(1.67 cfs + 0.15 cfs)) x 100

C-NOEC = 92%

#### ***Chlorine:***

The Spencer WWTP now uses ultraviolet radiation to disinfect the effluent and no longer uses chlorine in any of the treatment processes. As a result, total residual chlorine limits are no longer necessary and are not included in the draft permit

#### ***Phosphorus***

Phosphorus is an essential nutrient for aquatic plant growth in receiving waters. When in excess, phosphorus contributes to excessive growth of aquatic plants that can interfere with the attainment of recreational and aquatic life uses. High levels of aquatic plants (phytoplankton or algae and rooted plants) cause aesthetic impairments by reducing water clarity, imparting color, and choking water ways with excessive vegetative matter. Aquatic life uses in receiving waters are impacted by from excessive plant growth which can cause low dissolved oxygen levels because of dissolved oxygen consumption from plant respiration and biological decay of dead plant matter. Additionally, the excessive growth of certain phytoplankton species can exhibit toxicity to aquatic life, as well as bad odors. The process of producing high amounts of plant biomass in waters is referred to as eutrophication. When nutrients such as phosphorus are discharged because of human activities (e.g., WWTPs, and storm water), the process is referred to cultural or accelerated eutrophication. MASWQS specifies in 314 CMR: 4.05 that nutrients shall not exceed the site-specific limits necessary to control accelerated or cultural eutrophication in receiving waters.

Massachusetts Water Quality Standards also require that any existing point source discharge containing nutrients in concentrations which encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practical treatment to remove such nutrients (see 314 CMR 4.04 (5)). MassDEP has determined that an effluent total phosphorus concentration of 0.2 mg/l (200 µg/l) represents highest and best practical treatment for municipal wastewater treatment facilities. This limit was derived from a literature search and generally accepted treatment technology for phosphorus. Furthermore, EPA's Technical Transfer guidance published in 1987 (EPA/625/6-87/017) concludes that 0.2 mg/l is achievable with existing treatment technology.

The existing permit contains monthly average phosphorus limits of 0.3 mg/l and 0.75 mg/l for the growing season (May 1 – October 31) and winter season (November 1 – April 30), respectively, in order to address cultural eutrophication in receiving waters downstream of the discharge. Quaboag Pond, located downstream from the Spencer WWTF, is a highly used recreational pond that continues to experience excessive growth of plants and algae, and as a result, is in nonattainment with MASWQS. Quaboag Pond is currently included on Massachusetts' final 2004 Clean Water Act Section 303(d) list of waters requiring the development of Total Maximum Daily Loads (TMDLs).

To address the cultural eutrophication of Quaboag Pond, MassDEP has recently conducted a TMDL study of the pond. In accordance with Section 303(d) of the Clean Water Act, States are required to establish TMDLs for all listed waters where existing required pollution controls are not stringent enough to attain water quality standards. The TMDL must define the maximum amount of a pollutant load that a waterbody can receive and still attain water quality standards. Moreover, the TMDL must allocate the total allowable load to the contributing sources. The final TMDL for Quaboag Pond is included in the MassDEP report entitled *Total Maximum Daily Loads of Phosphorus for Quaboag & Quacumquasit Pond*, and dated May 16, 2006. The final report has undergone public review and has been submitted to EPA for approval. The TMDL report is now under review at EPA.

The technical analysis used in the development of the TMDL is based on extensive water quality monitoring of Quaboag and Quacumquasit Ponds and the tributary drainage areas, and the use of empirical loading and lake models. The monitoring data and technical analysis performed for the TMDL confirm that the pond is undergoing cultural eutrophication due to excessive phosphorus loading and that reductions in phosphorus loadings are needed. Phosphorus allocations were established for the Spencer WWTP, permitted storm water sources in the Spencer including Mass Highway, and nonpoint sources in the watershed based on land cover categories (e.g. agriculture). The TMDL sets an overall allowable load of phosphorus for Quaboag Pond of 2588 kg/yr or 7.09 kg/day. The wasteload allocation for the Spencer WWTP for the growing season represents approximately 5% of the allowable daily phosphorus load to the Pond.

The load allocation for the Spencer WWTP is divided into two seasons. There is an allocation for the growing season from May 1 – October 31, and another for the winter season from November 1 – April 30. The growing season phosphorus allocation was set at 0.79 lbs/day, which corresponds to a total phosphorus effluent concentration of 0.2 mg/l at an average discharge flow of 0.47 MGD, about half of the WWTP design flow of 1.08 MGD. The winter season allocation accounts for the increase in-stream flow that occurs during the winter season, and is set at 1.19 lbs/day, which corresponds to an effluent concentration limit of 0.3 mg/l at an average effluent flow of 0.47 MGD.

Federal regulations found at 40 CFR Part 122.44(d) (1)(vii)(B) require that effluent limits developed to protect water quality be consistent with the assumption and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR Part 130.7 (TMDLs and individual water quality-based effluent limitations). The draft permit therefore includes limits that are based on the technical analysis of the TMDL, and are consistent with the allocations discussed above. The growing season phosphorus limits in the draft permit an overall seasonal average mass limit of 0.79 lbs/day and a new winter seasonal average mass limit of 1.19 lbs/day which is based on the TMDL analysis. EPA concludes that the technical analysis performed for the TMDL study satisfactorily identifies allowable phosphorus loadings to Quaboag Pond, including the WLA for the Spencer WWTP, that are consistent with attaining eutrophication-related water quality standards in the Pond.

The monthly average summer concentration limit of 0.2 mg/l is also consistent with the highest and best practical treatment requirements of the Massachusetts Water Quality Standards. It should be recognized that effluent concentrations lower than this limit may have to be achieved in order to meet the TMDL-based mass limit when the treatment plant exceeds about half of its design flow (as shown above, a mass limit of 0.79 lbs per day and a concentration limit of 0.2 mg/l correspond to a flow of 0.47MGD).

The winter average monthly concentration limit has been reduced from 0.75 mg/l in the existing permit to 0.3 mg/l in the draft permit based on the TMDL's winter season phosphorus allocation to the facility (1.19 lbs/day) and an average effluent flow of 0.47 MGD. The average weekly concentration limit from the existing permit (1 mg/l) has been retained in the draft permit. It should be recognized that effluent concentrations lower than the winter seasonal average limit will have to be achieved in order to meet the TMDL-based mass limit (a mass limit of 1.19 lbs/day). For example, the allowable winter season concentration is reduced to 0.2 mg/l when the average effluent flow increases to 0.7 MGD.

As described, the TMDL is based on attaining water quality standards in the ponds downstream of the discharge. The rivers conveying the discharge to the ponds (i.e., Cranberry Brook and the Sevenmile River) are not listed for nonattainment of water quality standards for nutrients, DO, aquatic plants or indicators of eutrophication, so water quality-based limits more stringent than the highest and best limits required by MAWQS have not been considered to protect these water bodies. However, should new water quality information become available or if the state develops water quality criteria, the permit may be re-opened and modified.

**Monitoring:** The effluent monitoring requirements have been specified in accordance with 40 CFR 122.41(j), 122.44(i) and 122.48 to yield data representative of the discharge.

## **V. Sludge Information and Requirements**

Section 405(d) of the Clean Water Act requires that sludge conditions be included in all POTW permits. The Spencer Wastewater Treatment Plant has its sludge hauled off-site for treatment. The sludge requirements for the facility are outlined in the permit and defined the sludge attachment. If the ultimate sludge disposal method changes, the permit requirements pertaining to sludge monitoring and other conditions would change accordingly.

## **VI. Infiltration/Inflow Requirements**

Infiltration/inflow is extraneous water entering the wastewater collection system through a variety of sources. Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow reducing the capacity and the efficiency of the treatment works and may cause bypasses of secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

The draft permit includes requirements for the permittee to continue to implement a program to control infiltration and inflow (I/I) in the collection system. These requirements are continued from the existing permit. Annual I/I program reports submitted by the permittee, demonstrate that the permittee has made progress in removing I/I through the replacement of several deteriorating sewer pipes. The permittee has also developed a sewer bank which requires persons wanting to connect to the sewer system to address known areas of I/I. Nevertheless, a review of influent flow records to the Spencer WWTP clearly show that I/I still represents a substantial portion of the total flow treated by the WWTP. Additionally, on occasions during extreme high I/I events, secondary treatment bypasses have occurred at the facility which are prohibited by the draft permit. Finally, the permittee will need to continue to reduce I/I in order to comply with the seasonal mass phosphorus limits included in the draft permit.

The permit standard conditions for 'Proper Operation and Maintenance' are found at 40 CFR §122.41(e). These require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, the permittee has a 'duty to mitigate' as stated in 40 CFR §122.41 (d). This requires the permittee to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment. EPA and MassDEP maintain that an I/I removal program is an integral component to insuring permit compliance under both of these provisions.

The MassDEP has stated that inclusion of the I/I conditions in the draft permit shall be a standard State Certification requirement under Section 401 of the Clean Water Act and 40 CFR §124.55(b).

## **VII. Essential Fish Habitat Determination (EFH)**

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. § 1802 (10)). Adversely impact means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. § 600.910 (a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b) (1) (A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. After coordination with NMFS, EPA has concluded that no species listed under NMFS jurisdiction occur in the receiving waters identified in this fact sheet.

## **VIII. Endangered Species Act**

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants (“listed species”) and habitat of such species that has been designated as critical (a “critical habitat”). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species, where as the National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

As the federal agency charged with authorizing the discharge from this facility, EPA consulted with the USFWS as required under section 7 (a)(2) of the Endangered Species Act (ESA), for potential impacts to federally listed species. Based on a letter from the USFWS (July 20, 2006), it is EPA’s understanding that no federally-listed or proposed, threatened or endangered species or critical habitat, under the jurisdiction of the US Fish and Wildlife Service, are known to occur in the in the receiving waters identified in this permit. Furthermore, the effluent limitations and other permit requirements identified in this Fact Sheet are designed to be protective of all aquatic species.

## **IX. State Certification Requirements**

The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the State and expects that the draft permit will be certified.

## **X. Comment Period, and Procedures for Final Decisions**

All persons, including applicants, who believe, any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Massachusetts Office of Ecosystem Protection (CMP), One Congress Street-Suite 1100 Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. In reaching a final decision on the draft permit, the Regional Administrator will respond to significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period after the public hearing the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

Within 30 days following the notice of the final permit decision, interested parties may petition the Environmental Appeals Board to review any condition of the permit decision. Regulations regarding the appeal of NPDES permits may be found at 40 CFR Part 124.19.

**XI. EPA Contact**

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Mark Voorhees  
Office of Ecosystem Protection  
U.S. Environmental Protection Agency  
1 Congress Street  
Boston, Massachusetts 02114-2023  
Telephone: 617-918-1537

or

Paul Hogan  
Massachusetts Department of  
Environmental Protection  
Division of Watershed  
Management  
Worcester, MA 01608  
Telephone: 508-767-2796  
627 Main Street

Date: \_\_\_\_\_

Linda M. Murphy, Director  
Office of Ecosystem Protection  
US Environmental Protection Agency

**Attachment 1. Outfall 001 Effluent Characteristics Based on Average Monthly Data**

Date	Influent Flow (MGD)		Effluent Flow (MGD)		BOD <sub>5</sub> (mg/l)		BOD <sub>5</sub> % Removal		TSS (mg/l)		TSS % Removal		Total Phosphorus (mg/l)		Ammonia Nitrogen (mg/l)		Copper (ug/l)		Fecal coliform (cfu/100 ml)		LC50	C-NOEL 7-Day
	Monthly average	Maximum Daily	Monthly average	Maximum daily	Monthly average	Maximum Daily	Monthly average	Maximum Daily	Monthly average	Maximum Daily	Monthly average	Maximum Daily	Monthly average	Maximum Daily	Monthly average	Maximum Daily	Monthly average	Maximum Daily	Monthly average	Maximum Daily	Ceriodaphina	Ceriodaphina
Existing Limits	1.08 note 1	****			note 2	***	85%		note 2	***	85%	0.3 (Apr -Oct) 0.75 (Nov-Mar)	0.56 (May -Oct.) 8.5 (Nov.)	4	200	400	≥100	≥89				
Proposed Limits	1.08 note 1	****			note 2	***	85%		note 2	***	85%	0.2 (Apr -Oct) 0.75 (Nov-Mar)	0.56 (May -Oct.) 8.5 (Nov.) 15.3 (Dec-Apr.)	10	200	400	≥100	>92				
Sep. 2005	0.52	0.60	0.30	0.60	2.4	2.6	98.9	0.3	0.4	99.9	0.19	0.04	50	1	2	---	---					
Aug. 2005	0.47	0.55	0.25	0.49	3.0	4.3	98.8	0.4	0.7	99.8	0.20	0.04	68	2	2	---	---					
July 2005	0.55	0.94	0.29	1.18	2.7	3.5	98.6	0.6	1.4	99.8	0.19	0.11	69	6	105	---	---					
June 2005	0.58	0.69	0.15	0.30	2.5	4.6	98.6	0.7	1.3	99.7	0.18	0.09	80	2	2	---	---					
May 2005	0.77	1.09	0.35	0.56	1.3	1.8	99.0	0.2	0.3	99.9	0.17	0.12	28	0	0	>100	>100					
Apr. 2005	1.12	2.51	0.62	2.85	1.3	1.6	98.7	0.2	0.3	99.8	0.17	0.15	48	---	---	---	---					
Mar. 2005	0.80	2.90	0.47	1.15	1.8	4.5	97.4	0.8	2.3	98.3	0.16	0.29	130	---	---	---	---					
Feb. 2005	0.70	1.27	0.53	1.04	1.4	1.6	98.9	0.2	0.3	99.9	0.13	0.05	70	---	---	>100	>100					
Jan. 2005	0.96	2.54	0.75	2.35	1.3	1.4	98.8	0.3	0.4	99.8	0.14	0.06	30	---	---	---	---					
Dec. 2004	0.94	1.52	0.71	1.16	1.3	1.5	98.5	0.2	0.2	99.9	0.15	0.05	35	---	---	---	---					
Nov. 2004	0.61	1.18	0.41	0.86	1.7	2.1	99.0	0.3	0.4	99.9	0.17	0.04	50	---	---	>100	>100					
Oct. 2004	0.68	1.06	0.47	0.95	1.7	2.0	99.0	0.2	0.4	99.9	0.17	0.04	36	1	1	---	---					
Sep. 2004	0.86	1.82	0.69	1.88	1.6	1.9	98.8	0.3	0.5	99.8	0.20	0.03	37	0	0	---	---					
Aug. 2004	0.69	1.34	0.46	1.37	1.3	2.0	99.3	0.3	0.3	99.9	0.22	0.04	38	5	21	>100	>100					
July 2004	0.59	2.74	0.34	2.65	1.8	2.4	99.1	0.2	0.2	99.9	0.20	0.04	58	5	8	---	---					

Date	Influent Flow (MGD)		Effluent Flow (MGD)		BOD <sub>5</sub> (mg/l)		BOD <sub>5</sub> % Removal	TSS (mg/l)		TSS % Removal	Total Phosphorus (mg/l)	Ammonia Nitrogen (mg/l)	Copper (ug/l)	Fecal coliform (cfu/100 ml)		LC50	C-NOEL 7-Day
	Monthly average	Maximum Daily	Monthly average	Maximum daily	Monthly average	Maximum Daily	Monthly average	Monthly average	Maximum Daily	Monthly average	Monthly average	Monthly average	Monthly average	Monthly average	Maximum Daily	Ceriodaphnia	Ceriodaphnia
Existing Limits	1.08 note 1	****			note 2	***	85%	note 2	***	85%	0.3 (Apr -Oct) 0.75 (Nov-Mar)	0.56 (May -Oct.) 8.5 (Nov.)	4	200	400	≥100	≥89
Proposed Limits	1.08 note 1	****			note 2	***	85%	note 2	***	85%	0.2 (Apr -Oct) 0.75 (Nov-Mar)	0.56 (May -Oct.) 8.5 (Nov.) 15.3 (Dec-Apr.)	10	200	400	≥100	>92
June 2004	0.61	0.76	0.41	0.64	1.9	2.0	98.9	0.2	0.2	99.9	0.18	0.05	63	1	3	---	---
May 2004	0.80	1.29	0.75	1.37	2.4	2.7	95.0	0.6	0.7	99.6	0.16	0.09	46	0	0	>100	89
Apr. 2004	1.28	2.43	1.36	2.45	3.1	4.1	96.2	0.2	0.3	99.8	0.14	0.03	53	---	---	---	---
Mar. 2004	0.71	1.52	0.73	1.55	3.5	5.6	97.1	0.2	0.4	99.9	0.14	0.06	---	---	---	---	---
Feb. 2004	0.50	0.56	0.44	0.69	2.3	2.8	98.7	0.3	0.4	99.9	0.14	0.08	---	---	---	>100	>100
Jan. 2004	0.65	0.96	0.63	1.17	1.3	2.0	99.1	0.2	0.4	99.9	0.13	0.04	---	---	---	---	---
Dec. 2003	1.04	2.34	1.09	2.70	2.8	4.8	97.1	1.9	6.8	97.2	0.19	0.03	---	---	---	---	---
Nov. 2003	0.78	1.01	0.55	0.71	2.2	3.5	98.7	0.2	0.3	99.9	0.20	0.03	---	---	---	>100	>100
Oct. 2003	0.79	1.97	0.44	1.55	0.9	1.5	99.1	0.4	1.2	99.7	0.24	0.03	---	0	0	---	---
Maximum	1.28	2.90	1.36	2.85	3.5	2.8	99.3	1.9	6.8	99.9	0.24	0.29	130	6	105		
Minimum	0.47	0.55	0.15	0.30	0.9	1.4	95.0	0.2	0.2	97.2	0.13	0.03	28	0	0		
<b>Average</b>	0.75	1.48	0.55	1.34	2.0	2.8	98.4	0.4	0.8	99.7	0.17	0.07	55	2	12		

1. The 1.08 MGD flow limit is running annual arithmetic average

2. BOD<sub>5</sub> and TSS monthly average for May 1 - Oct 31 is 5.6 mg/l. BOD<sub>5</sub> and TSS monthly average for Nov 1 - Apr 30 is 30 mg/l.

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2006 Reissuance Page 2 of 2

## **RESPONSE TO PUBLIC COMMENTS**

From August 22, 2006 until September 20, 2006, the United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) solicited Public Comments on a draft NPDES permit, developed pursuant to an application from the Town of Spencer Wastewater Sewer Commission for its wastewater treatment plant, located in Spencer, Massachusetts. After reviewing the comments received, EPA has made the final decision to issue the permit authorizing the discharge. The following describes and responds to comments, and describes any subsequent changes to the draft permit. A copy of the final permit may be obtained by writing to Mark Voorhees, United States Environmental Protection Agency, 1 Congress Street, Suite 1100 (CPE), Boston, Massachusetts, 02114-2023 or by calling (617) 918-1537.

Copies may also be obtained from <http://www.epa.gov/region1/npdes/index.html>.

### **A. Comments Submitted by Cindy Delpapa, Commonwealth of Massachusetts, Riverways Program**

**Comment A1:** The Fact Sheet notes there have been bypass events at this facility. Since the monthly average effluent and most of the influent volumes are consistently well below the design flow of the facility, the need to bypass indicates a significant inflow and infiltration problem in the collection system. The standard permit requirements outlining I/I reduction efforts are a start but the permittee needs to implement I/I reduction strategies quickly, not just develop a reduction plan, if more bypass events are to be avoided. The prohibition against bypasses is strong incentive for immediate I/I removal and it is our hope the Permittee will work on I/I removal in addition to finalizing its remediation plan.

**Response A1:** Part I. B of the permit, Unauthorized Discharges, recognizes that bypass events are not permitted. Specifically, Part I. B states that, "Flow in excess of the plant's treatment capacity which does not receive full secondary treatment is not a permissible bypass under 40 CFR §122.41(m) and is not authorized by this permit". Thus, during any bypass event, the permittee would be in noncompliance with the conditions of the permit and subject to enforcement action. As noted by the commenter, prohibition against bypasses is a strong incentive for immediate I/I removal.

Furthermore, it is stated in the conditions of the permit, under Part I. C. 3, that The Permittee shall develop and implement a plan to control infiltration and inflow (I/I) to the separate sewer system. This plan is to be submitted to EPA and MassDEP within six months of the effective date of the permit, and must describe the Permittee's means for preventing infiltration/inflow related effluent limit violations and all unauthorized discharges of wastewater, including overflows and bypasses due to excessive infiltration/inflow. In this plan, the Town is required to provide the funding level and funding sources that will be used to remove sources of I/I. While we expect the Town to

move forward expeditiously to secure the necessary funding, we recognize that the Town must secure the funding using defined appropriation procedures.

**Comment A2:** The (phosphorus) limits in the draft permit are partially technology based and also a result of TMDL load allocations for downstream impoundments. The 0.2 mg/l limit is likely to fall short of reaching the EPA recommended ecoregional instream concentration in Cranberry Brook since there is limited dilution of the effluent in summer months but the load limits appear to be adequate to meet the TMDL load allocation for Quaboag Pond. The daily load limit is to be calculated as a seasonal average and reported at the end of the season. It is our opinion the end of season calculation is not an ideal approach to controlling phosphorus loads in the receiving water-especially with a facility struggling with excessive I/I. We hope this seasonal load limit will be reconsidered if the actual monthly and daily loads indicate problematic trends correlated to water quality problems (algal blooms, depressed DO, organic enrichment, aesthetic issues). While, as the Fact Sheet notes, Cranberry Brook is not listed as nonattainment for the indicators usually associated with cultural eutrophication it is not accurate to say Cranberry Brook does not experience these problems since the brook is listed as unassessed, as opposed to attaining uses, by the MassDEP, thus its status is unknown.

**Response A2:** EPA commits to reevaluate the phosphorus limitations based on a review of future daily and monthly phosphorus loading from the facility and available receiving water quality data. If a future review shows that a shorter averaging period is necessary to achieve water quality standards, EPA will consider reopening the permit and proposing such a limit (e.g., monthly average limit) in a permit modification.

As stated in the Fact Sheet, Cranberry Brook and the Sevenmile River are not listed for excursions of water quality standards for nutrients, DO, aquatic plants or other indicators of eutrophication. The purpose of this statement was to clarify that there is **not** current information available to ascertain whether the rivers are experiencing cultural eutrophication and whether water quality based phosphorus limits more stringent than those needed for Quaboag Pond are warranted at this time. However, EPA acknowledges the unknown status of these receiving waters. During the site visit the permit writer viewed Cranberry Brook in the vicinity of the discharge outfall and its confluence with the Sevenmile River and did not observe any evidence of cultural eutrophication. In any event, the Fact Sheet clearly states that should new water quality information become available or if the state develops water quality criteria that would require more stringent limits, the permit may be reopened and modified.

**Comment A3:** We agree with the statement in the Fact Sheet regarding the Spencer Facility's admirable efforts in maintaining low ammonia concentrations year-round. We also agree with the reasoning provided for the year-round ammonia limits. With such a low dilution in the Brook and the status of the waterway unassessed, providing the safe guard of a year-round ammonia limit is a sound idea.

**Response A3:** Comment noted for the record.

**Comment A4:** The facility is unique because it is one of the few plants which frequently treats more influent than it discharges due to “loss” of treated wastewater in the (created) wetland beds. Since there is often a significant dichotomy in the influent and effluent numbers, we hope the Permittee will continue to report influent volumes. Because of the difference in the flow treated at the facility and the discharge volume, we would like to recommend a slight modification to Part I.A.1.f to have the annual influent flow exceeding 80% design flow in a calendar year act as the trigger for a report to MassDEP. This request is based on the intent of this clause which revolves around the capacity of the plant to treat flows and this volume is better reflected by influent numbers for the facility.

**Response A4:** EPA agrees with this comment and has clarified Part I.A.1.f in the final permit to require the annual influent flow exceeding 80% design flow in a calendar year act as the trigger for a report to MassDEP.

**Comment A5:** The draft permit proposes to reduce the frequency of the whole effluent toxicity testing to twice annually based on recent test results. The PCS database indicates there was no WET data submitted for August 2005 which could be construed as a failure of the tests. May 2004 had a C-NOEL test result that would be a failure based on the new dilution factor. While we appreciate the requirement for retesting of the effluent should there be a WET test failure, we would still like to support the reduction in WET testing be delayed for at least another permit cycle given the change in the C-NOEL to 92%, and the ongoing copper exceedences.

**Response A5:** In August 2005, the LC50 was reported as >100%. The C-NOEC was not reported because the test was determined to be invalid due to 70% survival (less than the EPA acceptability criterion of  $\geq 80\%$ ) in the dilution water sample taken from Cranberry Brook, collected on August 19, 2005. As explained in a letter from the Town of Spencer to EPA (dated September 29, 2005), although no value was reported for C-NOEC, the test showed that treatment plant effluent (sample of 100% effluent) was not toxic to the test organisms.

The May 2004 chronic test reported a C-NOEC of 89%. The dilutions (percent effluent concentrations) used for this test were 6.25, 12.5, 25, 50, 89, and 100%. Only the 100% test failed the reproduction portion of the test. It cannot be deduced from this test whether a sample with an effluent concentration of 92% would have failed the test because this dilution was not analyzed. Therefore, EPA views the results of this test as passing or complying with the permit limit. However, EPA has reviewed more recent WET tests submitted for February, May, and August 2006. The results of these tests for LC50 (48-hour and 7-day), C-NOEC and C-LOEC were all >100%. Given the recent results and demonstrated consistency in the WWTF's ability to meet the WET limits, the final permit retains the requirement for two annual WET tests. However, as a contingency, the permit proposes to require that if any future toxicity test should fail to comply with the limits, the Permittee must re-test the effluent within fourteen days of the original test.

**Comment A6:** The 7Q10 flow for this facility was extrapolated using watershed area and flow data from the Seven Mile River gage. One potentially complicating factor was not mentioned in the narrative on the flow and this is the 0.97 mgd permitted and registered withdrawal of potable water in this river section. It is possible that a withdrawal of this size could have an affect on base flow since water withdrawals tend to peak during low flow months drawing from groundwater reserves feeding the river. Withdrawals from the groundwater of such a small drainage could mean there is a local dewatering in the stream. Has data been collected or observations made to see if the withdrawal does influence low flows? If this is a possibility, the dilution factor is likely not conservative enough and we hope the permit conditions can be reconsidered.

**Response A6:** EPA and MassDEP are not aware of existing data that could be used to evaluate the potential impacts of well withdrawals on low flow conditions in Cranberry Brook. It is difficult to ascertain whether the well is affecting the estimated 7Q10 flow for Cranberry Brook without site specific data. Without such data, EPA is relying on continuous stream flow data from a nearby gage on continuous flow data collected at the nearby USGS gage located on the Sevenmile River to estimate low flow conditions for this permit.

**B. Comments Submitted by Gregory J. McVeigh, Wright-Pierce on behalf of the Spencer Sewer Commission**

**Comment B1:** EPA/MADEP have included in Part I.A.1.f, “The Permittee is required, when the average annual flow in any calendar year exceeds 80 percent of design flow, to submit a report to MassDEP on how the Permittee will remain in compliance with the limitations in the permit, specifically flow.” Please confirm that the “average annual flow” reference is the influent flow. Also, explain the need to comply with influent flow limitations if discharge limitations are being met?

**Response B1:** The annual average flow referred to Part I.A.1.f is for influent flow. Part I.A.1.f in the final permit has been revised to clarify this requirement.

Influent flow limitations are necessary, even when discharge limitations are currently being met, to ensure that that future growth will not cause high flow-related effluent violations. As noted in the Fact Sheet, bypasses of secondary treatment have occurred at the facility because of excessive I/I in the collection system. Spencer is required to address excessive I/I and prevent future bypasses from occurring.

The flow limit, which is established at the design flow of the facility, also ensures that the water quality based limits in the permit are protective. The dilution factor used to calculate water quality-based effluent limits is established using the design flow. If discharge flows were to exceed the flow limit, the dilution factor would decrease and the water quality-based limits would not be protective of water quality standards.

**Comment B2:** 1/Month E. coli bacteria sampling during May 1- October 31 has been added. This is in advance of MADEP moving to E. coli testing at the end of 2006.

Therefore, for a period of time Spencer WWTP will be conducting 1/month, between May 1-October 31, *E. coli* and fecal coliform bacteria sampling. The Commission requests that the need to test for Fecal Coliform time out at the time the proposed revisions to the Massachusetts Water Quality Standards is adopted.

**Response B2:** EPA has revised the final permit such that the fecal coliform limits and monitoring will be eliminated one year from the effective date of the permit, when the *E. coli* limits go into effect. *E. coli* will be monitored and reported once per month for the first year of the permit, and thereafter increase to 1/week. The seasonal period during which both the fecal coliform and the *E. coli* limits are effective has been extended to April 1 – October 31 to ensure that the complete recreational season is covered.

**Comment B3:** Ammonia-Nitrogen limits for December 1 – April 30 of 15.2 mg/l or 136 lbs/day has been added. The winter limits are “precautionary” (if, nitrification were to cease during the winter) and does not seem warranted based on Spencer’s past performance. Also, the winter limits were developed based on less critical in-stream conditions than the November limits (pH 7.1 @ 5 degrees C) vs. pH 6.5 @ 5 degrees C and instream limit of 5.0 mg/l). This means that either the November limits are too low or the December limits are too high. Why are instream criteria for determining the limits different?

**Response B3:** While the Spencer WTF has performed very well at maintaining ammonia removal and discharging very low effluent ammonia concentrations during the cold-weather seasons, a reasonable potential still exists for the facility to cause or contribute to in-stream ammonia toxicity if nitrification were to fail at the facility during the cold weather season. Therefore, ammonia limits for the months of December to April are included in the final permit.

The existing permit includes an ammonia limit of 8.5 mg/l for the month November. As discussed, the facility has complied with this limit. This limit has been established to prevent in-stream toxicity and has been retained in accordance with antibacksliding requirements. The limits developed for the months of December to April are based on estimated in-stream pH and on the available dilution (30Q10), which was calculated for this period using stream flow data as discussed in the Fact Sheet. These conditions differ from conditions for the month of November, which has a lower available dilution flow and higher pH, resulting in a more stringent limit.

**Comment B4:** Total phosphorus (TP) May 1-October 31 seasonal average limit (0.79 lbs/day) is based on 0.2 mg/l and assumes that the limit could be met if the average summer discharge flow is 0.47 MGD. The current TP loading for May-October in the TMDL was based on Spencer WWTP’s DMR flows and concentrations reported (see second paragraph, page 42 of the TMDL). Please identify which DMR flow and load data were used by EPA/MassDEP to determine the current 131 kg/yr or 0.79 lbs/day loading.

The Fact Sheet shows that monthly average summer discharge flow during May 1-October 31 at the Spencer WWTP was 0.644 MGD. If the loading limit is based on actual discharge flows then why is an undocumented average summer discharge flow at the Spencer WWTP of 0.433 MGD required to meet the limit?

**Response B4:** The Spencer WLA is based on the TMDL analyses for Quaboag Pond. The analysis used a water quality model, ambient water quality data collected in the lake, and data collected from strategic locations in the watershed, including effluent data from the Spencer WWTF. This analysis is based on data collected during 2003. For the critical growing season, the WLA for the Spencer WWTF was set at 131 kg/yr. This WLA was derived using the model, which is based on data collected during 2003 and after considering reductions from other watershed phosphorus sources. The TMDL states that the Spencer WWTF would meet this WLA during the growing season if the effluent total phosphorus concentration is no higher than 0.2 mg/l as phosphorus and the average effluent flow was below 0.47 MGD. This flow value is in agreement with the average daily effluent flow rate for the growing season of 2003.

The commenter states that the monthly average summer discharge flow is 0.644 MGD, but does not specifically identify which data in the Fact Sheet were used to calculate this value. It appears that the commenter may have used the influent flow data in Attachment 1 and calculated the average flow for the months of May-September for 2004 and 2005. Based on using the effluent flow data in Attachment 1 for the same months, the summer average effluent flow is 0.399 MGD, which more closely reflects the TMDL flow value of 0.47 MGD.

**Comment B5:** The total phosphorus November 1-April 30 seasonal average limit (1.19 lbs/day) is based on a “winter flows are typically 50% higher” over the May 1-October 31 seasonal average limit, holding the concentration at 0.3 mg/l and assuming that the limit could be met if the average winter discharge flow is 0.47 MGD. Does EPA/MassDEP have site specific stream data to substantiate the “winter flows are typically 50% higher”?

Seeing “there is no specific information concerning the possible effect of winter adsorption or storage of phosphorus with subsequent release” why not establish a November 1-April 30 seasonal average limit based on a concentration of 0.3 mg/l and realistic monthly average winter discharge flow of 0.8257 MGD (see Fact Sheet). This equates to a limit of 2.07 lbs/day which provides a reduction in winter phosphorus concentrations and loads in keeping with the TMDL and provides a protective winter loading to both groundwater and soils between the constructed wetlands and nearby surface waters.

**Response B5:** The TMDL states that the winter instream flows are typically 50 % higher than summer flows and uses this as part of the basis for determining the seasonal phosphorus wasteload allocation for the Spencer WWTF. The average winter and summer flows for the Sevenmile River at gage 01175670 for 2003 were 23.22cfs and

10.63 cfs, respectively (Socolow, Zanca, Driskell, and Ramsbey 2003). The winter flow is approximately 50 % higher than the summer flow.

The total phosphorus November 1-April 30 seasonal average limit of 1.19 lbs/day is based on the TMDL analysis which considered seasonal tributary flow rates when calculating the seasonal wasteload allocation (WLA) for the Spencer WWTF. The commenter is requesting a higher seasonal phosphorus load than the WLA in the TMDL. The permit limits must be consistent with the WLA in the TMDL. Also, it appears that the commenter used the influent flows rather than the effluent flows in their calculation.

**Comment B6:** The second paragraph of “Paragraph B. Unauthorized Discharges” of the Draft NPDES permit requires all flows to receive full secondary treatment. The Spencer Sewer Commission, as part of the 1987 WWTP upgrade, had the existing Flo-Matcher wastewater pump station redesigned to be used as an influent high stormwater pump station to eliminate sanitary sewer overflows (SSO’s) within the collection system. This pump station redirects influent flows, above 5.4 MGD, into the treatment plant into the last two wetland beds for storage and discharge into the wetland effluent line to UV disinfection via underdrain flow from the wetlands. The influent high storm water pump station historically is used less than once per year. The current treatment process configuration prevents the Spencer WWTP and collection system from discharging untreated wastewater to surface waters, and enables the Spencer WWTP to comply with their effluent discharge limits during peak storms. The Commission request that the second paragraph be removed from the Draft NPDES permit.

**Response B6:** Occasional bypasses of secondary treatment occur at the Spencer WWTF because of excessive of wet-weather related I/I in the collection system. While partially treated bypasses are environmentally preferable to untreated SSOs, bypasses of the nature occurring in Spencer may not be authorized in NPDES permits (see 40 CFR 122.41(m)(4)(i), *Prohibition of bypass*). Such bypasses may be subject to enforcement since they do not meet the conditions defined in 40 CFR §122.41(m)(i)(A-C) because the removal of excessive I/I to reduce influent flow is a feasible alternative to the bypasses. Therefore, the final permit does not authorize secondary treatment bypasses at the facility. Continued efforts by the Town of Spencer to remove excessive I/I should eliminate the occurrence of bypasses at the facility.

**Comment B7:** Page 2 of the Fact Sheet discusses additional monitoring (BOD, TSS and total phosphorus), but conditions are not found in the permit. Please clarify.

**Response B7:** The reference on page 2 of the Fact Sheet that indicates additional monitoring (BOD, TSS and total phosphorus) for bypass events is in error. The final permit does not include new monitoring requirements for bypasses.

**Comment B8:** Paragraph C. 3, Infiltration/Inflow Control Plan. The Spencer Sewer department personnel, as a part of the current NPDES permit, have developed and submitted an annual I/I control plan addressing those items outlined in the Draft NPDES permit. Is it necessary for the Sewer Department to develop and submit a new I/I Control

Plan within 6 months of the effective date of the new permit or can they submit the annual update of the current I/I Control Plan by March 31, 2007?

**Response B8:** The final permit requires that that Spencer submit an Infiltration/Inflow Control Plan within six months of the effective date of the permit and that the plan must address all of the requirements specified in the final permit. Spencer's existing plan may be submitted if it meets these requirements or revised to meet the requirements.

**C. Comments Submitted by Andrea F. Donlon, River Steward, Connecticut River Watershed Council**

The commenter notes that because the Spencer WWTP discharges near the confluence with the Sevenmile River, it affects the water quality along part of a proposed canoe route, Quaboag River Canoe Trail.

**Comment C1:** The Fact Sheet associated with this permit was very complete, and contained rationale that is often missing in other Fact Sheets we have reviewed.

**Response C1:** Comment noted.

**Comment C2:** We are glad to see that this facility is using ultraviolet radiation treatment for bacteria, given impairments downstream for chlorine and pathogens. The recent bacteria levels shown in the Fact Sheet Attachment 1 indicate that bacteria levels are quite low. Chlorine has been eliminated. We are also pleased to see tertiary treatment through (created) wetland beds. This provides some beneficial groundwater recharge and an extra level of treatment.

**Response C2:** Comment noted.

**Comment C3:** We support the addition of *E. coli* testing in addition to fecal coliform testing, in preparation to the proposed changes in the state water quality standards. However, we recommend that *E. coli* testing be done as frequently (at the same time as) fecal coliform.

**Response C3:** The final permit requires *E. coli* monitoring and includes limits that will become effective in one year from the effective date of the permit (see Response B2). When the *E. coli* limits become effective, the monitoring frequency will increase to 1/week.

**Comment C4:** Seasonal limits for BOD, TSS, nutrients and dissolved oxygen (DO) should incorporate recreation period of April 1 to October 31 every year.

**Response C4:** The seasonal limits for these constituents are based on a seasonal period that represents the critical conditions under which these pollutants will have maximum impact on water quality. The selection of the critical period for these parameters is independent of the recreational period because the water quality impacts of concern for

these constituents are related to aquatic life health, not recreational use. For example, DO criteria are included in the Massachusetts Water Quality Standards to protect aquatic life. Critical conditions for DO which is impacted by BOD and ammonia occurs during warm-weather low-flow conditions when the oxygen carrying capacity of water is at its lowest and when biochemical oxidation and respiration rates (oxygen demand) are highest. During the month of April in Massachusetts, receiving waters typically have higher flow rates (more dilution and faster retention times) and always have cooler temperatures than the warm-weather summer and early fall season. As a result, it is unnecessary to extend these seasonal limits to include April because the impacts to aquatic life from these constituents are significantly less in April than during the low-flow high temperature conditions for which the permit limits were developed.

**Comment C5:** We support more stringent total phosphorus limits and more frequent testing of total phosphorus as proposed in the draft permit. This is being done as part of a TMDL to reduce nutrient loads in Quaboag Pond, which lies downstream of the Sevenmile River. However, although there are no numerical criteria for total phosphorus, the 1986 Quality Criteria of Water recommends in-stream phosphorus concentrations of 0.1 mg/L for any stream not discharging directly to lakes or impoundments and 0.05 mg/L in any stream entering a lake or reservoir. Given the small dilution factor for Cranberry Brook, the proposed permit limits may not be stringent enough to meet ecoregional recommendations for instream phosphorus in Cranberry Brook. Thus, even more stringent total phosphorus limits may be more appropriate for protection of the receiving waters directly downstream.

**Response C5:** As indicated in the Fact Sheet, Cranberry Brook and the Sevenmile River are not listed for nonattainment of water quality standards for nutrients, DO, aquatic plants or other indicators of eutrophication. Currently, available information is insufficient to determine whether the rivers are experiencing cultural eutrophication and whether water quality-based phosphorus limits more stringent than needed for Quaboag Pond are warranted at this time. However, EPA acknowledges the unknown status of these receiving waters. During the site visit the permit writer viewed Cranberry Brook in the vicinity of the discharge outfall and its confluence with the Sevenmile River and did not observe any evidence of cultural eutrophication. In any event, the Fact Sheet clearly states that should new water quality information become available or if the state develops water quality criteria that would require more stringent limits, the permit may be re-opened and modified.

**Comment C6:** The facility has not been complying with its permit limits for copper, nor is it likely to comply with the proposed (less stringent) limits. It is not clear when or how the facility will come into compliance. The permit should establish deadlines for complying with the Clean Water Act.

**Response C6:** EPA can only establish schedules in permits for new or more stringent permit limitations. However, the Town of Spencer is presently under an administrative order from EPA's Office of Environmental Stewardship (OES) to take steps to address the copper limit violations.

**Comment C7:** We notice that chronic NOEC and LC50 testing is proposed to be changed from quarterly to twice a year. We would like to see quarterly testing remain in place for this facility, especially given the high copper levels in the discharge.

**Response C7:** As shown by the WET tests results, the discharge of copper does not appear to be causing either acute or chronic toxicity to the test organisms. (Also, please see Response A5).

**Comment C8:** The Fact Sheet for this permit acknowledges the Infiltration and Inflow (I/I) problem at this facility. On page 2 of the Fact Sheet, it states that secondary treatment process bypass events occur at the facility due to wet weather conditions that result in high I/I in the collection system. According to the Fact Sheet, there have been four bypass incidents since February of 2003. The draft permit in Section C2 calls for a preventative maintenance program to prevent overflows and bypasses, including an inspection program. Section C3 of the permit calls for an I/I plan to be submitted to EPA and MassDEP within six months of the effective date of the permit. With respect to the bypass issue, there are no deadlines or milestones established in the draft permit. Given the seriousness of the I/I problem at this facility, we request that the final permit set certain conditions and timelines for making bypass events a thing of the past.

**Response C8:** EPA compliance will review the situation and take appropriate steps to reduce and eventually eliminate the high flow bypasses. The permit does not authorize the bypasses thus their occurrences must be handled by the EPA Enforcement Office.

#### REFERENCES

USGS Water Resources Data Report for Massachusetts and Rhode Island, Water Year 2003 By R.S. Socolow, J.L. Zanca, T.R. Driskell, and L.R. Ramsbey  
Water-Data Report MA-RI-03-1